

**HABITAT CONSERVATION PLAN
FOR WASHINGTON COUNTY, UTAH**

**RESTATED AND AMENDED
OCTOBER 2020**



Washington County Commission
197 East Tabernacle Street
St. George, Utah 84770



HABITAT CONSERVATION PLAN FOR WASHINGTON COUNTY, UTAH



Prepared for

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St. George, Utah 84770

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EXECUTIVE SUMMARY

Purpose and Need

Washington County, Utah, (the County) prepared a Habitat Conservation Plan (HCP) in 1995 that provided for the conservation of the Upper Virgin River population of the Mojave desert tortoise (*Gopherus agassizii*; MDT) (Washington County Habitat Conservation Plan Steering Committee and SWCA Environmental Consultants 1995; hereafter 1995 HCP). This document (the Amended HCP) restates and amends the 1995 HCP and supports the County's application for renewal of Incidental Take Permit (ITP) No. TE036719. A Renewed/Amended ITP is needed to extend the County's access to previously authorized, but unused, incidental take of the MDT for an extended term of 25 years. Amendments to the 1995 HCP are needed to incorporate developments in the best available science pertaining to the MDT, comply with current USFWS regulations pertaining to ITPs, incorporate current policy regarding amended HCPs (as applicable), and clarify the language to more accurately reflect the intent of the 1995 HCP. This summary provides a brief description of the Amended HCP. In addition, this Amended HCP documents the conservation successes of the County and its HCP Partners achieved during implementation of the 1995 HCP. If there are any discrepancies between this summary and other sections of the Amended HCP, the other section shall be viewed as controlling.

Extended Permit Term, Plan Area, and Permit Area

Based in part on planning projections of buildout potential (which occurs at a human population in Washington County of approximately 330,000), the County selected a 25-year duration for the Renewed/Amended ITP Term. This Renewed/Amended ITP Term generally coincides with the long-term population projection for 2045 (approximately 356,000 people).

This Amended HCP will be implemented in Washington County, Utah (the Plan Area). The Renewed/Amended ITP will reauthorize incidental take within the portion of the Plan Area that is generally east of the Beaver Dam Mountains (the Permit Area).

Covered Activities

The activities addressed by this Amended HCP (the Covered Activities) are those otherwise lawful, non-federal land use or land development activities that are under the direct control of the County and performed within the Permit Area that are reasonably certain to take one or more MDT. Generally, Covered Activities consist of the following:

1. A broad set of land development and land use activities that occur on non-federal land outside the Red Cliffs Desert Reserve (Reserve), such as land clearing and building construction, grazing and farming, utilities and other infrastructure, resource extraction and renewable energy development, and others; and
2. A narrow set of land development and land use activities that occur on land inside of the Reserve and performed in accordance with the applicable protocols and other measures specified in the conservation program of this Amended HCP. These include recreation uses; utility, water development, and flood control activities; management of the Reserve; and certain other specific uses.

This Amended HCP does not expand the list of Covered Activities beyond those addressed in the 1995 HCP. The proposed Northern Corridor highway (the Northern Corridor) is not a Covered Activity of the

Amended HCP because it is federal in nature and, thus, requires consultation under Section 7 of the Endangered Species Act (ESA). However, this Amended HCP does not expressly prohibit uses of the Reserve that are not Covered Activities. Incidental take of the MDT that may be associated with such activities is not covered by this Amended HCP nor the Renewed/Amended ITP. Proponents of activities within the Reserve that are not Covered Activities are responsible for achieving compliance with the ESA through other means.

Covered Species

The Renewed/Amended ITP authorizes take of species that are adequately addressed by this Amended HCP (the Covered Species). The MDT is listed as threatened with extinction and is the only Covered Species of this Amended HCP.

Incidental Take

Updated Habitat Mapping

The 1995 HCP estimated the extent of occupied and potential habitat for the MDT in the Plan Area based on the best available information at the time but acknowledged that the data were incomplete and imprecise. Since 1995, new, relevant information has become available regarding the extent of areas that are known to or may be used by the MDT in the Plan Area (MDT Habitat).

This Amended HCP provides updated estimates of the amount and extent of MDT Habitat in the Plan Area using a peer-reviewed habitat model prepared by the U.S. Geological Survey (USGS) with certain refinements to address land uses incompatible with MDT Habitat and other conditions specific to the Upper Virgin River Recovery Unit. Updated estimates of MDT Habitat were generated for the conditions circa 1995 and for conditions circa 2019. The refined model results circa 2019 were classified as either Occupied or Potential MDT Habitat based on cumulative records of MDT observations.

Habitat Surrogate

Take arising from the Covered Activities may occur through directly killing or wounding individual MDTs or through indirectly harming MDT by significantly altering MDT Habitat in ways that lead to actual death or injury of an individual MDT. This Amended HCP accounts for incidental take of the MDT in terms of a habitat surrogate metric: the acres of MDT Habitat that would be subject to direct modification by the Covered Activities.

However, the County emphasizes that establishing and applying a new surrogate metric in this Amended HCP, which incorporates the current best available information about MDT Habitat, does not alter the underlying amount or extent of incidental take subject to renewal for the Renewed/Amended ITP Term. Instead, this clarification only changes the means by which this previously authorized take is measured for the duration of the Renewed/Amended ITP Term.

Used and Reauthorized Incidental Take

Through 2019, the Covered Activities have caused the loss of 22,822 acres of MDT Habitat or 26% of the amount of take authorized under the 1995 HCP. The County requests the reauthorization of the remaining unused incidental take in an amount equivalent to the loss of up to 66,301 acres of MDT Habitat within the Permit Area. Up to 200 acres of this take could be applied to Covered Activities inside the Reserve, subject to compliance with other conservation measures specified in this Amended HCP.

Impacts of the Take Reauthorization

PRIOR ANALYSES

This Amended HCP adopts, with clarifications, the same set of Covered Activities as the 1995 HCP. This Amended HCP also adopts the same conservation measures as the 1995 HCP—excepting those conservation actions that have been completed during the original term of the ITP. Therefore, the implementation of this Amended HCP remains consistent with the analyses in the 1995 Environmental Impact Statement and 1996 Biological Opinion. In consideration of the No Surprises assurances provided to ITP permittees, substantial new analysis of the impacts of the reauthorized take is not warranted—the USFWS has already deemed the authorized take to be consistent with the issuance criteria for an ITP.

TEMPORAL IMPACTS

The County requests additional time within which to complete its incidental take. For the Renewed/Amended ITP Term, the County and the HCP Partners commit to continue implementing the conservation program of this Amended HCP and commit to providing new resources to implement ongoing conservation measures. Therefore, the impact of extending the duration of authorized takings will be beneficial to the conservation of the MDT through the commitment of additional resources and the implementation of additional conservation actions.

IMPACTS OF UPDATED HABITAT MAPPING AND ABUNDANCE ESTIMATES

Using the updated habitat modeling, the amount of incidental take subject to reauthorization (i.e., 66,301 acres of MDT Habitat) is 19% of the total amount of MDT Habitat available in the Plan Area circa 1995 and 21% of the MDT Habitat available in the Plan Area circa 2019. The proportion of MDT Habitat associated with incidental take remains similar to the proportions evaluated for the 1995 HCP (i.e., “Development of the entire take area would result in the loss of... approximately 22 percent of the entire desert tortoise habitat within the County” [USFWS 1995:28]).

The proportion of the Plan Area population of MDT subject to Covered Activities during the Renewed/Amended ITP Term is roughly similar to the proportion estimated in the 1995 HCP (i.e., 21% in this Amended HCP compared to 15% in the 1995 HCP) and is, therefore, generally consistent with the prior analyses.

Roles and Responsibilities

Washington County

The County is the ITP permittee and is responsible for administering this Amended HCP and complying with the terms and conditions of the Renewed/Amended ITP. The actions of the County are made through the deliberations and actions of the respective County legislative and executive bodies. The Washington County Commission provides final approval for all actions taken on behalf of the County pertaining to this Amended HCP.

The County provides for the HCP Administrator and HCP Biologist staff positions necessary to administer this Amended HCP.

Habitat Conservation Plan Partners

The County implements the Washington County HCP with the assistance of the other HCP Partners. The HCP Partners are those public entities with designated responsibility for implementing parts of the Washington County HCP and that are signatories to the Implementation Agreement associated with the Washington County HCP. The HCP Partners are:

- the USFWS,
- the Bureau of Land Management (BLM),
- the Utah Department of Natural Resources (UDNR),
- the Utah School and Institutional Trust Lands Administration (SITLA),
- Washington County, and
- Ivins City.

The responsibilities for implementing this Amended HCP may be broadly summarized (as a noninclusive list) as follows:

- The BLM has primary responsibility for the acquisition of non-federal lands within the Reserve.
- The BLM and UDNR (through Snow Canyon State Park) have primary responsibility for the long-term management of lands within the Reserve.
- The County has primary responsibility for administering the HCP, surveying for and removing MDT from certain lands subject to Covered Activities and providing a defined amount of financial support to the BLM and UDNR toward acquisition, management, and monitoring actions within the Reserve.
- The UDNR (through its Division of Wildlife Resources [UDWR]) has primary responsibility for translocating tortoises collected from lands subject to incidental take to other habitat areas and for biological monitoring of MDT and other listed species.
- SITLA is responsible for allowing its unacquired Reserve lands to be managed by the County for the benefit of the MDT and for allowing the BLM to acquire its lands as opportunities become available.
- SITLA and UDNR (through UDWR) have primary responsibility for implementing conservation measures for listed plants.
- The USFWS provides oversight of compliance with the terms and conditions of the ITP and provides guidance for the translocation program.
- Ivins City regulates allowed residential development activities in Reserve Zone 1.
- All HCP Partners contribute to adaptive management decisions through participation on advisory and technical committees.

Municipal Partners, Impact Fees, and Participation Agreements

In addition to the HCP Partners, municipalities contribute to this Amended HCP through Interlocal Agreements with the County (the Municipal Partners). The Municipal Partners collect fees from land developers and builders for implementation of this Amended HCP. As of 2020, all municipalities with jurisdiction in the Permit Area, except for the Town of Leeds, are Municipal Partners.

Other entities performing activities not under the direct regulatory control of the County or a Municipal Partner may enter into a Participation Agreement with the County to participate in this Amended HCP in return for paying any necessary fees and implementing any other necessary conservation actions as prescribed in this Amended HCP.

Advisory Committees

This Amended HCP uses a Habitat Conservation Advisory Committee (HCAC) and a Technical Committee (TC) appointed by the Washington County Commission to oversee and provide guidance on the implementation of the Washington County HCP. These committees provide adaptive management recommendations to the County, through the HCP Administrator, for addressing new information and uncertainty regarding the effectiveness of the conservation program. The HCAC and TC also create a platform for ongoing communication and coordination among the HCP Partners, other stakeholder groups, and the public. The HCAC is composed of representatives of the HCP Partners and other community stakeholders and the TC is composed of biologists and other conservation or technical professionals.

Conservation Program

Goals and Objectives

The County and the HCP Partners seek to achieve both community and biological goals and objectives. The community goals and objectives address the County's underlying purpose and need for continuing the implementation of the conservation program for a Renewed/Amended ITP Term. The biological goals and objectives guide the approach to the conservation of the MDT and other listed species in the Plan Area. The biological goals and objectives of this Amended HCP are consistent with the recommendations of the 2011 MDT Recovery Plan for the Upper Virgin River population of MDT.

Achievements and Implementation Status

The County and the HCP Partners have made substantial progress toward fully implementing the goals and objectives of the 1995 HCP and in several instances have exceeded their respective obligations under the 1995 HCP. The Reserve has been established and the majority of Reserve land acquisitions have been completed. Approximately 7,091 acres of the Reserve remain to be acquired, subject to the available resources and opportunities of the BLM and other HCP Partners. Regardless of acquisition status, the collaborative effort of the County and the HCP Partners has provided for the establishment, management and monitoring of the Reserve since approval of the 1995 HCP.

The County, as the ITP permittee and with the support of those entities performing Covered Activities under its direct control, committed in the 1995 HCP to implement a variety of conservation measures inside and outside of the Reserve. The 1995 HCP tracked implementation of these commitments with an incremental release schedule that ensured the takings did not outpace the conservation actions.

Accounting under the incremental release schedule demonstrates that these permittee commitments have been met in full, thereby releasing all the authorized incidental take for use.

Implementation of the conservation measures specified in the 1995 HCP have outpaced incidental takings of the MDT by Covered Activities. The County spent 170% of its required financial commitments toward implementing the Washington County HCP and approximately 60% of Reserve acquisitions have been completed. In contrast, only 26% of the originally authorized incidental take has been used through 2019, based on the updated metric for incidental take.

Desert Tortoise Conservation Measures

RED CLIFFS DESERT RESERVE

Design

The establishment of the Reserve is the primary conservation measure of the 1995 HCP that offsets the impacts of incidental take caused by the Covered Activities. The 1995 Reserve boundary met substantively the recovery recommendations contemplated in the 1994 and 2011 MDT Recovery Plans. The 1995 HCP defined the Reserve with a target acquisition boundary containing 61,022 acres. This Amended HCP formalizes prior boundary changes for an updated 2019 Reserve boundary that includes 62,009 acres. Previously approved Reserve boundary changes resulted in a net increase in the total size of the Reserve of approximately 987 acres. The Reserve is divided into five zones to facilitate management (Reserve Zones 1 through 5).

Acquisition Strategy

As of February 2020, approximately 665 acres of private land and 6,426 acres of SITLA-owned land (7,091 acres total) occur within the Reserve and remain to be acquired for the purposes of this Amended HCP. This Amended HCP anticipates the use of the following mechanisms for acquiring private and SITLA-owned lands within the Reserve:

1. Exchanges with BLM lands outside the Reserve boundary, on a case-by-case basis with individual landowners
2. Fee simple land purchases that may be supported by federal or state grant monies or other available sources
3. Purchases of conservation easements that may be supported federal or state grant monies or other available sources
4. Donations of fee simple interest or conservation easements

The County and the HCP Partners emphasize that all Reserve acquisitions will be limited to those transactions involving willing participants. No entity will be required or compelled to sell, donate, transfer, purchase, or receive lands or interest in lands for the purpose of this Amended HCP. This Amended HCP acknowledges that there are myriad circumstances affecting the availability and practicability of opportunities to complete Reserve acquisitions among willing parties that may vary over time and space. Therefore, this Amended HCP does not establish a timetable for completing Reserve acquisitions. However, the HCP Partners acknowledge that completing the Reserve acquisitions within the Renewed/Amended ITP Term is a priority conservation action under this Amended HCP and will prioritize the acquisition or, in SITLA's case, disposal of Reserve lands in their land transfer activities.

Long-Term Reserve Use and Management

The County and the HCP Partners acknowledge that the long-term use and management of the Reserve should: 1) be consistent with the community and biological goals and objectives of this Amended HCP and 2) continue to provide for the Covered Activities that are allowed uses of the Reserve. This Amended HCP clarifies the intent of the 1995 HCP that the respective landowners or land management agencies have the responsibility for ensuring that the long-term management and use of Reserve lands is consistent with the goals and objectives and allowed uses of this Amended HCP. In addition to the guidance provided by this Amended HCP, the long-term management of the Reserve is supported by the Red Cliffs National Conservation Area (RCNCA) designation, the BLM RCNCA Record of Decision and Resource Management Plan, and UDNR's MDT Management Plan for Snow Canyon State Park.

OTHER ACTIONS TO MINIMIZE AND MITIGATE THE IMPACT OF TAKE

Reserve Fencing

- The County will inspect all Reserve fencing installed for the purposes of the Washington County HCP, regardless of ownership, on an annual basis. The County will forward information on maintenance needs to the responsible landowner for action.
- HCP Partners will perform maintenance on Reserve fences as soon as practicable and in general within 60 days of notification of a maintenance issue. Maintenance of fences installed by the Utah Department of Transportation, Municipal Partners, or private landowners or developers are the independent responsibility of those respective entities.
- The County will assume responsibility for maintaining any Reserve fencing installed by SITLA until the BLM or another entity acquires the lands. Upon acquisition, the BLM or another acquisition entity will assume responsibility for maintaining these fences as part of its long-term management responsibility.
- The County and the HCP Partners may establish an endowment fund to help support ongoing fence maintenance activities. The endowment fund could receive funds from entities with fence maintenance responsibilities, the Municipal Partners, or other landowners subject to Reserve fencing obligations.
- The County and the HCP Partners will summarize their respective fence maintenance activities on an annual basis and provide such reports to the HCP Administrator for inclusion in the Annual Report.
- Installation of new fencing within the Reserve or along the boundary of the Reserve is not currently contemplated by Washington County or the HCP Partners. If, through adaptive management, the installation of new fencing is deemed a priority for achieving the biological goals and objectives of this Amended HCP, the landowner or management entity will be responsible for providing for the materials and labor for the installation and long-term maintenance of the fencing.

Law Enforcement

- The BLM and UDWR will continue to be responsible for providing law enforcement within lands acquired for the Reserve. Law enforcement activities within the Reserve will focus on access and use regulations that implement the Red Cliffs Desert Reserve Public Use Plan, applicable BLM Resource Management Plans (RMPs), and all laws and regulations (local, state, and federal) that pertain to the protection and conservation of threatened, endangered, candidate, and Utah sensitive species and their habitats.
- The County will continue to allocate existing resources from the Washington County Sheriff's Office to provide law enforcement on unacquired lands within the Reserve boundary owned by SITLA or the Municipal Partners. The County estimates that an appropriate level of effort for this activity is approximately 20% of a full-time law enforcement position (i.e., approximately 416 hours per year), which may be reduced as SITLA lands are acquired for the Reserve. However, the actual level of effort will be determined by demonstrated needs. Law enforcement responsibility for SITLA lands will shift to the BLM or other entity upon acquisition.
- The County will continue to report on County-supported law enforcement activities for the Reserve as part of the Annual Report. The BLM and UDWR will continue to provide reports of their respective law enforcement activities within the Reserve to the HCP Administrator for inclusion in the Annual Report.

Community Education and Outreach

- The County commits to continue its public education and outreach programs with the following specific actions:
 - The continued operation of the Red Cliffs Visitor Center, including regular visitor hours and providing for printed, web-based, and, at the discretion of the County, in-person learning opportunities;
 - Ongoing coordination with the HCP Partners through the deliberations of the HCAC on the content and distribution of education and outreach materials; and
 - Planning and funding to construct a new Red Cliffs Visitor Center facility in Washington County, as contemplated in the 1995 HCP. This new facility may also serve as a holding facility for MDT awaiting translocation or adoption or may support a head-start program.
- The BLM and UDNR will also continue their respective programs for education and outreach regarding the MDT, other rare and sensitive resources, and the Mojave Desert ecosystem.

Tortoise Translocation

- The County will continue to implement the clearance protocols (last amended in 2008) that are part of the Development Protocols, through the Renewed/Amended ITP Term or until all lands outside of the Reserve subject to the clearance protocols are either developed or proactively cleared and fenced.
- In no more than 5 years following ITP reissuance, the County, with support from UDWR biologist as available, will perform surveys across areas of MDT Habitat on non-federal lands outside the Reserve. Specific survey methods will be developed with the input of the HCAC in advance of implementing this measure and will consider the effectiveness and cost relative to the expected benefit.
- In no more than 5 years following ITP reissuance, the County will amend the clearance protocols (contained within the Development Protocols; Appendix A) to incorporate the results of the surveys. Amended clearance protocols will include additional locations in the Permit Area that will be subject to the mandatory clearance requirements, if any. The County will seek input and recommendations from the HCAC for updating the clearance protocols. The current clearance protocols will apply until amended.
- The County will provide qualified personnel covered by the appropriate federal and state permits for handling MDT to perform required clearance surveys and collect any encountered MDTs.
- The County will continue to operate a temporary holding facility for the immediate disposition and care of collected MDT prior to transfer to UDWR or other USFWS-approved entity for relocation, translocation, adoption, or other USFWS-approved purpose.
- The USFWS coordinates with the County, UDWR, and the BLM to plan for the translocation or other appropriate disposition of collected MDT and provides oversight for such activities.
- The USFWS issues Research and Recovery Permits to qualified persons under ESA Section 10(a)(1)(A) to pursue, capture, and collect (in addition to other forms of intentional, but ultimately beneficial, take) MDTs as part of translocation efforts. The cooperative agreement between the USFWS and UDWR under Section 6 of the ESA authorizes UDWR staff or authorized agents to carry out such conservation activities.
- The USFWS provides specific procedures for handling MDT that include considerations for tortoise hydration, temperature extremes, disease and parasites, capture, processing, movement,

and release. The USFWS also provides guidance in the form of Health Assessment Procedures to assess the condition of collected MDTs and determine their suitability for translocation).

- UDWR receives collected MDT from the County and performs health screenings of collected individuals to assess overall fitness and disease risk.
- UDWR coordinates with the BLM and the County to release healthy MDT into the Reserve or other USFWS-approved location, or places unsuitable candidates for translocation and individuals originating from captivity into an adoption program.
- The BLM has agreed to allow for the translocation of healthy MDT to certain of its lands within the Reserve. Subject to BLM approval, this may be expanded to lands outside the Reserve with a recommendation from the HCAC as an adaptive management measure.
- The County's, UDWR's, and the BLM's responsibility for the fate of translocated MDTs ceases once the MDTs are released into the Reserve or to another entity approved by the USFWS.
- The County, in coordination with UDWR, will initiate an adaptive management planning process with the HCAC within 2 years of the Renewed/Amended ITP to prepare a Translocation Management Plan. UDWR will lead the development of the Translocation Management Plan that, at a minimum, identifies other locations within the Plan Area that might be suitable for strategic MDT population augmentation and triggers for utilizing such alternatives.

Development Protocols

The Development Protocols minimize impacts to MDT from certain types of Covered Activities inside and outside the Reserve through project-specific review and input from the HCAC (and the TC, upon request). This review addresses the application of clearance protocols, the collection of MDT for translocation, the use of biological monitors, the application of seasonal restrictions, the minimization of disturbance footprints, the training of construction personnel, and similar activities.

- The County will dedicate HCP staff resources to review and make clearance determinations on project proposals and to coordinate with developers, the HCAC and TC, and the HCP Partners regarding such determinations.
- Landowners and developers may be required to obtain separate assistance from qualified and permitted biologists for certain aspects of the Development Protocols, such as preconstruction clearance surveys or on-site biological monitors for Covered Activities inside the Reserve.

The Development Protocols were expressly adopted for the federally managed portions of the Reserve in the Omnibus Public Lands Management Act of 2009, which states, “Nothing in [the RCNCA creation] Section prohibits the authorization of the development of utilities within the National Conservation Area if the development is carried out in accordance with (1) each utility development protocol described in the habitat conservation plan; and (2) any other applicable law (including regulation)” (Public Law 111-11 Sec. 1974(h)).

Recreation Management

Responsibility for managing public recreational activities within the Reserve rests with the respective land manager (e.g., the BLM, UDNR) but is closely coordinated with the County through the HCAC and TC. The Public Use Plan, developed by the HCAC, provides the primary guidance for managing public recreation on lands in the Reserve.

- The County commits to support the implementation of the Public Use Plan on lands within the Reserve through its recreation management, law enforcement, and community education and outreach actions. The County will also engage in the adaptive management process contemplated

in the Public Use Plan through continued facilitation of the HCAC and planning support for Public Use Plan amendments.

- The County launched a Trail Stewards Program to recruit, train, and support qualified volunteers in monitoring trail conditions, conducting minor trail maintenance, providing visitor information, and reporting instances of vandalism and noncompliance with Reserve regulations. The County intends to continue this program for the Renewed/Amended ITP Term.
- To the extent practicable, the HCP Partners (including the BLM) will use the Public Use Plan and HCAC as tools to harmonize recreation management in areas where there is no indication when property ownership changes.

Reserve Habitat and Fire Management Guidelines

This Amended HCP adopts the Reserve Habitat and Fire Management Plan adopted by the HCAC in October 2019 to help set priorities for Reserve management during the Annual Work Plan process and to provide guidance to the County, the HCP Partners, and fire crews for addressing wildfire-related threats within the Reserve.

The County commits to the following actions related to the Reserve Habitat and Fire Management Plan:

- The County will establish an adaptive management fund to help support planning, monitoring, and responses for fire management within the Reserve boundary.
- The County anticipates that its contributions to fire prevention and post-fire habitat restoration activities may be used anywhere within the Reserve and will be leveraged with resources from other HCP Partners. However, preference will be given to County, municipal, private, and SITLA lands for use of the allocated fire management funds.
- The County will use these habitat and fire management funds with HCAC recommendation and Washington County Commission approval. Unused funds at the end of the Renewed/Amended ITP Term may be transferred to the USFWS, BLM, or UDNR upon completion of Reserve land acquisitions.

ADAPTIVE MANAGEMENT AND MONITORING

This Amended HCP will continue to rely on the deliberations of the HCAC and TC for adaptive management recommendations. This committee process established by the 1995 HCP and coordinated by the County for the original ITP Term has proven highly successful at identifying and solving issues regarding the HCP's conservation program. The County commits to support adaptive management of the Reserve through the continued engagement of the HCP Biologist and the HCP Administrator.

The County has exceeded its commitments under the 1995 HCP to support monitoring activities within the Reserve. Under the 1995 HCP, the County provided substantial funding to support baseline monitoring by UDWR and BLM that demonstrated the efficacy of the conservation program and ITP compliance. Under the Amended HCP, MDT monitoring responsibility on acquired Reserve lands is a responsibility of UDWR and BLM.

- Continued baseline monitoring of the Reserve for long-term recovery planning purposes will be completed by the BLM and/or UDWR, with the use of their supplementary funds, when available.
- The County will provide limited additional financial support for the Renewed/Amended ITP Term to assist with these monitoring activities on SITLA or private lands in order to help attain the biological goals and objectives of this Amended HCP.

As time and funding permits, the County will support other efforts, such as recreational impact monitoring, raven monitoring, and its trail steward program. As part of the adaptive management program, the HCAC may occasionally recommend monitoring studies on specific topics, such as new threats to the MDTs within the Reserve or the effectiveness of Reserve adaptive management activities implemented in response to such threats. The County, through action by the Washington County Commission, may decide to contribute funds for recommended special topic monitoring studies, consistent with the estimated budget for this Amended HCP. Compliance monitoring will continue through oral reports provided to the USFWS and other HCP Partners at quarterly HCAC meetings and through written Annual Reports.

Budget and Funding

The County estimated its implementation costs based on a review of the original budget in the 1995 HCP, recent Annual Work Plan budgets recommended by the HCAC and approved by the Washington County Commission, and considerations for adaptive management and Changed Circumstances. The allocations of staff time and funding are illustrative. Actual budgeting for implementation of this Amended HCP will occur through the Annual Work Plan process, and both the budget line items and their associated costs in any given year may change (increase or decrease) over the course of the Renewed/Amended ITP Term. The County assures that funding will be available to implement this Amended HCP up to the level approximated in **Table ES-1**. The total expenses are estimated considering an annual rate of inflation consistent with the average for the 25-year period between 1994 and 2019 (i.e., 2.1%).

Overall, the County's estimated budget to implement its commitments to this Amended HCP is approximately \$852,230 per year (2020 dollar value). Over the 25-year Renewed/Amended ITP Term, the County commits to spend up to \$27,680,957 on the implementation of this Amended HCP, assuming that the Changed Circumstances are triggered. The County does not commit to spend more than this total amount but is also not required to spend the total estimated amount if its commitments under this Amended HCP are met.

The County and the Municipal Partners will continue to collect a fee on new building permits issued for residential, commercial, or industrial construction projects within their jurisdictions to raise the funding for the County's commitments to this Amended HCP. The Municipal Partners transfer assessed fees to the Washington County Treasurer on a quarterly basis. The County created an interest-bearing HCP Trust Fund to collect the transferred fees and other funds made available for implementation of the Washington County HCP (e.g., grant funds). As of January 2020, the HCP Trust Fund had a balance of approximately \$7 million.

The County may reduce the amount of the fee assessed on new building permits to account for a surplus balance in the HCP Trust Fund, provided the surplus amount is equivalent to at least 3 years of HCP implementation at the inflation-adjusted average annual budget estimate. Conversely, the County, largely through its Municipal Partners, will increase the amount of the fee if the balance of the HCP Trust Fund is not sufficient to cover the inflation-adjusted average annual budget estimate for the following year. Changes in these HCP-related fees will require the approval of the Washington County Commission and the Municipal Partners.

Other HCP Partners provide additional resources to fulfill their respective commitments toward achieving the biological goals and objectives of this Amended HCP.

The funding provided by the County for this Amended HCP is in excess of (i.e., more than doubles) the funding that the County committed to providing for the incidental take originally authorized with the approval of the 1995 HCP. Nonetheless, the County provides assurances that the general level and

distribution of funding illustrated in **Table ES-1** will be available to implement this Amended HCP through the Renewed/Amended ITP Term. However, many of the County's commitments during the Renewed/Amended ITP Term are intended to help achieve the goals and objectives of this Amended HCP—above and beyond the actions and resources needed to demonstrate that it has minimized and mitigated the impacts of the authorized incidental take to the maximum extent practicable.

Table ES-1. Habitat Conservation Plan Budget Line Items

General Budget Category and Description	Habitat Conservation Plan (HCP) Administration and Standard Conservation Program			Northern Corridor Changed Circumstance			Other Changed Circumstances		
	% of Staff Duties	Average Annual Expenses (2020 value)	Total Expenses (future value with inflation)	% of Staff Duties	Average Annual Expenses (2020 value)	Total Expenses (future value with inflation)	% of Staff Duties	Average Annual Expenses (2020 value)	Total Expenses (future value with inflation)
Administration									
Staff salaries and benefits; office and administrative expenses; meetings and training expenses; vehicle operation and replacement expenses	HCP Administrator 25%, HCP Biologist 15%	\$224,000	\$7,267,131	Outreach Coordinator 16%, Field Technician 8%, Administrative Assistant 100%	\$198,000	\$6,423,625	—	—	—
Land Acquisition									
Reserve land acquisition real estate transactions; Reserve Zone 6 land acquisition	HCP Administrator 10%	\$20,000	\$648,551	—	\$73,225	\$2,375,606	—	—	—
Other Conservation Measures									
Community education and outreach; Reserve fencing; law enforcement; translocation; grazing permit acquisition and retirement; Development Protocols; recreation management; Reserve habitat fire management; Cottonwood Road connectivity improvements	HCP Administrator 45%, HCP Biologist 60%	\$75,350	\$2,444,546	Outreach Coordinator 85%, Field Technician 80%	\$133,650	\$4,335,947	—	\$6,675	\$216,554
Monitoring and Adaptive Management Planning									
Baseline Reserve population monitoring; special topic monitoring and studies; planning support for adaptive management and Changed Circumstance	HCP Administrator 20%, HCP Biologist 25%	\$36,575	\$1,186,586	Field Technician 15%	\$80,000	\$2,595,404	—	\$3,750	\$121,660
Total Estimated Budget		\$355,925	\$11,547,115		\$484,875	\$15,730,582		\$10,425	\$338,214

Changed Circumstances

This Amended HCP identifies Changed Circumstances that may affect the MDT or the Plan Area and provides a response to each that the County will implement (**Table ES-2**) to remain eligible for the assurances of the No Surprises Rule

Approval of the Northern Corridor across the Reserve

This Changed Circumstance addresses the possibility that the proposed Northern Corridor will be approved and constructed across Reserve Zone 3. This Changed Circumstance will trigger upon BLM approval of right-of-way for the Northern Corridor across Reserve Zone 3 and USFWS issuance of a Biological Opinion that addresses incidental take of the MDT associated with the proposed Northern Corridor. In response to this Changed Circumstance, the HCP Partners will, among other things, increase the size of the Reserve by over 10%. The County will complete conservation activities in this area similar to the activities completed in Reserve Zone 3 between 1996 and 2016. It is estimated that these activities will cost approximately \$16 million over the Renewed/Amended ITP Term. A more complete description of these additional conservation measures follows.

- **Add Reserve Zone 6:** Establish a new Reserve Zone 6 in the vicinity of the former Bloomington incidental take area to the west of Interstate Highway 15 and south of the Santa Clara River. The new Reserve Zone 6 would include approximately 6,813 acres of primarily SITLA-owned or BLM-managed lands, with the intent that the BLM or other conservation entity would acquire most of the non-federal lands for conservation purposes. The County and the HCP Partners would establish a limited set of allowed uses of Reserve Zone 6 consistent with the allowed uses of other Reserve Zones and Zone-specific uses for existing state and local government infrastructure and uses and competitive use events that have the approval of a special recreation permit issued by the appropriate land management entity.

The County will also implement a variety of conservation measures to benefit the MDT within Reserve Zone 6, as follows:

- **Reserve Administration:** The County will provide additional funding for up to three full-time HCP support staff to include an Outreach Coordinator, Field Technician, and Administrative Assistant.
- **Reserve Land Acquisition:** The County will fund the acquisition of approximately 450 acres of SITLA-owned lands within proposed Reserve Zone 6 prior to the start of construction of the Northern Corridor. The actual acquisition acreage will depend on the final size of the ROW approved for the Northern Corridor and future replacements of Reserve lands acquired with the assistance of ESA Section 6 grant funding. The County does not commit to include in this commitment any adjacent ROW for other utility or infrastructure uses that may be approved in concert with the proposed Northern Corridor.
- **Reserve Fencing:** The County will install fencing along the eastern parts of the Reserve Zone 6 boundary and along the Navajo Road corridor to prevent motorized access outside the road right-of-way; and other fencing to enhance protections for listed plant species within Reserve Zone 6.
- **Law Enforcement:** The County will provide additional funding for Washington County Sheriff Deputy patrols within the Reserve.
- **Community Education and Outreach:** The County will provide additional funding for education and outreach efforts that may include videos, advertising, handouts, community engagement, contractor training, and volunteer coordination.

- Grazing Permit Acquisition and Retirement: The County and the HCP Partners will coordinate with the holders of active grazing permits applicable to Reserve Zone 6 and negotiate the acquisition of such grazing permits from willing sellers.
- Development Protocols: The County and the HCP Partners will subject the allowed uses of Reserve Zone 6 to the applicable provisions of the Development Protocols. The County will provide additional funds to support the application of Development Protocols associated with the proposed Reserve Zone 6.
- Recreation Management: The County, the BLM, and the other HCP Partners agree to reduce the total mileage of designated recreation access routes within Reserve Zone 6 to approximately 50 miles of primarily nonmotorized trails—a two-thirds reduction in the total mileage of existing trails. The County and the HCP Partners will amend the Public Use Plan to create a final trail plan that implements the targeted level of trail reduction within Reserve Zone 6. The County will act within its discretion to complete these Public Use Plan amendments within the first 5 years after this Changed Circumstance is triggered. The County also commits to funding recreation management activities within Reserve Zone 6, such as the installation of signs, trail maintenance or enhancement, parking improvements, and similar actions.
- Reserve Habitat and Fire Management: The County will provide additional funds to support the management of SITLA-owned lands in Reserve Zone 6 and financial support for HCP Partners with long-term management responsibilities associated with the proposed Reserve Zone 6. The activities performed with these funds will be consistent with the priorities established in the Reserve Habitat and Fire Management Plan and the Annual Work Plan.
- Monitoring and Adaptive Management Planning: The County and the HCP Partners will expand the biological monitoring program to include Reserve Zone 6. To support this expansion, The County will provide additional funding for baseline Reserve population monitoring and special topic monitoring for use by UDWR or another qualified contractor.
- **Retire Previously Authorized Reserve Zone 6 Take:** Retire the previously authorized, but unutilized, incidental take associated with the 3,341 acres of non-federal lands within Reserve Zone 6. The retirement of previously authorized incidental take creates a conservation benefit separate from the uplift from the establishment and management of Reserve Zone 6.
- **Cottonwood Road Tortoise Passages:** The County and the HCP Partners will provide technical assistance and funding to support the design, construction, maintenance, and/or monitoring of tortoise passages in Washington County, with an emphasis on creating connectivity across Cottonwood Road in Reserve Zone 3.

Table ES-2. Other Changed Circumstances

Changed Circumstance	Trigger	Response
Delisting of Mojave desert tortoise (MDT)	Final rule to remove the MDT from the list of threatened and endangered species becomes effective after publication in the <i>Federal Register</i>	Washington County (the County) may, in its discretion, cease implementing this Amended HCP for Covered Activities that occur outside of the Reserve and cease support for future Reserve land acquisitions. The County will continue to implement its conservation commitments for managing Covered Activities within acquired lands of the Reserve through the ITP Term. The County and those HCP Partners with long-term management responsibility for acquired Reserve lands will also continue to manage those lands in accordance with this Amended HCP.
New listed species or critical habitat changes	The USFWS publishes a Proposed Rule in the <i>Federal Register</i> that creates a new listed species or designates or revises Critical Habitat within the Plan Area	Within 90 days of notification, the County will meet and confer with the USFWS to determine if incidental take of the newly listed species in the Plan Area is reasonably certain to occur from Covered Activities or if destruction or adverse modification of Critical Habitat is reasonably certain to occur from Covered Activities. The USFWS may provide technical guidance to the County as it considers whether an amendment is warranted.
Wildfire in Reserve	A wildfire occurs on any non-acquired Reserve lands	Within 90 days, the County and the HCP Partners (with the input of the HCAC and TC) will prepare an initial restoration plan for the affected Reserve lands. The County will dedicate funds budgeted for implementing conservation actions associated with Reserve Habitat and Fire Management to actions prescribed in the initial restoration plan for at least 3 years following this Changed Circumstance, after which this funding may be applied in accordance with other priorities consistent with this category of spending. In the event of multiple fires over several years and budgeted monies are expended, the County will work with the HCP partners to identify other funding opportunities to continue to support these activities.
Exceptional Drought	The United States Drought Monitor indicates that any portion of the Reserve is within the D4 – Exceptional Drought Phase	Within 30 days of notification, the County will meet and confer with the USFWS and the Utah Department of Natural Resources-Utah Division of Wildlife Resources (UDWR; the lead agency of the translocation program) to determine what, if any, modifications to the conservation program may be prudent. If the County, the USFWS, and UDWR determine that a temporary suspension of MDT translocation is prudent, The County shall direct its HCP Partners to temporarily suspend MDT translocations into the Reserve. This temporary suspension of MDT translocations will stay in effect until drought conditions abate below the threshold or upon receiving clearance from the USFWS to resume translocation activities.
MDT disease	A disease of MDT not previously known to affect the UVRRU population is detected within the Plan Area or if the observed incidence of upper respiratory tract disease among MDT within the Reserve exceeds 25% of the population	The County will consult with the USFWS and UDWR about suspending MDT translocations into the Reserve. The County, UDWR, and the USFWS will discuss alternative translocation options and possible treatment for affected tortoises, subject to financial constraints and practicability.

Changed Circumstance	Trigger	Response
Private lands in Reserve become developed	A private landowner develops privately held lands within the Reserve boundary	The County and the HCP Partners, through the HCAC, may consider amendments or modifications to this Amended HCP that may be appropriate to accommodate any mitigation lands or funds provided by the private landowner through such independent action inside the Reserve. This may include amendments to the Reserve boundary to include the third-party mitigation lands or modifications to the funding program to coordinate the use of third-party mitigation funds for Reserve management and monitoring. The HCAC may meet and confer with the USFWS to discuss the potential disposition of any forms of mitigations (e.g., funds or lands), as they relate to this Amended HCP and its conservation program's goals and objectives, subject to approval by the County and the USFWS.
Non-participating municipalities	Any municipality in the Permit Area opts to not support the Washington County HCP or a Municipal Partner ceases to meet its funding obligations as established through an executed partnering agreement, such as a Memorandum of Understanding, Interlocal Agreement, or Implementation Agreement	If any Municipal Partner fails to meet its funding obligations as set forth in its partnering agreement, and that municipality is unable to provide a satisfactory solution, the incidental take authorization provided by the ITP will cease to automatically apply to non-federal lands within the jurisdiction of that municipality. A municipality that loses its benefits under the agreement may restore them but will be required to pay the County all previous fees that would have otherwise been paid prior to reentering the Washington County HCP or receiving its benefits. If this Changed Circumstance is triggered, and the municipality that lost its benefits under the permit is unwilling or unable to return to a compliant state, the County will meet and confer with the USFWS within 90 days of the initial notification to determine what, if any, modifications to the conservation program may be prudent. The County may allow for individual developers to sign HCP Participation Agreements directly with County, regardless of their municipality's participation. The developer would send any fees associated with their application or participation in this Amended HCP directly to the County. Upon execution of an individual Participation Agreement and payment of the appropriate fees, the incidental take authorization of the reissued ITP will be deemed to apply to the limits of individually enrolled property. Individual enrollments will be subject to approval by the Washington County Commission.

Alternatives to the Taking

No Incidental Take Extension

Under the No ITP Extension Alternative, the County would not seek a Renewed/Amended ITP Term and would not continue implementing the 1995 HCP. The ITP would expire and the County would cease to expend resources on implementation of the 1995 HCP, including support for implementing the 2006 Development Protocols (such as performing MDT clearance surveys and translocations). The Reserve boundary would remain in its current configuration, without the addition of Reserve Zone 6. The County would not provide funding to facilitate future Reserve land acquisitions, monitoring, tortoise removals, fence maintenance, law enforcement, outreach, recreation management, or other tortoise conservation actions in the Plan Area. The County staff positions created to support HCP implementation would be terminated and the HCAC and TC dissolved. Management decisions and activities on lands within the Reserve would remain the responsibility of the respective landowner, but regular coordination and collaborative adaptive management would no longer be supported by the County.

Incidental take of MDTs arising from Covered Activities would no longer be authorized through a streamlined, programmatic HCP and ITP. Instead, project proponents performing non-federal land use or

land development activities in the Plan Area, including on lands within the Reserve not already acquired by the BLM or UDNR, would have the responsibility to comply with the ESA on a project-by-project basis or through a separate programmatic approach. Prior to initiating a non-federal activity, each non-federal project proponent would have the responsibility to review its own activities to determine if the activity is reasonably certain to result in the incidental take of a listed species. If incidental take is likely, the project proponent could either modify the activity to avoid the reasonable certainty of take or seek authorization for such take from the USFWS. Project-specific permitting increases the processing time and staffing burden on both project proponents and the USFWS. Given the uncertainty associated with processing times for HCPs, project proponents may be at risk for significant project delays. For the County and the HCP Partners, the absence of a streamlined mechanism for obtaining incidental take authorization could have significant implications for their constituents, particularly in the case of local government HCP Partners with an obligation to provide adequate public utilities.

The County would also relinquish the remaining previously authorized but unused incidental take authorization in a No ITP Extension Alternative. The County earned the release of 100% of its authorized take through the incremental release schedule of the 1995 HCP through a combination of its spending on various conservation actions and the acquisition of Reserve lands. This alternative would waste many millions of dollars collected from the community and spent on conservation actions toward the good-faith implementation of the 1995 HCP.

The 1995 HCP was designed to offset the impacts of take through implementation of the recovery objectives of the MDT Recovery Plan for the Upper Virgin River population of MDT (1995 HCP:9, 120; USFWS 1994a, 2011). This alternative might make it more difficult for the USFWS to manage the Upper Virgin River MDT population in pursuit of its recovery objectives, since ITP applicants are only required to offset the impacts of authorized take to the maximum extent practicable and do not have an obligation to advance the recovery of listed species.

The County and the HCP Partners desire to continue the successful implementation of the Washington County HCP, since this programmatic approach to ESA compliance for most non-federal activities in the Plan Area supports the fulfillment of the County's community goals and objectives. The County and the Municipal Partners also have a duty to the public to continue to provide access to fully released incidental take authorization. The No ITP Extension Alternative does not satisfy the County's community goals and objectives, which is the purpose and need for the Washington County HCP.

Northern Corridor as a Covered Activity

The County considered an alternative to this Amended HCP that would address the proposed Northern Corridor as a Covered Activity. This alternative would continue to include the proposed addition and management of Zone 6 to the Reserve, specifically as mitigation for the proposed Northern Corridor. The County assumes that, under this alternative, the BLM would acknowledge in the Implementation Agreement that the proposed Northern Corridor would be an allowed use of the Reserve. With respect to the BLM's actions related to the proposed Northern Corridor, the BLM would (to the extent appropriate) also agree to adopt the analysis of the alternative Amended HCP related to the effects, the amount of incidental take, and the minimization measures associated with the proposed Northern Corridor. Finally, recognizing that the BLM may nonetheless make decisions that are contrary to the intent of the alternative Amended HCP, the alternative Amended HCP would continue to include the Changed Circumstance for Northern Corridor Non-Entitlement that ties the conservation measures associated with this new Covered Activity to actual approval of the project with a route that crosses Reserve Zone 3.

While the Northern Corridor is an activity proposed by a non-federal applicant (i.e., the Utah Department of Transportation) and would be routed partially on lands that, as of the preparation of this Amended

HCP, are under non-federal ownership, the proposed Northern Corridor also involves some federal lands and federal approvals through the BLM. Therefore, even under this alternative, the proposed Northern Corridor involves federal actions that may affect, and would be likely to adversely effect, the MDT (with incidental take) and would trigger the need for formal interagency consultation under Section 7 of the ESA.

Given the proposed Northern Corridor's federal nexus, the County rejected this alternative on the basis that any incidental take of MDT associated with the proposed Northern Corridor would more properly be addressed through the required interagency consultation process. This approach is supported by regulations finalized in 2019 by the USFWS clarifying the scope of "effects of the action" that must be addressed in ESA Section 7 interagency consultation and providing a means to address responsibilities of federal agencies and non-federal applicants in a Biological Opinion and Incidental Take Statement (84 *Federal Register* (FR) 44976). Through interagency consultation, the BLM would bear the responsibility to evaluate the effects of the proposed Northern Corridor across both federal and non-federal lands, estimate the amount of incidental take of the MDT, and propose reasonable and prudent measures to minimize the take—thereby vesting with the federal agency a stronger role in the development of conservation measures associated with the Northern Corridor. Therefore, the County does not need to add the Northern Corridor as a Covered Activity or request incidental take authorization for the MDT through the ITP, as these actions are more appropriately addressed through interagency consultation.

Reduced Permit Area

At the suggestion of the USFWS, the County considered alternatives to this Amended HCP that would reduce the size of the Permit Area to either the remaining undeveloped portions of the incidental take areas delineated in the 1995 HCP or the updated areas of Occupied MDT Habitat that are on non-federal and non-Tribal lands. In either alternative the Reserve itself would be retained in the Permit Area to allow take authorization for the Covered Activities inside the Reserve.

This reduced Permit Area alternative would have the effect of reducing the amount of incidental take reauthorized under the renewed ITP. The County would give up the previously authorized, but unutilized, take authorization associated with areas of potential MDT habitat and other lands in the UVRRU that may be suitable for use by MDT. The reduced Permit Area would leave many non-federal project proponents in Washington County without a ready means to address ESA compliance for the MDT, which is problematic given the history of MDT being easily collected and transported to areas where they have not previously been known to occur.

The County and the Municipal Partners have completed in full the conservation measures required of them in return for the incidental take authorized under the 1995 HCP and Original ITP, providing funding for the implementation of conservation measures in excess of the required amounts. These prior conservation actions released the full amount of previously authorized incidental take under the Original ITP. The County and the Municipal Partners have a duty to the public to continue to provide access to fully released incidental take authorization, which is contrary to the outcome of this alternative. The reduced Permit Area alternative does not satisfy the County's community goals and objectives, which is the purpose and need for the Washington County HCP.

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Glossary

Term or Abbreviation	Definition
1995 HCP	Abbreviation for the original version of the <i>Habitat Conservation Plan for Washington County, Utah</i> prepared in 1995; see Washington County HCP Steering Committee and SWCA (1995).
Adaptive Management	Adaptive management is the process for addressing uncertainty in the outcomes of conservation programs and involves an iterative process of monitoring, evaluating, and adapting management based on current knowledge; see Chapter 6.3.3 .
Amended HCP	Abbreviation for this amended 2020 version of the <i>Habitat Conservation Plan for Washington County, Utah</i> ; supports Washington County's application for renewal of Incidental Take Permit No. TE036719 to extend the expiration date.
amsl	Acronym for above mean sea level
Annual Report	A report of Washington County HCP activities provided to the USFWS by Washington County on or before January 31 of each year; the Annual Report covers the period between January 1 and December 31 of the prior year.
Beaver Dam Slope	Location of a population of MDT within the Plan Area but outside of the Permit Area that is not covered for incidental take by ITP No. TE036719.
CFR	Acronym for Code of Federal Regulations
Changed Circumstances	Defined in the No Surprises rule as “changes in circumstances affecting a species or geographic area covered by [an HCP] that can reasonably be anticipated by [plan] developers and the [USFWS] and that can be planned for (e.g., the listing of new species, or a fire or other natural catastrophic event in areas prone to such events).” (50 CFR §17.3; HCP Handbook:9-38).
Considered Species	Species occurring within the Plan Area that are listed by the USFWS as threatened or endangered and considered for incidental take coverage during preparation of this Amended HCP.
The County	Abbreviation for Washington County
Covered Activities	Certain otherwise lawful, non-federal activities that are reasonably certain to take one or more MDT individuals from the UVRRU population and for which authorization for such take is provided by ITP No. TE036719, as renewed and/or amended.
Covered Species	Species for which incidental take from the Covered Activities is reasonably certain to occur and is addressed by the Washington County HCP and ITP; the MDT is the only Covered Species in the Washington County HCP and ITP.
Critical Habitat	As defined in Section 3(5)(A) of the ESA
CWA	Acronym for the Clean Water Act
Development Protocols	Revised and consolidated protocols for implementing Covered Activities under the 1995 HCP; the most recent version was recommended by the HCAC and was approved by the Washington County Commission in 2006 (HCAC 2006) and amended in 2008 (HCAC 2008); adopted in this Amended HCP (see Appendix A).
DTMOG	Acronym for Desert Tortoise Management Oversight Group
DWMA	Acronym for Desert Wildlife Management Area
EIS	Acronym for Environmental Impact Statement
Enhancement of Survival Permit	Permits issued by the USFWS in accordance with Section 10(a)(1)(A) of the ESA, authorizing intentional take of listed species associated with actions that are beneficial to the species (e.g., translocation or monitoring activities).
EPA	Acronym for the U.S. Environmental Protection Agency
ESA	Acronym for Endangered Species Act; 16 United States Code (USC) §1531 et seq.
Renewed/Amended ITP Term	25 years from issuance of the Renewed/Amended ITP
°F	Abbreviation for degrees Fahrenheit
FR	Acronym for the <i>Federal Register</i>

Term or Abbreviation	Definition
Habitat Conservation Advisory Committee	Oversees the administration of the Washington County HCP and advises the Washington County Commission on the interpretation of the HCP document and matters involving protected species in the Plan Area. The HCAC includes representation from Washington County, UDNR, the BLM, the USFWS, environmental organizations, local government, local developers, and citizens at large.
Habitat Conservation Plan	A conservation plan meeting the requirements of Section 10(a)(2)(a) of the ESA
HCAC	Acronym for the Habitat Conservation Advisory Committee
HCP	Acronym for the Habitat Conservation Plan
HCP Administrator	A Washington County employee responsible for day-to-day administration of the Washington County HCP
HCP Biologist	A Washington County employee employed full-time as a biologist responsible for assisting the HCP Administrator in day-to-day administration of the Washington County HCP, supervised by the HCP Administrator. Chair of the Technical Committee.
HCP Handbook	<i>Abbreviation for the Habitat Conservation Planning and Incidental Take Permit Processing Handbook</i> (USFWS and NMFS 2016)
HCP Partners	Agencies that partner and collaborate with Washington County as signatories to the Implementation Agreement to implement the Washington County HCP
Implementation Agreement	An agreement between parties that provides for direct contractual obligations and undertakings between parties related to implementation of the Washington County HCP
Incidental Take Permit	A permit issued under Section 10(a)(1)(B) of the ESA to a non-federal entity undertaking otherwise lawful activities that are reasonably certain to result in the incidental taking of an endangered or threatened wildlife species
Interlocal Agreement	An agreement between the County and a Municipal Partner that provides for direct contractual obligation and undertakings related to implementation of the Washington County HCP
ITP	Acronym for Incidental Take Permit
MDT	Acronym for Mojave desert tortoise (<i>Gopherus agassizii</i>)
MDT Recovery Plan	<i>Abbreviation for the Desert Tortoise (Mojave Population) Recovery Plan</i> ; see USFWS (1994a) and USFWS (2011)
Memoranda of Understanding/Agreement	A formal document describing agreements between one or more parties and developed through negotiations
MOA	Acronym for Memorandum of Agreement
MOU	Acronym for Memorandum of Understanding
Municipal Partners	Local governments and agencies that participate in the Washington County HCP through Interlocal Agreements with Washington County, providing funding and other support for implementation of the Washington County HCP
National Conservation Area	Areas designated as National Conservation Lands by the U.S. Congress and managed by the BLM under the National Landscape Conservation System
NCA	Acronym for National Conservation Area
NEPA	Acronym for National Environmental Policy Act
NHPA	Acronym for National Historic Preservation Act
NLCD	Acronym for National Land Cover Dataset
NMFS	Acronym for National Marine Fisheries Service
Northeastern Mojave Recovery Unit	Identified in the MDT Recovery Plan (USFWS 1994a, 2011) as one of five Recovery Units within the range of the MDT that captures the Beaver Dam Slope population of MDT found in the southwestern corner of Washington County.

Term or Abbreviation	Definition
Northern Corridor	A new roadway proposed by UDOT that, if approved, would connect Washington Parkway in Washington City to Red Hills Parkway in St. George. The proposed Northern Corridor Highway is described in a Plan of Development submitted to the BLM with an application for a ROW across BLM-managed lands within the Red Cliffs Desert Reserve.
No Surprises	Regulatory assurances to ITP permittees provided by the 1998 USFWS rule (63 FR 8859, codified at 50 CFR §17.22, §17.32, §222.2)
Occupied MDT Habitat	Areas of modeled MDT Habitat suitable for use by MDT that have demonstrated occupancy by MDT individuals (see Chapter 3.2.3); occupancy is approximated by a 1-kilometer zone around documented observations of MDT individuals or sign.
OHV	Acronym for off-highway vehicle
Original ITP	The version of ITP No. TE036719 first issued in 1996 with approval of the 1995 HCP
Original ITP Term	20 years following issuance of ITP No. TE036719; expiration date of March 14, 2016; expiration was suspended for the duration of the ITP renewal process
Permit Area	The geographic area wherein incidental take of the MDT is authorized by the ITP. The portion of Washington County that occurs outside of the Northeastern Mojave Recovery Unit. Excludes the lands in the southwestern corner of Washington County that are associated with the Beaver Dam Slope population of MDT.
Plan Area	The entirety of Washington County, Utah
Potential MDT Habitat	Areas of modeled MDT Habitat suitable for use by MDT as determined by the updated MDT habitat modeling (see Chapter 3.2.3), but where MDT occupancy is unknown or the area has not been adequately surveyed to confirm MDT presence.
Renewed/Amended ITP	ITP No. 036719 renewed with an extended term and other amendments with approval of the Amended HCP
Renewed/Amended ITP Term	25 years from date of issuance of the Renewed/Amended ITP
RCNCA	Acronym for Red Cliffs National Conservation Area
RCNCA RMP	<i>Acronym for Red Cliffs National Conservation Area Record of Decision and Resource Management Plan (BLM 2016a)</i>
Recovery Unit	Divisions of the MDT range established by the USFWS for the purpose of recovery planning.
Reserve	Abbreviation for the Red Cliffs Desert Reserve
Reserve Zones	Divisions of the Reserve that each have specific allowable uses and management principles
ROW	Abbreviation for Right-of-Way
Surrogate Rule	USFWS rulemaking finalized in 2015 establishing the criteria for the use of surrogate metrics to measure and track incidental take authorized through Section 7 of the ESA (80 FR 26832)
SUU	Acronym for Southern Utah University
SWCA	Abbreviation for SWCA Environmental Consultants
TC	Acronym for Technical Committee
TCA	Acronym for Tortoise Conservation Area
Technical Committee	A committee that provides technical guidance to the HCAC and HCP Administrator related to the biology and conservation of the MDT and other protected species occurring within the Plan Area
Tortoise Conservation Area	Established by the MDT Recovery Plan (USFWS 2011), TCAs "include desert tortoise habitat within critical habitat, Desert Wildlife Management Areas, Areas of Critical Environmental Concern, Grand Canyon-Parashant National Monument, Desert National Wildlife Refuge, National Park Service lands, Red Cliffs Desert Reserve, and other conservation areas or easements managed for desert tortoises." These are designated focal areas for long-term monitoring of MDT and are used to evaluate population trends throughout the range of the species.
UDNR	Acronym for Utah Department of Natural Resources
UDOT	Acronym for Utah Department of Transportation

Term or Abbreviation	Definition
UDPR	Acronym for Utah Division of Parks and Recreation; a division of UDNR
UDWR	Acronym for Utah Division of Wildlife Resources; a division of UDNR
Unforeseen Circumstances	Unforeseen Circumstances are changes in circumstances affecting a species or geographic area covered by an HCP that could not reasonably have been anticipated by the ITP applicant and the USFWS at the time of the HCP's development and that result in a substantial and adverse change in the status of any Covered Species (50 CFR §17.3).
UNHP	Acronym for Utah Natural Heritage Program
Upper Virgin River Recovery Unit	Identified in the MDT Recovery Plan as one of five Recovery Units within the range of the MDT. The Upper Virgin River Recovery Unit includes all MDT Habitat east of the Beaver Dam Mountains within Washington County, Utah.
URTD	Acronym for Upper Respiratory Tract Disease, a disease that affects MDT
USACE	Acronym for U.S. Army Corps of Engineers
USC	Acronym for United States Code
USDM	Acronym for United States Drought Monitor
USFS	Acronym for U.S. Forest Service
USFWS	Acronym for U.S. Fish and Wildlife Service; the federal agency responsible for administering and enforcing the ESA with respect to non-marine species
USGS	Acronym for U.S. Geological Survey
Utility Development Protocols	Describes the process for reviewing utility development and maintenance proposals inside of the Reserve and the protocols to avoid or minimize potential incidental take associated with the proposed activity. Consolidated with other avoidance and minimization measures in the Development Protocols. The HCP Partners agree that the application of the Utility Development Protocols on federal lands of the Reserve are consistent with the conservation of the MDT.
UVRRU	Acronym for Upper Virgin River Recovery Unit
WUI	Acronym for wildland-urban interface

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CHAPTER 1. INTRODUCTION

1.1 OVERVIEW

Washington County (the County), Utah, with the assistance of a steering committee, prepared a Habitat Conservation Plan (HCP) in 1995 that provided for the conservation of the Upper Virgin River population of the Mojave desert tortoise (*Gopherus agassizii*; MDT) (Washington County Habitat Conservation Plan Steering Committee and SWCA Environmental Consultants 1995; hereafter 1995 HCP).^{1,2} The MDT is a wildlife species identified by the U.S. Fish and Wildlife Service (USFWS) as threatened with extinction in the foreseeable future under the federal Endangered Species Act (ESA; 16 United States Code [USC] §1531 et seq.). Implementation of the 1995 HCP established the Red Cliffs Desert Reserve (Reserve), facilitated the designation of most of the Reserve as the Red Cliffs National Conservation Area (RCNCA) (Public Law 111-11), provided for a variety of management and monitoring activities for the MDT and other species within the Reserve, and launched a successful program that removes MDT from lands planned for development and translocates them into the Reserve (McLuckie et al. 2018; Nussear et al. 2012; USFWS 2011:36).

The 1995 HCP supported the issuance of an Incidental Take Permit (Original ITP; permit number TE036719) by the USFWS to the County on March 15, 1996, that authorized the incidental take of MDT from the Upper Virgin River Recovery Unit (UVRRU) resulting from otherwise lawful land use and land development activities within the County. The Original ITP had a term of 20 years and an expiration date of March 14, 2016. Before the expiration of the Original ITP, the County notified the USFWS of its intent to seek renewal of the ITP (Robert Sandberg, Washington County HCP Administrator, letter to Larry Crist, USFWS, January 30, 2015).³

This version of the Washington County HCP (Amended HCP) restates and amends the 1995 HCP and supports the request by the County to renew the Original ITP (i.e., the County seeks the issuance of a Renewed/Amended ITP). The Renewed/Amended ITP is needed to extend the term of the Original ITP and continue the County's access to previously authorized, but unused, incidental take for 25 more years (the Renewed/Amended ITP Term). Amendments to the 1995 HCP are needed to incorporate advances in the best available science pertaining to the MDT, comply with current USFWS regulations pertaining to ITPs, incorporate current policy regarding amended HCPs (as applicable), and clarify the language and intent of the 1995 HCP. In addition, this Amended HCP documents the conservation successes of the County and the HCP Partners achieved from the implementation of the 1995 HCP.

1.2 1995 HABITAT CONSERVATION PLAN AND INCIDENTAL TAKE PERMIT NO. TE036719

The County prepared the 1995 HCP with the goal of reducing the potential for conflicts between otherwise lawful land use activities and species protected by the ESA. The 1995 HCP established that the MDT was the only species warranting incidental take authorization under the Original ITP and that the MDT would be the focus of the conservation program. The 1995 HCP also identified voluntary conservation measures to benefit other protected species in the County. The Plan Area for the 1995 HCP was the limits of the County.

¹ Capitalized terms, acronyms, and other abbreviations are defined in the Glossary.

² The 1995 HCP has undergone several minor amendments since its original approval, with the recommendation and approval of the Habitat Conservation Advisory Committee (HCAC).

³ The USFWS acknowledged receipt of the County's request to renew ITP No. TE036719 (Larry Crist, USFWS, letter to Robert Sandberg, Washington County HCP Administrator, March 24, 2015). The March 24, 2015, letter confirmed that the County "may continue the activities authorized by your existing permit" until the USFWS has acted on the County's ITP renewal request, subject to compliance with 50 Code of Federal Regulations [CFR] §13.22.

The Permit Area, where incidental take was authorized, excluded the portion of the Plan Area associated with the Beaver Dam Slope population of MDT in the Northeastern Mojave Recovery Unit. **Figure 1** depicts the general location of the Plan and Permit Areas established by the 1995 HCP and adopted in this Amended HCP.

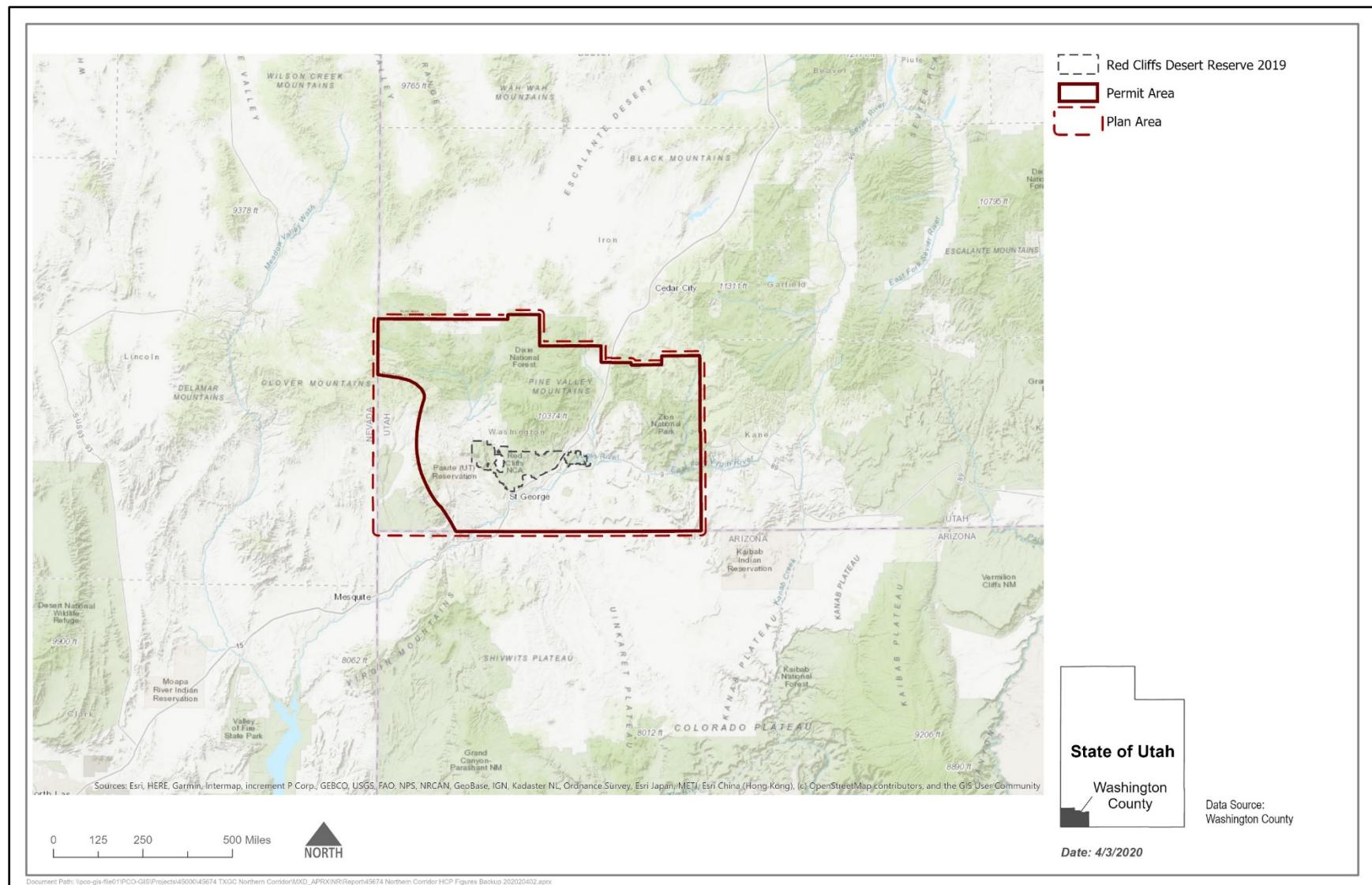
The County engaged the assistance of a 15-member steering committee to draft the 1995 HCP. The steering committee included representatives from a broad spectrum of stakeholder interests, including federal government agencies (i.e., Bureau of Land Management [BLM]—St. George Field Office and, in a nonvoting capacity, the USFWS), state government agencies (i.e., Utah Department of Natural Resources-Division of Wildlife Resources [UDWR] and Utah Division of Forestry, Fire and State Lands), local government entities (i.e., the Washington County Commission, Washington County Mayors' Association, and Washington County Water Conservancy District), environmental groups (i.e., The Nature Conservancy [TNC], Southern Utah Wilderness Alliance, and Humane Society of the United States), and land use interests (i.e., Washington County Cattlemen's Association, Rocky Mountain Ventures, and others). The steering committee also included, in a non-voting capacity, representatives of several federal congressional offices. The engagement of these broad interests on the steering committee ensured that the 1995 HCP struck a balance between otherwise lawful land use and land development activities and conserving the Upper Virgin River population of MDT and other protected species that co-occur with the MDT. In February 1996, the USFWS approved the 1995 HCP and issued the Original ITP.

The County and the steering committee, with the guidance of the USFWS, designed the conservation program of the 1995 HCP to achieve most of the recovery recommendations of the 1994 *Desert Tortoise (Mojave Population) Recovery Plan* (MDT Recovery Plan; USFWS 1994a) relevant to the UVRRU (1995 HCP:9, 120).⁴ The central conservation measure of the 1995 HCP was the creation of the 61,022-acre Reserve. The Reserve design was consistent with the criteria for the Upper Virgin River Desert Wildlife Management Area (DWMA) envisioned by the 1994 MDT Recovery Plan (USFWS 1994a:62–63; see discussion in Chapter 7.1.2 of the 1995 HCP).

Creating the Reserve involved actions by the County and its HCP Partners to define the Reserve boundary (1995 HCP:21–43), consolidate approximately 18,609 acres of private or public school trust lands within the Reserve boundary (approximately 30.5% of the total Reserve area) into federal or state ownership⁵ (1995 HCP:21–24, 95), and establish certain land use restrictions protecting the MDT within the Reserve (1995 HCP:91–94). Other conservation measures of the 1995 HCP included actions to manage the Reserve for the benefit of the MDT (e.g., removing grazing, installing fencing, eliminating several motorized routes) (1995 HCP:90, 96, 97), perform monitoring and research activities (1995 HCP:94–95, 96), provide education to the public (1995 HCP:94), implement protocols for performing certain types of land use activities inside and outside of the Reserve (i.e., subdivision development, utility development, road development, recreation) (1995 HCP:43–44), and experimentally collect and translocate MDT from areas subject to land development and other human activities to underoccupied portions of the Reserve (1995 HCP:94–95).

⁴ The 1995 HCP did not adopt the 1994 recovery recommendation to close Skyline Drive within the Reserve.

⁵ Landownership within the Reserve in 1995 consisted of 38,034 acres of BLM-managed lands (62.3% of the Reserve area); 4,379 of state park lands (7.2% of the Reserve area); 10,938 acres of lands owned by the Utah State Institutional and Trust Lands Administration (SITLA) (17.9% of the Reserve area), and 7,671 acres of private or local government lands (12.6% of the Reserve area).

**Figure 1. Location of the Plan and Permit Areas.**

The County and the HCP Partners adopted a conservation program designed to “promote conservation and recovery” of the MDT (ITP No. TE036719:2) and meet substantially the recovery goals for the MDT in the UVRRU (1995 HCP:9, 120). In return, the 1995 HCP and Original ITP provided authorization for the incidental take of MDT within the Permit Area.⁶ The Original ITP authorized incidental take of MDT associated with Covered Activities that included otherwise lawful land use and land development activities across approximately 350,000 acres of non-federal lands outside the Reserve and a specific set of activities that could occur within the Reserve (i.e., certain so-called management prescriptions for the individual Reserve Zones). The 1995 HCP acknowledged that incidental take of MDT could occur when Covered Activities affected habitat suitable for use by the MDT, including areas with known use by MDT and areas where MDT occupancy had not yet been observed. Thus, the intent of the 1995 HCP was that all areas where MDT might occur within the Permit Area on non-federal lands outside the Reserve could be subject to Covered Activities, and all MDT using such areas were authorized to be incidentally taken.

In addition, the 1995 HCP intended to authorize incidental take of MDT associated with a limited set of Covered Activities inside the Reserve, including low-density development in Reserve Zone 1 (1995 HCP:25); the reconstruction of Skyline Drive (1995 HCP:38); water development (1995 HCP:44); flood control (1995 HCP:44); the maintenance, fencing, and improvement of certain roads (1995 HCP:44); and other utility corridor construction and maintenance (1995 HCP:44). The 1995 HCP included Utility Development Protocols (UDPs). The UDPs were designed to avoid or minimize substantially the impact of water development and utility corridors within the Reserve (1995 HCP:43–44). The UDPs were updated in 2006 and consolidated with certain other conservation measures of the 1995 HCP (Development Protocols; **Appendix A**). Additionally, the Habitat Conservation Advisory Committee (HCAC) recommended and the Washington County Commission approved a Public Use Plan (PUP) to help manage recreation within the Reserve (Washington County Habitat Conservation Plan [HCP] Administration 2000; Washington County Ordinance No. 2007-949-0 Recreation in the Red Cliffs Desert Reserve; **Appendix B**).

The 1995 HCP and Original ITP provided authorization to take incidentally all MDT occurring within the Permit Area on non-federal lands outside the Reserve. At the time of the 1995 HCP, the best available information suggested that up to 12,264 acres of habitat occupied by MDT were present within the Permit Area on non-federal lands outside the Reserve (the 1995 HCP refers to this acreage as the *incidental take areas*). Estimates of MDT density suggested that approximately 1,169 adult MDT might have occurred in these incidental take areas. At the time, this was the total estimated population of MDT in the Permit Area on non-federal lands outside the Reserve. The 1995 HCP established special administrative procedures for performing Covered Activities in the incidental take areas (e.g., advance notification, with MDT surveys and translocation prior to development) and required the HCP Administrator to track the acres of incidental take areas that were released for Covered Activities. An administrative release schedule ensured that land development in the incidental take areas did not outpace the implementation of certain conservation measures specified in the 1995 HCP (1995 HCP:114, 115).

The 1995 HCP also estimated that the Permit Area contained 31,282 acres of potential MDT habitat on non-federal lands outside of the Reserve that was deemed suitable for use by MDT, but where occupancy had not been observed. However, the 1995 HCP provided neither density estimates nor an estimate of the number of MDT that may occur in these areas. Indeed, the 1995 HCP described potential habitat as “areas that theoretically could support desert tortoises but have shown no evidence of tortoise occupation” (1995 HCP:47). Nevertheless, the 1995 HCP and Original ITP provided blanket take coverage for Covered

⁶ The 1995 HCP acknowledged that the MDT may be found anywhere in the County, including areas where occupancy by MDT had not been documented or even where potential habitat was not present, and that “[t]he take permit is therefore necessary in all non-reserve areas to resolve the potential for conflict” (1995 HCP:47).

Activities performed in potential habitat or non-habitat, without being subject to the release schedule (1995 HCP:47).

Furthermore, the 1995 HCP acknowledged that the best available information regarding the distribution and abundance of MDT in the Permit Area was uncertain. For example, the 1995 HCP allowed for the HCP Administrator to “dynamically” adjust the mapping of occupied and potential habitat areas based on new information (1995 HCP:47–48).

1.3 AMENDED HABITAT CONSERVATION PLAN

With this Amended HCP, the County restates and amends the 1995 HCP and seeks a Renewed/Amended ITP with an extended 25-year term. The USFWS contemplated the need for HCP amendments and ITP renewals in its 2016 *Habitat Conservation Planning and Incidental Take Permit Processing Handbook* (HCP Handbook; USFWS and National Marine Fisheries Service [NMFS] 2016). The HCP Handbook provides guidance to the USFWS for considering such actions (see language in Chapters 12, 14, 16, and 17 of the HCP Handbook). Notably, Chapter 17.4.2 of the HCP Handbook states:

Any ESA section 10 permit is eligible to be renewed before the term expires if so stated on the permit. [US]FWS regulations at 50 CFR 13.22 and NMFS regulations at 50 CFR 222.304 allow a permit to remain in effect while we consider a renewal request, but only if the renewal request is received at least 30 days before expiration (see HCP Handbook Toolbox).

Although it might not be likely that we need to renew large HCPs with terms lasting for decades, renewing incidental take permits is a practical concern. A permittee may not always begin covered activities before their permit nearly expires. In such cases, we should review the HCP to determine if changes are necessary. Revisions depend on how much of the originally covered activity has been completed, whether the mitigation has kept pace with impacts, or possibly if the status of covered species has changed. The effects of climate change, or other factors, may lead us to recommend new species or habitat surveys to identify potential HCP amendments. As we consider renewal requests we will honor No Surprises assurances as much as practicable, but any renewed permit must satisfy applicable statutory and regulatory requirements in force as of the date of the approval of the renewal request. Permit renewals must be advertised in the Federal Register before we make our decision, even if there are no revisions.

The circumstances for renewal described in the HCP Handbook apply to this Amended HCP and the County’s request to extend the time in which it may perform the Covered Activities. Namely, the Original ITP was identified as a renewable permit, the County applied for a renewal in advance of the original expiration date, the USFWS acknowledged receipt of the renewal application, and the County (as the permittee, in conjunction with those entities performing Covered Activities under its direct control) did not complete the Covered Activities before the expiration of the Original ITP, and the mitigation commitments prescribed under the 1995 HCP have kept pace with (actually exceeded) the takings. The Amended HCP includes revisions appropriate to address changes to the status of the listed species in the Plan Area and current regulatory requirements for ITPs. Furthermore, the USFWS has advertised the Amended HCP and the request for the Renewed/Amended ITP in the Federal Register prior to making its decision.

This Amended HCP makes certain changes to facilitate the continued implementation of this recovery-focused HCP for the Renewed/Amended ITP Term, including:

- clarifying the language to more accurately reflect the original intent of the 1995 HCP with respect to the scope of the Covered Activities outside and inside of the Reserve;
- providing a current accounting of previously authorized versus used incidental take, using an updated surrogate metric;
- incorporating updated information on biology and distribution of MDT;
- addressing changes in regulation and applicable policy guidance related to HCPs, such as the No Surprises rule (*63 Federal Register [FR] 8859*), Surrogate Rule (*80 FR 26832*), and the HCP Handbook; and
- providing explicitly for Changed Circumstances.

While the content of the 1995 HCP has been reorganized, clarified, and updated in this Amended HCP, the overall intent and basic framework of the 1995 HCP has been preserved. The County and the HCP Partners have, in good faith, implemented the 1995 HCP for more than 24 years in accordance with the terms and conditions of the Original ITP. In fact, the 1995 HCP has been so effective that the USFWS highlighted the program in the revised HCP Handbook under “Successes of the HCP Program” (HCP Handbook:1-4, 1-5). The County seeks to continue its successful partnership with the USFWS and other HCP Partners for the Renewed/Amended ITP Term.

1.4 WASHINGTON COUNTY AND THE HABITAT CONSERVATION PLAN PARTNERS

The County implements the Washington County HCP with the assistance of other HCP Partners. This partnership is essential to achieving the biological goals and objectives of this Amended HCP. The HCP Partners are public entities with designated responsibility for implementing parts of the Washington County HCP and that are signatories to the Implementation Agreement associated with the Washington County HCP. Namely, the HCP Partners are the USFWS, BLM, State of Utah (acting through UDNR and the Utah School and Institutional Trust Lands Administration [SITLA]), the County, and Ivins City. The HCP Partners have different roles and responsibilities under the Washington County HCP, but it is their collaborative effort that drives the success of the program. **Table 1** summarizes, in general, the roles, responsibilities, and authorities under which the HCP Partners contribute to the biological goals and objectives of the Washington County HCP. Additional detail regarding roles and responsibilities occurs throughout this document and in the Implementation Agreement.

In addition to the HCP Partners, municipalities contribute to the Washington County HCP through Interlocal Agreements with the County (herein, the Municipal Partners). The Municipal Partners collect fees from land developers and builders for the Washington County HCP. As of 2020, all County municipalities with jurisdiction inside the Permit Area, except for the Town of Leeds, are Municipal Partners.

Table 1. Habitat Conservation Plan (HCP) Partners and Their Primary Roles, Responsibilities, and Authorities

HCP Partner	Primary Role	Primary Responsibilities	Authorities Supporting HCP Responsibilities*
Washington County (the County)	Incidental Take Permit (ITP) permittee	<ul style="list-style-type: none"> • HCP administration through the staff duties of the HCP Administrator and HCP Biologist • Habitat Conservation Advisory Committee (HCAC) and Technical Committee (TC) support and participation • Implementation of certain specified minimization and mitigation measures for Covered Activities (see Chapter 6.3.2) • Facilitation and limited financial support for land acquisition efforts by other HCP Partners • Adaptive management through HCAC participation • Technical assistance through TC participation 	<ul style="list-style-type: none"> • ITP No. TE036719 • Implementation Agreement with HCP Partners • Interlocal Agreements with Municipal Partners
Ivins City	ITP support	<ul style="list-style-type: none"> • Maintenance and enforcement of HCP-related ordinances and agreements (particularly related to Red Cliffs Desert Reserve (Reserve) lands within Ivins City jurisdiction) • Collect funds for implementation of minimization and mitigation measures • Adaptive management process through HCAC participation 	<ul style="list-style-type: none"> • Implementation Agreement with HCP Partners • Interlocal Agreement with the County • Town ordinances and zoning related to HCP conservation measures
State of Utah School and Institutional Trust Lands Administration (SITLA)	ITP support	<ul style="list-style-type: none"> • Allows all SITLA-owned land located in the Reserve to be managed for the conservation and recovery of the Mojave desert tortoise (MDT), as long as federal HCP Partners reasonably prioritize acquisition of these lands 	<ul style="list-style-type: none"> • Implementation Agreement with HCP Partners • Utah Code Title 53C-1-102 (School and Institutional Trust Lands Management Act) • Omnibus Parks and Public Lands Management Act of 1996, 110 Stat. 4093, 4138-4139 (mandating that SITLA land be valued as developable land and not as designated Critical Habitat)
State of Utah—Department of Natural Resources (UDNR) (primarily through the Division of Wildlife Resources [UDWR] and State Parks and Recreation)	Support for MDT regional recovery	<ul style="list-style-type: none"> • Supporting role in the acquisition of non-federal Reserve lands through Endangered Species Act (ESA) Section 6 grants and other available means • Long-term management of Reserve lands under UDNR control • Long-term baseline monitoring of MDT populations • Permit authorizations and assistance for MDT clearance surveys and translocations • Adaptive management process through HCAC participation • Technical assistance through TC participation 	<ul style="list-style-type: none"> • Implementation Agreement with HCP Partners • Desert Tortoise Management Plan, Snow Canyon State Park, Washington County, Utah (UDWR 2004) • UDWR is Utah's wildlife authority and is vested with the functions, powers, duties, rights, and responsibilities relating to the management of protected wildlife. Utah Code Ann. § 23-14-1(1). Subject to the broad policymaking authority of the Utah Wildlife Board, see id. § 23-14-3(2), UDWR is charged to protect, propagate, manage, conserve, and distribute protected wildlife throughout the state, id. § 23-14-1(2). All wildlife in Utah, not held by private ownership and legally acquired, is a Utah public trust resource, id. § 23-13-3; and all wildlife within Utah, including wildlife on public or private land, falls within UDWR's jurisdiction, id. § 23-15-2.

HCP Partner	Primary Role	Primary Responsibilities	Authorities Supporting HCP Responsibilities*
Bureau of Land Management (BLM)	Support for MDT regional recovery	<ul style="list-style-type: none"> • Acquisition of non-federal Reserve lands through purchases, exchanges, or other available means • Long-term management of Reserve lands under BLM management • Participate on HCAC to help facilitate species recovery and adaptive management • Participate on the TC to help facilitate species recovery, provide technical assistance, and support adaptive management 	<ul style="list-style-type: none"> • Implementation Agreement with HCP Partners • Omnibus Public Lands Management Act of 2009 (established the Red Cliffs National Conservation Area (RCNCA); Public Law 111-11) • Resource management plans (RMPs) for the RCNCA and the St. George Field Office[†]
U.S. Fish and Wildlife Service	ITP oversight; support for MDT regional recovery	<ul style="list-style-type: none"> • Ensure compliance with ITP terms and conditions • Facilitate acquisition of non-federal Reserve lands through ESA Section 6 grants and other available means • Participate on HCAC to help facilitate species recovery and adaptive management • Participate on the TC to help facilitate species recovery, provide technical assistance, and support adaptive management • Facilitate recovery through available funds, where appropriate • Conduct translocation research and provide guidance for updating and revising translocation plans, as necessary 	<ul style="list-style-type: none"> • Endangered Species Act of 1973, as amended, and various implementing regulations and policy guidance • Revised Recovery Plan for the Mojave Population of the Desert Tortoise (<i>Gopherus agassizii</i>) (USFWS 2011)

* This is not an exclusive list of legal authorities or guidance documents that may be pertinent to each of the HCP Partners.

[†] The BLM is considering amendments to these RMPs in connection with the proposed Northern Corridor. Also, see BLM (2016a) for additional discussion of BLM land management authorities relevant to the Reserve.

1.5 REGULATORY FRAMEWORK

Since the preparation and approval of the 1995 HCP, the USFWS has made substantive changes to the regulations and policy guidance related to HCPs and ITPs. Key among these changes are the releases of the 1996 and 2016 versions of the HCP Handbook, the 1998 No Surprises rule (USFWS 1998), the 2015 Surrogate Rule for establishing metrics for tracking take (80 FR 26832), the 2016 rule revising the definition of “destruction and adverse modification” of Critical Habitat (81 FR 7214), and 2018 guidance regarding the definitions of and proper means for addressing forms of take related to harm or harass (USFWS 2018a). Important aspects of the regulatory environment associated with the preparation of HCPs and issuance of ITPs are summarized in the following subchapters.

Section 9 of the ESA prohibits take of species of fish or wildlife that are listed as endangered (16 USC §1538(a)). The USFWS extended this take prohibition to most threatened fish or wildlife species, including the MDT, by regulation (50 Code of Federal Regulations [CFR] §17.31). The ESA does not prohibit take of listed plant species. Rather, with respect to listed plants, Section 9(a)(2) of the ESA prohibits, among other things, removing and reducing to possession any such species from areas under federal jurisdiction; maliciously damaging or destroying any such species on any such area; or removing, cutting, digging up, damaging, or destroying any such species from any other area in knowing violation of state law or in the course of any violation of state criminal trespass law (16 USC §1538(a)).

Take is defined in Section 3 of the ESA as “to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct” (16 USC §1532(19)). *Harm* is defined by USFWS regulation as “an act which actually kills or injures wildlife. Such act may include significant habitat modification or degradation where it actually kills or injures wildlife by significantly impairing essential behavioral patterns, including breeding, feeding or sheltering” (50 CFR §17.3).

Under Section 10(a)(2)(B) of the ESA, the USFWS is required to issue an ITP where the applicant has met certain statutory issuance criteria. Specifically, the USFWS must issue an ITP when it finds, after an opportunity for public comment, that an application and conservation plan (commonly referred to as an HCP) demonstrate that:

- the taking will be incidental;
- the applicant will, to the maximum extent practicable, minimize and mitigate the impacts of such taking;
- the applicant will ensure that adequate funding for the HCP will be provided;
- the taking will not appreciably reduce the likelihood of survival and recovery of the species in the wild;
- the applicant will ensure that other measures that the USFWS may require as being necessary or appropriate will be provided; and
- the USFWS has received such other assurances as may be required that the HCP will be implemented (16 USC §1539(a)(2)(B)).

Regulations promulgated by the USFWS require that, in addition to the criteria above, an applicant must include in its HCP “procedures to deal with unforeseen circumstances” (50 CFR §17.22(b)(2)(i)(C)). ESA implementing regulations also give ITP permittees regulatory assurances under the No Surprises Rule that provide certainty as to their future obligations under an ITP (50 CFR §17.22, §17.32, §222.2).

The HCP Handbook provides guidance to ITP applicants and the USFWS regarding the preparation of HCPs and the process for obtaining an ITP.⁷ The USFWS acknowledges that seeking an ITP is a

⁷ The guidance provided in the HCP Handbook is based in part on policies of the U.S. Department of Interior and the USFWS that have been withdrawn. On July 30, 2018, the USFWS withdrew its agency-wide Mitigation Policy and the more focused

voluntary action by an applicant (HCP Handbook:3-2) and that “[u]ltimately, landowners or project proponents need to assess whether take is reasonably certain to occur as a result of their activities to inform their decision whether to seek incidental take coverage” (HCP Handbook:3-3). The HCP Handbook also provides guidance regarding amendments and renewals for HCPs and ITPs (HCP Handbook:17-5).

The USFWS promulgated regulations pertaining to the renewal of permits (see 50 CFR §13.22), that apply to ITPs.

Section 7(a)(2) of the ESA requires that federal agencies ensure that actions that the agencies authorize, fund, or carry out are not likely to jeopardize the continued existence of listed species in the wild or result in the destruction or adverse modification of Critical Habitat (16 USC §1536(a)(2)). Where an agency action *may affect* one or more listed species or may destroy or adversely modify habitat designated as critical under ESA Section 4, the action agency consults with the USFWS to ensure that jeopardy to the relevant species or destruction or adverse modification of any designated critical habitat is not likely to occur. *Jeopardize the continued existence of* is defined by regulation as “to engage in an action that reasonably would be expected, directly or indirectly, to reduce appreciably the likelihood of both the survival and recovery of a listed species in the wild by reducing the reproduction, number, or distribution of that species” (50 CFR §402.02). *Destruction or adverse modification* is also defined by regulation and means “a direct or indirect alteration that appreciably diminishes the value of critical habitat for the conservation of a listed species. Such alterations may include, but are not limited to, those that alter the physical or biological features essential to the conservation of a species or that preclude or significantly delay development of such features” (50 CFR §402.02).

The USFWS considers its issuance of an ITP a federal action to which the consultation requirement of ESA Section 7(a)(2) applies (HCP Handbook:3-27). With respect to the issuance of ITPs, the USFWS functions as both the action agency and the resource agency, such that the USFWS consults with itself concerning the effects of its issuance of the ITP. According to the HCP Handbook, the consultation must include, among other things, an assessment of the impacts and likelihood of jeopardy and any adverse modification of Critical Habitat for all listed species (HCP Handbook:3-27, 3-28).

Endangered Species Act Compensatory Mitigation Policy, stating that “it is no longer appropriate to retain the ‘net conservation gain’ standard throughout various Service-related activities and is inconsistent with current Executive branch policy” (USFWS 2018b, 2018c). The notices of withdrawal also state that all policies or guidance that were superseded by the now-withdrawn policies are reinstated (USFWS 2018b, 2018c). The December 21, 2016, HCP Handbook was intended, in part to ensure consistency with “the most recent policies, such as the revised [US]FWS Mitigation Policy, which was announced via a *Federal Register* notice on November 21, 2016” (USFWS 2016a). Therefore, the County notes that some guidance in the HCP Handbook related to or arising from the withdrawn policies of the USFWS should be subject to reconsideration in light of the now-reinstated prior policies.

CHAPTER 2. COVERED ACTIVITIES

Generally speaking, the Covered Activities addressed by the 1995 HCP and carried forward into this Amended HCP are of two categories:

- A broad set of land development and land use activities that may occur on non-federal land outside the Reserve; and
- A narrow set of land development and land use activities that may occur on land inside the Reserve when performed in accordance with the applicable protocols and other measures specified in the conservation program of this Amended HCP.

The Covered Activities, whether inside or outside of the Reserve, are subject to the following criteria:

- must be non-federal and performed within the Permit Area;
- must be otherwise lawful and conducted in accordance with all applicable local, state, and federal laws, regulations, ordinances, and permissions;
- are subject to the direct control of the County, a non-federal HCP Partner, or a Municipal Partner through regulatory control such as zoning, or permitting, or other legal authority;
- effects of the activities have been analyzed in the 1995 HCP or the Amended HCP; and
- must be reasonably certain to cause incidental take of the MDT.

The County, as the ITP permittee, establishes direct control over Covered Activities through a variety of mechanisms, including the Implementation Agreement with HCP Partners, Interlocal Agreements with Municipal Partners, Participation Agreements and Certificates of Inclusion, or local zoning, permitting, or other legal authorities, as applicable.

Activities that are not reasonably certain to take MDT are not subject to the terms and conditions of the Renewed/Amended ITP, even if such activities are similar to the Covered Activities (e.g., land development in an area that is not habitat for the MDT). This Amended HCP does not expand the list of Covered Activities beyond those addressed in the 1995 HCP.

2.1 COVERED ACTIVITIES OUTSIDE THE RESERVE

The 1995 HCP expressly identified activities for which incidental take of MDT was authorized (1995 HCP:116). This Amended HCP refines this list of activities to carry forward only those that meet the criteria specified above. Other activities noted in the 1995 HCP are not reasonably certain to cause incidental take, are not under the direct control of the County, or do not otherwise warrant inclusion as a Covered Activity. **Table 2** lists each of the Covered Activities specifically identified in the 1995 HCP and identifies the Covered Activities that are carried forward into this Amended HCP. However, the list of activities in **Table 2** is not exhaustive; any ground-disturbing activities outside of the Reserve meeting the criteria for a Covered Activity and having effects substantially similar to those analyzed in this Amended HCP are also Covered Activities.

Table 2. Covered Activities and Means of Direct Control or Authority

Activity Type	Means of Direct Control or Authorization by Washington County*
Amended HCP Covered Activities	
Livestock grazing	Zoning Ordinances of the County or a Municipal Partner
Creation of new utility easements and the maintenance of existing utility easements, including, but not limited to, power, telephone, and cable television lines; water, sewer, and natural gas pipelines; and associated access roads	Encroachment Permits issued by the County or a Municipal Partner
Land clearing	Excavation Permits issued by the County or a Municipal Partner
Building construction	Building Permits issued by the County or a Municipal Partner
Recreation events	Special Use Permits issued by the County, a Municipal Partner, or SITLA
Vehicle use	Traffic Ordinances of the County or a Municipal Partner
Agricultural land treatments such as plowing, disking, mowing, swathing, and harrowing	Zoning Ordinances of the County or a Municipal Partner
Mining	Conditional Use Permits issued by the County or a Municipal Partner
Drilling for resources, including, but not limited to, petroleum, natural gas, other hydrocarbon, and water for exploration or production purposes	Conditional Use Permits issued by the County or a Municipal Partner
Firefighting to abate public nuisance and protect life and property	Government service performed directly by the County, a Municipal Partner, or an HCP Partner
Clearing for landfill exploration or production purposes	Conditional Use Permits issued by the County or a Municipal Partner
Renewable energy development	Conditional Use Permits issued by the County or a Municipal Partner
1995 HCP Covered Activities Not Carried Forward to Amended HCP[†]	
Hiking, sightseeing, camping, and equestrian activities	N/A
Keeping of pets, when under the control of the owner	N/A
Irrigation of areas for agriculture, landscaping, horticulture, or domestic purposes	N/A
Use of herbicides and pesticides	N/A
Harvest of vegetation, native or introduced	N/A
Collection of biological or mineral specimens	N/A
MDT translocation and monitoring activities	N/A

* The County may establish independent direct control for any Covered Activity by executing a Participation Agreement/Certificate of Inclusion with the proponent of a non-federal project. See **Chapter 7.5**.

[†] Analysis of effects for activities not carried forward is provided in separate ESA Section 7 interagency consultation documents.

The geographic restrictions on this set of Covered Activities (i.e., “non-federal lands” and “outside of the Reserve”) are applied at the time the otherwise lawful activity occurs. For example, the Covered Activities may include future otherwise lawful land uses that occur on lands under federal ownership at the outset of the Renewed/Amended ITP Term but that have become non-federal by the time the otherwise lawful land use occurs, such as may occur through land exchanges associated with Reserve land acquisitions⁸ or other BLM land sales or dispositions.

⁸ BLM land exchanges are contemplated as one of several tools for achieving the acquisition of Reserve lands (see **Chapter 6.3.1.2**). Such exchanges are federal actions subject to ESA Section 7 interagency consultation and analysis under the National

2.2 COVERED ACTIVITIES INSIDE THE RESERVE

The 1995 HCP identified certain activities within the Reserve as being consistent with the management goals of individual Reserve Zones. These are activities variously referred to in the 1995 HCP as *management principles, management regulations, or approved or recognized* uses of Reserve lands. Some of these activities are associated with uses of Reserve lands that existed prior to the 1995 HCP, while others are new or future activities deemed to be of “critical importance to the residents of Washington County” (1995 HCP:43). In either case, the 1995 HCP intended that these limited activities be allowed in the Reserve and are provided for under the framework of the 1995 HCP when performed in accordance with certain protocols.

While not explicitly acknowledged in the 1995 HCP, some of these activities may cause incidental take of the MDT and warrant explicit coverage by this Amended HCP and Renewed/Amended ITP. The County has direct control over these activities when performed directly by the County, through agreements with the HCP Partners and Municipal Partners, and through the issuance of permits or other legal mechanisms, as applicable. This Amended HCP clarifies that the following limited set of otherwise lawful land development and land use activities performed within the Reserve are Covered Activities:

- **Recreation uses and related facilities:** Covered Activities include individual or small-group forms of recreation on designated trails or use areas within the Reserve, when performed in accordance with the conservation measures specified in the PUP (see **Appendix B**). As established in the 1995 HCP, this set of Covered Activities explicitly includes hiking, birdwatching, photography, camping, horseback riding, and hunting by unorganized individuals or small groups of individuals in guided or controlled tours (1995 HCP:25–43). The construction, operation, and maintenance of facilities associated with covered recreational uses of the Reserve are also Covered Activities when performed in accordance with the conservation measures specified in the Development Protocols (see **Appendix A**). This allowed use also includes emergency search and rescue actions necessary to protect human health and safety. As described in **Table 2**, recreation activities by individuals or small groups are addressed by the USFWS in the documentation supporting the USFWS’s ESA Section 7 consultation for the Renewed/Amended ITP.
- **Utilities, access roads, water development, and flood control:** Covered Activities include the construction, operation, use, maintenance, upgrade or expansion, decommissioning, or emergency repair of otherwise lawful infrastructure facilities related to the distribution or transmission of utilities (including, but not limited to, electric, telephone, cable, water, wastewater, and natural gas), water development projects (including, but not limited to, wells, pump stations, and reservoirs), flood/stormwater control facilities (including, but not limited to, detention ponds and sedimentation ponds), and access roads needed to construct and maintain such facilities, when performed within designated existing or new Rights-of-Way (ROWS) on lands within the Reserve in accordance with the conservation measures specified in the Development Protocols (see **Appendix A**). Infrastructure facilities, as contemplated herein, include the temporary and permanent ROWs or workspaces and the physical structures associated with such facilities.
- **General Reserve management:** Reserve management activities may include, but are not limited to, vegetation management, invasive species control, firefighting, controlled burns, predator control, recreation management, and the installation and maintenance of fencing. Some Reserve management activities may be in response to emergency situations, such as wildfires or floods.

Environmental Policy Act. However, it is anticipated that the analysis in this HCP would simplify and streamline these future analyses with respect to incidental take of the MDT (see HCP Handbook:3-16 and 14-31). The USFWS could, at its discretion, adopt or adapt the ESA Section 7 analysis performed for the Renewed/Amended ITP to streamline the preparation of its future Biological Opinions for applicable federal land exchanges.

Promptly addressing such events is essential to protect the overall conservation value of the Reserve and to protect human health and safety. These activities may, in certain circumstances, cause incidental take of MDT.

- **Zone-specific allowed uses:** This Amended HCP clarifies that the following zone-specific allowed uses are Covered Activities when performed in accordance with the conservation measures specified in **Chapter 6**. Reserve Zones 4 and 5 do not have zone-specific allowed uses.
 - **Reserve Zone 1:** Low-density residential development limited to a maximum overall density of one unit per acre with minimized surface disturbance during development, retention of native vegetation, and restrictions on exotic plant materials.
 - **Reserve Zone 2:** Existing state and local government uses are Covered Activities, including, but not limited to, existing public recreational access and use of related facilities and various infrastructure facilities (e.g., detention basins, wells, utility access roads).
 - **Reserve Zone 3:** Existing state and local government uses are Covered Activities, including, but not limited to, the continued operation, use, and maintenance of facilities associated with the City of St. George law enforcement training range, the debris basin behind City Creek dam, Pioneer Park, and other various infrastructure facilities (e.g., detention basins, wells, utility access roads).

Some activities specifically allowed within the Reserve under the 1995 HCP are no longer relevant to this Amended HCP and have been removed from the list of Covered Activities. For example, the 1995 HCP covered the continued operation of the Moroni Feeds Turkey Farm in Reserve Zone 3 (1995 HCP:32). However, the private lands associated with the former Moroni Feeds Turkey Farm in Reserve Zone 3 have been acquired for conservation purposes by UDWR, and the farming activity has been discontinued. The former site of the turkey farm is now part of an effort by UDWR and other conservation partners to restore native habitat (Keleher 2019). Similarly, the lands previously associated with a private residence and mining activities in Reserve Zone 4 (1995 HCP:38, 39) have been acquired by the BLM. Residential use in Reserve Zone 4 has been discontinued (Washington County Utah Recorder's Office 2019) and the lands of Reserve Zone 4 are now under federal ownership and managed by the BLM and are no applicable for Covered Activities. The retirement of these previously authorized uses and restoration of the associated lands creates a conservation benefit for the MDT in excess of that anticipated under the 1995 HCP.

Neither the 1995 HCP nor this Amended HCP expressly prohibit uses of the Reserve that are not Covered Activities. For example, the 1995 HCP stated:

Landowners have been consulted throughout the HCP process and have been encouraged to participate in these land exchanges [for Reserve acquisition]. In the event they do not, the HCP will have no legal effect on their property and the HCP will place no restrictions on land use within the reserve. However, such lands will not participate in the benefits and protections inherent in an incidental take permit issued as part of this HCP, and therefore the landowner will be subject to the Section 9 enforcement provisions under the Act (1995 HCP:21, 22).

Incidental takings of MDT associated with activities that are not Covered Activities is not authorized by the Renewed/Amended ITP. Proponents of activities that are not Covered Activities, whether inside or outside the Reserve, are responsible for achieving compliance with the ESA through other means.

2.3 SIMILAR ACTIVITIES WITH A FEDERAL NEXUS

Activities that are similar in nature to the Covered Activities may also occur on federal lands within the Plan Area, both within the Reserve and outside the Reserve, or have another federal nexus such as federal funding or authorization. The County and the HCP Partners acknowledge that federal actions, including those that are similar to the Covered Activities, may be subject to other authorizations or requirements.

Section 7 of the ESA pertaining to federal interagency consultations provides a separate process for authorizing incidental take that occurs in connection with a federal nexus (i.e., the involvement of federal lands, funds, or approvals). ESA compliance for activities with a federal nexus must be addressed through this alternate process. However, federal interagency consultations can be streamlined by the conservation measures and analyses included in HCPs and the USFWS's related documentation (i.e., National Environmental Policy Act [NEPA] review documents and the Biological Opinions prepared for ITP issuance). The 2016 HCP Handbook provides guidance for integrating Section 7 interagency consultations with HCPs (see HCP Handbook:3-16, 14-31) and regulations finalized by the USFWS in August 2019 provide that the USFWS may rely on analyses contained in other documents, like an HCP, to prepare a Biological Opinion (84 FR 44976).

Collaboration is an important principle of this Amended HCP and achieving the biological goals and objectives of this Amended HCP requires the cooperation of multiple HCP Partners across many layers of government. To reaffirm this collaborative effort, the County and the HCP Partners intend, subject to appropriate review and process, that the allowed uses of the Reserve (i.e., the Covered Activities inside the Reserve described in **Chapter 2.2**), when performed in accordance with the conservation measures specified in this Amended HCP, should also be allowed within those portions of the Reserve that are under federal ownership. The County and the HCP Partners agree, to the extent practicable in accordance with applicable regulations, to seek consistency with the language of the Amended HCP when considering actions that are similar to the Covered Activities and implemented in a manner consistent with the conservation program of this Amended HCP. As initially evaluated in the 1995 HCP, such activities are consistent with the conservation of the MDT and adequately minimize and mitigate the impacts of incidental take of the MDT—even when performed within the Reserve (1995 HCP:25, 43–44). The analysis of effects of the Covered Activities and the related conservation measures in this Amended HCP are equally applicable to non-federal and federal lands and can be considered in Section 7 consultations by federal agencies.

The County and the HCP Partners also acknowledge that the UDPs (currently contained within the Development Protocols; see **Appendix A**) were expressly adopted for the federally managed portions of the Reserve in the Omnibus Public Lands Management Act of 2009, which states: “Nothing in [the Red Cliffs NCA creation] Section prohibits the authorization of the development of utilities within the National Conservation Area if the development is carried out in accordance with (1) each utility development protocol described in the habitat conservation plan; and (2) any other applicable law (including regulation)” (Public Law 111-11: Sec. 1974(h)).

Therefore, when a federal HCP Partner, such as the BLM, authorizes an action that is similar to a Covered Activity (whether inside or outside the Reserve) the federal HCP Partner may incorporate this Amended HCP’s relevant conservation measures into its authorization and Biological Assessment. The federal HCP Partner may refer to the effects analysis in the HCP to describe the effects of the similar, but federalized, activities on the MDT, thereby simplifying the federal Biological Assessment and streamlining the interagency consultation process (see HCP Handbook:14-31). In such circumstances, the federal action agency would provide to the USFWS updated information on the status of the MDT and a calculation of incidental take of MDTs associated with the activities on federal land in its Biological Assessment (see HCP Handbook:14-31).

CHAPTER 3. CONSIDERED AND COVERED SPECIES

3.1 CONSIDERED SPECIES

Fifteen threatened or endangered species have known or potential ranges that include the Plan Area (Considered Species; USFWS 2019b, 2019c). These Considered Species and their 2019 federal listing statuses are identified in **Table 3**. At the time of this writing, there are no species within the Plan Area that are candidates for federal listing or that are subject to a proposed listing rule published in the *Federal Register* (USFWS 2019b, 2019c).

Appendix C provides a brief summary of each of these Considered Species and a high-level evaluation of the potential for the Covered Activities to incidentally take individuals of these species. As described in this appendix and summarized in **Table 3**, the Covered Activities will not, with reasonable certainty, cause incidental take of any Considered Species other than the MDT. Therefore, the County does not propose to include any Considered Species other than the MDT as Covered Species in this Amended HCP. Nevertheless, this Amended HCP includes conservation measures for certain Considered Species. These additional conservation measures (see **Chapter 6.5**) help attain the biological goals and objectives of this Amended HCP and, where necessary, avoid jeopardizing the continued existence of a listed species or destroying or adversely modifying Critical Habitat.

Table 3. Considered Species and Incidental Take Assessment Summary

Common Name (Scientific Name)	Federal Listing Status	Incidental Take Assessment	Covered Species	Conservation Measures Proposed
Mojave desert tortoise (<i>Gopherus agassizii</i> ; MDT)	Threatened (55 Federal Register [FR] 12178)	The Covered Activities will destroy or modify MDT Habitat within the Permit Area (USFWS 2011). Incidental take is anticipated via the killing, wounding, or harming of MDT.	Yes	Yes—see Chapter 6.3
California condor (<i>Gymnogyps californianus</i>)	Endangered (32 FR 4001) Experimental population (61 FR 54045)	California condor breeding and roosting habitat does not overlap with MDT Habitat in the Permit Area. However, California condor foraging habitat includes open foothills and grasslands that may be used by MDT (USFWS 2011, 2013a, 2017a, 2017b). Therefore, the California condor may be affected by Covered Activities that destroy or significantly modify MDT Habitat. Despite exposure to potential effects, the loss of potential California condor foraging habitat by Covered Activities is not reasonably certain to cause take of the California condor due to the abundance of such habitat across the range of the species and the ability of California condors to cover very large areas while foraging.	No	No
Mexican spotted owl (<i>Strix occidentalis lucida</i>)	Threatened (58 FR 14248)	There is no overlap between breeding and roosting habitat for the Mexican spotted owl and areas of MDT Habitat, as the steep terrain typical of Mexican spotted owl breeding habitat is inaccessible to MDT. However, there may be some overlap between potential foraging habitat for the Mexican spotted owl and areas used by MDT (USFWS 2011, 2012). Lewis (2014) found that Mexican spotted owl presence was positively associated with topographic roughness and curvatures (i.e., owls prefer complex landscapes with steep canyons and avoid flat areas). Lewis (2014) also found that Mexican spotted owl presence was positively associated with narrower canyons containing greater canopy cover and vegetation height and density. Habitats preferred by owls (i.e., steep-walled canyons and dense vegetation) are not typically used by MDT (USFWS 2011). The Covered Activities are not reasonably certain to cause take of Mexican spotted owl due to the lack of recent or verified owl observations within MDT Habitat on non-federal lands in the Permit Area and the different habitat preferences of the Mexican spotted owl and MDT. It is unlikely that Mexican spotted owls would be exposed to the Covered Activities.	No	No
Southwestern willow flycatcher (<i>Empidonax traillii extimus</i>)	Endangered (60 FR 10695)	Breeding and foraging habitat for the southwestern willow flycatcher may overlap with MDT Habitat within floodplains of the Virgin River, although co-occurrence of these species is not common as MDT do not typically occupy densely vegetated riparian areas used by the southwestern willow flycatcher (USFWS 2002, 2011, 2017c). Furthermore, conservation measures by Washington County (the County) and municipalities substantially restrict land development activities within floodplains and riparian areas, where these species may co-occur (see Chapter 6.5). Therefore, the Covered Activities are not reasonably certain to cause incidental take of this species.	No	Yes—see Chapter 6.5

Common Name (Scientific Name)	Federal Listing Status	Incidental Take Assessment	Covered Species	Conservation Measures Proposed
Western yellow-billed cuckoo (<i>Coccyzus americanus</i>)	Threatened (79 FR 59991)	Western yellow-billed cuckoo habitat may overlap with MDT Habitat within the floodplains of the Virgin River, although these species do not typically co-occur as MDT do not commonly occur in the densely vegetated riparian areas used by yellow-billed cuckoos (USFWS 2011). Biological and physical features essential to yellow-billed cuckoo breeding habitat include woodlands within floodplains with understory and overstory components, are at least 220 acres in extent, and are a contiguous or nearly contiguous patch (USFWS 2020a). Furthermore, conservation measures by the County and municipalities substantially restrict land development actions within floodplains and riparian areas within the Permit Area, where these species may co-occur (see Chapter 6.5). Therefore, the Covered Activities are not reasonably certain to cause incidental take of this species.	No	Yes—see Chapter 6.5
Yuma Ridgway's rail (<i>Rallus obsoletus [= longirostris] yumanensis</i>)	Endangered (32 FR 4001)	There are no occurrence records of the Yuma Ridgway's rail (previously, the Yuma clapper rail) along the Virgin River upstream of the confluence of the Beaver Dam Wash (in Arizona), and no sightings of the species are documented in Utah (personal communication, Day, 2019; USFWS 2006, 2014a, 2017d, 2018d). Therefore, the Yuma Ridgway's rail is not known to occur in the Permit Area and incidental take from Covered Activities is not reasonably certain to occur.	No	No
Virgin River chub (<i>Gila seminuda [=robusta]</i>)	Endangered (54FR 35305)	The Virgin River chub is a fully aquatic species. Habitat for the Virgin River chub does not overlap with MDT Habitat. However, the Critical Habitat for these species includes portions of the 100-year floodplain of the Virgin River (USFWS 1995, 2008a, 2011). Conservation measures by the County and local municipalities substantially restrict land development actions within floodplains and riparian areas within the Permit Area (see Chapter 6.5). Furthermore, activities that directly affect the aquatic habitat of this species are also likely to have a federal nexus through federal authorizations by the U.S. Army Corps of Engineers (USACE) under Section 404 of the Clean Water Act (CWA) that would trigger review under Section 7 of the Endangered Species Act (ESA). Therefore, the Covered Activities are not reasonably certain to cause incidental take of this species nor destroy or adversely modify its Critical Habitat.	No	Yes—see Chapter 6.5
Woundfin (<i>Plagopterus argentissimus</i>)	Endangered (35 FR 16047)	The woundfin is a fully aquatic species. Habitat for the woundfin does not overlap with MDT Habitat. However, the Critical Habitat for these species includes portions of the 100-year floodplain of the Virgin River (USFWS 1995, 2008a, 2011). Conservation measures by the County and local municipalities substantially restrict land development actions within floodplains and riparian areas within the Permit Area (see Chapter 6.5). Furthermore, activities that directly affect the aquatic habitat of this species are also likely to have a federal nexus through federal authorizations by the USACE under Section 404 of the CWA that would trigger review under Section 7 of the ESA. Therefore, the Covered Activities are not reasonably certain to cause incidental take of this species nor destroy or adversely modify its Critical Habitat.	No	Yes—see Chapter 6.5

Common Name (Scientific Name)	Federal Listing Status	Incidental Take Assessment	Covered Species	Conservation Measures Proposed
Dwarf bear-poppy (<i>Arctomecon humilis</i>)	Endangered (44 FR 64250)	The dwarf bear-poppy occurs in areas that are MDT Habitat (USFWS 2011 2013b). However, the ESA does not prohibit take of listed plant species. U.S. Fish and Wildlife Service (USFWS) guidance states that because “[i]mpacts to plants do not fall under the definition of ‘take’...[the USFWS] cannot authorize incidental take of plants” (HCP Handbook:7-2). Therefore, the dwarf bear-poppy is not included as a Covered Species. While not a Covered Species, the County will, to the extent practicable, implement conservation measures for this plant species to help achieve the biological goals and objectives of this Amended Habitat Conservation Plan (HCP).	No	Yes—see Chapter 6.5
Fickeisen plains cactus (<i>Pediocactus peeblesianus fickeiseniae</i>)	Endangered (78 FR 18938)	The Fickeisen plains cactus does not share habitat with the MDT; the cactus occurs at slopes of a much higher elevation than the MDT (Arizona Rare Plant Guide Committee 2001; Arizona Game and Fish Department 2011). The only known population of the cactus in Washington County occurs on the BLM-managed property near Hurricane Cliffs (USFWS 2020b). Because the only known population of Fickeisen plains cactus is located on federal lands, which are areas that are not subject to Covered Activities, the Covered Activities are not expected to jeopardize the continued existence or recovery of the species. Additionally, the Covered Activities will not adversely modify Critical Habitat for the Fickeisen plains cactus, since Critical Habitat for this species occurs outside of the Plan Area in Coconino and Mohave Counties, Arizona (USFWS 2019d). Furthermore, the ESA does not prohibit take of listed plant species. USFWS guidance states that because “[i]mpacts to plants do not fall under the definition of ‘take’... [the USFWS] cannot authorize incidental take of plants” (HCP Handbook:7-2). For these reasons, the Fickeisen plains cactus is not included as a Covered Species in this Amended HCP.	No	Yes—see Chapter 6.5
Gierisch mallow (<i>Sphaeralcea gierischii</i>)	Endangered (78 FR 49149)	The Gierisch mallow may share the same general habitat as the MDT, but Utah Natural Heritage Program records do not identify known localities in areas that are also MDT Habitat (UDWR 2005). Only 1% of lands identified by the USFWS as occupied habitat for the Gierisch mallow occur on non-federal lands within the Plan Area. Therefore, Covered Activities are not likely to affect the Gierisch mallow. Furthermore, the ESA does not prohibit take of listed plant species. USFWS guidance states that because “[i]mpacts to plants do not fall under the definition of ‘take’...[the USFWS] cannot authorize incidental take of plants” (HCP Handbook:7-2). The Gierisch mallow is not included as a Covered Species.	No	Yes—see Chapter 6.5
Holmgren milk-vetch (<i>Astragalus holmgreniorum</i>)	Endangered (66 FR 49560)	The Holmgren milk-vetch occurs in areas that are MDT Habitat (USFWS 2007, 2011). However, the ESA does not prohibit take of listed plant species. USFWS guidance states that because “[i]mpacts to plants do not fall under the definition of ‘take’... [the USFWS] cannot authorize incidental take of plants” (HCP Handbook:7-2). Therefore, Holmgren milk-vetch is not included as a Covered Species. While not a Covered Species, this Amended HCP includes certain conservation commitments to avoid jeopardizing the continued existence of this listed plant species.	No	Yes—see Chapter 6.5

Common Name (Scientific Name)	Federal Listing Status	Incidental Take Assessment	Covered Species	Conservation Measures Proposed
Jones cycladenia (<i>Cycladenia humilis</i> var. <i>jonesii</i>)	Threatened (51 FR 16526)	Jones cycladenia is not currently known to occur in the County (USFWS 2008b). Therefore, the Covered Activities will have no effect on this plant species. Furthermore, because the ESA does not prohibit take of listed plant species and USFWS guidance states that because “[i]mpacts to plants do not fall under the definition of ‘take’...[the USFWS] cannot authorize incidental take of plants” (HCP Handbook:7-2), the Jones cycladenia is not included as a Covered Species.	No	No
Shivwits milk-vetch (<i>Astragalus ampullarioides</i>)	Endangered (66 FR 49560)	The Shivwits milk-vetch may share the same general habitat as the MDT, but Utah Natural Heritage Program (UNHP) records do not identify known localities in areas that are also MDT Habitat (UNHP 2019). The ESA does not prohibit take of listed plant species. USFWS guidance states that because “[i]mpacts to plants do not fall under the definition of ‘take’...[the USFWS] cannot authorize incidental take of plants” (HCP Handbook:7-2). Therefore, the Shivwits milk-vetch is not included as a Covered Species. While not a Covered Species, the County proposes conservation measures for this plant species to help achieve the biological goals and objectives of this Amended HCP.	No	Yes—see Chapter 6.5
Siler pincushion cactus (<i>Pediocactus</i> [= <i>Echinocactus</i> = <i>Utahia</i>] <i>sileri</i>)	Threatened (44 FR 61786)	The Siler pincushion cactus may share the same general habitat as the MDT (UDWR 2005; USFWS 2008c, 2011, 2018e), although this species is only known to occur at two localities within privately owned lands of the Plan Area that may be subject to Covered Activities (UNHP 2019). One population was monitored by the BLM prior to a land exchange; however, the BLM only documented two individuals during the last survey in 1995 and documented increased disturbance in the area (Hreha and Meyer 1994 and Armstrong et al. 1995, as cited in UNHP 2019). The second locality, associated with the White Dome cactus population, contains approximately 170 individuals and is located on private lands that may be subject to Covered Activities of this Amended HCP; this population represents approximately 2% of the range-wide population (USFWS 2020c). The USFWS is not aware of any Siler pincushion cactus individuals that occur in MDT Habitat on non-federal lands in the County (USFWS 2020c). Therefore, it is not reasonably certain that this species will be exposed to Covered Activities. Furthermore, as the ESA does not prohibit take of listed plant species, and USFWS guidance states that because “[i]mpacts to plants do not fall under the definition of ‘take’...[the USFWS] cannot authorize incidental take of plants” (HCP Handbook:7-2), the Siler pincushion cactus is not included as a Covered Species.	No	Yes—see Chapter 6.5

Note: Appendix C contains additional information and analysis for each Considered Species.

3.2 COVERED SPECIES—MOJAVE DESERT TORTOISE

3.2.1 Life History

The MDT is a large, herbivorous reptile that can live up to 80 years. Adults reach 8 to 15 inches in length and weigh 8 to 15 pounds. The shell has a domed carapace; a relatively flat, unhinged plastron; and is greenish tan to dark brown. The flattened forelimbs have heavy, claw-like scales, and the hind limbs are comparatively more elephantine (Ernst and Lovich 2009, as cited in USFWS 2011).

The MDT is typically active outside of its burrow for only a portion of a year, depending largely on weather conditions. Periods when this species is typically more active range from 6 weeks to 5 months (USFWS 2018f). Tortoises have been observed aboveground any time of year, including during seasons when this species is typically less active (e.g., December 1 to February 15; USFWS 2018f). The MDT is most active during the spring and early summer when annual plants are available for forage, ambient temperatures are not extreme, and some precipitation may occur. As a result of the relatively moderate summer temperatures in the UVRRU compared to other parts of the MDT range, MDT in this area tend to be active during the midsummer months (USFWS 2008d). However, the MDT is more consistently active in the spring and fall, and MDT clearance surveys associated with the Covered Activities are restricted to March 15 through May 15 and August 20 through October 20 (see Development Protocols in **Appendix A**). For the purposes of utility development within the Reserve, the MDT active period is February 15 through November 30 (see **Appendix A**).

Desert tortoises, including the MDT, prefer to feed on herbaceous perennials and winter annuals but also feed on perennial grasses, perennial shrubs, and cacti (USFWS 2011). Additionally, desert tortoises have been observed consuming bone material scavenged from mammal scat (National Park Service [NPS] 2019a), small animals, and insects (Jennings 1997). The diet of a desert tortoise varies according to the temporal availability of preferred food plants. A recent study in the western Mojave Desert showed that MDT are selective herbivores that may seek out particular rare herbaceous perennials (Jennings and Berry 2015). It has also been shown that native forage plants are more highly preferred over nonnative forage plants (Jennings 1997; Jennings and Berry 2015), and that a diet composed mostly of nonnative annual grasses does not promote growth of hatchling tortoises (Drake et al. 2016).

Home range sizes for MDT vary between individuals and fluctuate depending on the sex, location, available resources, and weather patterns. Male home range sizes can be as large as 89 hectares (220 acres), but female home ranges may be only half that size (Franks et al 2011; USFWS 2011). The home ranges of individual MDT often overlap, and MDT do not defend or maintain specific use areas (Harless et al. 2009). MDTs use an average of seven to 12 different burrows within their home range (O'Connor et al. 1994, as cited in USFWS 2011) and MDT occasionally travel outside of their home ranges on long-distance forays. However, typical movements are short and concentrated in local areas containing one or more burrows (Sadoti et al. 2017). Over the lifetime of an MDT, one individual may use more than 1.5 square miles (almost 1,000 acres) of habitat and may occasionally venture more than 7 miles outside of its home range (Berry 1986, as cited in USFWS 2011).

MDTs are slow growing and long lived, and take between 13 and 20 years to reach sexual maturity (USFWS 2011). Male MDT begin competing for females as early as March and April and can continue this breeding activity into October. After mating, females can store sperm for 5 or more years. Females normally lay one or two clutches of one to 10 eggs per year. In some cases, during years with environmental pressures such as low rainfall, few to no eggs are laid (Henen 1997; Wallis et al. 1999). Eggs are deposited in a shallow nest from late spring to early summer. During incubation, the soil temperature can determine the sex of the hatchlings, with temperatures equal to or below 86.9 degrees Fahrenheit (°F) producing all males and temperatures equal to or above 90.5°F producing all females. A

temperature of approximately 88.3°F results in a 1:1 sex ratio of males and females (Rostal et al. 2002). The typical length of incubation is between 90 and 120 days (USFWS 2008d); however, one study of 12 wild females in southwestern Utah reported emergence after 67 to 104 days, with a mean incubation time of 89.7 days (McLuckie and Fridell 2002; as cited in Berry and Murphy 2019). Like many other characteristics of MDT life history, growth and reproduction vary depending on precipitation patterns. Growth rates increase during years with higher precipitation and subsequent higher annual plant production (USFWS 2011).

3.2.2 Range, Recovery Units, and Designated Critical Habitat

The MDT is found across portions of four states to the north and west of the Colorado River in southwestern Utah, northwestern Arizona, southern Nevada, and southeastern California. The MDT occurs in both the Mojave and Sonoran Deserts (Edwards et al. 2016; USFWS 2011). For recovery planning purposes, the USFWS created five Recovery Units that encompass the entire range of the species: Western Mojave, Colorado Desert, Northeastern Mojave, Eastern Mojave, and Upper Virgin River (**Figure 2**) (USFWS 2011). The Recovery Unit boundaries identify evolutionarily significant MDT populations and are based (in part) on approximate ecosystem boundaries relevant to the MDT. The Recovery Units also take into consideration information regarding genetic variability, behavior patterns, and morphology. Within each Recovery Unit, the USFWS identified one or more DWMAAs that contained (or could contain, with appropriate management) at least one viable MDT population resistant to extinction processes.

The UVRRU is the smallest Recovery Unit and is entirely contained within the County. The UVRRU is also the most isolated of the Recovery Units, as it is situated at the northeast end of the MDT range. It shares its western border with the Northeastern Mojave Recovery Unit, and the crest of the Beaver Dam Mountains separates the Upper Virgin River population of MDT from the Beaver Dam Slope population of MDT (see **Figure 2**). Potential habitat connectivity between the UVRRU and the Northeastern Mojave Recovery Unit is limited to approximately a 1.5-mile-wide area along the boundary between these Recovery Units within the County (see **Chapter 5.4.2** for the description of the updated MDT Habitat Mapping; potential habitat connectivity is illustrated in **Figure 5**). The U.S. Geological Survey (USGS; Nussear et al. 2009) also maps potentially suitable MDT habitat to the south, which connects to the Northeastern Mojave Recovery Unit and is limited to an area approximately 2 miles wide within the Virgin River floodplain in Mohave County, Arizona (see inset **Figure 2**). The UVRRU does not abut any other Recovery Units.

The USFWS designated 10,072 square miles (6,446,200 acres) as Critical Habitat for the MDT in 1994 (59 FR 5820, USFWS 1994b), distributed across 12 Critical Habitat units (see **Figure 2**). Designated Critical Habitat within the UVRRU totals 54,600 acres, which is less than 1% of the total acreage of designated Critical Habitat for the species. However, this relatively small amount of Critical Habitat includes one of the densest known MDT populations. The specific physical and biological features of MDT Critical Habitat are 1) sufficient space to support viable populations within each of the Recovery Units and to provide for movement, dispersal, and gene flow; 2) sufficient quality and quantity of forage species and the proper soil conditions to provide for the growth of these species; 3) suitable substrates for burrowing, nesting, and overwintering; 4) burrows, caliche caves, and other shelter sites; 5) sufficient vegetation for shelter from temperature extremes and predators; and 6) habitat protected from disturbance and human-caused mortality (59 FR 5820–5866).

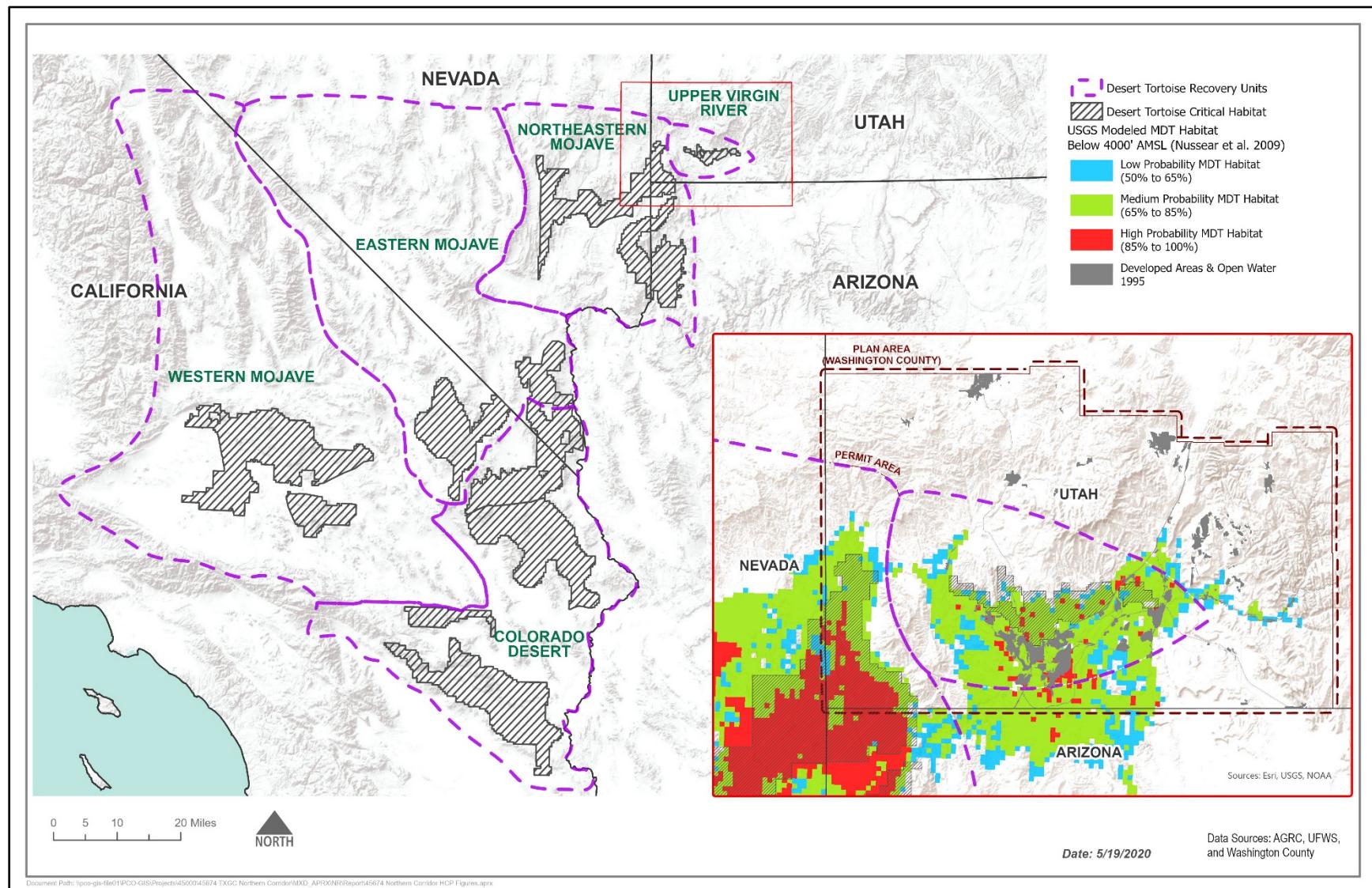


Figure 2. Mojave desert tortoise (MDT) Recovery Units and Critical Habitat designations and U.S. Geological Survey modeled MDT Habitat in the Plan Area vicinity.

3.2.3 Habitat Characteristics and Estimates

3.2.3.1 *Habitat Characteristics*

MDTs are most often found along the gently sloping terrains associated with desert scrub habitat between 2,000 and 3,300 feet in elevation above mean sea level (amsl) (Nussear et al. 2009). However, records of MDT locations range from below sea level to as high as 7,300 feet above mean sea level (amsl; USFWS 2011). MDTs have also been found in steeper, rockier areas such as rocky outcrops, alluvial deposits, and bajadas (Gardner and Brodie 2000, as cited in USFWS 2008d).

The MDT occupies a variety of habitats from flats and slopes at lower elevations typically characterized by creosote bush scrub to rocky slopes at higher elevations with blackbrush scrub and juniper woodlands (USFWS 2011). However, the MDT prefers areas with a lower density of shrubs and a higher density of herbaceous forbs. Dominant plant species within areas occupied by MDT include creosote, succulents, cheesebush (*Ambrosia salsola*), blackbrush, hopsage (*Grayia* spp.), shadscale (*Atriplex confertifolia*), Mojave saltbush (*Atriplex spinifera*), and allscale (*Atriplex polycarpa*). This species is also found in scrub-steppe vegetation types and semi-desert grassland complexes. MDTs prefer areas with sandy-gravel soils that are friable enough for digging burrows but firm enough so as not to collapse (USFWS 2011).

MDTs seek shelter during unfavorable conditions in dug-out burrows, rodent or other animal burrows, and caliche caves (USFWS 2011) and may remain mostly inactive during periods of drought (Duda et al. 1999). The availability of such shelter sites is an important aspect of habitat suitability. Even when MDT are active, burrows or shrubs are used as cover during the night or hottest part of the day (Nagy and Medica 1986; Zimmerman et al. 1994).

The Upper Virgin River population of MDT is at the northeast edge of the species' range where winters are relatively longer and colder and summers are milder compared to the rest of the species' range. Because of the relatively mild summer climate, MDT in the UVRRU are more active during the summer than in other parts of the species' range (USFWS 2011); however, they shade up during the heat of the day. Within the UVRRU, MDT have been found to use more rugged terrain such as mesas, sand dunes, and canyons. Here, MDT will often use sandstone and lava caves as well as burrows (Bury et al. 1994, as cited in USFWS 2011). MDTs in the UVRRU are associated with creosote-bursage and thermic blackbrush habitat with the highest presence found in warm grassland habitat (Jones et al. 2015).

Within the RCNCA (which is contained within the Reserve), preliminary habitat analysis and modeling (that incorporates data from surveys conducted up to 4,000 feet amsl) indicate that MDT presence is associated with middle to low elevations (2,800 to 4,300 feet amsl), flat to gentle slopes (mean slope of 8 percent), and south to southwest exposures (mean aspect of 202 degrees) (Jones et al. 2015). An analysis of 8,750 observations of MDT or their sign within the UVRRU found that only 16% of these observations were from locations above 4,000 feet in elevation (NPS 2019b). This includes three MDT observations from the upper slopes of the Beaver Dam Mountains, five observations from the general vicinity of Snow Canyon State Park, and one record near Apple Valley. All other MDT observations above 4,000 feet are from the vicinity of an apparently isolated MDT population near Springdale that is presumed to be an introduced population (1995 HCP). Reported detections of MDT in this Springdale population are higher than for other areas of the UVRRU because Zion National Park biologists have heavily monitored these tortoises. If the Springdale observations are an outlier population, the other 99.9% of MDT observations from the UVRRU occur at an elevation below 4,000 feet.

3.2.3.2 *Plan Area Habitat Estimates circa 1995*

3.2.3.2.1 1995 HABITAT CONSERVATION PLAN HABITAT MAPPING

The 1995 HCP estimated the extent of occupied and potential habitat for the MDT in the Plan Area based on field data collected in 1991 from approximately 1,000 miles of transect surveys across the Plan Area and other data from the UDNR and BLM reporting signs of MDT occupancy (i.e., burrows, scat, carcasses, or individuals) (1995 HCP:12).

Based on these data, the 1995 HCP mapped areas of occupied and potential MDT Habitat. The 1995 HCP estimated that 122,891 acres of MDT habitat occurred within the Plan Area (see 1995 HCP:Table ES1). The 1995 HCP also estimated that approximately 55,947 acres of occupied MDT habitat and 31,282 acres of potential MDT habitat were present within the Permit Area (1995 HCP:Table 2.1; USFWS 1996).

Figure 3 shows the approximate distribution of the occupied or potential MDT habitat within the Permit Area described in the 1995 HCP. While the 1995 HCP explicitly identified only 87,229 acres of the Permit Area as occupied or potential habitat for the MDT, the 1995 HCP also stated that MDT could also be found in “non-habitat” areas (1995 HCP:47). However, the 1995 HCP stated that “the probability of finding endemic tortoises in non-habitat areas is very low” (1995 HCP:47). Because of the historical use of MDT as pets and the ease of transporting the animal, the Original ITP provided incidental take coverage to all non-habitat areas to resolve the potential for conflict.

While this mapping effort represented the best available information at the time, as noted above, the 1995 HCP acknowledged that the data were incomplete and imprecise.

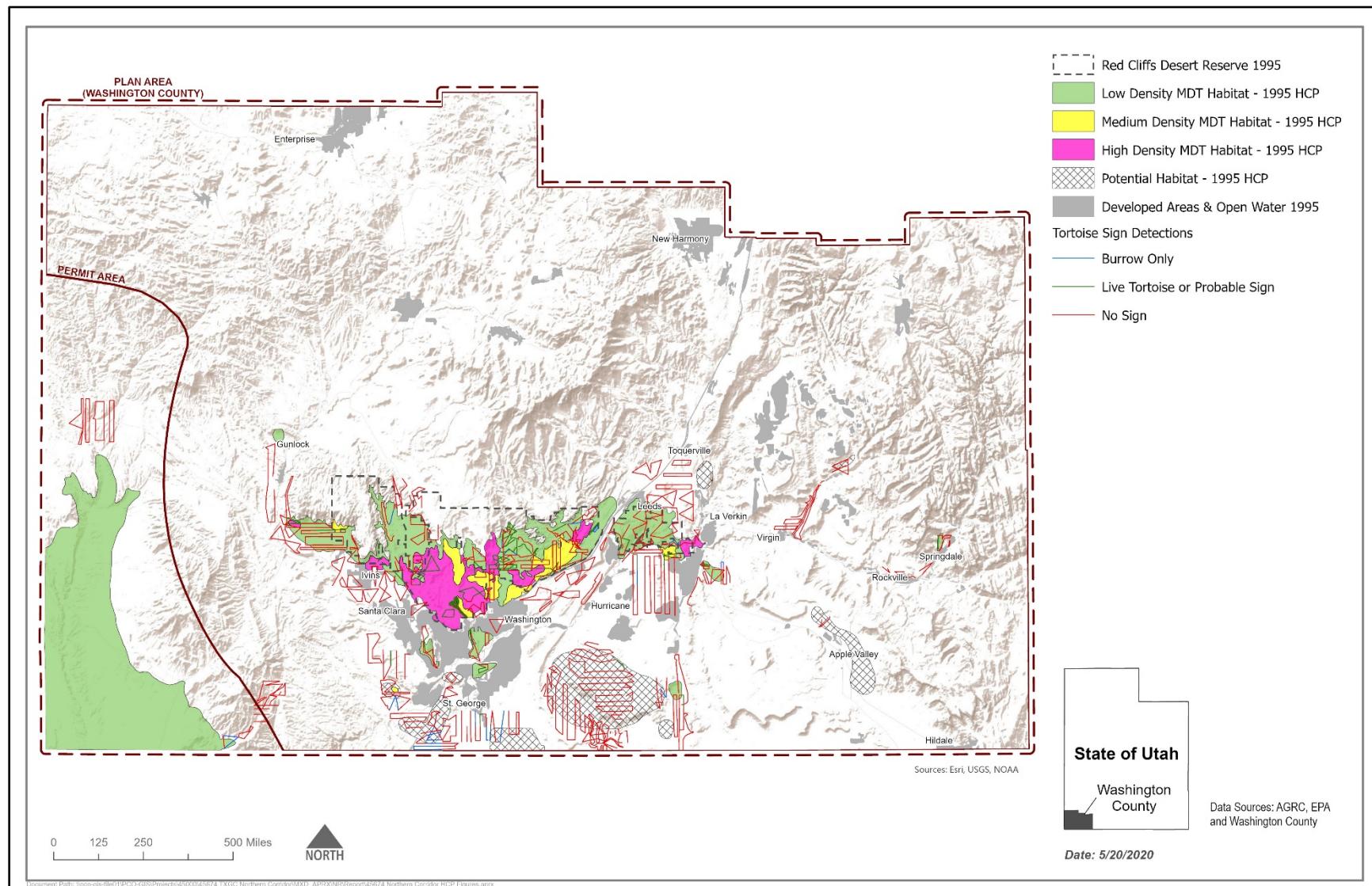


Figure 3. Extents of occupied and potential Mojave desert tortoise habitat from the 1995 Habitat Conservation Plan.

3.2.3.2.2 U.S. GEOLOGICAL SURVEY MODEL WITH APPROXIMATE 1995 DEVELOPMENT CONDITIONS

The USFWS Desert Tortoise Recovery Office uses a peer-reviewed habitat model prepared by the USGS (Nussear et al. 2009) to estimate the distribution of MDT across its range and approximate the amount and extent of suitable habitat for the species. The USGS model quantifies the statistical probability of MDT habitat potential at a spatial resolution of 1 square kilometer (0.39 square mile), based on an analysis of 16 environmental data layers and MDT occurrences (Nussear et al. 2009). However, the scale of the USGS model is relatively coarse and the model does not account for anthropogenic changes to the landscape, such as urban development (Nussear et al. 2009). This updated approach to approximating MDT Habitat applies to the range of the species and is independent of anthropogenic changes to the landscape, thereby allowing for an updated interpretation of historic habitat availability based on characteristics of the natural landscape that relies on the present best available information.

For the purposes of this Amended HCP, Washington County (in coordination with UDNR) made the following refinements to the output of the USGS model to approximate the extent of MDT Habitat within the Plan Area:

- Removed areas with less than 50% probability of habitat potential;
- Removed areas above 4,000 feet in elevation, based on the distribution of documented MDT occurrences in the Plan Area;
- Removed land covers that do not support MDT (i.e., open water and hardscape or developed areas)
 - Excluded surface waters are associated with the Quail Creek Reservoir, Sand Hollow Reservoir, Gunlock State Park, and the Virgin River (USGS 2016);
 - Excluded hardscape areas were identified from three spatial data sources: the County's developed land data set (Washington County GIS 2019), Southwest Regional Gap Analysis Project Landsat imagery for surface hardness (Lowry et al. 2005), and LANDFIRE overlays (USGS 2019). Because the methods and assumptions of the USGS model are significantly different than the mapping used in the 1995 HCP, and the USGS model evaluates potentially suitable habitat conditions in the absence of anthropogenic changes to the landscape (such as land development), the County estimated the extent of hardscape areas circa 1995 (to approximate conditions evaluated in the 1995 HCP) and circa 2019 (to approximate conditions at the time of the HCP amendment; see results in the following subchapter). This approach allows for a consistent evaluation of actual losses of modeled MDT Habitat within the Plan Area during implementation of the 1995 HCP (i.e., incidental take);
- Removed small patches of modeled habitat less than 1 square kilometer in size when isolated by open water or hardscape.

This updated analysis suggests that the Plan Area may have actually contained 356,956 acres of MDT Habitat circa 1995 (**Figure 4**). Approximately 89,122 acres of this MDT Habitat occurred on non-federal lands outside the Reserve within the Permit Area.

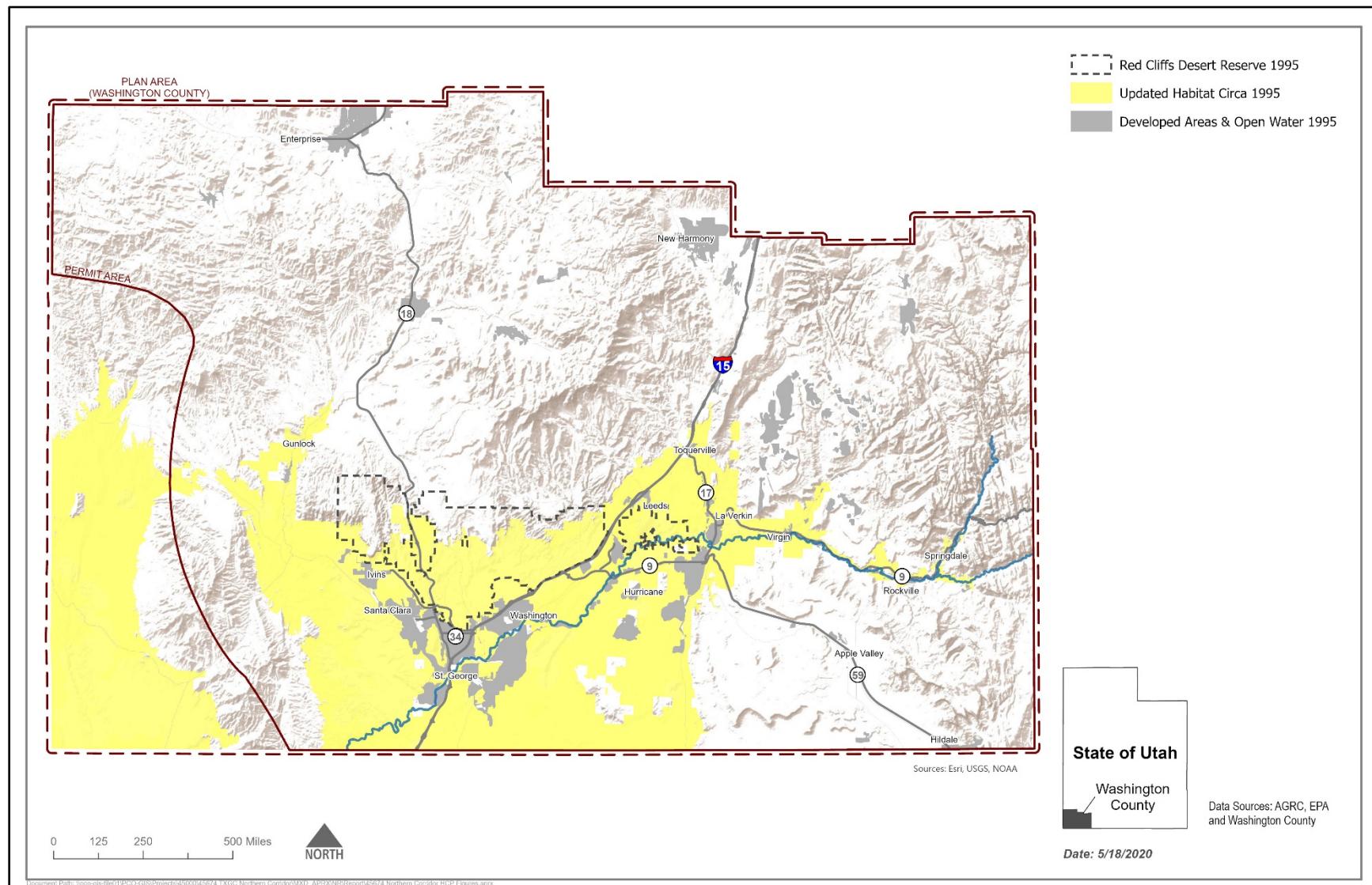


Figure 4. Updated Mojave Desert Tortoise Habitat within the Plan and Permit Areas circa 1995.

3.2.3.3 Plan Area Habitat Estimates circa 2019

This Amended HCP incorporates the modified USGS model, as described in the previous subchapter, to estimate the extent of MDT Habitat in the Plan Area circa 2019. This Amended HCP also classified areas of 2019 modeled MDT Habitat as either Occupied MDT Habitat or Potential MDT Habitat. Occupied MDT Habitat is modeled habitat associated with documented MDT occurrences, as described below. Potential MDT Habitat is modeled habitat that is not associated with a documented MDT occurrence but may be suitable for use by MDT. Many areas of Potential MDT Habitat have not been subject recently to surveys for the presence or absence of MDT. For planning purposes, this Amended HCP assumes that MDT may use to some extent all areas of Occupied and Potential MDT Habitat within the Plan Area.

To estimate the extent of Occupied MDT Habitat in the Permit Area, this Amended HCP uses the locations of recorded MDT observations and sign, including the data from more than 1,000 miles of survey transects investigated for the 1995 HCP. Additional MDT observation data are provided from opportunistic occurrence reports or surveys, UDWR monitoring studies, and County-sponsored or project proponent surveys. Systematic surveys for MDT across the Plan and Permit Areas have not been performed since the surveys that preceded the 1995 HCP. Data points located within hardscaped areas were removed, as the individual MDTs associated with these data points have likely been translocated to the Reserve or have otherwise been incidentally taken. Each remaining MDT data point was buffered by a 1-kilometer-radius (0.62 mile) circle to capture the maximum home range size and most long-distance movements of MDT (Berry and Murphy 2019; Drake et al. 2015; Franks et al. 2011). Also included in the extent of Occupied MDT Habitat are areas previously identified in the 1995 HCP as incidental take areas. This mapping effort uses the 2019 boundaries of the incidental take areas, some of which have been modified during the original ITP Term as a contemplated adaptive management response to new information.

Table 4 and **Figure 5** summarize and depict the extents of Occupied and Potential MDT Habitat within the Plan and Permit Areas.

Table 4. Occupied and Potential Mojave Desert Tortoise (MDT) Habitat Acreage circa 2019

Landowner or Management Entity	Inside Permit Area (acres)			Outside Permit Area (acres)			Plan Area Total (acres) All MDT Habitat
	Occupied	Potential	All MDT Habitat	Occupied	Potential	All MDT Habitat	
Federal	45,008	72,888	117,896	34,388	50,258	84,646	202,542
Bureau of Land Management	44,964	71,395	116,359	34,388	50,258	84,646	201,005
Other federal land managers*	44	1,493	1,537	-	-	-	1,537
Non-federal	28,387	51,966	80,353	4,940	9,317	14,257	94,610
Utah School and Institutional Trust Lands Administration	12,458	17,690	30,148	4,442	6,261	10,703	40,851
Utah Department of Natural Resources	5,121	387	5,508	-	-	-	5,508
Utah Department of Transportation	77	190	267	-	-	-	267
Local governments and private	10,731	33,699	44,430	498	3,056	3,554	47,984
Tribal	1,202	18,596	19,798	-	-	-	19,798
Total	74,597	143,450	218,047	39,328	59,575	98,903	316,950

Note: Acreage calculations of habitat estimates across geographies or time periods may not be consistent due to imprecision among data layers from different sources and rounding.

* Includes lands managed by the Department of Defense, the National Park Service, or the U.S. Forest Service.

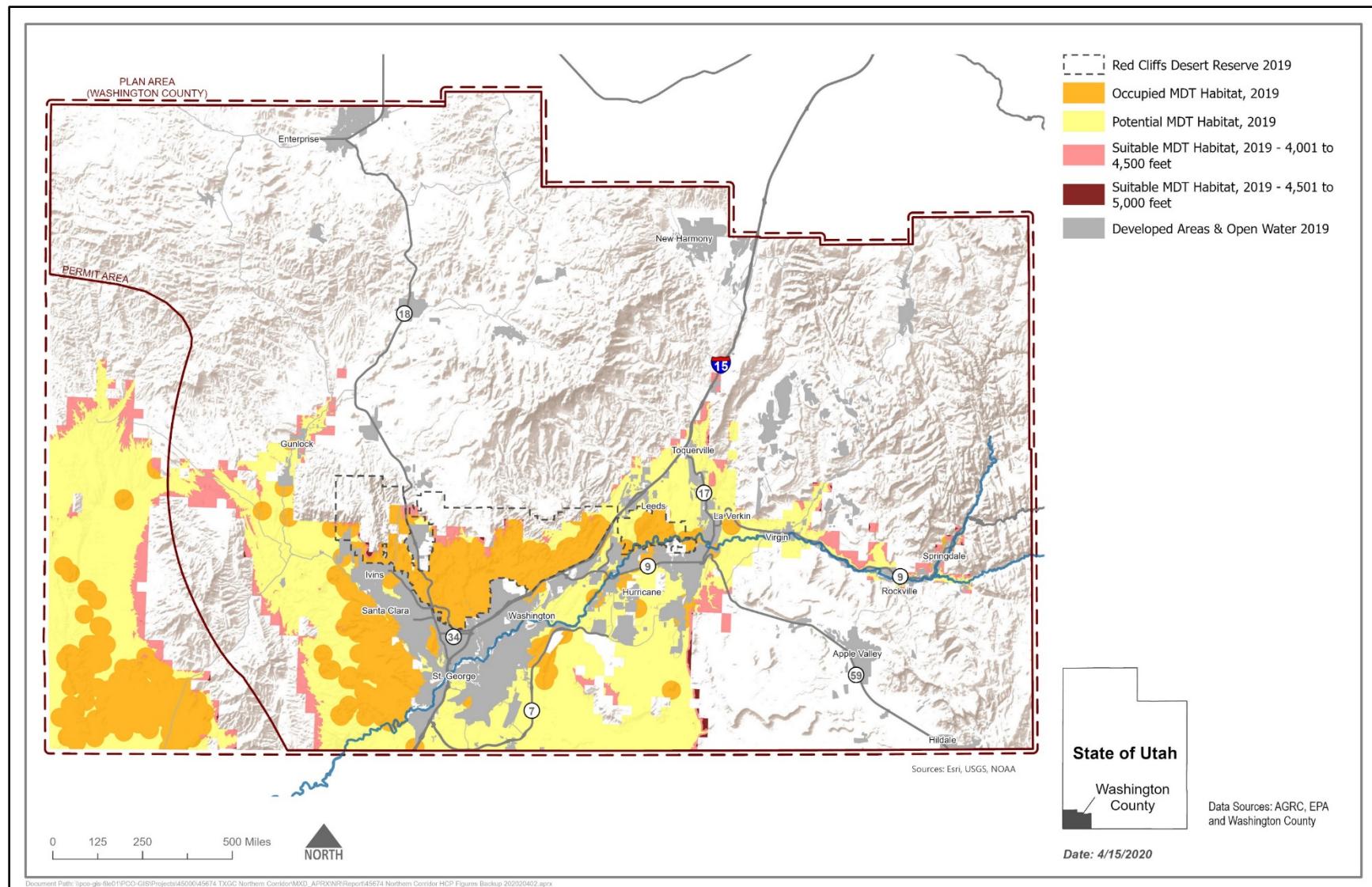


Figure 5. Occupied and Potential Mojave Desert Tortoise Habitat within the Plan and Permit Areas circa 2019.

3.2.3.4 ***Estimated Habitat Losses Between 1995 and 2019***

Table 5 summarizes the estimated extents of MDT Habitat in the Plan Area and portions thereof under the methods and time periods described in the prior subchapters. Based on the updated habitat modeling, approximately 40,000 acres of MDT Habitat within the Permit Area (15%) may have been lost to development activities between 1995 and 2019, with approximately 22,821 acres of loss occurring on non-federal lands outside of the Reserve (26%).

Table 5. Summary of Habitat Estimates circa 1995 and 2019

Mapping Method and Period	Plan Area	Permit Area	Non-federal Land Outside Reserve*	Reserve [†]
1995 HCP Mapping [‡]	154,173 acres	87,229 acres	24,096 acres	38,787 acres
Modified USGS Model circa 1995	356,956 acres	258,059 acres	89,122 acres	38,719 acres
Modified USGS Model circa 2019	316,950 acres	218,047 acres	66,301 acres	39,168 acres
Change 1995 to 2019 (based on the modified USGS model)	-40,006 acres	-40,012 acres	-22,821 acres	+449 acres

Note: Acreage calculations across geographies or time periods may not be consistent due to imprecision among data layers from different sources and rounding.

* Limited to the Permit Area and excludes Tribal lands; approximates the lands where Covered Activities may cause incidental take of the MDT.

[†] The boundary of the Reserve has changed over time. The calculations here are based on the Reserve boundary relevant to the period of the habitat mapping.

[‡] Includes habitat acres summarized in Table ES-1 of the 1995 HCP plus acres of mapped potential habitat not included in Table ES-1 of the 1995 HCP.

3.2.4 Population Size, Density, and Trends

3.2.4.1 ***Range-Wide***

Definitive population numbers for the MDT are not known across the range of the species. However, efforts have been made to estimate population numbers through a combination of habitat modeling and on-the-ground survey work (Allison 2015; Allison and McLuckie 2018; McLuckie et al. 2018).⁹ Based on modeling and extrapolation from surveys, there are an estimated 212,343 MDT occupying approximately 17 million acres of modeled habitat across the five Recovery Units comprising the MDT range (Allison and McLuckie 2018). This range-wide population estimate is believed to overestimate the true population of MDT, since it is based on density estimates from survey data collected from Tortoise Conservation Areas (TCAs) that are believed to contain the densest populations of MDTs and which have been extrapolated to all potentially suitable habitats across the range (USFWS 2019e). **Table 6** summarizes the distribution of this estimated MDT population across the five Recovery Units. It is important to note that this habitat modeling excluded impervious surfaces (i.e., paved roads and developed areas) as they do not provide MDT habitat (USFWS 2019e). According to a 2009 modeling effort, approximately 36% of the UVRRU was covered in impervious surfaces (USFWS 2019e).

⁹ It is important to note that surveys and modeling have occurred across a variety of spatial geographies associated with the conservation and management of the MDT: USFWS Recovery Units, TCAs, and Critical Habitat Units. These geographies can often become conflated when describing MDT population and density estimates. There are five Recovery Units, which are the largest management boundaries and essentially capture the entire range of the species. The 17 TCAs, which are focal areas for conservation and management of MDT delineated within the Recovery Units, typically encompass Critical Habitat Units and other protected lands within the Recovery Units. The 12 Critical Habitat Units typically fall within or are adjacent to a TCA (USFWS 2011). Reserve Zones 1 through 5 are a TCA within the larger UVRRU and overlap with most, but not all, of the Upper Virgin River Critical Habitat Unit.

Table 6. Population Estimates by Recovery Unit

Mojave Desert Tortoise (MDT) Recovery Unit	Modeled MDT Habitat (square kilometers and [square miles])	2004 Estimated MDT Abundance	2014 Estimated MDT Abundance	Percent Change in Estimated Abundance (2004–2014)
Western Mojave	23,139 [8,934]	131,540	64,871	-50.6%
Colorado Desert	18,024 [6,959]	103,675	66,097	-36.2%
Northeastern Mojave	10,664 [4,117]	12,610	46,701	+270.3%
Eastern Mojave	16,061 [3,885]	75,342	24,664	-67.3%
Upper Virgin River	613 [237]	13,226	10,010*	-24.3%
Total Range-Wide	68,501 [26,448]	336,393	212,343	-36.9%

Sources: Allison and McLuckie 2018, USFWS 2019e

Note: Abundance numbers are extrapolated from modeled habitat based on estimated densities derived from Tortoise Conservation Areas. The standard error for the total estimated abundance is 31,391 MDT.

* This number is reported for direct comparison with the other recovery units. However, updated abundance estimates specific to the UVRRU are provided in Chapter 3.2.4.2. The updated abundance estimates for the UVRRU may not be directly comparable to the estimates provided for the other recovery units.

The 2014 range-wide MDT population estimate represents a decline of almost 125,000 adults over the prior 10-year period—a nearly 37% overall population decline (Allison and McLuckie 2018). This decline was not evenly distributed across the range of the species. For example, and contrary to overall trends, MDT densities in the Northeastern Mojave Recovery Unit increased at an approximate rate of 13.1% per year between 2004 and 2014 (Allison and McLuckie 2018).

3.2.4.2 *Upper Virgin River Recovery Unit and Plan Area*

The Red Cliffs Desert Reserve TCA hosts a higher density of adult MDT than any other TCA (Berry and Murphy 2019). According to line-distance sampling efforts in 2017, Reserve Zones 2, 3, and 5 support approximately 19.6 adult MDT per square kilometer (36.7 per square mile) and 2,250 adult MDT (McLuckie et al. 2018). Prior to wildfires in 2005, densities were as high as 29.6 MDT per square kilometer. However, UDWR considers the population of MDT within the Reserve to have stabilized: “there is no evidence of further declines in tortoise densities” (McLuckie et al. 2020). Within Reserve Zone 4, translocations of tortoises are increasing tortoise density (estimated to be 13.4 MDT per square kilometer in 2017) (McLuckie et al. 2018). The most recent study by UDWR indicated that MDT translocation in Reserve Zone 4 “is successful in establishing and sustaining a healthy persistent population” (McLuckie et al. 2019).

Unlike other Recovery Units, trends of juvenile MDT population numbers and survivorship are consistent with trends of adult MDT within the UVRRU (USFWS 2019e). In other words, as densities of adult MDT become stable and/or increase, juvenile numbers stabilize and increase as well, which is important to long-term viability and indicates that adults are healthy and reproducing. In other Recovery Units, juvenile numbers are generally declining faster than adult populations.

3.2.5 Threats

According to the USFWS, “the most apparent threats to the desert tortoise are those that result in mortality and permanent habitat loss across large areas, such as urbanization and large-scale renewable energy projects, and those that fragment and degrade habitats, such as proliferation of roads and highways, off-highway vehicle activity, and habitat invasion by nonnative invasive plant species” (USFWS 2019e:4) The USFWS has also indicated that predation, disease, drought, fire, and climate change threaten MDT populations (USFWS 2019e).

CHAPTER 4. HABITAT CONSERVATION PLAN AREA AND PERMIT AREA FOR THE INCIDENTAL TAKE PERMIT

4.1 DEFINITIONS, LOCATION, AND EXTENT

The Plan Area is the geographic area where the Covered Activities and conservation measures performed in accordance with this Amended HCP will occur. Consistent with the 1995 HCP, the Plan Area for this Amended HCP is the entirety of the County (see **Figure 1**). Actions taken to implement the conservation measures of this Amended HCP may occur anywhere within the Plan Area, guided by adaptive management.

This Amended HCP clarifies that incidental take is authorized only for the Upper Virgin River population of MDT. Therefore, the Permit Area for the ITP includes the portion of the Plan Area that occurs outside of the MDT Northeastern Mojave Recovery Unit., as described by the MDT Recovery Plan (USFWS 2011; see **Figures 1 and 2**). The Permit Area contains approximately 2,145 square miles (1,372,743 acres) or 88% of Washington County.

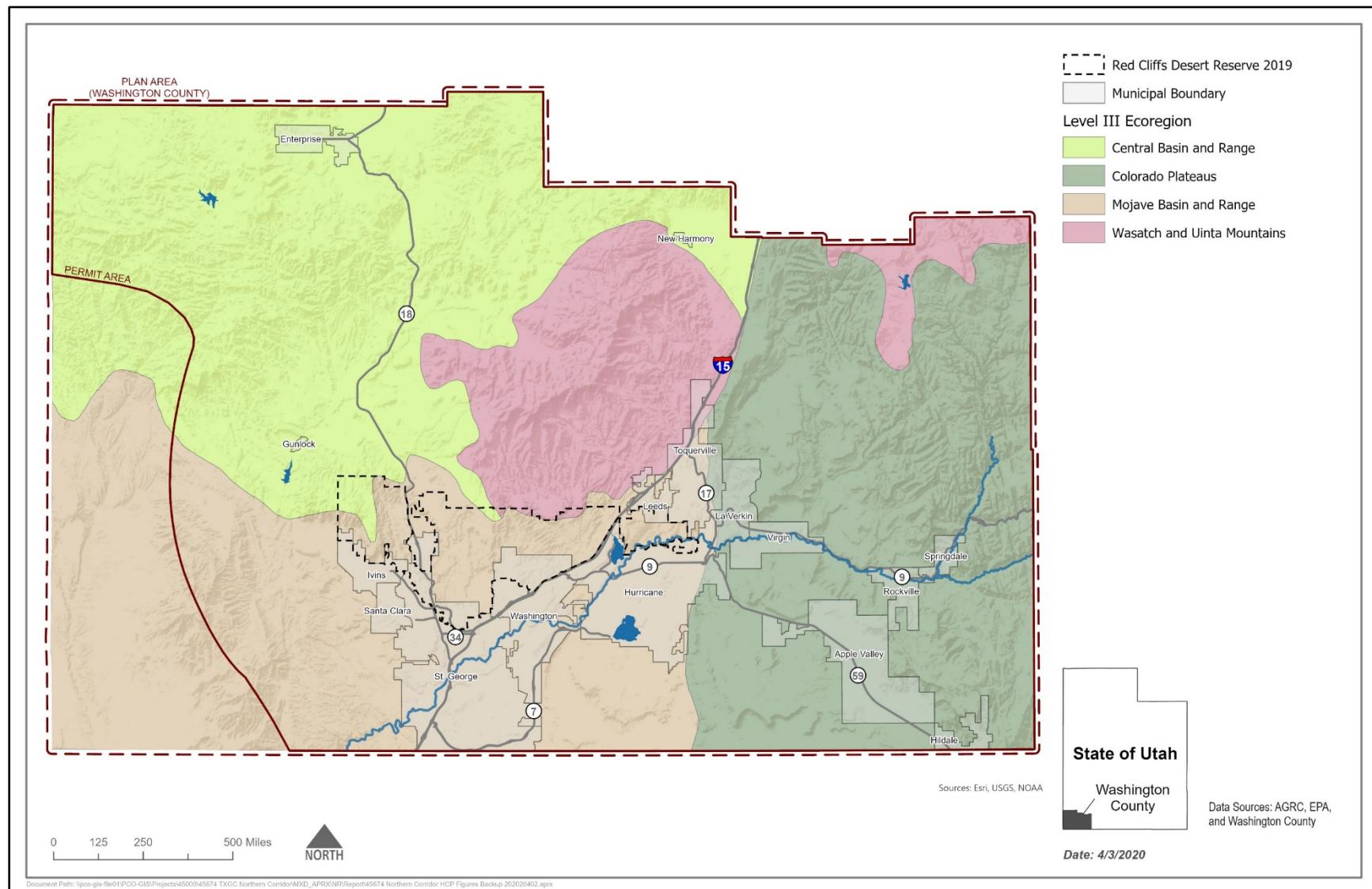
4.2 NATURAL ENVIRONMENT

The BLM assembled substantial information on the natural environment within the Plan Area, with an emphasis on conditions within BLM-managed lands, in the draft Environmental Impact Statement (EIS) analyzing its 2016 Resource Management Plans for the Red Cliffs National Conservation Area (RCNCA), Beaver Dam Wash NCA, and the BLM St. George Field Office (BLM 2015). Much of the information in BLM (2015) applies generally to the Plan and Permit Areas. Below, information from BLM (2015) and other relevant information sources provides a brief summary of the environmental context of this Amended HCP as it relates to the MDT.

4.2.1 Ecoregions

The Plan Area is ecologically diverse and lies at the intersection of four national-scale (Level III) ecoregions, as defined by Woods et al. (2001): Central Basin and Range, Mojave Basin and Range, Wasatch and Uinta Mountains, and Colorado Plateaus (**Figure 6**). Within the Plan Area, the MDT is associated primarily with habitats of the Mojave Basin and Range ecoregion, particularly the subecoregions (also defined by Woods et al. 2001) representing Creosote Bush-Dominated Basins and Arid Footslopes (see **Figure 6**).

Woods et al. (2001) describes the physical landscape of the Mojave Basin and Range ecoregion as characterized by “basins and scattered mountains that are generally lower, warmer, and drier than those of the Central Basin and Range [ecoregion].” Creosote bush (*Larrea tridentata*) generally dominates the vegetation communities of the Mojave Basin and Range ecoregion, particularly in the alluvial fans, valleys, and scattered buttes of the Creosote Bush-Dominated Basins that occur between 2,200 and 4,000 feet amsl (Woods et al. 2001). Other common vegetation in these basins include blackbrush (*Coleogyne ramosissima*), white bursage (*Ambrosia dumosa*), and a variety of other associated shrubs and grasses. The Arid Footslopes, at a slightly higher elevation of 3,000 to 5,000 feet above mean sea level, support vegetation that includes big sagebrush (*Artemisia tridentata*), blackbrush, Mormon tea (*Ephedra* sp.), yellowbrush (*Chrysothamnus viscidiflorus*), galleta (*Pleuraphis jamesii*), Indian ricegrass (*Achnatherum hymenoides*), cheatgrass (*Bromus tectorum*), and cholla (*Cylindropuntia* sp.) (Woods et al. 2001).

**Figure 6. Ecoregions of the Plan Area.**

4.2.2 Topography

The Plan Area exhibits a highly varied topography with mountain ranges and river valleys as well as alluvial fans, foot slopes, canyons, knolls, hills, mesas, buttes, flats, floodplains, and washes (USGS 1980). Elevations in the Plan Area range from a low of 2,500 feet amsl in the floodplains of the Virgin River valley to a high of 10,361 feet amsl at Signal Peak in the Pine Valley Mountains. Approximately one-third of the Plan Area occurs at elevations below 4,500 feet amsl. Most observations of MDT in Washington County occur at or below this elevation (see **Chapter 3.2.3.1** for more information).

Prominent mountain ranges in the Plan Area include the Pine Valley Mountains across the central part of the Plan Area, the Bull Valley Mountains in the northwest corner of the Plan Area, and the Red Mountains to the north of Ivins City. The Beaver Dam Mountains at the southwest corner of Washington County are largely outside of the Permit Area, forming the boundary between the Upper Virgin River and Beaver Dam Slope populations of MDT (USGS 1980).

The Virgin and Santa Clara Rivers cross the Plan Area flowing generally to the south and west, and they merge in St. George. The Virgin River drains lands to the east of the Pine Valley Mountains while the Santa Clara River drains lands to the west of the Pine Valley and Red Mountains. The western edge of the Plan Area drains to Beaver Dam Wash, which merges with the Virgin and Santa Clara Rivers to the south of the Plan Area in Mohave County, Arizona. The northern edge of the Plan Area drains to the north, with creeks and streams terminating in desert (USGS 1980). In addition to these prominent rivers and washes, numerous other waterways, reservoirs, and lakes occur in the Plan Area. The National Hydrography Dataset (USGS 2016) maps 7,045 miles of ephemeral, intermittent, and perennial waterways in the Plan Area, as well as 2,424 acres of open water bodies distributed among 315 features.

4.2.3 Climate, Flood, Drought, and Wildfire

Within the Plan Area, the climate is generally warmer and drier than the rest of the state and varies largely as a function of elevation and topography. The average annual precipitation in the Plan Area ranges between 5 and 20 inches, with more precipitation falling in the higher elevation areas (USGS 2005). The average annual temperature in the Plan Area is 61 °F, with an average winter temperature of 42 °F and average summer temperature of 81 °F (BLM 2015). In the most recently produced climate normals, the National Oceanic and Atmospheric Administration (2019) calculated that minimum and maximum seasonal temperatures ranged from 71.6 °F to 98.7 °F in the summer and from 32.2 °F to 54.7 °F in the winter for the period between 1981 and 2010. Monthly daily high and low temperatures and mean monthly precipitation totals at St. George, which approximates the local climate conditions within the Plan Area that are most relevant to the MDT, are shown in **Table 7**.

Table 7. Monthly Normal Climate Summary at St. George, Utah (1981–2010)

Climate Data	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Normal daily maximum air temperature (degrees Fahrenheit [°F])	53.7	58.8	67.3	75.2	85.8	95.7	101.4	99.1	91.7	77.7	62.9	51.9
Normal daily minimum air temperature (°F)	31.0	35.3	41.6	48.7	58.7	67.3	74.5	72.8	63.2	49.7	38.0	30.6
Normal mean monthly precipitation total (inches)	1.38	1.26	1.18	0.55	0.21	0.17	0.48	0.76	0.57	0.68	0.71	0.85

Source: National Oceanic and Atmospheric Administration (2019)

Monsoonal storms, common in late summer, can cause localized flash flooding in the region (BLM 2015). In 2013, the BLM completed a rapid ecological assessment of the Mojave Desert, finding that most of this ecoregion may be affected by possible changes to precipitation regimes (Comer et al. 2013). Summer thunderstorms may increase in number and/or intensity, causing flash flooding. While precipitation modeling for the Mojave rapid ecological assessment did not find a statistically significant change in the amount of precipitation overall (Comer et al. 2013), this modeling did suggest there may be a slight upward trend in the amount of precipitation occurring during the fall (BLM 2015). Climate modeling from the Multivariate Adaptive Constructed Analogs (MACA) Datasets, which downscale information from 20 global climate models to make predictions at local scales, similarly suggests that fall precipitation may increase (Abatzoglou and Brown 2012; Hegewisch and Abatzoglou 2019).

Additionally, MACA modeling predicts that the St. George area will experience greater precipitation during the winter, summer, and fall seasons and stable or slightly decreasing precipitation in the spring for the periods of 2010 to 2039 and 2040 to 2069. Overall, MACA modeling predicts that annual precipitation will increase by 5.6% to 6.2% under the higher emissions scenario for the period of 2040 to 2069 (Abatzoglou and Brown 2012; Hegewisch and Abatzoglou 2019). Flash flooding can damage fencing installed and maintained as a conservation measure for MDT and other listed species.

Droughts are a frequent and natural part of Utah's climate. Snowmelt is the source of water for many river basins, and lower than normal precipitation during the winter and spring often triggers drought conditions in the state. Conversely, although rare, snowmelt and heavy rainfall can result in severe flooding. However, Utah and other southwestern states have not experienced the upward trend in the frequency of extreme precipitation events as in many other areas of the United States (Frankson et al. 2017). Historical records indicate that Utah fluctuates between periods of extended wet and dry periods, such as in 2000, when dry conditions caused near-record low water levels in Great Salt Lake, or in 2005, when heavy rains resulted in severe flooding along the Virgin and Santa Clara Rivers in the County (Frankson et al. 2017). Severe drought conditions occurred across the landscape of the Reserve in 2002, resulting in no landscape-wide perennial or annual plant growth for the spring or fall of that year (McLuckie et al. 2018).

Although much of Utah is characterized by fire-dependent ecoregions (Bailey 2010), the southwestern Utah ecosystems are not adapted to frequent, intense, or severe wildfires (BLM 2015). Because fire ignition and spread are highly dependent on fuel moisture, wildfires in Utah are typically seasonal. Soils and fuel lose moisture accumulated over the winter and spring due to warming temperatures, which typically results in the summer and fall fire seasons.

Warmer spring and summer temperatures are generally expected to lead to longer fire seasons due to earlier decreases in soil and vegetative moisture (Running 2006). Researchers have found that increasing temperatures and alterations in precipitation patterns are changing the factors that influence natural fire regimes, particularly with respect to western forest ecosystems (Running 2006; Westerling et al. 2006). Average annual temperatures are increasing across Utah, which results in increased evaporation rates and an increased potential for drought and wildfire. However, between 1992 and 2015 researchers found "no strong trend" towards a longer fire season in Utah (Jakus et al. 2017). Nevertheless, within the Reserve, fire has negatively affected MDT habitat, and the resulting habitat degradation has become more severe with the expanded occurrence of invasive grasses (BLM 2015). Approximately 13,506 acres of the RCNCA (30% of 44,859 total acres) burned between 2000 and 2015, some of which burned multiple times during that period (BLM 2015). In 2020 through mid-October, three wildfires burned a combined 11,754 acres within Reserve Zone 3, of which 8,814 acres were designated MDT Critical Habitat, and 2,526 acres were previously unburned.

The presence of invasive annual grasses within the Plan Area alters the natural fire regime of the landscape, increasing both the frequency and severity of wildfires. Frequent or large-scale fires are not a

natural aspect of the Mojave Desert, and its vegetation communities are not fire adapted (Paysen et al. 2000). Invasive annual grasses alter the fire regimes of these communities by filling in the gaps between desert plants, removing the naturally fire-resistant breaks between individual plants, thereby increasing fine fuel loads and creating a contiguous and highly flammable fuel source (BLM 2015). The invasive annual grasses subsequently benefit from wildfires, resprouting quickly and colonizing areas where native species were lost to fire, further contributing to their spread (BLM 2015).

Climate change is predicted to affect the American Southwest with increased drought events and increased temperatures (The Global Change Research Program, as cited in Berry and Murphy 2019). Under drought conditions, nonnative grasses would proliferate, which would also increase fuel loads, thereby making habitat more susceptible to wildfires and could cause direct mortality and loss of habitat for MDT (Berry and Murphy 2019; Drake et al. 2016).

4.2.4 Vegetation Communities and Land Cover

The National Land Cover Database (NLCD) is a nationwide classification of land use and land cover types based on remote sensing data at a spatial resolution of 30 meters (98.4 feet) (Yang et al. 2018). The 2016 version of the NLCD models more than one-half of the Plan Area (54% of the total area) as shrub/scrub land cover, with evergreen forest and herbaceous land covers representing approximately 30% and 9% of the Plan Area, respectively (**Figure 7**). Developed and planted/cultivated land covers (i.e., pasture/hay and cultivated crops) within the Plan Area represent less than 4% of the total area (see **Figure 7**).

Vegetation communities mapped within the RCNCA include the following (based on historical descending order of dominance): mesic blackbrush; barren lands; thermic blackbrush; pinyon-juniper woodland; big sagebrush steppe; creosote bush-white bursage scrub; desert sand sagebrush desert washes; warm desert riparian; warm season grassland, montane riparian; and mountain shrub (BLM 2016a).

Creosote bush-white bursage scrub occurs along the southern border of Reserve Zones 1 through 5,¹⁰ with Reserve Zone 1 having the least amount of creosote bush-white bursage and Reserve Zone 5 having the highest proportion. Mesic blackbrush also occurs across Reserve Zones 1 through 5, along with small patches of warm season grassland. Reserve Zone 4 contains mainly mesic blackbrush and creosote bush-white bursage. Reserve Zone 1 consists of higher elevation vegetation communities with pinyon-juniper woodland at the northern end, mesic blackbrush at the southern end, and desert sand shrub interspersed throughout.

All of the ecological systems in the Reserve have a high departure from their natural range of variability due to the presence of nonnative grasses and forbs in burned and unburned areas (Provencher et al. 2011). Invasive annual grasses common to the RCNCA and vicinity include red brome (*Bromus rubens*) and cheatgrass.

¹⁰ See **Figure 11** for a depiction of the Reserve Zones.

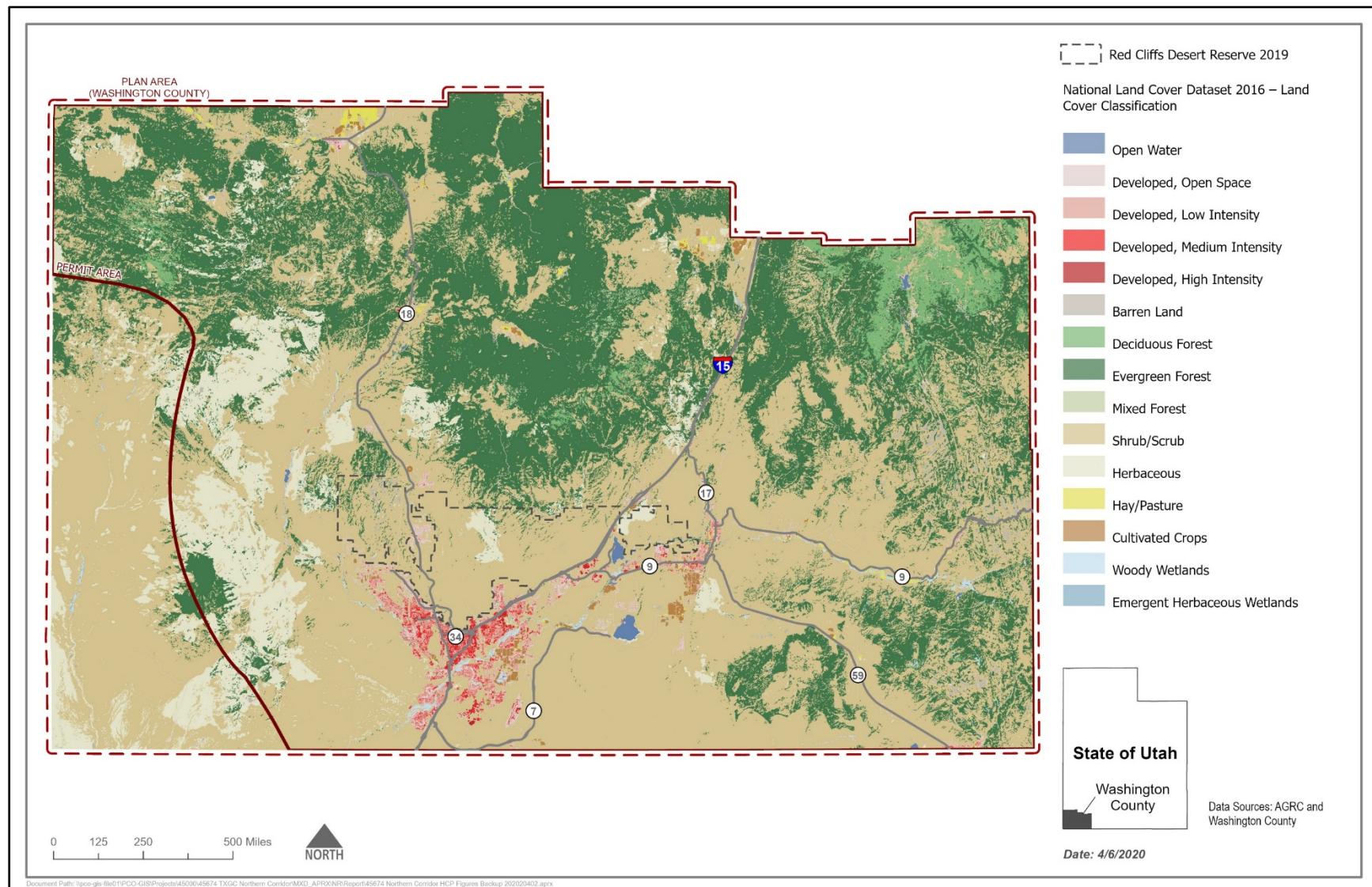


Figure 7. Land use and land cover types in the Plan Area.

4.3 HUMAN ENVIRONMENT

4.3.1 Human Population and Population Centers

The Plan Area is located at the southwest corner of the State of Utah and abuts the states of Nevada to the west and Arizona to the south. The City of St. George, in the south-central portion of the Plan Area, is the county seat of the County. The Plan Area also includes the incorporated municipalities of Apple Valley, Enterprise, Hildale, Hurricane, Ivins, La Verkin, Leeds, New Harmony, Rockville, Santa Clara, Springdale, Toquerville, Virgin, and Washington, in addition to several other unincorporated towns and small population centers. The U.S. Census Bureau reported the human population of the County as 138,115 in 2010 and estimated the 2017 population as 165,662 (U.S. Census Bureau 2018).

Since 1995, when the U.S. Census Bureau estimated the human population of the County as 72,261 (U.S. Census Bureau 2002), the estimated human population of the County increased by 129%. Data from the 2018 Population Estimates Program administered by the U.S. Census Bureau suggests that during the period from 2010 to 2018, the County population grew an average of 2.7% annually (U.S. Census Bureau 2018). Based on human population estimates produced by the U.S. Census Bureau for 2016 and 2017, St. George was the fastest-growing metropolitan area in the United States (DeMille 2018). Long-term population projections produced by the Kem. C Gardner Policy Institute at the University of Utah suggest the population of Washington County will reach approximately 356,000 people by the year 2045 (Perlich et al. 2017).

To help relate land use plans to population projections, the County commissioned a Coordination Plan that synthesized all proposed developments included in the General Plans for each of the major urban areas within the County. Based on the cumulative development proposed in these General Plans, the County concluded that the total population at potential “buildout”¹¹ was 328,000 people (Washington County 1997, as cited in City of St. George 2002). This estimate closely followed another buildout projection commissioned by the Washington County Water Conservancy District, which projected a potential population at full buildout of 333,000 people under a medium-growth scenario (Boyle Engineering Corporation et al. 1995).

Based in part on the projections of buildout potential (which occurs at a human population of approximately 330,000), Washington County selected a 25-year duration for the Renewed/Amended ITP Term, which generally coincides with the long-term population projection for 2045 (approximately 356,000 people; Perlich et al. 2017). In other words, it is reasonable to conclude that Covered Activities could fully use the amount of incidental take reauthorized through this Amended HCP and the ITP by the end of the extended term. This approach is also consistent with the intent of the 1995 HCP whereby incidental take authorization was provided for all non-federal lands outside of the Reserve, assuming a condition of full buildout.

4.3.2 Landownership and Land Use

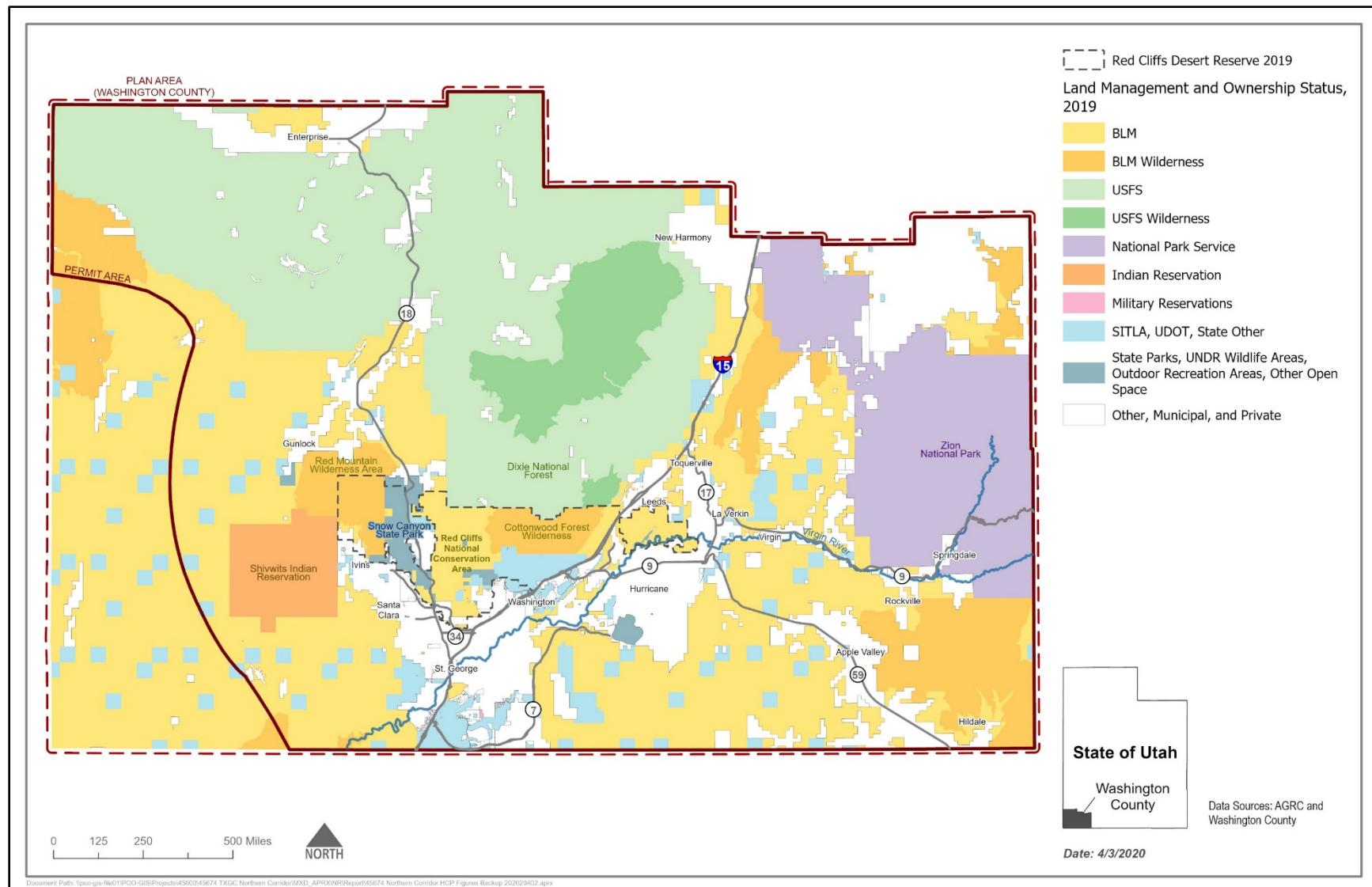
Most of the land in the Plan Area (75% of the total) is under federal ownership and is managed by the U.S. Forest Service (USFS), BLM, or NPS (**Table 8; Figure 8**). Approximately 23% of the Plan Area is under state, county, municipal, or private ownership (see **Figure 8**), and less than 2% is under Tribal control.

¹¹ Potential buildout represents an upper boundary for a population in a defined area, it does not have an associated timeline. The buildout analysis projects the cumulative total development that could occur within an area under the current laws and existing zoning regulations. These buildout projections are only planning benchmarks and do not imply that land development will cease once the population reaches the buildout projections nor that population growth will cease once development uses all available land.

Table 8. Landownership in Washington County, Utah, circa 2019

Landowner/Agency Management	Acres	Percentage of Plan Area (%) [*]
Federal—Total	1,162,496	75%
Bureau of Land Management	634,603	41%
U.S. Forest Service	395,169	25%
National Park Service	132,656	9%
Department of Defense	68	0%
Tribal	28,829	2%
Non-Federal—Total	364,925	23%
Utah School and Institutional Trust Lands Administration	74,608	5%
Utah Department of Natural Resources	11,298	1%
Utah Department of Transportation	456	0%
Local government and private lands	278,563	18%
Plan Area Total	1,556,250	100%

* Percentages are rounded and do not equal 100%

**Figure 8. Landownership in the Plan Area.**

CHAPTER 5. INCIDENTAL TAKE

5.1 EFFECTS OF THE COVERED ACTIVITIES

The Covered Activities are described in **Chapter 2**. The Covered Activities may directly and/or indirectly affect MDT and can cause incidental take in the form of kill, wound, or harm.

5.1.1 Habitat Loss, Fragmentation, and Edge Effects

The development of land in areas of MDT Habitat causes habitat loss and increase habitat fragmentation. Land development also increases the extent of the wildland-urban interface (WUI), a form of edge effect. The WUI intensifies the potential effects of fragmentation and habitat loss and increases the likelihood of human/tortoise interactions. The Reserve has an extensive WUI, as it borders private and municipal lands in the cities of St. George, Ivins, and Hurricane. However, much of the MDT Habitat on non-federal lands bordering the Reserve is degraded habitat already fragmented by roads and isolated by other developments.

Habitat loss in the form of urban and agricultural developments has led to extirpation of MDT adjacent to many cities (USFWS 2019e). According to Berry and Murphy (2019), “major parts of valleys once supporting high densities of tortoises have become urban, ex-urban, and industrialized; examples include Indian Wells, Antelope, Victor, Apple, Chuckwalla, and Las Vegas valleys in California and Nevada, and St. George in Utah.” Since the completion of the 2010 Five-Year Review of the MDT by the USFWS, almost 30 Biological Opinions related to renewable energy projects (i.e., solar facilities) were issued (USFWS 2019e), resulting in the range-wide loss of 48,041 acres of MDT habitat that supported a predicted 4,363 adult MDT (USFWS 2019e). These projects were not located within Critical Habitat and most adult tortoises were translocated elsewhere.

Habitat fragmentation refers to the consequence of habitats being broken into smaller and more isolated patches. As habitat fragments become smaller and increasingly isolated, isolated groups of individuals may become more vulnerable to increased genetic drift and inbreeding, with a reduction of genetic variation within the population and a decrease in heterozygosity (Berry and Murphy 2019). These isolated populations are less resilient to stochastic events, and as a result, more vulnerable to extirpation. Urbanization, roads, agriculture, energy and military developments, and other aspects of the built environment can fragment habitat and can have detrimental effects on MDT. The shape, size, and proximity of each new landscape piece contributes to the level of effect on the animal. When the built environment bisect or cut off an MDT’s home range and/or preferred movement corridors (i.e., desert washes), foraging and breeding behavior can be altered.

Fragmentation can occur on a local level (e.g., one road separating MDT from interpopulation movements) or on a regional level (e.g., a city and suburban landscape separating two geographically distinct populations that may be genetically linked). For example, within the Reserve, MDT exclusion fencing is present along both sides of Cottonwood Road to prevent vehicular collisions with MDT. The fencing bisects the western half of Reserve Zone 3 from south to north and creates a nearly absolute barrier to natural MDT movements, resulting in two separate populations west and east of Cottonwood Road within the zone. Additionally, Interstate 15 precludes the natural connection of MDT populations north and south of the highway. Interstate 15 follows the southern border of Reserve Zone 3, in a southwest to northeast direction. The interstate, along with urban development and the Virgin River, are a barrier to MDT populations to the south (see **Chapter 6.3.1.1.3**).

The effect of fragmentation and loss of linkages among populations of the MDT may be partially expressed by the loss of genetic variability and genetic heterogeneity (Averill-Murray et al. 2013). Studies have revealed that pairs of MDT from opposite sides of a road exhibit greater genetic differentiation than pairs from the same side of a road (Latch et al. 2011). Studies of historical genetic analysis suggest that gene flow between MDT subpopulations was high, corresponding to higher levels of habitat connectivity. Because MDT are a low-mobility species, they require corridors or linkages that can sustain individuals for extended periods, or even multigenerational populations (Averill-Murray et al. 2013). To buffer populations from detrimental genetic effects, populations need to be connected by areas of habitat occupied by MDT (Averill-Murray et al. 2013).

Population viability analyses indicate that although population declines may be reversed, losing large blocks of habitat adjacent to protected areas could be a major setback for population recovery (Doak et al. 1994, as cited in Averill-Murray 2013). Averill-Murray et al. (2013) recommended broad habitat linkages rather than narrow bands to allow individual MDT to interact with neighboring individuals and successfully propagate genetic variability. According to Edwards et. al (2004:497), “genetic data suggest that gene flow among populations is part of the evolutionary history of the desert tortoise and therefore inter-population movements may be critical to the long-term viability of populations.” Edwards et. al (2004:496) concluded, “It is unlikely that a closed population of desert tortoises experiencing a dramatic reduction in adult survivorship would be able to offset that loss through compensatory increase in reproductive output. The high level of past gene flow among populations suggests that if a population were to experience a catastrophic decline as a result of drought or other stochastic event, its recovery may rely heavily on the immigration of new individuals from adjacent mountain ranges for recovery.” In other words, the inability to repopulate may be a more important factor in MDT long-term survival than the lack of genetic variability (USFWS 2019f). A widely distributed species such as the MDT is impacted by the fragmentation of surrounding habitat and loss of connectivity to neighboring populations that can facilitate repopulation and recovery (Allison and McLuckie 2018; Fahrig 2007). Natural dispersal barriers such as mountain ranges or extremely low-elevation valleys can also influence the distribution and genetic viability of tortoises (Hagerty et al. 2011).

5.1.2 Recreation Uses

Off-highway vehicle (OHV) use has been shown to negatively affect the MDT and its habitat in numerous ways, including direct mortality of MDT, potential collapse of burrows, increased exposure to and spread of invasive plant species, soil compaction and erosion, loss of vegetation, and changes in hydrology (Bury and Luckenbach 2002; Keith et al. 2008). Tortoises can be disturbed while in their burrows or burrows can collapse, trapping or crushing the animal. The noise and vibrations associated with vehicle use in the desert can disturb animals and alter normal behavior patterns (Berry and Murphy 2019; Tuma et al. 2016;). One study noted that MDT stopped moving for almost 2 hours when frightened by noise or vibrations (Bowles et al. 1999); therefore, movement between burrow networks may be reduced.

Other recreational activities such as hiking, camping, or biking can impact MDT through the introduction of access roads, expansion of social trails, and continued trampling and compaction of soils. Trash and litter associated with recreational use and parking areas may result in subsidizing predators such as coyotes and ravens (Kristan and Boarman 2003), increasing the vulnerability of tortoises. The presence of recreationists may disrupt normal MDT behavior patterns (Tuma et al. 2016).

Recreation in the Reserve includes an extensive trail system of more than 130 miles of non-motorized trails for hiking, biking, camping, equestrian riding, and other recreational activities (BLM 2019a). In addition, many miles of non-designated social trails occur throughout the Reserve. Motorized/OHV recreational activities within the Reserve have been eliminated and the monitoring of impacts from non-

motorized recreation has been occurring since 2006. The HCP Partners use, as applicable, staff and volunteers to conduct trail maintenance, cleanup, and restoration projects where needed (Rognan 2019).

Some recreation activities may also provide a benefit to the MDT through awareness, protection, and community science data, formerly referenced as citizen science (BLM 2016b; Rognan and Schijf 2018; Rognan et al. 2017;). The RCNCA had an estimated 151,000 visits in 2016, mostly in the form of day use by hikers, mountain bikers, and equestrians (BLM 2016b). Between October 1, 2018, and September 30, 2019, visitor numbers for the RCNCA were 220,725 (personal communication, Dawn Ferris-Rowley, BLM RCNCA, to Amanda Aurora, SWCA, February 14, 2020). Other parts of the Reserve also receive visitors that are not included in the data for the RCNCA. Recreationalists using the sensitive areas often encounter wildlife and report locations of sightings. These data contribute to the presence/absence and distribution data for a large area outside Reserve areas that are monitored systematically. In 2017, signage was posted at various trailheads outside of the Reserve (i.e., Red Bluff Area, BLM Areas of Critical Environmental Concern (ACECs), and SITLA lands near Moe's Valley) to request submittal of MDT sightings (Rognan and Schijf 2018; Rognan et al. 2017). More than 90 observations of MDT were submitted by the public, with the majority coming from hikers and mountain bikers. Data from these sightings confirmed MDT distribution in areas without formal surveys or existing records of detection.

5.1.3 Grazing

Grazing affects MDT by reducing the availability of native plants, increasing the spread of nonnative vegetation, and causing soil compaction and the loss of biocrusts that support soil stability, provide nutrients, and increase soil water holding capacity (Fleischner 1994; Lovich and Bainbridge 1999; Reisner et al. 2013). Livestock can also trample MDT individuals and collapse burrows (Lovich and Bainbridge 1999; Nussear et al. 2012). Livestock tend to graze preferentially on native vegetation, allowing nonnative plants to gain a larger hold (USFWS 2011). A diet composed mostly of nonnative annual grasses does not promote growth of hatchling tortoises (Drake et al. 2016). Studies in MDT habitat have shown that grazing has a negative correlation with the presence of tortoise sign (Berry et al. 2014; Keith et al. 2008). However, recovery of native perennial shrubs and annual plants increased forage potential for MDT (Abella 2008; Keith et al. 2008) and the removal of grazing in areas of higher densities of MDT reduced invasive plant species (Brooks 1995; Reisner et al. 2013). Recovery of fragile or slow-growing vegetation may take years following grazing removal, and the proliferation of low-forage-quality invasive species in the interim may continue to limit the productivity of an area for MDT.

Grazing by livestock has been eliminated from Reserve Zones 1 through 5.

5.1.4 Utilities, Renewable Energy, Mining, Drilling, Water Development, and Flood Control

Utility projects typically result in the removal of natural vegetation and alteration of habitat. Short-term, construction-related activities could include clearing vegetation, trenching, placing a temporary or permanent access road, and other ground-disturbing sources. Removal of vegetation reduces forage potential and the availability of cover sites and could encourage the establishment of nonnative, invasive plant species. If MDT are present during construction, potential interactions with vehicles or equipment could cause MDT to be crushed, resulting in injury or mortality. In addition, the noise, dust, and vibrations generated by large equipment could disturb individual MDTs, possibly causing them to leave protected sites and increase their vulnerability for injury or death. Standing water from water leaks or other project activities can draw MDT and predators to the project site, increasing the risk for injury and mortality. Overhead utility lines typically result in less ground disturbance than a buried pipeline. However, transmission lines provide perching habitat for ravens, and towers may provide protected sites for nests; ravens are a known MDT predator. It may take many years following site restoration to return

the project area to preconstruction conditions, and it is unclear if full restoration in this unique habitat is even possible. Following construction, operations and maintenance activities may maintain all or a portion of the site in a permanent disturbed condition, and regular use of access roads and the presence of workers may disturb, injure, or kill MDT.

In desert environments, large projects can impact tortoise habitat by fragmenting the habitat, imposing barriers to movement (many of these facilities are fenced with tortoise-proof fencing), removing suitable land from use by tortoises, attracting predators, and increasing the risk of fire (Cameron et al. 2012, Lovich and Ennen 2011, 2013). Mining and drilling for resources increase the degradation of habitat through land changes, vehicle access, human access, potentially toxic byproducts (e.g., heavy metals, changes in soil chemistry), and fugitive dust (Chaffee and Berry 2006; Lovich and Bainbridge 1999).

5.1.5 Roadways and Vehicle Traffic

The placement of roads through MDT habitat is well understood to cause disruptions by influencing movements, fragmenting habitats, and causing direct mortality during crossing attempts. It has been shown that wide, heavily traveled roads, as well as fenced roads, disrupt the movement, dispersal, and gene flow of MDT populations (USFWS 2018f). Tortoises are slow-moving animals with large home ranges. Road expansion and tortoise-exclusion fencing increase habitat fragmentation and limit habitat connectivity. However, the fencing of roads also minimizes potential MDT mortalities and habitat destruction by reducing the risk of collisions and limiting the access of OHVs into MDT habitat. In addition to direct interactions with MDTs, roads increase the spread of nonnative plant species (Brooks and Berry 2006; Brooks and Chambers 2011), which reduces MDT forage quality and increases the risk of fire within MDT habitat. Additionally, roads can be a direct source of fire, increased litter, and increased toxicants into the environment.

How much of an impact a roadway has on an individual tortoise or population is a function of the size and frequency of the use of the road, as well as the presence or absence of exclusion fencing. Von Seckendorff Hoff and Marlow (2002) identified a direct correlation between higher traffic levels and greater road avoidance distances in Nevada. They reported that the magnitude of the road impact zone for roads without exclusion fencing varied from 2,150 to 4,250 meters (7,054 to 13,944 feet) for two-lane to four-lane highways and 1,090 to 1,389 meters (3,576 to 4,557 feet) for graded and maintained electrical transmission line access roads. The zone of impact increased significantly with increasing traffic levels, and populations were found to be depressed from less than 175 meters to up 4.6 km (574 feet to 2.9 miles) from a roadway (Von Seckendorff Hoff and Marlow 2002). Von Seckendorff Hoff and Marlow (2002) did not address the potential beneficial effects of exclusion fencing on these relationships.

Beyond direct mortality and habitat fragmentation, there are several potential indirect effects on MDT as a result of the presence of roads in suitable habitat. Recent research by Peaden et al. (2017) showed that carapace temperatures were greater when animals were within 20 meters (66 feet) of a road or fence compared to when animals were farther away, which can result in increased thermal stress sometimes leading to death. The same study found that “tortoise movement velocity was greater when animals were near a fence or road than away from them,” which can result in increased energy expenditure and stress (Peaden et. al 2017:20). Road-crossing mortality has been found to impact nesting females, which can skew the sex ratios of tortoises, contributing to a decline in population growth and viability (Aresco 2005, as cited in Peaden et. al 2017). Research suggests that roads alter the movements of MDT by promoting movement along the road rather than across it, which can affect genetic diversity (Latch et al. 2011). Also, roads provide human access into habitat, magnifying effects such as poaching, predation, and habitat degradation (Latch et al. 2011). Additionally, roads and linear corridors add impervious surfaces to the landscape, which concentrate runoff and erosion (Lovich and Bainbridge 1999).

Within the Permit Area, road development, expansion, and maintenance are often tied to private development projects or municipal jurisdictions on non-federal lands. Conservation measures first established in the 1995 HCP require that MDT are surveyed for and relocated in advance of road construction, as applicable. In most areas adjacent to the Reserve, desert tortoise fencing has been required. Herbicide and weed control also reduce the spread of invasive species during and after road construction. Within the Reserve, roads have been consolidated and some unpaved non-designated roads were closed off as a management strategy to reduce fragmentation and restore habitat. The HCP Partners, using staff and volunteers, have spent many hours restoring habitat on abandoned roads and removing invasive species in heavily impacted areas, such as Pioneer Park, Mill Creek, and the upper Cottonwood Road area (Rognan 2019).

As discussed in **Chapter 5.1.1**, habitat fragmentation disrupts natural movement corridors and may contribute to a reduction in genetic flow and the long-term viability of MDT populations (Averill-Murray et al. 2013; Berry and Murphy 2019; USFWS 2018f). For example, Cottonwood Road within Reserve Zone 3 is fenced to prevent tortoise mortality due to vehicle collisions, but no under-roadway crossings or other methods to promote connectivity across the road are provided. Although breaches in the fence sometimes occur, connectivity across this road is effectively zero and the MDT west and east of Cottonwood Road are considered by the USFWS to be separate analytical units until connectivity can be restored (USFWS 2019f).

Under-roadway crossing structures are present along Red Hills Parkway in the Reserve, although use of these crossings appears to be infrequent. Only a single MDT crossing has been documented (USFWS 2019f). However, BLM and USFWS research efforts determined that desert tortoises are one of many species that benefit from these crossing structures and found that “Mojave Desert tortoises use culverts for shelter and safe passage underneath the roadways that stand between them and additional habitat, mates and food” (Balduini 2018). Many of the Covered Activities promote the use of vehicles, development of roads, and construction of MDT exclusion fencing. In turn, these impact MDT distribution, increase the risk of disease or predation, increase human access, and increase the spread of invasive species that alter the composition of vegetation in MDT habitat and increase the potential for catastrophic fire.

5.1.6 Predation

The MDT is preyed upon by many different animals. MDT eggs are consumed by Gila monster (*Heloderma suspectum*), foxes (*Vulpes* sp.), coyote (*Canis latrans*), snakes, and badger (*Taxidea taxus*). Juvenile MDT are susceptible to birds of prey, common ravens (*Corvus corax*), bobcats (*Lynx rufus*), skunks (*Mephitis* spp.), badgers, and feral or free-roaming dogs and cats (Emblidge et al. 2015; Esque et al. 2010; Liebezeit and George 2002). There have also been cases of mountain lion (*Puma concolor*) and black bear (*Ursus americanus*) preying on desert tortoises (Lovich et al 2014; Medica and Greger 2009). Adult MDT are predated on less often than eggs and juveniles. However, there is evidence of ravens, golden eagles, coyotes, bobcats, mountain lions, badgers, and domestic dogs preying on adult MDT (Berry and Murphy 2019; Marlow 2000).

Some of these predator species, referred to as subsidized predators, benefit greatly from human presence and increases of discarded food and garbage, cleared spaces for easier location of prey, and reduction/fragmentation of habitat that concentrates animals into smaller areas. One subsidized predator, the raven, is a known predator primarily of young tortoises and may reduce the recruitment of young tortoises into adult size classes (Berry et al. 2013; Lovich et al. 2011). The addition of human-made structures such as transmission and water lines (e.g., irrigation, flood control, ponds/reservoirs) can support raven nesting and feeding, increasing the interactions of ravens and tortoises in desert environments (Boarman et al. 2006). Corvid predation is noted to be highest and most successful along

habitat edges and fragments (Liebezeit and George 2002). This success has led to a boom in the raven population throughout the desert tortoise range (Fleischer et al. 2008). During one study in the Desert Tortoise Natural Area in California, 136 carcasses of juvenile desert tortoises with evidence of raven predation were found at the base of fence posts (Campbell 1986).

While raven predation in the Reserve has been occurring for many years (i.e., in 1997, nearly 34 MDT carcasses were observed in Reserve Zone 5 near a single raven roost site), data has only been consistently gathered since 2015 (Schijf et al. 2018). Recent surveys in the area have identified raven predation as a cause of hatchling and juvenile mortality, including two individuals in 2015, eight in 2017, four in 2018, and fourteen in 2019 (Rognan and Draper 2015; Schijf et al. 2017; Schijf et al. 2018; Schijf and Rognan 2019). New raven nests are discovered each year within the Reserve, primarily on cliffs or other natural features. However, ravens appear to be spreading across the Reserve into locations where they were not previously detected (Schijf et al. 2018; Schijf and Rognan 2019). Within the Reserve, MDT carcasses attributed to raven predation have been found in Reserve Zones 2 through 5 and adjacent to Zone 5 (outside of the Reserve) (Schijf et al. 2018; Schijf and Rognan 2019). While raven predation in the Reserve appears relatively low overall, it may be high in the immediate vicinity of active nests, as observed in 2019. Determining the actual predation rate is difficult since most carcasses go unobserved and detection rates decrease substantially in as few as 3 days after predation occurs (Schijf and Rognan 2019). Raven predation is expected to increase across the Permit Area as the County continues to grow (Schijf et al. 2018). As noted in recent studies, the increase in raven populations as a result of human development has subsequently increased the predation of tortoises by ravens (Boarman 2003; Boarman et al. 2006; Esque et al. 2010; Kristan and Boarman 2007; Boarman et al. 2006; Esque et al. 2010).

Coyotes are also a predator of tortoises, with several studies showing tortoise remains within coyote scats (Cypher et al. 2018; Esque et al. 2010; Lovich et al. 2014). The frequency of coyotes preying on tortoises appears to increase during drought conditions, as other food sources become less available (Esque et al. 2010). However, tortoises spend a large percentage of time underground in burrows and occur in relatively low density within their habitat. The relatively low frequency of desert tortoise remains detected within coyote scats suggests that tortoises are an incidental prey item and likely are consumed opportunistically by the coyote (Cypher et al. 2018). Of note, UDWR implements a predatory control program that provides monetary incentives for hunters to remove coyotes (UDWR 2019).

Domestic dogs are another example of subsidized predators (USFWS 1994a). When left to roam (i.e., off leash), they can have a significant impact on ecosystems and the wildlife supported by these habitats (Young et al. 2011). Free-roaming dogs may harass wildlife, including MDT, therefore increasing stress and energetically costly behavior that reduces survival (Lenth et al. 2008). Domestic dogs are typically associated with human settlements; these hunters may occur singly but also in packs, expanding out from the urban interface (Berry and Murphy 2019; Esque et al. 2010). Dogs can prey on both juvenile and adult tortoises, decreasing the existing population and potential recruitment (Esque et al. 2010). In the Reserve and elsewhere across the range of the desert tortoise, dogs have been observed attacking tortoises, and tortoise remains have been found in dog scat (Berry et al. 2014; Boyer and Boyer 2006; Washington County Habitat Conservation Plan Technical Committee [TC] 2019a). Despite leash requirements within the Reserve, predation by domestic dogs (as well as ravens) likely play a role in the population dynamics of MDT within the Reserve (McLuckie et al. 2018) and the decline of MDT within the Permit Area.

5.1.7 Disease

Disease is a common occurrence in natural populations of wildlife. However, disease can weaken an already declining population and leave a species vulnerable to other threats. Upper Respiratory Tract Disease (URTD) has been found in both wild and captive populations of desert tortoise (Jacobson et al. 1991). URTD focuses on the upper respiratory tract and causes lesions in the nasal cavity, excessive nasal

discharge, swollen eyelids, and sunken eyes. In its advanced stage it can lead to lethargy and, potentially, death. This condition could be further heightened by environmental stresses, malnutrition, and immune deficiencies (Jacobson et al. 1991).

Researchers have identified two mycoplasmas, *M. agassizii* and *M. testudineum*, that are primary causative agents of tortoise mycoplasmosis (i.e., a disease caused by a *Mycoplasma* spp.; e.g., URTD) in multiple gopher tortoise species in the United States (e.g., *G. agassizii*, *G. polyphemus*, and *G. morafkai*) (Jacobson et al. 2014). “URTD appears similar to other mycoplasmal infections: following colonization the host develops clinical disease in association with antibody production, reducing the pathogen load but progressing into chronic disease with intermittent clinical signs” (Aiello et al. 2016:830). Although disease-caused mortality is typically low, it may increase as a result of environmental stressors or at a later stage of infection (Brown et al. 2002). Research suggests that mycoplasmosis in tortoises is characterized by an initially high mortality and is followed by relatively low mortality and high morbidity. However, “the effects of mycoplasmosis on mortality, morbidity and the long-term health and viability of tortoise populations are poorly understood” (Jacobson et al. 2014:261).

Although tortoises with subclinical infections may transmit *Mycoplasma* spp., transmission is more likely to occur when the infected tortoise exhibits clinical signs (Jacobson et al. 1995). Research on URTD dynamics demonstrate that the rate of transmission of *M. agassizii* is directly related to seroprevalence (i.e., the level of a pathogen occurring in a population), where study sites with ($\geq 25\%$) seroprevalence had a higher force of infection (i.e., probability per year of a susceptible tortoise becoming infected) than sites with low ($< 25\%$) seroprevalence (Ozgul et al. 2009). Disease transmission models indicate that, in most situations, high transmission rates of URTD are limited to extensive contact between hosts over multiple days. Based on studies of wild tortoises, such extensive contacts were rare events, suggesting that under normal conditions transmission risk is low. However, these transmission models indicate that less contact may be needed if the infected host has a particularly high load of *Mycoplasma* spp. (i.e., a more severe infection) (Aiello 2018).

Other diseases that can cause harm, such as herpes virus, cutaneous dyskeratosis (shell disease), and shell necrosis, are found within the MDT population (Berry and Murphy 2019; USFWS 2011). Less is known about these diseases; however, it has been postulated that certain diseases (e.g., cutaneous dyskeratosis and shell necrosis) can be caused by increased environmental toxins such as heavy metals, mercury, arsenic, and chlorinated hydrocarbons (Chaffee and Berry 2006; Jacobson et al. 1994; Martel et al. 2009).

Disease is prevalent in all populations of MDT and could pose an increased threat to the MDT in the Permit Area as a result of the Covered Activities. Tortoises within the Reserve have been shown to have several diseases that can be detrimental to the overall population—specifically, URTD and shell disease. URTD and shell disease are the most common diseases reported in the Reserve (McLuckie et al. 2018). Within the Reserve, shell disease was observed in relatively high-density MDT areas. In addition, the percentage of MDT with URTD clinical signs has increased since 2013, although fluctuations have occurred throughout sampling. URTD has been observed throughout the Reserve, thereby increasing the MDT population’s vulnerability to harmful events (e.g., drought, habitat degradation) in the future (McLuckie et al. 2018).

Stressors such as malnutrition or drought can increase immunosuppression in turtles (Boarman 2002). Nutritional values of nonnative vegetation may be diminished for the MDT (Drake et al. 2016) and impair the overall fecundity of the population. Within the Reserve, a severe drought in 2002 resulted in no perennial or annual plant growth for the spring or fall of that year. Starting in the fall of 2002, Reserve personnel observed abnormal MDT behavior, including failure to hibernate as well as emaciated tortoises and an increase in URTD (McLuckie et al. 2018). The following year, in 2003, surveys identified an increase in the number of shell remains, presumably a result of increased mortality from the drought.

Proximity to urban areas can contribute to disease occurrence in MDT (Berry et al. 2006, Jacobson et al. 2014). Interaction with diseased pet tortoises that have been released into the wild population or wild tortoises that have been translocated from areas with a higher exposure to disease can increase the risk of diseases in the overall MDT population. For MDT processed through the translocation program of the Washington County HCP, individuals receive health evaluations, including blood tests, to reduce the potential for a MDT to expose others to disease.

5.1.8 Fire Management

As part of the 2016 *Red Cliffs National Conservation Area Record of Decision and Resource Management Plan* (RCNCA RMP), fire management for the RCNCA includes reduction of invasive species along roadway corridors through manual removal and herbicide use (BLM 2016a). The reduction of nonnative and invasive plant species by either method would reduce the potential for catastrophic fires in areas of MDT habitat. Other ways to protect habitat include maintenance of firebreaks, increasing public awareness of the dangers of fires, and continuing to research and monitor the effectiveness of restoration programs. As part of the management of the Reserve, fire management programs, reduction of nonnative and invasive plants, and fire-damaged habitat restoration are ongoing activities that enhance conditions for the MDT (**Appendix D**). Restoring the vegetation and monitoring/policing human activities (e.g., recreation, trail closure observance) in previously burned areas could also reduce the deleterious effects of habitat loss and degradation of resources for the MDT.

5.2 REQUESTED REAUTHORIZATION OF INCIDENTAL TAKE

The County has applied for the Renewed/Amended ITP to extend time wherein the County and others under the County's direct control may continue to access the previously authorized, but as yet unutilized incidental take. Here, the County provides an accounting of the amount of previously authorized take that has been used and the amount that is subject to reauthorization under the Renewed/Amended ITP.

5.2.1 Used Incidental Take Authorization

Since issuance of the ITP in 1996 and through 2019, the amount of incidental take used due to the conduct of Covered Activities has been approximately 22% to 46% of the authorized amount, depending on the metric used to track these takings. The following paragraphs calculate the amount of take authorized used under the metrics established in the 1995 HCP (provided herein for context and completeness) and the updated metric established in this Amended HCP.

5.2.1.1 Prior Metrics

In terms of the number of individual animals, the 1995 HCP estimated that 1,169 adult MDT were subject to incidental take from the Covered Activities. The County processed 776 MDT through the Washington County HCP and entered these individuals into the relocation, translocation, or adoption programs led by the HCP Partners. Approximately 35% of the 776 processed MDT were juveniles or hatchlings (**Table 9**). As the data used to establish the estimated population of MDT subject to the take authorization were based only on considerations of adult individuals, debiting juvenile and hatchling individuals from the limit on individual MDTs authorized for take is not a consistent application of that take metric.

Alternately, many of the MDT processed through the Washington County HCP were received from UDWR, BLM, animal control, law enforcement, or the public and were collected from residential yards and roadways (i.e., lands not included in the 1995 HCP's incidental take areas). An unknown number of these individuals had origins outside of the Permit Area. These individuals were not taken by the Covered

Activities but were instead collected intentionally to benefit the species. Take of individuals collected and processed for recovery purposes was authorized by UDWR's recovery permit and other Section 6 agreements with the USFWS.

Therefore, not all of the 776 reported MDT individuals processed through the Washington County HCP should appropriately be debited from the 1,169 MDT authorized for take. The County estimates that 257 MDT individuals should be appropriately characterized as taken by the Covered Activities (**Table 9**; 22% of the 1,169 MDT individuals authorized for take).

Table 9. Mojave Desert Tortoise (MDT) Processed through the Washington County Habitat Conservation Plan (HCP) between 1996 and 2019

Description of Take	Adult MDT	Juvenile or Hatchling MDT	Total MDT
Incidental take	257	161	418
"Recovery" take	245	113	358
Total MDT Processed through the Washington County HCP	502	274	776

Note: Reporting data was insufficient to determine status as incidental or intentional take for 58 tortoises, including 29 adults and 29 juveniles. These "unknown" tortoises were included in the incidental take category.

In terms of the original habitat mapping of the 1995 HCP, Covered Activities in the Permit Area have caused the loss of approximately 5,700 acres or 46% of the 12,264 acres of incidental take areas (i.e., areas mapped as occupied habitat) described in the 1995 HCP.

5.2.1.2 Updated Metrics

In terms of the updated habitat modeling described in **Chapter 3.2.3.2** (i.e., the updated take metric for this Amended HCP), the Covered Activities caused the loss of 16,037 acres of Occupied MDT Habitat and 6,785 acres of Potential MDT Habitat (together, 22,822 acres of MDT Habitat) from non-federal lands in the Permit Area. These losses represent less than 26% of the modeled extent of MDT Habitat on non-federal lands outside the Reserve circa 1995.

5.2.2 Requested Reauthorization of Remaining Take Authorization

To clarify the implementation of this Amended HCP, the County will account for incidental take of the MDT in terms of a single habitat surrogate metric: the acres of MDT Habitat occurring on non-federal or non-Tribal lands within the Permit Area that could be subject to direct modification by the Covered Activities. In the following subchapters, the County explains why a habitat surrogate, using the updated estimates of remaining MDT Habitat, is an appropriate metric for tracking incidental take of the MDT and makes its request for renewed authorization to use the remaining incidental take. Recent guidance from USFWS also recommended the use of a habitat surrogate for estimating and tracking take of MDT in two other HCPs for this species (Desert Tortoise Recovery Office 2020).

However, the County emphasizes that establishing and applying a new surrogate metric in this Amended HCP, which incorporates the current best available information about the distribution of MDT Habitat, does not alter the underlying amount or extent of incidental take subject to renewal for the Renewed/Amended ITP Term. Instead, this clarification only changes the means by which this previously authorized take is measured for the duration of the Renewed/Amended ITP Term.

5.2.2.1 *Habitat Surrogate for Take of Individuals*

Use of a habitat surrogate to track incidental take must meet the three conditions established in the USFWS Surrogate Rule (50 CFR §402.14) and consistency with the guidance in the HCP Handbook should be considered (see HCP Handbook:8-3). This subchapter sets forth the information required by the Surrogate Rule to justify the use of a habitat surrogate for incidental take of MDTs. There is significant USFWS precedent for the use of surrogate metrics in HCPs. Federal courts have upheld the USFWS's use of habitat as a proxy for take under Section 7 of the ESA,¹² and it is common practice of the USFWS to use surrogate metrics in both the ESA Section 7 and Section 10 contexts.

5.2.2.1.1 *CONDITION 1: IMPRACTICAL TO TRACK INDIVIDUALS*

Take arising from the Covered Activities may occur through directly killing or wounding individual MDT or through indirectly harming MDT by significantly altering MDT Habitat in ways that lead to actual death or injury of an individual MDT. However, predicting or tracking the precise number of individual MDTs taken by the Covered Activities is, at best, very difficult to determine and functionally impractical.

First, the methods used to survey for MDT in areas prior to implementation of a Covered Activity do not achieve perfect detection of all individuals within the survey area (USFWS 2018g). In fact, the USFWS recommends that the MDT detections recorded during such field surveys be adjusted with a mathematical formula to “[account] for tortoises that are missed during surveys because they were hidden deep in burrows or not observed even if visible in burrows or above ground” (USFWS 2018g:8). USFWS (2018f:13) states that “[MDT] are cryptic and spend much of their time underground in burrows (Burge 1977; Nagy and Medica 1986; Bulova 1994) and therefore not all animals within an area will be seen by even the best trained surveyors.” Furthermore, the USFWS acknowledges that

- “[the] best available information indicates that surveyors do not see desert tortoises that are smaller than 180 mm [7.1 inches] with the same frequency that they see the large animals” (USFWS 2018g:6);
- “[t]he amount of rainfall influences the likelihood that desert tortoises will be active and visible during your survey” (USFWS 2018g:8); and
- (for smaller project areas or linear corridors) that there is a potential for resident MDT to be offsite in another part of its home range when a survey is performed (USFWS 2018g:10).

Therefore, the USFWS relies on statistical estimates and confidence intervals rather than a complete census of individuals to quantify the abundance of MDT in a particular area.

Imperfect detection of MDT, by even “the best trained surveyors,” means that it is impractical under most circumstances to determine with precision the actual number of MDT that are present in an area and that might be subject to incidental take by Covered Activities. Similarly, the MDT clearance protocols performed in advance of Covered Activities may not detect or collect every MDT that occurs on such sites. Furthermore, the 2009 Development Protocols, which are a practicable minimization measure for the Covered Activities, do not require formal surveys and clearance of MDT from areas of low density

¹² See, e.g., *Arizona Cattle Growers' Ass'n v. U.S. Fish and Wildlife Service*, 273 F.3d 1229, 1248-1250 (9th Cir. 2001) (“[T]he use of ecological conditions as a surrogate for defining the amount or extent of incidental take is reasonable so long as these conditions are linked to the take of the protected species.”); *Ctr. For Biological Diversity v. Zinke*, 2018 U.S. Dist. LEXIS 8704, at *23-24 (S.D. Fla. Jan. 17, 2018) (“Using a habitat to assess harm to a species is not a novel concept; it is codified in the ESA. 50 C.F.R. § 402.14(i)(1)(i) (four factors for use of ‘habitat or ecological conditions’ in lieu of ‘take’ of individual species.”); *Audubon Soc. Of Portland v. National Marine Fisheries Service*, 849 F.Supp.2d 1017, 1045-46 (D. Oreg. 2011); *Oregon Natural Desert Ass'n v. Tidwell*, 716 F.Supp.2d 982, 999 (D. Oreg. 2010).

MDT Habitat that are not adjacent to the Reserve, which may result in undetected take of individual MDTs.

Use of the USFWS's statistical formula to translate detections of adult MDT into estimates of the total number of individuals that may occur in an area is also impractical for the purpose of estimating take in this Amended HCP. This Amended HCP is a long-term, programmatic conservation plan with a large Permit Area where Covered Activities may occur over a period of many years. Comprehensive surveys of MDT occurrence are not available to provide a reliable input to the USFWS's formula for the purpose of estimating the true number of MDT that may be taken. While clearance surveys could provide a means to track take during implementation of this Amended HCP, it is not practical to perform them up front to reliably estimate the total amount of take for reauthorization. Therefore, the USFWS's formula for addressing incomplete detection of MDT during surveys does not offer a more reliable means for estimating the total amount of take of MDT associated with Covered Activities.

Nor are the estimates of MDT abundance and density within the Permit Area (see **Chapter 3.2.4.2**) reliable for estimating the number of MDT individuals that may be taken, either directly or as an input to the USFWS's formula. For instance, the published population estimates are based on surveys within portions of the Reserve that contain higher densities of MDT than those parts of the Permit Area where most Covered Activities occur (USFWS 2019e). The density estimate for areas outside of the Reserve are approximated from the adjacent recovery unit and assumed to be applicable to the Permit Area. At best, available density estimates only provide a coarse scale, order-of-magnitude approximation of the number of MDT that might be incidentally taken by the Covered Activities, with a level of precision that is insufficient to accurately estimate or track incidental take.

5.2.2.1.2 CONDITION 2: RATIONAL LINK TO TAKEN INDIVIDUALS

Tracking take of MDT in terms of the acres of MDT Habitat that is directly modified by Covered Activities is a surrogate metric with a rational link to the true number of taken individuals. All individual MDT that are reasonably certain to be incidentally taken by Covered Activities are those that use, at least occasionally, areas of MDT Habitat that would be directly modified by the Covered Activities. Even if they are not detected, such individual MDT are exposed to the effects of the Covered Activities and have the potential to be killed, wounded, or harmed (i.e., taken).

Estimating and tracking incidental take using a habitat surrogate also accounts for take that may occur as a cumulative or long-term effect of the Covered Activities. Such effects might otherwise go unaccounted for if take was tracked in terms of the number of individuals detected during clearance surveys in advance of Covered Activities. This error would occur whether using either raw detection numbers or estimates that account for detectability.

5.2.2.1.3 CONDITION 3: METRIC IS MEASURABLE

Tracking the acres of MDT Habitat that is subject to Covered Activities over time is readily measurable through multiple means. First, the extent of MDT Habitat at the outset of the renewed ITP Term is mapped in this Amended HCP. Second, the land management and regulatory entities with responsibility for authorizing Covered Activities routinely consider the specific location and extent of Covered Activities within their jurisdictions (e.g., municipalities issue development or building permits that are specific to certain properties), and this spatial information is maintained in public records. Other publicly available and independent sources of information can also be used to track the extent of Covered Activities over time, such as aerial imagery or other map products. Therefore, the extent of Covered Activities performed within areas of MDT Habitat over the renewed ITP Term may readily be measured and compared to the extent of the reauthorized incidental take.

5.2.2.2 *Amount of Renewed Take Authorization*

The County requests incidental take authorization for the MDT associated with the Covered Activities in an amount equivalent to the direct loss of up to 14,466 acres of Occupied MDT Habitat and 51,835 acres of Potential MDT Habitat within the Permit Area. These combined 66,301 acres represent the current extent of MDT Habitat occurring within the Permit Area, outside of the 2019 Reserve boundary, on lands that are not under federal or Tribal management as of the preparation of this Amended HCP. This amount of incidental take is equivalent to the amount of previously authorized but unused take authorization under the Original ITP term.

The County requests incidental take using a metric based on the acres of MDT Habitat subject to direct loss from Covered Activities. However, like in the 1995 HCP, the County acknowledges that MDT may occasionally be found outside of lands modeled as MDT Habitat. Non-federal lands within the Permit Area without MDT Habitat are not subject to the provisions of this Amended HCP as incidental take of MDT is not reasonably certain to occur. Similarly, otherwise lawful activities performed on lands absent of use by MDT are also not subject to the provisions of this Amended HCP. However, the County advises proponents of such activities to be prepared to document the methods and findings that lead to a conclusion of MDT absence and recommends coordination with the USFWS. Consistent with the 1995 HCP, these non-habitat areas are automatically “released” for otherwise lawful land use activities. **Figure 9** shows the distribution of non-federal lands within the Plan Area circa 2019.

As funding permits, Washington County will continue to use its available translocation funds, staff time, and temporary care facilities to assist UDWR, the BLM, and other agencies with MDT that may be encountered in non-habitat areas, such as residential areas and along roadways. However, these MDT will be reported separately from the MDT incidentally taken by Covered Activities in the Annual Reports to the USFWS and the HCP Partners and not included in estimates of incidental take to be authorized through the Renewed/Amended ITP. Annual Reports will include a cumulative total of all tortoises processed by HCP staff since the inception of the 1995 HCP for informative purposes.

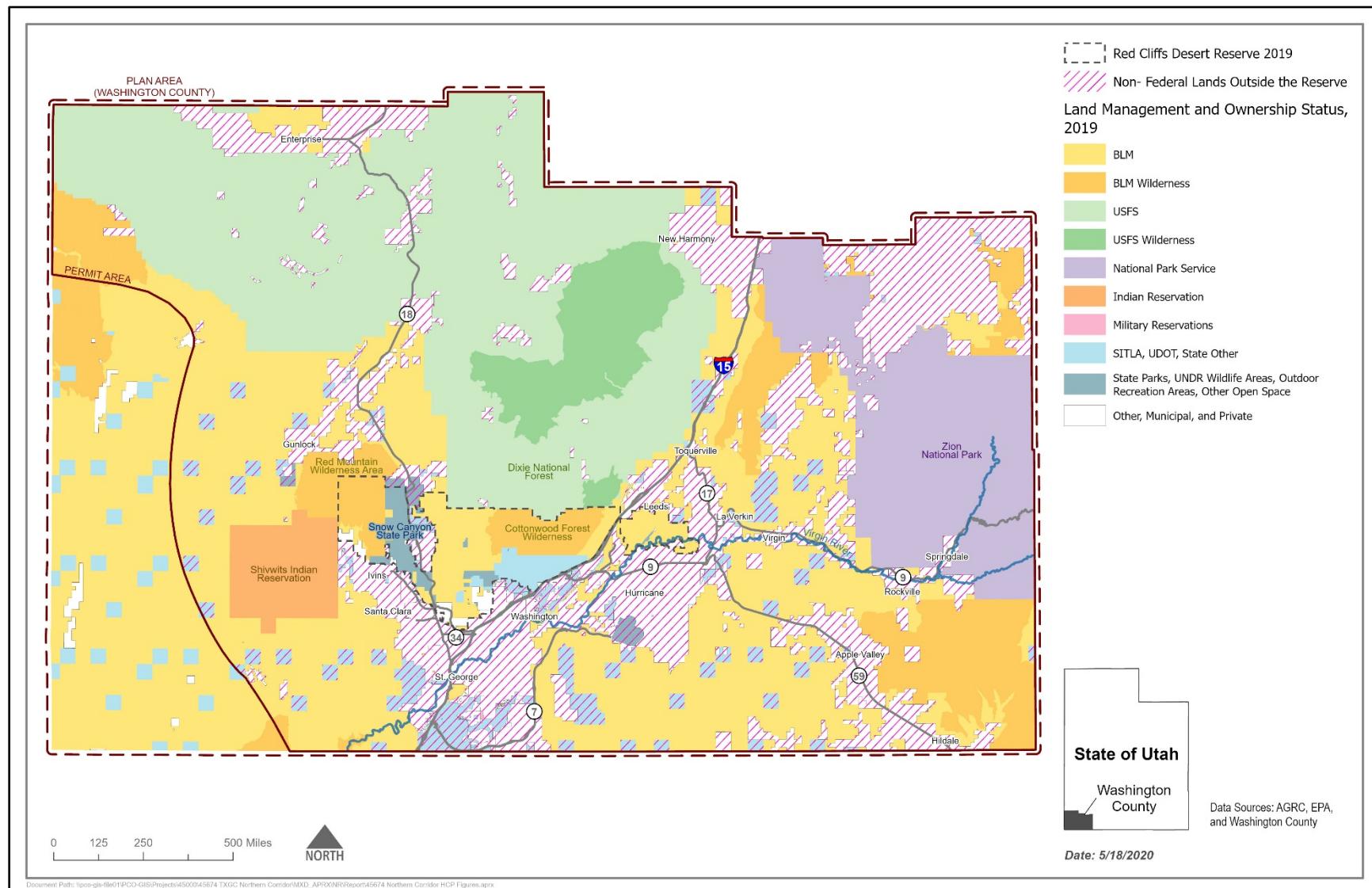


Figure 9. Landownership of the Plan Area highlighting the non-federal lands within the Permit Area and outside the Reserve (2019).

5.3 APPLICATION OF INCIDENTAL TAKE INSIDE THE RESERVE

While the 1995 HCP clearly allowed for incidental take of MDT inside the Reserve, it did not quantify nor expressly limit the amount of incidental take associated with the various Covered Activities inside the Reserve. From a review of HCAC and TC minutes and other available records, the County estimates that Covered Activities or similar activities on federal lands within the Reserve during the original ITP Term caused the permanent (or, in some cases, temporary) loss of approximately 40 to 50 acres of MDT Habitat. This equates to approximately 2 acres of habitat loss per year associated with new utility pole footings, utility access roads, trails, or recreation facilities and does not account for any offsetting actions (such as replacement conservation lands) that typically occur with each such activity at the recommendation of the HCAC. **Figure 10** shows the distribution of utilities within the boundaries of the RCNCA and identified by the BLM (2016a). All existing utility corridors and features are approved and recognized as existing uses, whether or not they are shown in **Figure 10**.

The 1995 HCP did not create any explicit obligation for the proponents of Covered Activities or similar activities on federal lands inside the Reserve to implement conservation measures other than those prescribed in the Development Protocols. Nonetheless, to help achieve the biological goals and objectives of the Washington County HCP, the 2006 version of the Development Protocols includes a process of review by the HCAC and, if requested by the HCAC, the TC (see **Appendix A:6**). The Development Protocols provide that the HCP Administrator may refer proposals to the HCAC for review and recommendations on measures to offset impacts to individual MDTs, MDT Habitat, and/or the viability of the MDT population within the Reserve. At the request of the HCAC, the TC may perform an additional review of the proposal and make recommendations to the HCAC regarding the consistency of the proposal with respect to the goals and objectives of the HCP and other relevant HCP provisions. For the purposes of this Amended HCP and with respect to Covered Activities, the County determines whether or not to approve the proposal and under what conditions; other agency approvals may also be needed for a project to proceed. In practice, the HCAC has recommended (generally with concurrence from the TC) that project proponents provide offsets for habitat loss in the form of additions to the Reserve at ratios ranging from 1:1 to 6:1, based on guidance from the Desert Tortoise Management Oversight Group (DTMOG; Desert Tortoise Compensation Team 1991).

For this Amended HCP, the County proposes the following:

- The amount of MDT Habitat within the Reserve that may be permanently lost to Covered Activities will not exceed 200 acres over the duration of the Renewed/Amended ITP Term. The intent is to allow small-scale utility development in the Reserve in accordance with the Development Protocols, which include consideration of “avoidance areas.” Considering the estimated average annual loss of habitat from Covered Activities or similar activities on federal lands within the Reserve, approximately 50 acres of new habitat loss might be expected over the Renewed/Amended ITP Term. However, given the uncertainty associated with this estimate (i.e., many projects referenced in the HCAC or TC minutes do not estimate the acres of disturbance), the County believes a reasonable upper estimate to the amount of permanent habitat loss within the Reserve due to Covered Activities may be closer to 200 acres over the Renewed/Amended ITP Term. Covered Activities inside the Reserve are subject to compliance with the Development Protocols (Appendix A);
- Conservation measures that address HCAC or TC recommendations for offsetting impacts to MDT taken by Covered Activities Inside the Reserve may include the following:
 - The acquisition and permanent protection of MDT Habitat outside of the Reserve at impact-to-protection ratios consistent with guidance in DTMOG (1991);

- Case-by-case consideration for conservation credit generated by actions that enhance connectivity of MDT Habitat across the Plan Area, restore degraded MDT Habitat, prevent wildfire within the Reserve, control invasive species within the Reserve, or contribute to MDT head-starting or population augmentation efforts within the Plan Area; or
- Conservation credit acquired from in-lieu fee programs or third-party conservation banks, if such program becomes available in the future.

The County acknowledges that the impact-to-conservation ratios appropriate for actions other than habitat acquisition and protection may be greater than those recommended in DTMOG (1991).

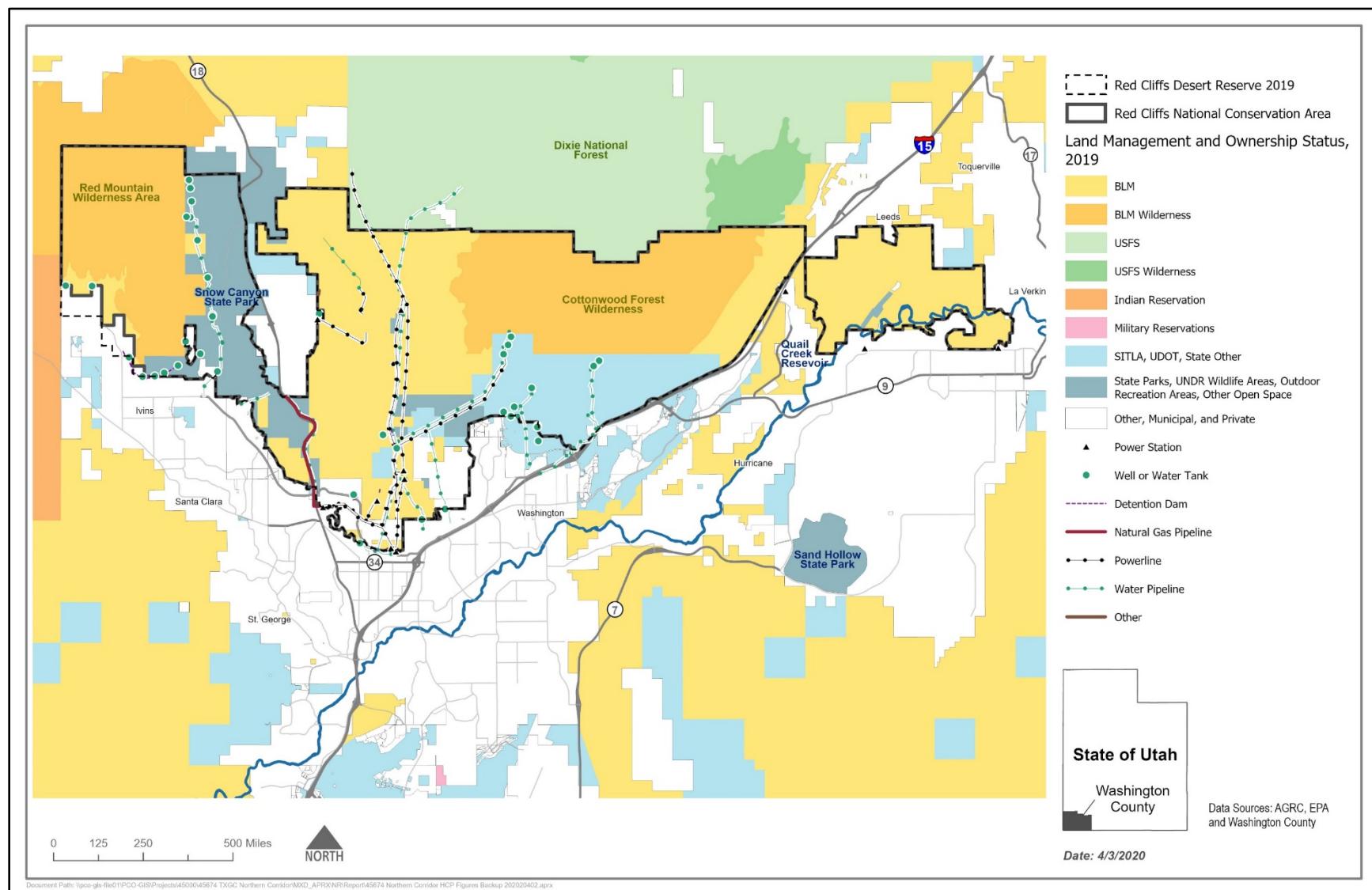


Figure 10. Utility infrastructure within the Red Cliffs National Conservation Area and vicinity.

5.4 IMPACTS OF TAKE REAUTHORIZATION

This Amended HCP adopts, with clarifications, the Covered Activities of the 1995 HCP. This Amended HCP also adopts the conservation measures as the 1995 HCP, thereby extending (with clarifications, as appropriate) the implementation of the Washington County HCP through the Renewed/Amended ITP Term. Therefore, the implementation of this Amended HCP remains consistent with the analysis in the 1996 Biological Opinion (USFWS 1996) and 1995 Environmental Impact Statement (USFWS 1995). In consideration of the No Surprises assurances provided to ITP permittees, substantial new analysis of the impacts of the reauthorized take is not warranted—the USFWS previously determined the authorized take to be consistent with the issuance criteria for an ITP.

The Environmental Impact Statement prepared by the USFWS regarding its decision to issue the Original ITP clarified the agency's scope of analysis as follows (USFWS 1995:28):

Assuming that the entire take area in the County would be developed over the 20-year permit period, an estimated take of 1,169 desert tortoises, representing 15 percent of the total estimated desert tortoise population in Washington County (excluding the Beaver Dam Slope) would occur. Development of the entire take area would result in the loss of 12,264 acres of desert tortoise habitat or potential desert tortoise habitat, or approximately 22 percent of the entire desert tortoise habitat within the County.

The USFWS previously determined in its 1996 Biological Opinion (USFWS 1996:2) that

...the proposed issuance of a 20-year incidental take permit authorizing incidental take of desert tortoise in accordance with measures required by the HCP and its IA [Implementation Agreement], to allow for otherwise legal activities associated with growth and development in Washington County, including building and housing construction, mining, farming, road building, and utility corridors, is not likely to jeopardize continued existence of desert tortoise...Further, mitigative measures proposed by the Applicant and to be implemented by the Applicant and other parties have been designed to promote conservation and recovery of this species.

However, some of the underlying information associated with the analyses in the 1996 Biological Opinion and 1995 Environmental Impact Statement has changed over time in ways that could affect the USFWS's analysis of the impacts of the reauthorized take against the jeopardy and destruction or adverse modification of critical habitat standards related to ITP issuance. This updated information includes the duration over which incidental take would occur, the amount and extent of MDT Habitat in the Plan Area, and the estimates of MDT density and abundance within the Reserve. The following subchapters describe briefly how updated information compares to the prior analyses and findings of the USFWS concerning the original take authorization associated with the Washington County HCP.

5.4.1 Temporal Impacts of Renewed/Amended ITP Term

The USFWS's analysis of the 1995 HCP and decision to issue the Original ITP was based on a term of 20 years and contemplated that both the authorized incidental take and the conservation program would be completed within that term. As of 2019, 26% of the original incidental take authorization was used and the County completed 170% of its committed obligations under the 1995 HCP conservation program, as measured by expenditures on conservation actions. The HCP Partners completed the acquisition of 60% of the Reserve and remain diligent in efforts to acquire the remaining acres. In addition, many other conservation achievements have been realized related to monitoring, research, adaptive management, and translocation (see **Chapters 5.2.1 and 6.2**). Despite only using 26% of the previously authorized take, the

County and the HCP Partners have established, used, managed, and monitored the Reserve in full accordance with the conservation program described in the 1995 HCP for the duration Original ITP Term.

The County requests additional time within which to complete its incidental take (the Renewed/Amended ITP Term). As described in **Chapter 6**, the County and the HCP Partners commit to continue implementing the conservation program for the Renewed/Amended ITP Term, including the commitment of new resources to implement ongoing conservation measures. Therefore, under these circumstances, the impact of extending the duration of authorized takings will be beneficial to the conservation of the MDT through the continued implementation of conservation actions.

The extended period of incidental taking itself creates a conservation benefit to the MDT, since those individuals not yet taken contribute to the status of the species by remaining part of the population. Furthermore, since the County's conservation commitments specified in the 1995 HCP have been fully met and the Reserve has been established, used, managed, and monitored as if it were fully acquired, these conservation actions have generated substantial benefit well in advance of actual takings, which are far from fully used. These temporal conservation benefits are a logical extension of the policy guidance in the 2016 HCP Handbook that directs USFWS to consider the potentially adverse impacts of mitigation that happens after the taking (see 2016 HCP Handbook:9-27) and is consistent with USFWS guidance for other species that promotes a slow pace of take as a measure that minimizes impacts (see, for example, guidance for avoidance and minimization measures by the USFWS West Virginia Field Office pertaining to bats that recommends project proponents phase impacts over multiple years; USFWS 2017e).

5.4.2 Impacts of Updated Habitat Mapping

The updated habitat mapping indicates that the extents of Occupied and Potential MDT Habitat across the Plan and Permit Areas are greater than were explicitly mapped in the 1995 HCP. In total, the updated mapping recognized nearly three times more MDT Habitat in the Permit Area circa 1995 than the mapping in the 1995 HCP, with most of the increase attributable to expanded recognition of Potential MDT Habitat (**Table 10**). The primary reason the current mapping indicates more occupied and potential habitat is that the 1995 habitat mapping was based on the results of more than 1,000 miles of transect surveys that, while extensive, only directly sampled a portion of the Plan Area. The updated modeling relies on both the original surveys, more recent MDT observations, and the range wide USGS habitat model (as modified for the UVRRU).

While the results of the updated habitat mapping differ from the mapping used in the 1995 HCP, this circumstance is not entirely unanticipated. The 1995 HCP acknowledged that the original habitat mapping was incomplete and imprecise, and that MDT could occur outside of those areas delineated as occupied or potential habitat (1995 HCP:47–48). Therefore, the impact of the updated habitat information is negligible with respect to the prior analysis of the impact of the taking (i.e., the potential for incidental take was anticipated across the full extent of non-federal lands outside of the Reserve and within the Permit Area). The updated mapping ensures that the occupied and potential habitat areas are represented more explicitly as locations that may support MDT, even if transect surveys have yet to verify occupancy.

Most of the newly recognized MDT Habitat occurs outside the Reserve on federal or Tribal lands. The MDT Habitat estimates outside the Reserve increased by approximately 202,783 acres or 132% of the original acreage, with most of this increase (68%) occurring on lands not subject to Covered Activities. For lands not subject to Covered Activities, most are protected from intensive land use and development and are managed (at least in part) for conservation purposes that either explicitly or incidentally benefit the MDT (such as BLM ACECs).

Using the updated habitat modeling, the amount of incidental take subject to reauthorization (i.e., 66,301 acres of MDT Habitat) is 19% of the total amount of MDT Habitat available in the Plan Area circa 1995 and 21% of the MDT Habitat available in the Plan Area circa 2019. The proportion of MDT Habitat associated with incidental take remains similar to the proportions evaluated for the 1995 HCP (i.e., “Development of the entire take area would result in the loss of... approximately 22 percent of the entire desert tortoise habitat within the County” [USFWS 1995:28]).

Table 10. Comparison of Original and Updated Estimates of Mojave Desert Tortoise (MDT) Habitat

Plan Area Geography and Habitat Type	1995 Original Habitat Estimates*	1995 Updated Habitat Modeling†	Difference Due to Mapping Method (circa 1995 conditions)	2019 Updated Habitat Modeling†	Difference Over Time (updated habitat modeling)
Plan Area					
Occupied MDT Habitat	122,891 acres	N/A	N/A	113,925 acres	N/A
Potential MDT Habitat	31,282 acres	N/A	N/A	203,025 acres	N/A
<i>Total MDT Habitat</i>	<i>154,173 acres</i>	<i>356,956 acres</i>	<i>202,783 acres</i>	<i>316,950 acres</i>	<i>-40,006 acres</i>
Permit Area					
Occupied MDT Habitat	55,947 acres	N/A	N/A	74,597 acres	N/A
Potential MDT Habitat	31,282 acres	N/A	N/A	143,450 acres	N/A
<i>Total MDT Habitat</i>	<i>87,229 acres</i>	<i>258,059 acres</i>	<i>170,830 acres</i>	<i>218,047 acres</i>	<i>-40,012 acres</i>
Non-Federal Land Outside Reserve (Permit Area Only)					
Occupied MDT Habitat	12,264 acres	N/A	N/A	14,466 acres	N/A
Potential MDT Habitat	11,832 acres	N/A	N/A	51,835 acres	N/A
<i>Total MDT Habitat</i>	<i>24,096 acres</i>	<i>89,122 acres</i>	<i>65,026 acres</i>	<i>66,301 acres</i>	<i>-22,821 acres</i>
Reserve*					
Occupied MDT Habitat	38,787 acres	N/A	N/A	34,847 acres	N/A
Potential MDT Habitat	0 acres	N/A	N/A	4,321 acres	N/A
<i>Total MDT Habitat</i>	<i>38,787 acres</i>	<i>38,719 acres</i>	<i>-68 acres</i>	<i>39,168 acres</i>	<i>449 acres</i>

Note: Acreage calculations across geographies or time periods may not be consistent due to imprecision among data layers from different sources and rounding.

* From 1995 HCP (Table 2.1) and USFWS (1996:2)

† See Chapter 3.2.3.3

‡ Based on Reserve boundary applicable to the time.

5.4.3 Impacts of Updated Desert Tortoise Density and Abundance Estimates

A premise of the 1995 HCP was that the MDT Habitat within the Reserve was of generally greater suitability than the habitat associated with incidental take outside of the Reserve. The 1995 HCP approximated this suitability difference with MDT density estimates for areas of occupied habitat, categorized as high (an average of 250 MDT per square mile), medium (an average of 75 MDT per square

mile), and low (an average of 25 MDT per square mile) (1995 HCP:Table 2.1).¹³ The 1995 HCP did not provide a density estimate for MDT that may occupy areas of potential habitat or non-habitat. **Table 11** summarizes the acres of MDT habitat within these density estimate categories inside and outside of the Reserve, as adapted from the 1995 HCP.

Table 11. Plan Area Distribution of Mojave Desert Tortoise (MDT) Habitat by Density Category (1995)

Location	High-Density Habitat* (acres)	Medium-Density Habitat* (acres)	Low-Density Habitat* (acres)	Potential Habitat† (acres)
Inside Reserve	12,903 (88% of all high-density habitat)	5,437 (80% of all medium-density habitat)	20,447 (20% of all low-density habitat)	0 (0% of all potential habitat)
Outside Reserve—non-take	177 (1% of all high-density habitat)	65 (1% of all medium-density habitat)	71,597 (71% of all low-density habitat)	14,900 (48% of all potential habitat)
Outside Reserve—take	1,612 (11% of all high-density habitat)	1,316 (19% of all medium-density habitat)	9,336 (9% of all low-density habitat)	16,384 (52% of all potential habitat)
Total	14,692	6,818	101,380	31,284

* Numbers taken from 1995 HCP:Table ES2.

†Numbers digitized from 1995 HCP mapping (see **Chapter 5.4.2**).

As reviewed in the 1995 HCP, most of the previously mapped high- and medium-density occupied habitat (88% and 80%, respectively) was captured in the Reserve. Most of the low-density habitat occurred either within the Reserve (20%) or on lands outside of the Reserve, but not subject to take by Covered Activities (i.e., occurring outside of the Permit Area and/or on federal lands; 71%). The majority of the habitat subject to take involved habitat classified only as having the potential for use by MDT, without an estimate of MDT density.

The best available information indicates that the present average density of MDT within the Reserve is 19.6 MDT per square kilometer (McLuckie et al. 2018). The USFWS approximates the present average density of MDT outside the Reserve as 1.3 MDT per square kilometer, based on the estimated density of MDT in the adjacent Northeastern Mojave Recovery Unit (Laura Romin, USFWS, personal communication, to Amanda Aurora, SWCA, via email on April 23, 2020). However, survey data for approximately 5,150 acres of land contained within the proposed Reserve Zone 6 (see **Chapter 9.1.1.1**) demonstrates that the density of MDT in this area rivals that of the Reserve (i.e., approximately 22.5 MDT per square kilometer, see Rognan et al. 2017). Based on these density estimates and the assumption that habitat suitability is associated with density of occupation, the Reserve continues to contain habitat that, on average, is of apparently higher suitability for the MDT than areas outside of the Reserve that are subject to Covered Activities (excepting the area associated with the proposed Reserve Zone 6). Therefore, updated information on MDT density (as a surrogate for habitat suitability) does not significantly alter the USFWS findings for the 1995 HCP.

The 1995 HCP estimated the abundance of MDT in the Plan Area as 7,883 adult individuals. Based on the acreages and densities reported in the 1995 HCP, 6,476 of these MDT were thought to occur within the Reserve (82% of the Plan Area population), 1,169 MDT were subject to incidental take from Covered

¹³ The MDT density estimates referenced in the 1995 HCP translate to densities of approximately 96.5, 29.0, and 9.7 MDT per square kilometer (250.0, 75.0, and 25.0 MDT per square mile), respectively. These density estimates have since been shown to be much greater than the true density, based on more precise survey methods employed by UDWR since 1998. UDNR reported the estimated density of MDT in the Reserve to be 19.6 MDT per square kilometer (36.7 per square mile) (McLuckie et al. 2018).

Activities (15% of the Plan Area population), and the remainder (238 MDT) were believed to occur on lands outside the Reserve that were not subject to Covered Activities (3% of the Plan Area population).

Chapter 3.2.4.2 provides updated estimates of MDT abundance in the Plan Area, Permit Area, Reserve, and areas subject to incidental take from the Covered Activities. These updated estimates suggest that the Reserve contains approximately 48% of the estimated Plan Area population, the MDT subject to incidental take from Covered Activities may be approximately 19% of the Plan Area population, and MDT outside of the Reserve but not subject to Covered Activities may be approximately 33% of the Plan Area population. The proportion of the Permit Area population subject to Covered Activities during the Renewed/Amended ITP Term (21%) is roughly similar to the proportion estimated in the 1995 HCP (i.e., 21% in this Amended HCP compared to 15% in the 1995 HCP) and therefore generally consistent with the prior analyses.

CHAPTER 6. CONSERVATION PROGRAM

The conservation measures specified in the 1995 HCP were a multi-agency, collaborative effort consistent with the recovery recommendations of the 1994 MDT Recovery Plan. Key among those conservation measures was the establishment, management, and monitoring of the Reserve for the benefit of the MDT. The recovery focus of the 1995 HCP's conservation measures ensured that the conservation program fully offset the impacts of the authorized incidental take of MDT.

The County and the HCP Partners, in partnership with the USFWS, have made substantial progress toward fully implementing the goals and objectives of the 1995 HCP and in several instances have exceeded their respective obligations under the 1995 HCP (see **Chapter 6.2**). The Reserve has been established and the majority of the designated acres acquired for conservation purposes by the HCP Partners. Approximately 7,091 acres of the Reserve remain to be acquired, subject to the available resources and opportunities of the BLM and other HCP Partners (see **Chapter 6.3.1.2**). Regardless of acquisition status, the collaborative effort of the County and the HCP Partners has provided for the establishment, management and monitoring of the Reserve since approval of the 1995 HCP.

The County, as the permittee, and in conjunction with those entities performing Covered Activities under its direct control, committed in the 1995 HCP to implement a variety of conservation measures inside and outside of the Reserve. The 1995 HCP and Original ITP tracked compliance with those permittee commitments and ensured that take did not outpace mitigation actions with an incremental release schedule for the authorized incidental take associated with known to be occupied MDT habitat (see **Chapter 6.2.1**). Accounting under the incremental release schedule demonstrates that these permittee commitments have been met in full, thereby releasing all of the authorized incidental take for use through the Covered Activities.

Thus, the circumstances of this Amended HCP and the County's request for ITP renewal are consistent with the guidance provided in the HCP Handbook for renewals where the activities authorized by the ITP have not yet been completed (see HCP Handbook at chapter 17.4.2). The purpose of this Amended HCP is to support the County's application for renewal of its ITP. The conservation program of this Amended HCP consolidates, clarifies, updates, and expands the conservation measures of the 1995 HCP. In doing so, this Amended HCP continues the recovery focus of the 1995 HCP and the County's additional commitments to the conservation of the MDT ensures that the impacts of the requested ITP renewal are fully offset.

6.1 CONSERVATION PROGRAM GOALS AND OBJECTIVES

With this Amended HCP, the County and the HCP Partners seek to achieve both community and biological goals and objectives. The community goals and objectives address the County's underlying purpose and need for continuing the implementation of the conservation program for the Renewed/Amended ITP Term. The biological goals and objectives guide the conservation of the MDT and other Considered Species. Both sets of goals and objectives are essential to setting the direction of the conservation program.

6.1.1 Community Goals and Objectives

The community goals and objectives of this Amended HCP, as first contemplated in the 1995 HCP and reasserted with some modifications here, are to support continued economic growth and development in the Plan Area, which contains one of the fastest growing metropolitan areas in the United States (see **Chapter 4.3.1**), in a manner that complies with the ESA by:

- providing regulatory certainty for the continued implementation of Covered Activities, including certain limited recreation and public infrastructure uses of the Reserve;
- streamlining the process for addressing ESA compliance for the Covered Activities and, where applicable, similar federal actions in the Permit Area;
- preserving the scenic splendor of the local Mojave Desert ecosystem enjoyed by residents and visitors to the Plan Area;
- engaging stakeholders in the planning and oversight of actions taken to implement this Amended HCP;
- providing information to the public about the conservation of the MDT and the local Mojave Desert ecosystem to promote stewardship of these natural resources; and
- addressing proactively the conservation of other listed species, including those that might become listed as threatened or endangered in the future.

The County also intends for this Amended HCP to respond to the proposed Northern Corridor. Although not a Covered Activity, the proposed Northern Corridor has been identified as an important piece of local infrastructure in transportation planning documents since the mid-1980s (Washington County 2012), and federal consideration for a Northern Corridor across the RCNCA is mandated in the 2009 Omnibus Public Lands Bill (Public Law 111-11). This Amended HCP responds to the proposed Northern Corridor as a Changed Circumstance affecting the conservation value of the Reserve and provides for substantial new conservation actions in response (see **Chapter 9.1.1**)

But for the attainment of these community goals and objectives, the progress toward meeting the biological goals and objectives would not be possible.

6.1.2 Biological Goals and Objectives

The overarching intent of the Washington County HCP is to create a conservation program, compatible with the County's community goals and objectives, for conserving the Upper Virgin River population of MDT in its native habitat in perpetuity. The 1995 HCP identified several biological goals and objectives for the conservation program, restated with some modifications here as follows:

- To the maximum extent practicable, conserve the Upper Virgin River population of MDT within the Plan Area by
 - meeting substantively the recovery recommendations for establishing the Upper Virgin River DWMA (i.e., the Reserve) contemplated in the 1994 and 2011 MDT Recovery Plans;
 - placing most lands within the Reserve under BLM or UDNR ownership, subject to willing partnerships with non-federal landowners;
 - managing the acquired lands within the Reserve in a manner consistent with the conservation missions of the BLM and UDNR, with enforcement of associated land use restrictions;
 - removing land uses from the Reserve that are not Covered Activities and that impact the MDT, such as land development, grazing, off-road use, mining, and others;
 - incentivizing the siting of Covered Activities in areas that are not MDT habitat or that are poor-quality MDT habitat through land use planning, impact fees, and environmental education;

- translocating healthy MDT individuals from areas affected by Covered Activities to the Reserve, thereby minimizing the impacts of the Covered Activities on the MDT and expanding the protected MDT population; and
- monitoring MDT population trends and MDT threats in the Permit Area to support adaptive management actions.
- Contribute to the conservation of Considered Species in the Plan Area by
 - conserving, primarily through the establishment and management of the Reserve, the ecological value and biological diversity of the Mojave Desert landscape that provides food and cover for Considered Species and other native wildlife and plants; and
 - allocating funds and staff support for the monitoring, management, or enhancement of habitats for Considered Species within the Plan Area.

These biological goals and objectives are carried forward into this Amended HCP. The biological goals and objectives remain consistent with the recommendations of the 2011 MDT Recovery Plan for the Upper Virgin River population of MDT. For reference, **Table 12** summarizes the recovery strategies and recommended actions from the 2011 MDT Recovery Plan, as adapted from USFWS (2011:x–xi).

Table 12. Strategic Elements and Actions for Recovery of the Mojave Population of the Desert Tortoise

1. Develop, Support, and Build Partnerships to Facilitate Recovery
1.1. Establish regional, interorganizational Recovery Implementation Teams to prioritize and coordinate implementation of recovery actions.
2. Protect Existing Populations and Habitat
2.1. Conserve intact desert tortoise habitat. 2.2. Minimize factors contributing to disease (particularly Upper Respiratory Tract Disease). 2.3. Establish/continue environmental education programs. 2.4. Increase law enforcement. 2.5. Restrict, designate, close, and fence roads. 2.6. Restore desert tortoise habitat. 2.7. Install and maintain urban or other barriers. 2.8. Sign and fence boundaries of sensitive or impacted areas. 2.9. Secure lands/habitat for conservation. 2.10. Restrict off-highway vehicle events within desert tortoise habitat. 2.11. Connect functional habitat. 2.12. Limit mining and minimize its effects. 2.13. Limit landfills and their effects. 2.14. Minimize excessive predation on tortoises. 2.15. Minimize impacts to tortoises from horses and burros. 2.16. Minimize impacts to tortoises from livestock grazing.
3. Augment Depleted Populations through a Strategic Program
3.1. Develop protocols and guidelines for the population augmentation program, including those specific to head-starting and translocation. 3.2. Identify sites at which to implement population augmentation efforts. 3.3. Secure facilities and obtain tortoises for use in augmentation efforts. 3.4. Implement translocations in target areas to augment populations using a scientifically rigorous, research-based approach.

4. Monitor Progress toward Recovery

- 4.1. Monitor desert tortoise population growth.
- 4.2. Monitor the extent of tortoise distribution in each Recovery Unit.
- 4.3. Track changes in the quantity and quality of desert tortoise habitat.
- 4.4. Quantify the presence and intensity of threats to the desert tortoise across the landscape.

5. Conduct Applied Research and Modeling in Support of Recovery Efforts within a Strategic Framework

- 5.1. Determine factors that influence the distribution of desert tortoises.
- 5.2. Conduct research on the restoration of desert tortoise habitat.
- 5.3. Improve models of threats, threat mitigation, and desert tortoise demographics.
- 5.4. Conduct research on desert tortoise diseases and their effects on tortoise populations.
- 5.5. Determine the importance of corridors and physical barriers to desert tortoise distribution and gene flow.**

6. Implement an Adaptive Management Program

- 6.1. Revise and continue development of a recovery decision support system.
- 6.2. Develop/review recovery action plans.
- 6.3. Amend land use plans, habitat management plans, and other plans as needed to implement recovery actions.
- 6.4. Incorporate scientific advice for recovery through the Science Advisory Committee.**

Source: USFWS (2011:x–xi)

As a step down from the 2011 MDT Recovery Plan, the 2014 Recovery Action Plan (the most recent version) identifies priority actions in pursuit of securing the conservation of the Upper Virgin River population of MDT. **Table 13** summarizes the recommendations of the 2014 Recovery Action Plan for the Upper Virgin River population of MDT, in order of priority (USFWS 2014b). The DTMOG and the local Recovery Implementation Teams reexamine these priorities on an annual basis to develop specific recovery projects.

Table 13. Recommended Recovery Actions for the Mojave Desert Tortoise (MDT) in the Upper Virgin River Recovery Unit

Priority Rank	Recovery Action Type	Priority Rank	Recovery Action Type
1	Environmental education	15	Install and maintain human barriers (preserves)
2	Restore habitat	16	Designate and close roads (travel management plan)
3	Increase law enforcement	17	Fire management planning and implementation
4	Install and maintain human barriers (wildland-urban interface)	18	Manage disease in captive populations
5	Sign and fence protect areas	19	Restore habitat (toxicants/unexploded ordnance)
6	Decrease predator access to human subsidies	20	Withdraw mining
7	Remove grazing (close allotments)	21	Connect habitat (culverts/underpasses)
8	Install and maintain tortoise barrier fencing	22	Speed limits
9	Targeted predator control	23	Install and maintain tortoise barriers (open off-highway vehicle areas)
10	Control dogs	24	Land acquisition
11	Restore roads (e.g., vertical mulching)	25	Restore habitat (garbage cleanup)
12	Manage disease in wild populations	26	Minimize wild horse and burro impacts
13	Landfill management	Not ranked	Other (e.g., ensure no net loss of habitat within the Reserve)
14	Sign designated routes		

Source: USFWS (2014b)

6.2 COMPLETED CONSERVATION ACTIONS

The USFWS acknowledged the success of the 1995 HCP in the 2016 revision of the HCP Handbook (see HCP Handbook:1-5), particularly with respect to the establishment of the Reserve and the effective partnerships fostered among the County and the other HCP Partners. Specific conservation accomplishments achieved through the collaboration of the HCP Partners through 2019 are summarized in **Table 15** and in Capone (2016). As described below, implementation of the conservation measures specified in the 1995 HCP have outpaced incidental takings of the MDT by Covered Activities. The County spent 170% of its required financial commitments toward implementing the Washington County HCP and approximately 60% of Reserve acquisitions have been completed during the Original ITP Term. In contrast, only 26% of the originally authorized incidental take has been used through 2019, based on the updated metric for incidental take (see **Chapter 5.2.1**).

6.2.1 Washington County Conservation Actions and Incremental Releases

The 1995 HCP included an administrative provision whereby the funding or completion of certain conservation measures “released” a certain amount of the incidental take authorized by the ITP, a provision referred to in the 1995 HCP as “incremental implementation” (1995 HCP:114, 115). This administrative accounting tracked the implementation of those actions required of the County to minimize and mitigate the impacts of the authorized take and to ensure that pace of take remained in line with the implementation of the recovery-focused actions of the BLM related to the agency’s commitment to acquire lands within the Reserve. Incremental implementation ensured that the implementation of conservation measures occurred in advance of or concurrent with incidental take from Covered Activities performed within areas identified in the 1995 HCP as *incidental take areas*, *take areas*, or *incremental take acreage*. The incidental take areas that were subject to incremental implementation under the 1995 HCP totaled 12,264 acres, or the extent of occupied MDT habitat mapped on non-federal lands outside of the Reserve circa 1995 (see **Chapter 3.2.3.2.1**). Incremental implementation did not apply to authorized take associated with other Covered Activities. Covered Activities performed in areas of potential habitat or non-habitat were automatically released for Covered Activities upon ITP issuance (see 1995 HCP:47).

The incremental implementation release schedule contemplated the expenditure by the County of \$7,000,000 in constant 1994 dollars to implement the MDT-related components of the 1995 HCP, including both administration and conservation actions. Lands within the incidental take areas were released for Covered Activities with the expenditure of this budget at specified dollar-to-acre ratios. The acquisition of Reserve lands also triggered the release of incidental take areas at specified ratios, without restriction as to the means, funding, or involvement of the County or the HCP Partners. For example, acquisitions completed by the federal or state HCP Partners or with the support of federal funding released incidental take areas. The full release of the 12,264 acres of incidental take areas was contingent on full expenditure of the \$7,000,000 budget, by budget category, and the complete acquisition of the Reserve. As indicated by the approval of the 1995 HCP and issuance of the original ITP, the funding of these conservation actions and the establishment and acquisition of the Reserve lands were deemed by the USFWS to fully offset the impacts of all incidental taking in the Permit Area.

In 2010, the USFWS performed a comprehensive review of the Washington County HCP, including the progress toward completing mitigation requirements. It became clear that during implementation of the 1995 HCP many new HCP activities approved by the HCAC during the annual budget process were not accounted for in the incremental implementation release schedule (i.e., actions taken to address adaptive management needs). The USFWS and the County agreed to more specific guidance on how to account for spending not originally addressed in the 1995 HCP (see the 2010 document entitled “Mitibank

Instructions” in the HCP Administrator’s files). The HCAC confirmed in 2017 that the County would be credited for spending beyond the specified budgets listed in the incremental implementation release schedule.¹⁴ The HCP Administrator has since tracked all expenses in the incremental implementation schedule following these instructions.

Table 14 includes an accounting of the County’s spending on implementation of the 1995 HCP and associated releases of the incidental take areas through November 2019, in accordance with the 1995 HCP and 2010 Mitibank Instructions guidance.

Table 14. 1995 Habitat Conservation Plan (HCP) Release Schedule and Actual Releases through November 2019

Activity Category	Release Increment*	1995 HCP Budgeted Expenditures and Acquisitions	Actual Expenditures and Acquisitions through 2019	Actual Acres Released through 2019
Law Enforcement	\$1,000	\$650,000	\$1,550,023	1,550
Reserve Acquisition Support	\$1,000	\$1,500,000*	\$1,629,172	1,629
Fencing and Signing	\$1,000	\$500,000	\$846,512	846
Monitoring	\$1,000	\$1,000,000	\$1,693,525	1,694
Other Species Conservation†	\$1,000	\$1,950,000	\$1,627,220	1,627
HCP Biologist Staff Position	\$1,000	\$760,000	\$2,399,343	2,399
Retirement of Grazing Permits	\$5,000	\$175,000	\$157,005	31
Education	\$5,000	\$500,000	\$950,966	190
Translocation	\$5,000	\$240,000	\$137,932	28
Reserve and HCP Administration	\$10,000	\$1,780,000	\$4,521,147	452
Reserve Land Acquisition	2.3 acres	18,428 acres	11,119 acres	4,834
Total		\$9,055,000 and 18,428 acres	\$15,399,254 and 11,119 acres	15,281

* The budgeted amount includes \$1,000,000 identified for “Habitat Acquisition” in Table 6.5 of the 1995 HCP (i.e., the Incremental Release Table) and another \$500,000 identified for “Facilitate Land Exchanges” in Table 6.3 of the 1995 HCP (i.e., the HCP Budget Table).

† Line item and budgeted amount are from Table 6.3 of the 1995 HCP (HCP Budget Table) but were not originally part of the incremental release schedule. Release credit for this activity category was established in 2010 with the Mitibank Instructions guidance.

As of November 2019, the County has spent \$6,344,254 more than originally budgeted for implementation of the 1995 HCP (70% more) and HCP-related activities released 3,017 acres more than the originally contemplated 12,264 acres of incidental take areas (25% more). However, some individual activity categories remain incomplete when compared to the original budget: Other Species Conservation (underspent by \$322,780), Retirement of Grazing Permits (underspent by \$18,000), and Translocation (underspent by \$102,068). The actual costs needed to fully implement these underspent activities was less than originally budgeted. For example, the County purchased and retired all grazing permits applicable to lands within the original boundary of the Reserve for less than budgeted in the 1995 HCP (Capone 2016).

¹⁴ During early renewal discussions with the USFWS, it was the County’s understanding that it would be retroactively credited for spending beyond the budgets listed in the incremental implementation release schedule. The issue came to a vote at a budget discussion during the September 2017 HCAC meeting (HCAC 2017). At the time, Larry Crist (USFWS) promised to include the extra expenses as a part of the ITP renewal and apply the credits retroactively. The HCAC (including an “aye” vote by the USFWS) voted in favor of the motion “to restore monitoring to the budget with the understanding that USFWS will give the County the appropriate mitigation credit retroactively.” Since that time, the County and the HCP Partners have continued to proceed in good faith that credit would be given for these and other expenses above and beyond the budgets identified in the incremental implementation release schedule.

Reserve Land Acquisitions are also incomplete, with only 60% of the target acreage deemed acquired for conservation purposes. Despite the lag in acquisitions, none of the unacquired Reserve lands have been actually developed to date, due in part to the actions of the County and the HCP Partners to stay engaged with landowners. Therefore, unacquired Reserve lands continue to support the conservation of the MDT due to the voluntary cooperation of these landowners.

Furthermore, not all of the 18,428 acres targeted for acquisition within the Reserve were intended to be acquired by the BLM or UDNR (see **Chapter 6.3.1.1**). These lands should either qualify for release based on completion of required actions by other HCP Partners or be deducted from the acquisition acreage target. For example, 746 acres of private lands in the Kayenta development that are an allowed use and Covered Activity inside the Reserve with the observance of specific development prescriptions (see **Chapter 2.2**). Ivins City (an HCP Partner) has adopted all of the Kayenta requirements through its zoning and city ordinances. Similarly, Ivins City owns 56 acres, St. George City (also an HCP partner) owns 1,050 acres, and the County owns 118 acres in the Reserve, most of which are not intended to be exchanged or sold to the BLM or UDNR. Instead the County and these municipalities have agreed to manage these lands for MDT conservation under the management guidelines of the Washington County HCP, the PUP, and the Development Protocols. Since these areas are under long-term MDT management agreements consistent with the HCP, these lands are eligible for the release credits under the incremental implementation release schedule.

Actual land development between 1996 and 2019 has only directly modified approximately 5,700 acres of the 12,264 acres of incidental take areas identified in the 1995 HCP (46% of the total; see **Chapter 5.2.1**). Therefore, under the framework of the 1995 HCP, actual impacts have lagged well behind actual releases to date (i.e., 15,281 acres released versus 5,700 acres developed as of November 2019). Released acres exceeded the total amount available (12,264) by 3,017 acres or 25%, thereby releasing all remaining private lands in the County for development and providing an excess mitigation credit of 25% that could be applied to Changed Circumstances.

For the actions within the County's responsibility and control, the County met or exceeded the obligations of the 1995 HCP required to offset the impacts of the authorized incidental take, spending over \$6 million in excess of its \$9 million commitment. For those categories of activities in the original incremental implementation release schedule where the County did not fully meet the specified funding targets:

- The acquisition and retirement of grazing permits retired were completed under budget and with expanded scope (i.e., the retirement of grazing permits in Reserve Zone 4 was not required by the 1995 HCP, but the action nonetheless benefits the translocated population of MDT in Reserve Zone 4);
- Translocation spending (tortoise housing facilities and disease testing) was under budget since significantly fewer tortoises were found and translocated than the 1,169 that were originally estimated to occur on the designated take areas.
- Based on the metrics for compliance with the 1995 HCP, the County has (on balance) met or exceeded its specified responsibilities for addressing the impacts of the previously authorized incidental take. In addition, the County's conservation actions are well ahead of actual takings, since actual use of the previously authorized incidental take is at only 36% (using updated habitat metrics) (see **Chapter 5.2.1**).

6.2.2 Partner Conservation Actions

The conservation actions of the HCP Partners, consistent with their individual roles and responsibilities under the 1995 HCP have firmly established the Reserve and have ensured that the Reserve lands are monitored and managed in support of the conservation of the MDT (**Table 15**).

Table 15. Washington County and Partner Conservation Accomplishments

Habitat Conservation Plan (HCP) Implementation and Conservation Actions	County	Utah Department of Natural Resources (UDNR)	Bureau of Land Management (BLM)	U.S. Fish and Wildlife Service (USFWS)	Municipal Partner	Other Partners
PROGRAM ADMINISTRATION AND FUNDING						
The addition of multiple County staff positions and support for intern and volunteer labor to administer the HCP and perform management, monitoring, and public outreach for the Reserve.	✓				✓	
Establishment of a UDWR Washington County Field Office to assist with reconciliation of wildlife conservation and economic/water development activities in the County.	✓	✓				
Regular (i.e., monthly or quarterly, as applicable) Habitat Conservation Advisory Committee and Technical Committee meetings to coordinate and facilitate administration of the Washington County HCP and acquisition, management, and monitoring of the Reserve.	✓	✓	✓	✓	✓	
Regular reporting and documentation of HCP-related activities, such as research/field reports, Annual Work Plans, committee reports and recommendations, and the like.	✓	✓	✓	✓	✓	
Expenditures by UDNR of approximately \$1 million to \$1.5 million per year through its Washington County Field Office to work with HCP Partners and others on managing habitat, wildlife, and reconciling conflicts between wildlife conservation and development activities in the County.		✓				
Expenditures by the County from fees collected by the Municipal Partners of \$13,772,034 through November 2019 to implement the 1995 HCP, including support for Reserve acquisitions and a variety of management, enforcement, education, Mojave desert tortoise (MDT) translocation, and monitoring activities.	✓				✓	
Expenditures by the County from fees collected by the Municipal Partners of \$1,627,220 through November 2019 to implement conservation measures benefiting other Considered Species in the Plan Area.	✓				✓	
RESERVE DESIGN, ACQUISITIONS, AND LONG-TERM MANAGEMENT						
Designation of the originally contemplated Reserve boundary, encompassing 61,022 acres and most of the Upper Virgin River Critical Habitat Unit for the MDT.	✓	✓	✓	✓	✓	Utah School and Institutional Trust Lands Administration (SITLA) and private landowners
Informal expansion of the Reserve boundary by approximately 1,000 acres, to improve the Reserve size and functionality.	✓	✓	✓	✓	✓	

Habitat Conservation Plan (HCP) Implementation and Conservation Actions	County	Utah Department of Natural Resources (UDNR)	Bureau of Land Management (BLM)	U.S. Fish and Wildlife Service (USFWS)	Municipal Partner	Other Partners
Acquisition of 11,119 acres of the Reserve by transfers of land (through various means and funding sources, which includes the expanded Reserve acres noted in the line above) to federal or state conservation management, representing approximately 60% of the 18,428 acres targeted for acquisition in the 1995 HCP.	✓	✓	✓	✓	✓	SITLA, The Nature Conservancy (TNC), The Trust for Public Land
Designation of 45,000 acres of BLM lands within the Reserve as a National Conservation Area (NCA) in 2009 (Public Law 111-11), providing additional resources through the BLM for land acquisition, management, and personnel to accomplish conservation objectives.	✓	✓	✓		✓	
Adoption by the BLM of a Resource Management Plan (RMP) for the Red Cliffs NCA (RCNCA) and updates to the BLM St. George Field Office RMP emphasizing protections for the MDT consistent with the 1995 HCP (BLM 2016a).			✓			
Encumberment of approximately 1,700 acres of UDNR-owned Reserve lands (acquired with the support of federal Endangered Species Act Section 6 grant funds) with rules explicitly promoting MDT conservation by addressing recreation use, seasonal closures, and trail use designations (see State Park Rules Authorized by Parks and Recreation Act Title 63, Chapter 11, Utah Code Annotated).		✓		✓		
Development and adoption by UDWR of various management documents expanding the mission of Snow Canyon State Park to include MDT habitat management objectives. UDWR prepared and implements the following plans in support of the Washington County HCP: <ul style="list-style-type: none"> • Desert Tortoise Management Plan for Snow Canyon State Park (2004) • Weed Management Program (2004) Snow Canyon State Park RMP amended in 1998 to follow 1995 HCP recommendations (UDWR 1998).		✓				
MINIMIZATION AND MITIGATION MEASURES						
<u>TRANSLOCATION:</u> Collection and translocation of 485 healthy MDT individuals from areas subject to Covered Activities into Reserve Zone 4 between 1999 and 2018 (McLuckie et al. 2019), with documentation of long-term retention and reproduction within the translocated population, essentially repopulating Reserve Zone 4.	✓	✓	✓	✓		
<u>TRANSLOCATION:</u> Health assessments and veterinary care for collected MDT prior to translocation or adoption.	✓	✓				

Habitat Conservation Plan (HCP) Implementation and Conservation Actions	County	Utah Department of Natural Resources (UDNR)	Bureau of Land Management (BLM)	U.S. Fish and Wildlife Service (USFWS)	Municipal Partner	Other Partners
<u>TRANSLOCATION:</u> Creation and implementation of an adoption program for captive MDT not suitable for translocation to the Reserve, including publication of an adoption booklet.		✓				
<u>RECREATION MANAGEMENT:</u> Approval and implementation of the 2000 Public Use Plan, in coordination with the HCP Partners, to manage recreational uses within the Reserve.	✓	✓	✓	✓	✓	
<u>DEVELOPMENT PROTOCOLS:</u> Preparation, approval, and implementation of protocols for minimizing the impact of utilities, access roads, water development, and flood control Covered Activities within the Reserve and <i>incidental take areas</i> of the 1995 HCP (i.e., the Development Protocols).	✓	✓		✓	✓	Washington County Water Conservancy District
<u>GRAZING PERMITS:</u> Permanent retirement of 30,725 acres of grazing permits on lands within the Reserve, including all four allotments in Reserve Zone 3, as originally committed in the 1995 HCP, and three additional allotments in Zone 4, in excess of the commitment in the 1995 HCP. Also, retired grazing within the portion of Snow Canyon State Park within the Reserve.	✓	✓	✓			
<u>FENCING:</u> Installation, inspections, and maintenance on more than 85 miles of fencing to minimize adverse impacts to MDT within the Reserve, expanding the original commitment in the 1995 HCP by 15 miles.	✓	✓	✓		✓	Utah Department of Transportation, developers
<u>LAW ENFORCEMENT:</u> Funding by the County for two law enforcement officers under the BLM and UDWR to patrol the Reserve for the first 5 years of HCP implementation, as originally committed in the 1995 HCP. Continued funding by the County for County-sponsored law enforcement activities for the remainder of the original ITP Term, exceeding the County's commitments specified in the 1995 HCP.	✓	✓	✓		✓	
<u>LAW ENFORCEMENT:</u> Dedication of UDWR Conservation Officers to Reserve patrols (1995–2000) and development of law enforcement action plans to address compliance issues. Continued coordination of law enforcement activities within the Reserve, including investigations and reporting of unauthorized takings of MDT and annual Reserve field tours by law enforcement officers to identify areas of concern.		✓				
<u>LAW ENFORCEMENT:</u> BLM law enforcement activities funded through monies made available with the RCNCA designation.			✓			
<u>EDUCATION AND OUTREACH:</u> Creation of a Trail Stewards Program by the County to engage volunteers in the management of recreation uses of the Reserve and assist with monitoring and management activities.	✓					
<u>EDUCATION AND OUTREACH:</u> Creation of a full-time County outreach coordinator position pending ongoing funding appropriation. Operation by the County of an education center in St. George (outside the Reserve), with	✓				✓	Conserve Southwest Utah

Habitat Conservation Plan (HCP) Implementation and Conservation Actions	County	Utah Department of Natural Resources (UDNR)	Bureau of Land Management (BLM)	U.S. Fish and Wildlife Service (USFWS)	Municipal Partner	Other Partners
outreach programs promoting interest in the MDT, the Mojave Desert ecosystem, and related natural and cultural resources.						
<u>EDUCATION AND OUTREACH:</u> Development and distribution of education materials and participation in educational events to promote appreciation of native desert wildlife, including classroom presentations; presentations at public libraries; and educational hikes within the Reserve.		✓				
<u>EDUCATION AND OUTREACH:</u> Presentations on MDT biology, ecology, conservation, and management at professional organizations and conferences, including the Desert Tortoise Council, the Wildlife Society, Turtle Survival Alliance, and the Distance Sampling Conference.	✓	✓				
<u>EDUCATION AND OUTREACH:</u> Established the Washington County Urban Wildlife Program; on call through Dispatch 16 hours a day / 7 days a week to resolve wildlife issues with the public, landowners, and communities.		✓				
<u>EDUCATION AND OUTREACH:</u> Snow Canyon State Park, with more than 500,000 visitors annually, has an extensive education and outreach program, including on-site programs for K-12 students, extensive public presentations and guided hikes, printed education materials, and a robust volunteer Trail Steward program, all which contribute to the biological goals and objectives of this HCP.		✓				
MONITORING, RESEARCH, AND ADAPTIVE MANAGEMENT						
Designed and implemented a long-term MDT monitoring program for the Reserve (Fridell et al.1998), with 320 kilometers (200 miles) of survey transects to estimate density and abundance for Reserve Zones 2, 3, and 5, including staffing, field coordination, and training. Published biannual monitoring reports on annual density and abundance of the MDT within the Reserve (1998, 1999, 2000, 2001, 2003, 2005, 2007, 2009, 2013, 2015, and 2017).	✓	✓				
Completed a research study regarding the effectiveness of the MDT translocation program (McLuckie et al. 2019).	✓	✓	✓			
Performed other studies of MDT within the Reserve, including the following: <ul style="list-style-type: none"> • Mortality analysis following the 2005 wildfires within the Reserve (2007) • Long-term telemetered sample of MDT in Zone 3 to monitor aboveground activity for the distance sampling model and assessed activity levels, movements, home range, habitat use, and survival • Remote camera culvert monitoring and MDT movement studies along Red Hills Parkway and Tuacahn Drive to assess culvert use by MDTs 	✓	✓				

Habitat Conservation Plan (HCP) Implementation and Conservation Actions	County	Utah Department of Natural Resources (UDNR)	Bureau of Land Management (BLM)	U.S. Fish and Wildlife Service (USFWS)	Municipal Partner	Other Partners
Shared data with academic institutions supporting research on topics such as MDT thermal preferences, genetics, diseases, and tick pathogens.						
Sent diseased MDT to the Alabama Department of Agriculture laboratory to help determine the cause of MDT die-off within the Reserve (2003–2010).	✓	✓				
Preparation and implementation of a Human Impact Monitoring Program (2005) to identify and recommend actions for reducing the impact of recreational use of the Reserve.	✓	✓	✓	✓		Northern Arizona University, Southern Utah University
Designed and implemented annual raven monitoring (2015) in the Reserve and adjacent areas.	✓					
Maintained a long-term weather monitoring station within the Reserve (2010–present) to monitor precipitation, humidity, soil moisture, and surface and air temperatures; assisted with data collection on MDT surface activity patterns; and assessed the supplemental watering schedule for out-plantings.		✓				
Adaptive management responses to unanticipated challenges from wildfires in the Reserve, including financial and labor support for collaborative planning, implementation of habitat restoration measures, creation of fuel breaks, support for research on fire prevention and restoration, and effectiveness monitoring.	✓	✓	✓			Conserve Southwest Utah
Completion of numerous habitat improvement projects within Reserve, including closure and restoration of a large municipal dump, closure of off-highway vehicle trails and other redundant roads and trails, trash cleanup efforts to combat littering and illegal dumping, removal of invasive or exotic plants, and removal of fencing from retired grazing allotments.	✓	✓	✓			
Organized efforts to control litter, encourage landfill use, and minimize raven and other predator attractants inside and outside the Reserve. Formed committee called “Give Your Land a Hand.” Committee members, including HCP staff, meet on monthly basis to organize several cleanup projects in the county (including in MDT habitat) each year. Focused several projects on non-federal lands in the Reserve and in the proposed Zone 6 area. Cleanup projects are anticipated to grow in scope/size as the public becomes more informed of these community service opportunities. These efforts directly reduce impacts from litter, garbage and other predator attractants, but also provide an important educational message to the community to keep public lands clean.	✓		✓			Conserve Southwest Utah, General Public

Habitat Conservation Plan (HCP) Implementation and Conservation Actions	County	Utah Department of Natural Resources (UDNR)	Bureau of Land Management (BLM)	U.S. Fish and Wildlife Service (USFWS)	Municipal Partner	Other Partners
CONSERVATION ACTIONS FOR OTHER SPECIES						
Completed and coordinated collaborative Conservation Agreements and Strategies to preclude the need for federal listing of sensitive species in Washington County (e.g., Virgin spinedace, flannelmouth, Gila monster, relict leopard frog, and Arizona toad).		✓				Washington County Water Conservancy District, Virgin River Program
Complete Washington County Sensitive Species Plan (1998) summarizing the distribution of and developing methods for monitoring inventory gaps and relative abundance.		✓				
Developed the Virgin River Program and led recovery efforts for Virgin River fish species.		✓				Washington County Water Conservancy District
Implemented recovery efforts for southwestern willow flycatcher (i.e., management and monitoring, riparian restoration activities, floodplain protections).	✓	✓				Washington County Water Conservancy District, Virgin River Program
Collected and reported occurrence information for sensitive species to the Utah Natural Heritage Program database.	✓	✓				
Updated threats assessments in the Utah Wildlife Action Plan for sensitive native reptiles and amphibians occurring within the Reserve.		✓				
Completed a rare plant study and inventory in the proposed Reserve Zone 6 area.	✓	✓				SITLA
Collected native seed of endangered and rare plants in the County for research and propagation projects.	✓	✓	✓	✓		Conserve Southwest Utah, U.S. Department of Agriculture, TNC, and Utah Valley University
Acquired lands and completed several fencing projects to protect rare and endangered plants.	✓	✓	✓	✓		TNC, SITLA

Sources: Keleher (2019); personal communications, Cameron Rognan, Washington County HCP Administrator, (2019)

6.3 ONGOING DESERT TORTOISE CONSERVATION MEASURES

The Washington County HCP serves dual functions: 1) supporting the County's ITP authorizing take of the MDT associated with Covered Activities; and 2) coordinating actions by other HCP Partners (primarily the BLM and UDNR) that are intended to further the recovery of the MDT in the UVRRU. This Amended HCP clarifies these roles and responsibilities, as generally described in **Table 1** and **Chapter 1.4**. The County and the HCP Partners reiterate their commitment to implementing the Washington County HCP, as originally set forth in the 1995 HCP and continued with this Amended HCP and the execution of an amended Implementation Agreement.

The following subchapters restate the conservation measures identified in the 1995 HCP that contribute to meeting the recovery-based biological goals and objectives of the Washington County HCP and provide guidance to the HCP Partners responsible for the long-term management and monitoring of the Reserve. The County also identifies the specific actions that it commits to implement during the Renewed/Amended ITP Term, in part with funding provided by the Municipal Partners. However, the County asserts that it has met or exceeded its specified responsibilities for addressing the impacts of the previously authorized incidental take and that these new commitments are above and beyond the actions required of it to minimize and mitigate the impacts of the reauthorized incidental take. The County may rely on the No Surprises assurances afforded to it by the good-faith completion of its identified responsibilities under the 1995 HCP.

6.3.1 Red Cliffs Desert Reserve

The establishment of the Reserve is the primary conservation measure of the 1995 HCP. The 1995 Reserve boundary met substantively the recovery recommendations for establishing the Upper Virgin River DWMA contemplated in the 1994 and 2011 MDT Recovery Plans (USFWS 1994a, 2011; see **Chapter 6.1.2**). The 1994 MDT Recovery Plan describes the DWMA as those areas “in which recovery actions will be implemented to provide for the long-term persistence of viable desert tortoise populations and the ecosystems upon which they depend” (USFWS 1994a:31).

Under the 1995 HCP, acquisition and long-term management of the Reserve is primarily a responsibility of the BLM, with certain lands associated with Snow Canyon State Park acquired and managed by UDNR. The County's contributions to Reserve acquisition and management defined in the 1995 HCP were limited in scope and duration. It was believed that portions of the Reserve not already under BLM or UDNR management would be acquired quickly through a large exchange and the Reserve would be designated an NCA within 5 years of ITP issuance. As a result, the County committed to assist UDNR and the BLM with the preparation of long-term management plans and provided 5 years of financial support to the BLM for this purpose (1995 HCP:Table 6.3). This Amended HCP reaffirms that Reserve acquisitions and long-term management are not the obligations of the County. Nonetheless, the County recognizes the importance of the Reserve to achieving the biological goals and objectives of the Washington County HCP.

6.3.1.1 *Reserve Design*

6.3.1.1.1 TARGET ACQUISITION AREA

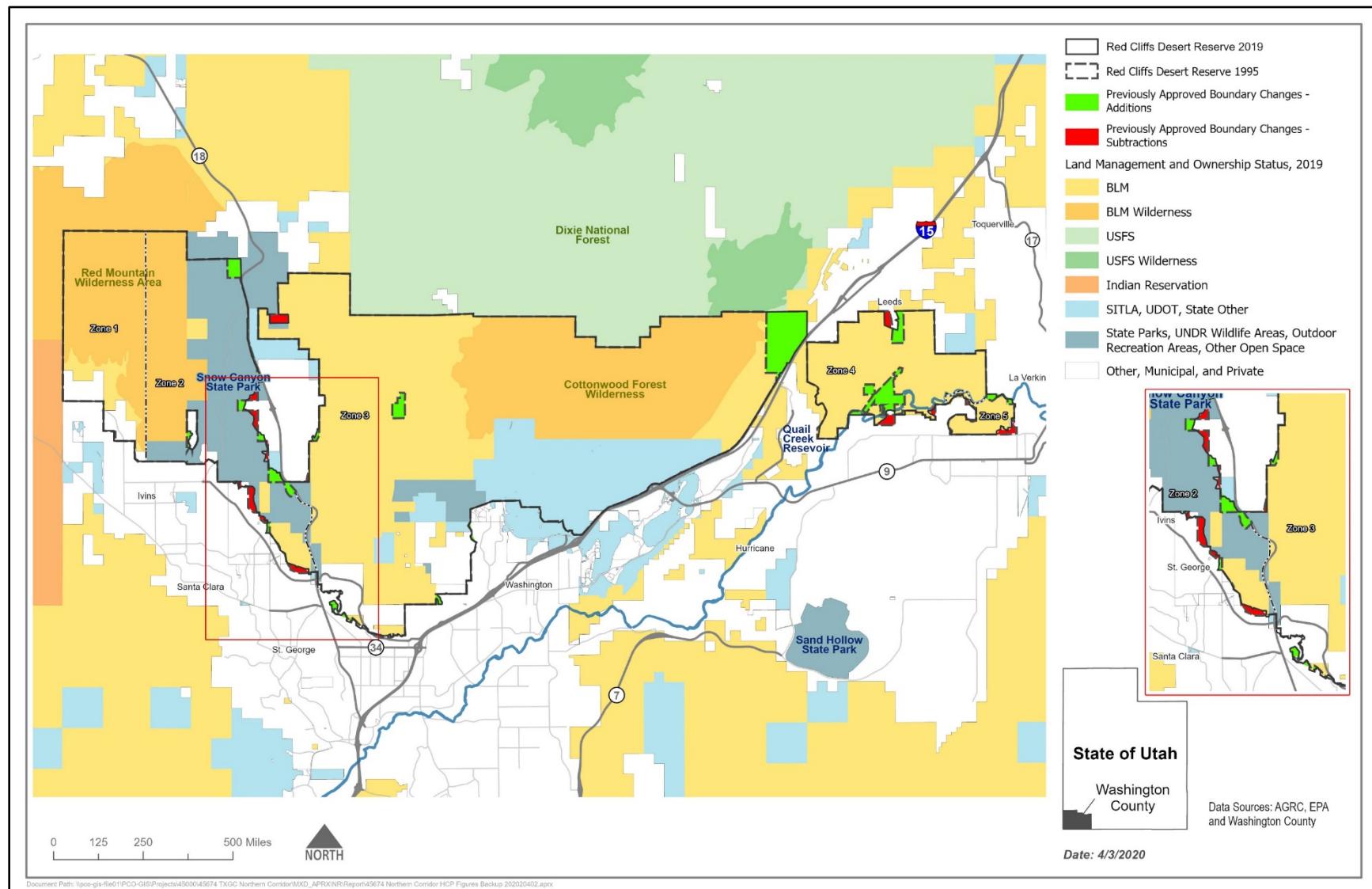
The 1995 HCP defined a target acquisition area for the Reserve containing 61,022 acres. Between 1995 and 2019, the County and the HCP Partners identified and capitalized on opportunities for expanding the size of the Reserve. Reserve boundary adjustments have originated from negotiated offsets to minimize the impacts of allowed disturbances within the Reserve (based on recommendations of the TC), minor adjustments refining the external boundary of the Reserve, and other expansion opportunities. Expansion opportunities not tied to a negotiated offset or boundary refinement represent the largest additions to the

Reserve and included the addition of the Moroni Turkey Farm (98 acres) and Virgin River Land Preservation properties (12 acres) in Reserve Zone 3, mineral rights acquisitions in Reserve Zone 4 (350 acres), and the White Reef addition to Reserve Zone 3 (approximately 780 acres) (**Figure 11**). In total, these opportunistic additions to the Reserve have totaled approximately 1,240 acres.

All Reserve boundary changes were evaluated and recommended by the HCAC and the TC, and were ultimately approved by the County. The previously approved Reserve expansion areas are under BLM, UDNR, or County ownership or management for the benefit of the MDT. This Amended HCP formalizes these boundary changes for an updated 2019 Reserve boundary that includes 62,009 acres. In total, these previously approved Reserve boundary changes resulted in a net increase in the total size of the Reserve of approximately 987 acres (see **Figure 11**).¹⁵

Using the updated MDT habitat mapping, the 1995 Reserve boundary captured approximately 38,718 acres of MDT Habitat. The expanded 2019 Reserve boundary contains approximately 39,168 acres of MDT Habitat, an increase of approximately 450 habitat acres (approximately 1%).

¹⁵ A precise breakdown and analysis of the additions and subtractions to the Reserve are not possible since a precise map or digital representation of the 1995 Reserve boundary comprising the 61,022 acres described in the 1995 HCP is not available. Current digital boundary files recreated from the maps included in the 1995 HCP and available base map layers, such as parcel and ownership boundaries, circumscribe an area of 60,740 acres as the best approximation of the 1995 Reserve boundary. This approximation of the 1995 Reserve boundary is 282 acres short of the total size of the Reserve described in the 1995 HCP. This discrepancy is minor with respect to the overall size of the Reserve (less than 0.5% of the reported size of the Reserve in the 1995 HCP).

**Figure 11. Reserve boundary changes 1995–2019.**

6.3.1.2 RESERVE ZONES

The Reserve is divided into five zones to facilitate management (Reserve Zones 1 through 5; see **Figure 11**), generally described as follows:

- Zone 1 extends from the Tribal lands east to Ivins and includes the Kayenta development where MDT occur in low densities. This zone also contains high-elevation pinyon-juniper habitat in the Red Mountain Wilderness, where tortoises are not expected to occur.
- Zone 2 extends north from Ivins City and east to State Highway 18 and includes most of Snow Canyon State Park. This area contains a high density of MDT in some high-quality habitats.
- Zone 3 comprises the area between State Highway 18 and Interstate 15 and is fragmented into three subunits by tortoise fencing on Red Hills Parkway and Cottonwood Road. However, this Reserve Zone contains the largest block of contiguous MDT Habitat and is considered the core of the Reserve.
- Zone 4 is bounded on the west by Interstate 15 and Quail Creek Reservoir and on the south by the Virgin River. This Reserve Zone initially contained either no or very few MDT in 1995 and was included in the Reserve as a translocation site for MDT.
- Zone 5 is bounded on the north by the Virgin River and on the south by the City of Hurricane. Although small, this Reserve Zone contains the highest densities of MDT.

Table 16 summarizes the acreage and distribution of MDT Habitat within each Reserve Zone, based on the 2019 Reserve boundary.

Table 16. 2019 Reserve Zones and Mojave Desert Tortoise (MDT) Habitat Areas

Reserve Zone	Occupied MDT Habitat (acres)	Potential MDT Habitat (acres)	Other Suitable* or Non-Habitat (acres)	Total Size (acres)
Zone 1	1,018	196	4,899	6,113
Zone 2	2,411	31	7,866	10,308
Zone 3	25,037	2,396	11,934	39,367
Zone 4	3,753	1,697	61	5,511
Zone 5	429	0	283	712
Total Reserve	32,648	4,320	25,043	62,011

* Suitable MDT Habitat are lands identified by the U.S. Geological Survey model with at least 50% habitat probability that occur between 4,000 and 5,000 feet above mean sea level. Modeled habitat at these elevations is not included in the estimates of Occupied or Potential MDT Habitat used in this Amended HCP.

6.3.1.3 FRAGMENTATION AND CONNECTIVITY

The MDT Habitat present within the Reserve and the MDT individuals that occupy this habitat are relatively isolated from the rest of the MDT range by both human-made and natural landscape barriers. The southern and eastern boundaries of the Reserve largely abut developed or urbanizing lands associated with the communities of Ivins, Santa Clara, St. George, Washington, Hurricane, and Leeds. The Virgin and Santa Clara Rivers also roughly parallel the southern and eastern boundaries of the Reserve. With the exception of Reserve Zone 1 (the Kayenta development), all private properties adjacent to the Reserve were fenced. Tortoise-proof fencing was not installed on Reserve Zone 1 to facilitate opportunities for gene transfer with MDT on adjacent Tribal lands and in support of a least-cost migration corridor which

may connect the UVRRU to the Northeast Mojave Recovery Unit. Despite these efforts, MDT dispersal may be affected by the low-density housing in Kayenta.

The Beaver Dam Mountains create a natural topographic barrier to the continuity of MDT Habitat to the southwest of the Reserve. To the north, MDT Habitat naturally terminates with increased elevation and changes in the ecoregional landscape. These human and natural features represent barriers to the continuity of MDT Habitat, and presumably also to the natural dispersal of MDT individuals, between the Reserve and other portions of the MDT range to the west and south.

The Reserve itself contains a variety of human-created fragmentation barriers, primarily in the form of roads and tortoise-proof fencing. For example, Reserve Zones 2 and 3 are fragmented by State Highway 18 and adjacent urban development. Similarly, Reserve Zones 3 and 4 are fragmented by Interstate 15 and adjacent urban development. Reserve Zones 4 and 5 are fragmented, at least in part, by the Virgin River. Within Reserve Zone 3, Cottonwood Road and Red Hills Parkway are north-south barriers that fragment MDT Habitat. Tuacahn Road similarly creates an internal boundary within Reserve Zone 2. These sources of internal fragmentation were present and considered in the design of the original Reserve boundary in 1995.

6.3.1.2 Reserve Acquisition Strategy

The Reserve boundary defines a target acquisition area for the consolidation of most remaining private and SITLA-owned lands into BLM or UDNR ownership or management. However, some Reserve lands are intended to remain in private, municipal, or County ownership. As of February 2020, approximately 665 acres of private land (of the total 2,981 acres of privately owned lands) and 6,426 acres of SITLA-owned land (7,091 acres total) occur within the Reserve and remain to be acquired for the purposes of this Amended HCP (**Table 17**). The BLM, with support from the County and other HCP Partners as may be available, will continue to work toward the completion of these acquisitions as resources and opportunities allow.

Table 17 summarizes the landownership holdings within each of the Reserve Zones, as of the preparation of this Amended HCP.

Table 17. Ownership and Acreage of Lands within Each Reserve Zone in 2019*

Owner or Manager	Zone 1 (acres)	Zone 2 (acres)	Zone 3 (acres)	Zone 4 (acres)	Zone 5 (acres)	Total (acres)
Federal lands	5,321	4,361	29,528	5,387	713	45,311
Bureau of Land Management (BLM)	5,321	4,361	29,528	5,387	713	45,311
State lands	0	5,813	7,802	102	—	13,717
Utah School and Institutional Trust Lands Administration	—	3	6,422	—	—	6,426
Utah Department of Natural Resources (UDNR)—Snow Canyon State Park	—	5,789	317	—	—	6,106
UDNR-Utah Division of Wildlife Resources	—	5,810	1,379	102	—	7,291
Private and other lands	788	133	2,038	22	—	2,981
Total (acres)	6,109	10,308	39,368	5,511	713	62,009

* Lands within the Reserve boundary subject to acquisition as of November 2019. However, only approximately 665 acres of private lands in the Reserve are subject to acquisition, with the remainder being part of the Kayenta development or other allowed uses of the Reserve.

The 1995 HCP established that Reserve acquisitions were the primary responsibility of the BLM (1995 HCP:21–22). The BLM reaffirmed its responsibility subsequent planning documents (see BLM 2016a, 1999).¹⁶ The County committed to providing support for Reserve land acquisitions through administrative and financial assistance related to typical land transaction processes and costs (e.g., appraisals, inventories, title work, legal representation) (1995 HCP:95). The USFWS, UDNR, and the County have also supported Reserve land acquisitions through grant-funded transactions, when resources and willing sellers have been available.

The County notes that the original intent of the 1995 HCP was for the BLM to complete a mass exchange of nearly all non-federal lands in the Reserve for BLM lands outside of the Reserve in a single transaction. However, due to forces beyond the control of the parties, this mass exchange did not occur and is impractical under current conditions.

Expanding on the 1995 HCP, this Amended HCP anticipates the use of the following mechanisms for acquiring private lands and SITLA-owned lands within the Reserve:

- Exchanges with BLM lands outside the Reserve boundary, on a case-by-case basis with individual landowners;
- Fee simple land purchases that may be supported by monies from the federal Land and Water Conservation Fund, USFWS Cooperative Endangered Species Conservation Fund (also known as ESA Section 6 funds), the sale of BLM-managed lands (as provided for under the 2009 Omnibus Public Land Management Act), Utah's Endangered Species Mitigation Fund (the LeRay McAllister Critical Lands Conservation Fund administered by the Utah Governor's Office of Management and Budget), or other available sources;
- Purchases of conservation easements that may be supported by monies from the federal Land and Water Conservation Fund, USFWS Cooperative Endangered Species Conservation Fund, the sale of BLM-managed lands (as provided for under the 2009 Omnibus Public Land Management Act), or other available sources; or
- Donations of fee simple interest or conservation easements.

The County and the HCP Partners intend, to the maximum extent practicable, that the acquisition of non-federal lands in Reserve Zone 3 will be prioritized over acquisitions in other Reserve Zones,¹⁷ subject to available opportunities and resources.

¹⁶ The following management actions were prescribed by the BLM in the 1999 St. George Field Office RMP (BLM 1999:2.2): “LD-04: BLM will acquire selected non-federal lands, with owner consent, for such purposes as ensuring public access to key use areas, consolidating public ownership of lands critical to recovery of species listed under the Endangered Species Act, providing essential public recreation opportunities, protecting important resources such as floodplains, riparian areas, wildlife habitat, cultural sites, and wilderness, and meeting the mutually agreed upon objectives of local, state, and federal plans or programs. Although most acquisitions will occur through exchange, they may also be made through purchase, donation, or conservation easement. LD-05: Over the life of the Plan, it is expected that BLM may acquire up to 18,000 acres of land within Washington County. Nearly all of these acres will result from BLM’s fulfilling its commitment to acquire available state and private lands within the Washington County Habitat Conservation Plan (HCP) Reserve and to fulfill existing statewide exchange agreements with the Utah School and Institutional Trust Lands Administration to remove trust inholdings from within federally reserved areas” (BLM 1999:2.2). See also, the 2016 *Red Cliffs National Conservation Area Record of Decision and Approved Resource Management Plan* (RCNCA RMP; BLM 2016a:40). The RCNCA RMP prescribes the following management action toward attainment of the goals pertaining to MDT within the RCNCA, “SST-7: Prioritize the acquisition of non-federal lands or interests in critical tortoise habitat within the NCA boundaries from willing land owners through purchase, exchange of public lands identified for disposal outside of the NCA boundaries, donation, or conservation easement.”

¹⁷ This priority list does not include the County’s commitment to acquire approximately 450 acres of land in Reserve Zone 6 prior to the start of construction of the Northern Corridor. See **Chapter 9.1.1** for more details on the County’s response to the Northern Corridor Changed Circumstance.

This Amended HCP establishes that conservation easements are an acceptable tool for achieving Reserve acquisitions. The County and the HCP Partners anticipate that conservation easements associated with Reserve acquisitions should be in perpetuity. However, subject to USFWS approval, term conservation easements may be appropriate in circumstances where perpetual easements are not practicable. Reserve lands acquired through a conservation easement must be used and managed in accordance with this Amended HCP.

Consistent with the 1995 HCP, the County and the HCP Partners intend to rely on BLM land exchanges, federal assistance through the Land and Water Conservation Fund and the USFWS Cooperative Endangered Species Conservation Fund, funds generated from the sale of BLM-managed lands, and other sources as may become available to acquire and manage Reserve lands. The consolidation of Reserve lands into federal or UDNR ownership would not be possible, let alone practicable, without such federal support.

In recognition of SITLA's participation in this Amended HCP as a new HCP Partner, the BLM and USFWS acknowledge that they will continue to consider Reserve land acquisition as a top priority for federal land acquisition support in Utah. Furthermore, when SITLA is a willing seller, the BLM in Utah will prioritize the acquisition of SITLA Reserve lands to the maximum extent practicable.

The County and the HCP Partners emphasize that all Reserve acquisitions will be limited to those transactions involving willing participants. No entity will be required or compelled to sell, donate, transfer, purchase, or receive lands or interest in lands for the purpose of this Amended HCP. This Amended HCP acknowledges there are myriad circumstances affecting the availability and practicability of opportunities to complete Reserve acquisitions among willing parties that may vary over time and space. Therefore, this Amended HCP does not establish a timetable for completing Reserve acquisitions. However, the HCP Partners acknowledge that completing the Reserve acquisitions within the Renewed/Amended ITP Term is a priority conservation action under this Amended HCP and will prioritize the acquisition or, in SITLA's case, disposal of Reserve lands in their land transfer activities.

The County and the HCP Partners commit to coordinate through the deliberations of the HCAC to identify and advance potential acquisition opportunities until Reserve acquisitions are complete. Upon reissuance of the ITP, the County will direct the HCAC to create a standing subcommittee (i.e., the Land Acquisition Subcommittee) tasked with following up on the progress of Reserve land acquisitions, engaging with private landowners and SITLA representatives on new potential opportunities, and creating collaborative partnerships for facilitating acquisition transactions. In general, this subcommittee will prioritize acquisitions in Reserve Zone 3 over those in other Reserve Zones. However, in accordance with the 1995 HCP, for those landowners who do not elect to participate in Reserve land acquisition efforts, this Amended HCP will have no legal effect and will place no restrictions on the use of such property within the Reserve. Unless explicitly provided for as a Covered Activity, activities on unacquired Reserve lands may not take advantage of the incidental take authorization provided by this Amended HCP and ITP.

The County will continue to support Reserve land acquisitions by facilitating coordination with the Reserve's private landowners and SITLA representatives regarding potential acquisition opportunities and mutually agreeable terms for acquisitions. The County will also commit financial resources toward offsetting costs associated with real estate transactions involving Reserve land acquisitions (i.e., appraisals, surveys, title searches, recording fees, and the like). SITLA has agreed to work with the BLM toward the eventual acquisition of its Reserve lands.

6.3.1.3 *Long-Term Reserve Use and Management*

The County and the HCP Partners acknowledge that the long-term management of the Reserve is an ongoing commitment for addressing the permanent impacts of habitat loss from the Covered Activities. Long-term use and management of the Reserve should also 1) be consistent with the community and biological goals and objectives of this Amended HCP; and 2) continue to provide for the Covered Activities that are allowed uses of the Reserve.

The 1995 HCP established that the BLM would acquire and manage the majority of the Reserve, including most of the lands in Reserve Zones 1, 3, 4, and 5. The BLM will have no management authority over private, municipal, county, state, or SITLA-owned lands within the Reserve boundary. UDNR would manage its holdings within Reserve Zone 2 as part of Snow Canyon State Park and smaller Section 6 acquisitions in Reserve Zones 3 and 4. Ivins City agreed to implement certain land use and development restrictions within the portion of the Reserve within its city limits, which have been incorporated into its General Plan and code of ordinances (Ivins City 2015). The County agreed to create an ongoing administration for the purpose of minimizing, mitigating, and monitoring impacts to the Upper Virgin River population of MDT as well as creating a framework for dealing with other candidate and sensitive species (1995 HCP:v-vii, 10). The County has also agreed to manage Reserve lands owned by SITLA until such time as these lands are acquired or through the end of the Renewed/Amended ITP Term, whichever occurs sooner (see **Chapter 7.1**).

Uses of the Reserve not identified as Covered Activities are not prohibited by this Amended HCP but are subject to the authorities and approvals, where applicable, of the respective landowner or land management agency. The County and the HCP Partners will use their respective authorities to further the goals and objectives of this Amended HCP when considering approvals of non-Covered Activities within the Reserve. Incidental take associated with non-Covered Activities is not authorized by this Amended HCP and ITP and would require separate authorization from the USFWS.

In 2009, Congress designated all public BLM-managed lands within the Reserve as an NCA (Public Law 111-111). The NCA designation required the BLM to create the RCNCA RMP for the long-term management of the NCA. As of 2019, the BLM managed 45,311 acres within the RCNCA boundary, approximately 74% of the original Reserve boundary. Approved in 2016, the RCNCA RMP formally established the management objective to “work collaboratively with local, state, and federal partners to accomplish the goals and the objectives of the Washington County HCP and its implementation agreement” (BLM 2016a:64). The RCNCA RMP directs the management of BLM-managed public lands within the NCA and commits the BLM to collaborate with the HCP Partners to accomplish the goals and objectives of the Washington County HCP and the recovery goals established in the 1994 and 2011 MDT Recovery Plans (1995 HCP:9; BLM 2016a; USFWS 1994a, 2011).

The UDNR manages Snow Canyon State Park, which makes up approximately 10% of the Reserve area, or 6,106 acres within Reserve Zones 2 and 3 (**Table 17**). Acknowledging the State Park as a unique entity within the Reserve, UDWR created a detailed management plan for Snow Canyon State Park that adopted the broad management goals from the 1995 HCP for Reserve Zone 2: to protect MDT habitat and provide environmental education opportunities (UDWR 2004; 1995 HCP:27–31). The UDNR manages Snow Canyon State Park under its MDT Management Plan, which it developed with consideration of and in concurrence with the 1995 HCP to fulfill the recovery goals and objectives established in the 1994 MDT Recovery Plan (UDWR 2004; USFWS 1994a). UDWR also owns and manages another 1,185 acres across Reserve Zones 2, 3, and 4, some of which was acquired with the support of ESA Section 6 grant funds. These lands are encumbered with restrictions that protect the conservation values for which they were acquired (i.e., to support the conservation and recovery of the MDT).

The County contributed to the management of the Reserve in accordance with the conservation measures specified in the 1995 HCP, which have been completed (see **Chapter 6.2**). In addition, implementation of other habitat connectivity projects within and outside the Reserve by the County and HCP Partners have supported Reserve design values and ecological values in the UVRRU, as well as species-level biological needs. For example, the County has provided assistance in ground-truthing and habitat connectivity efforts in support of several Upper Virgin River Recovery Implementation Team proposals, including: submitting a proposal and assisting in field efforts to collect genetic samples for the purpose of assessing gene flow and genetic connectivity between populations; providing HCP staff support, including support for associated citizen science efforts, to ground truth unsurveyed areas in the proposed reserve Zone 6; and provided HCP staff field support for identifying possible connectivity corridors between tortoise populations (Cameron Rognan, Washington County HCP Administrator, personal communication to Michael Heimbuch, SWCA, via email dated September 18, 2020). For the duration of the Renewed/Amended ITP Term, the County commits to supporting the long-term management of the Reserve by continuing to administer this Amended HCP (which provides a framework and venue for coordination among the HCP Partners and MDT technical experts on the TC) and providing additional funding and services to implement certain management and monitoring activities within the Reserve, described in **Chapters 6.3.2 and 6.3.3**.

6.3.2 Other Actions to Minimize and Mitigate the Impact of Take

In addition to the design, acquisition, and long-term management of the Reserve, the 1995 HCP identified other conservation measures to minimize and mitigate the impacts of the Covered Activities on MDT. In the following subchapters, this Amended HCP:

- summarizes the conservation measures specified in the 1995 HCP to reiterate the scope and intent of this aspect of the conservation program;
- describes the conservation benefits achieved through the Original ITP Term; and
- identifies the additional actions to be taken by the County over the Renewed/Amended ITP Term that further support the goals and objectives of this Amended HCP.

6.3.2.1 Reserve Fencing

The 1995 HCP called for the installation of approximately 70 miles of fencing within and around the Reserve. The conceptual fencing plan in the 1995 HCP envisioned the application of four different types of fencing or barriers: 1) barriers sufficient to deter passage by humans, pets, and MDT (Foot Traffic and Tortoise Fencing); 2) barriers sufficient to deter passage by MDT only (Tortoise Only Fencing); 3) gates or similar barriers to deter passage by vehicles (Vehicle Barriers); and 4) barriers sufficient to deter human foot access (but not animal access) to areas with endangered plants (Range Fencing) (1995 HCP:90–91).

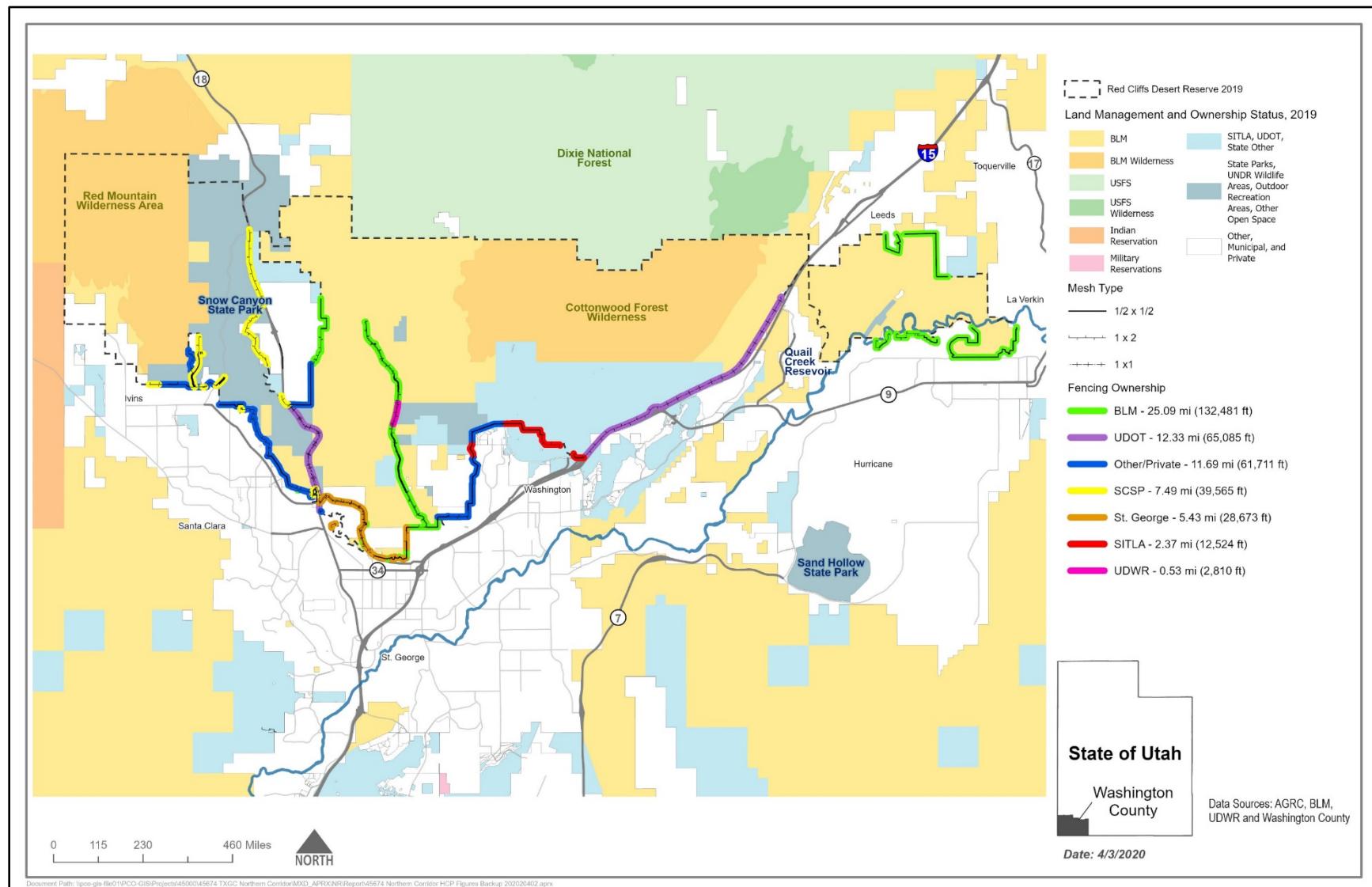
The 1995 HCP contemplated that the fencing and barriers would be installed over time during the ITP Term, with specific details for the design and installation to be reviewed and approved by the HCAC and the Washington County Commission. The Implementation Agreement associated with the 1995 HCP further specified the entities responsible for installing and maintaining fencing for the Reserve. The Implementation Agreement also specified that the County would be responsible for inspecting the condition of this fencing.

During the original ITP Term, more than 85 miles of fencing have been installed within and around the Reserve. **Figure 12** illustrates the locations of current Reserve fencing, by type and maintenance responsibility.

Reserve fencing reduces the amount of direct mortality and injury of MDT from Covered Activities by the following:

- Preventing MDT from colliding with vehicles on the public roads that cross the Reserve
- Preventing MDT from leaving the Reserve and wandering into adjacent developed or urbanized areas where the risk of mortality is increased
- Limiting uncontrolled access to and use of the Reserve by individuals, motorized vehicles, and pets

Reserve fencing supports the 2011 MDT Recovery Plan by contributing to strategic elements and recovery actions related to Protecting Existing Populations and Habitat (see **Table 12**) and at least five of the 26 identified UVRRU-specific recovery priorities (see **Table 13**). Reserve fencing also helps to achieve the biological goals and objectives of this Amended HCP related to other Considered Species, such as listed plants (see **Chapter 6.1.2**).

**Figure 12. Fencing installation and maintenance responsibilities.**

The County and the HCP Partners clarify their responsibilities and commitments for Reserve fencing as follows:

- The County will inspect all Reserve fencing installed for the purposes of the Washington County HCP, regardless of ownership, on an annual basis. The County will forward information on maintenance needs to the responsible landowner for action.
- HCP Partners will perform maintenance on Reserve fences as soon as practicable and in general within 60 days of notification of a maintenance issue. Maintenance of fences installed by the Utah Department of Transportation, Municipal Partners, or private landowners or developers are the independent responsibility of those respective entities.
- The County will assume responsibility for maintaining any Reserve fencing installed by SITLA until the BLM or another entity acquires the lands. Upon acquisition, the BLM or another acquisition entity will assume responsibility for maintaining these fences as part of its long-term management responsibility.
- The County and the HCP Partners may establish an endowment fund to help support ongoing fence maintenance activities. The endowment fund could receive funds from entities with fence maintenance responsibilities, the Municipal Partners, or other landowners subject to Reserve fencing obligations.
- The County and the HCP Partners will summarize their respective fence maintenance activities on an annual basis and provide such reports to the HCP Administrator for inclusion in the Annual Report.
- Installation of new fencing within the Reserve or along the boundary of the Reserve is not currently contemplated by Washington County or the HCP Partners. If, through adaptive management, the installation of new fencing is deemed a priority for achieving the biological goals and objectives of this Amended HCP, the landowner or management entity will be responsible for providing for the materials and labor for the installation and long-term maintenance of the fencing.

6.3.2.2 *Law Enforcement*

The 1995 HCP contemplated the need for law enforcement to ensure that lands within the Reserve are used in accordance with applicable federal, state, and local rules. The 1995 HCP established that the BLM and UDNR would have the primary responsibility for providing law enforcement within the Reserve. The BLM, as a federal land management agency, has been granted law enforcement authority by Congress. UDNR is responsible for enforcing wildlife laws in the State of Utah. In addition, the County has law enforcement authority anywhere on the Reserve and municipalities have law enforcement authority over the portion of the Reserve within their respective corporate municipal boundaries.

The County, with HCP funds, committed to support the activities of two full-time law enforcement agents (one from the BLM and another from UDNR) for a period of 5 years from ITP issuance. The County fulfilled this commitment. After 5 years, the 1995 HCP contemplated that law enforcement for the Reserve would be supported by the BLM through funding made available with the designation of the RCNCA. The BLM and UDWR anticipated signing a cooperative agreement to address shared law enforcement responsibilities within the Reserve.

However, in the event that NCA designation was delayed, the County and UDWR also committed to continue support for law enforcement in the Reserve until NCA designation or so long as law enforcement was required by the terms of the ITP. The 1995 HCP specified that the County's ongoing

assistance in this circumstance would be in the form of using existing law enforcement resources from the Washington County Sheriff's Office and by cross-training HCP staff to support enforcement duties.

Congress established the RCNCA in 2009. Washington County provided law enforcement support through the resources of the Washington County Sheriff's Office beyond the date of NCA designation and through the duration of the original ITP Term, in excess of its commitments. UDWR assigned Conservation Officers to Reserve patrols through 2000 and continued to support and coordinate the activities of law enforcement officers within the Reserve to identify areas of concern. UDWR also provided resources to investigate and report unauthorized takings of MDT.

The County agreed to report on County-supported law enforcement activities for the Reserve as part of the Annual Report. The BLM and UDWR agreed to provide reports of their respective law enforcement activities within the Reserve to the HCP Administrator for inclusion in Annual Reports.

Law enforcement within the Reserve is a long-term management activity that helps maintain the conservation value of the Reserve. For example, MDT may be directly or indirectly taken by as a result of unauthorized OHV use, free-roaming or unleashed dogs, off-trail hiking, illegal camping, shooting, or other unauthorized or illegal uses of the Reserve. Effective law enforcement can help prevent or reduce the severity of unauthorized Reserve uses that can kill, wound, or harm via habitat modification individual MDTs. Reserve law enforcement supports the 2011 MDT Recovery Plan by contributing to strategic elements and recovery actions related to Protecting Existing Populations and Habitat (see **Table 12**), specific UVRRU recovery priorities for increasing law enforcement (Priority Rank #3; see **Table 13**), and biological goals and objectives of the Washington County HCP (see **Chapter 6.1.2**).

The County and the HCP Partners commit to the following law enforcement activities:

- The BLM and UDWR will continue to be responsible for providing law enforcement within lands acquired for the Reserve. Law enforcement activities within the Reserve will focus on access and use regulations that implement the Red Cliffs Desert Reserve Public Use Plan, applicable BLM Resource Management Plans (RMPs), and all laws and regulations (local, state, and federal) that pertain to the protection and conservation of threatened, endangered, candidate, and Utah sensitive species and their habitats.
- The County will continue to allocate existing resources from the Washington County Sheriff's Office to provide law enforcement on unacquired lands within the Reserve boundary owned by SITLA or the Municipal Partners. The County estimates that an appropriate level of effort for this activity is approximately 20% of a full-time law enforcement position (i.e., approximately 416 hours per year), which may be reduced as SITLA lands are acquired for the Reserve. However, the actual level of effort will be determined by demonstrated needs. Law enforcement responsibility for SITLA lands will shift to the BLM or other entity upon acquisition.
- The County will continue to report on County-supported law enforcement activities for the Reserve as part of the Annual Report. The BLM and UDWR will continue to provide reports of their respective law enforcement activities within the Reserve to the HCP Administrator for inclusion in the Annual Report.

6.3.2.3 *Community Education and Outreach*

The 1995 HCP called for the creation of an environmental education center in Washington County to "foster cooperation between the education community; local, State and Federal governments; and private interests with respect to the establishment of a nature education center. The center would provide opportunity for people of all ages and backgrounds to gain a greater understanding of the unique and varied ecosystems found in Washington County" (1995 HCP:94). To support the creation of the education

center, the County committed to provide \$500,000 over the original ITP Term for use on educational activities and to prepare an education plan. The 1995 HCP also contemplated the construction of a new facility for the visitor center.

During the original ITP Term, the County created and maintains a robust program for community education and outreach as part of the 1995 HCP and proposes to continue this program as part of this Amended HCP. This community education and outreach program includes the following:

- **Red Cliffs Desert Reserve Visitor Center**—The County operates the Red Cliffs Desert Reserve Visitor Center that provides regular visitor hours, live animals, exhibits, presentations, and printed publications about the Washington County HCP, the Reserve, the MDT, and other local wildlife, plants, and ecosystems. The Visitor Center also provides information about allowed recreational uses of the Reserve. Since 2016, annual visitation to the Visitor Center is approximately 6,400 visitors, with an increasing trend each year.
- **Web Presence**—The County hosts an extensive website about the Reserve and the administration of the HCP (www.redcliffsdesertreserve.com). The website provides information about allowed recreational access and public uses of the Reserve, the natural landscape and ecology of the Reserve, opportunities for public participation in the management of the Reserve and implementation of the HCP, and contact information for the HCP Administrator and HCP Partners, among other topics. HCP staff also conduct outreach to the public on social media.
- **Education Programs**—The County provides educational programs or materials about the Reserve, its natural resources, wildlife, and recreational opportunities. To support this effort, the County staffs an Outreach and Education Coordinator dedicated to managing education and outreach programs related to the Reserve and the Washington County HCP. Although the outreach position was not anticipated in the 1995 HCP, since its creation in 2007, it has reached over 73,000 individuals through 623 presentations. The position became full time in 2017, further increasing the reach and effectiveness of the program.

The County exceeded its commitment to supporting community education and outreach activities, spending almost double the committed level of efforts specified in the 1995 HCP. In addition, the BLM and UDNR also provide community education and outreach services within Washington County (see **Table 15**).

Education and outreach are ranked among the highest priorities for MDT recovery in the UVRRU (see **Table 13**), contributing to recovery actions that Develop, Support, and Build Partnerships to Facilitate Recovery and Protect Existing Populations and Habitat (see **Table 12**). The 2011 MDT Recovery Plan notes that education programs have “been shown to effectively change learned behavior and can be used to reduce stakeholder conflict before it happens” (USFWS 2011:69). These programs help minimize the effects of the Covered Activities inside the Reserve, particularly with respect to allowed recreation uses. However, the education programs also minimize the effects of Covered Activities outside the Reserve by providing training to construction workers, homeowners, and businesses about compliance with the Development Protocols. Education and outreach are particularly important given that the Reserve is at the urban interface and the primary location for outdoor recreation in the community. The outreach program is also necessary to meet the demands of a growing human population and robust tourism opportunities so that new residents and visitors can learn about and better appreciate the conservation needs of the local landscape and the biological goals and objectives of this Amended HCP.

The County recognizes that education and outreach activities support both the community and biological goals and objectives of this HCP and it has invested significant resources in developing the Red Cliffs Desert Reserve Visitor Center and related programs (see **Chapter 6.1.2**). The County commits to continue its public education and outreach programs with the following specific actions:

- The continued operation of the Red Cliffs Visitor Center, including regular visitor hours and providing for printed, web-based, and, at the discretion of the County, in-person learning opportunities;
- Ongoing coordination with the HCP Partners through the deliberations of the HCAC on the content and distribution of education and outreach materials; and
- Planning and funding to construct a new Red Cliffs Visitor Center facility in Washington County, as contemplated in the 1995 HCP. This new facility may also serve as a holding facility for MDT awaiting translocation or adoption or may support a head-start program.

Similarly, as part of their conservation missions and subject to the availability of funding, the BLM and UDNR will also continue their respective programs for education and outreach regarding the MDT, other rare and sensitive resources, and the Mojave Desert ecosystem.

6.3.2.4 *Tortoise Translocation*

The 1995 HCP included the translocation of MDT from areas affected by Covered Activities into the Reserve as an experimental program, since the efficacy of this minimization measure had not been established (1995 HCP:94–95). As part of this experimental program, the County committed to implement clearance protocols (currently included in the Development Protocols) to collect MDT from certain areas subject to Covered Activities outside of the Reserve. Upon collection, the County also agreed to temporary care for collected MDT until transfer to an entity designated by the USFWS for subsequent translocation. The 1995 HCP stated that the County would not be responsible for the ultimate disposition or fate of translocated MDT, which were considered taken by the Covered Activities. The County also committed to provide \$240,000 to support the temporary care of collected MDT during the original ITP Term. The USFWS committed to provide \$750,000 to the experimental translocation program. The 1995 HCP contemplated that the translocation program could become a permanent conservation measure, to be funded by fees collected for the HCP, other funding sources, and/or reallocation of the 1995 HCP budget.

The initial translocation experiment proved to be successful and the County and the HCP Partners have continued the translocation program for the duration of the original ITP Term (see **Table 15**). Between 1999 and 2018, 485 MDT (including 317 adults) were translocated into Reserve Zone 4. UDWR has performed a long-term monitoring study of the translocation program, confirming that translocations performed under the 1995 HCP have been successful (McLuckie et al. 2019). McLuckie et al. (2019) reported that :[l]ong term density trends (1987 to 2017) are positive and increasing within Management Zone 4 indicating that translocated tortoises have successfully established a persistent and viable population,” with a population estimate “suggesting high survival and low mortality” and frequent observations of “juvenile or immature tortoises, indicating that adult tortoises are reproducing and maintaining a sustaining population.” Prior to translocation efforts, Reserve Zone 4 was thought to contain few or no MDT (McLuckie et al. 2019). As of the preparation of this Amended HCP, the population estimate in Reserve Zone 4 is 285 adult MDT (with a confidence interval of 160 to 507 individuals (McLuckie et al. 2019).

It is clear that the translocation program has created a significant conservation benefit and substantially minimized the impact of the authorized take to an extent not contemplated in the 1995 HCP.

Translocation preserves the life and reproductive potential of many MDT removed from areas subject to Covered Activities, thereby minimizing the impact of authorized take. Translocated MDT in Reserve Zone 4 effectively repopulated unoccupied habitat with a “persistent and viable population.” This program repopulated approximately 3,753 acres of previously unoccupied MDT habitat in Reserve Zone 4. Furthermore, the translocation program supports strategic elements of the 2011 MDT Recovery Plan

that Augment Depleted Populations through a Strategic Program (see **Table 12**) and the biological goals and objectives of the Washington County HCP (see **Chapter 6.1.2**). In addition, the County has minimized the degradation of habitat from fragmentation outside the Reserve by establishing new population augmentation sites in areas that help meet recovery plan objectives (see Repopulation of Reserve Zone 4: **Chapter 6.4.2**, and also Tortoise Translocation: **Chapter 6.3.2.4**) and to support meeting biological and community goals.

This Amended HCP continues the translocation program. As contemplated in the 1995 HCP, the County partners with UDWR, the BLM, and the USFWS to implement the translocation of MDT. This Amended HCP clarifies the roles, responsibilities, and commitments of each entity with respect to implementing the translocation program as a standard part of this conservation program as follows:

- The County will continue to implement the clearance protocols (last amended in 2008) that are part of the Development Protocols, through the Renewed/Amended ITP Term or until all lands outside of the Reserve subject to the clearance protocols are either developed or proactively cleared and fenced.
- In no more than 5 years following ITP reissuance, the County, with support from UDNR biologists as available, will perform surveys across areas of MDT Habitat on non-federal lands outside the Reserve to better understand the distribution of MDT. Specific survey methods will be developed with input of the HCAC in advance of implementing this measure and will consider the effectiveness and cost relative to the expected benefit.
- In no more than 5 years following ITP reissuance, the County will amend the clearance protocols (contained within the Development Protocols; **Appendix A**) to incorporate the results of the surveys. Amended clearance protocols will include additional locations in the Permit Area that will be subject to the mandatory clearance requirements. The County will seek input and recommendations from the HCAC for updating the clearance protocols. The current clearance protocols will apply until amended.
- The County will provide qualified personnel covered by the appropriate federal and state permits for handling MDT to perform required clearance surveys and collect any encountered MDT.
- The County will continue to operate a temporary holding facility for the immediate disposition and care of collected MDT prior to transfer to UDWR or other USFWS-approved entity for relocation, translocation, adoption, or other USFWS-approved purpose.
- The USFWS coordinates with the County, UDWR, and the BLM to plan for the translocation or other appropriate disposition of collected MDT and provides oversight for such activities.
- USFWS issues Research and Recovery permits to qualified persons under ESA Section 10(a)(1)(A) to pursue, capture, and collect (in addition to other forms of intentional, but ultimately beneficial, take) MDT as part of translocation efforts. The cooperative agreement between the USFWS and UDWR under Section 6 of the ESA authorizes UDWR staff or authorized agents to carry out such conservation activities (USFWS 2015a, 2019a).
- The USFWS provides specific procedures for handling MDT that include considerations for tortoise hydration, temperature extremes, disease and parasites, capture, processing, movement, and release (see USFWS 2009, 2013c). The USFWS also provides guidance in the form of Health Assessment Procedures to assess the condition of collected MDT and determine their suitability for translocation (see USFWS 2016b, or as may be revised).
- UDWR receives collected MDT from the County and performs health screenings of collected individuals to assess overall fitness and disease risk.

- UDWR coordinates with the BLM and the County to release healthy MDT into the Reserve or other USFWS-approved location or places unsuitable candidates for translocation and individuals originating from captivity into an adoption program.
- The BLM has agreed to allow for the translocation of healthy, collected MDT to certain of its lands within the Reserve, in accordance with the HCP. Subject to BLM approval, this may be expanded to lands outside the Reserve with a recommendation from the HCAC as an adaptive management measure.
- The County's, UDWR's, and the BLM's responsibility for the fate of translocated MDT ceases once the MDT are released into the Reserve or to another entity approved by the USFWS.
- The County, in coordination with UDWR, will initiate an adaptive management planning process with the HCAC within 2 years of the Renewed/Amended ITP to prepare a Translocation Management Plan (to be attached to the Amended HCP as **Appendix E**). UDWR will lead the development of the Translocation Management Plan that, at a minimum, identifies other locations within the Plan Area that might be suitable for strategic MDT population augmentation and triggers for utilizing such alternatives.

6.3.2.5 *Grazing Permit Acquisition and Retirement*

The 1995 HCP called for the acquisition and retirement of grazing permits on SITLA-owned and other public lands within the Reserve (see **Chapter 6.1.2**). All such grazing permits affecting MDT Habitat within the Reserve boundary have been successfully retired. No additional action is required by the County or the HCP Partners to complete this conservation measure.

6.3.2.6 *Development Protocols*

The 1995 HCP prescribed the application of certain measures to reduce the amount or minimize the impact of incidental take arising from certain Covered Activities (see 1995 HCP:43–45, 86). For instance, the 1995 HCP included Utility Development Protocols (also addressing water development and flood control activities), Road Protocols, and a Subdivision Policy. The County consolidated these various protocols and policies in the Development Protocols (last updated in 2008), prepared with the input and recommendation of the HCAC and the TC.

Depending on the type and location of a Covered Activity, the Development Protocols minimize impacts to MDT through additional project-specific review and input from the TC and HCAC, the application of clearance protocols, collecting MDT for translocation, use of biological monitors, application of seasonal restrictions, minimization of disturbance footprints, training construction personnel, and similar activities. These actions reduce MDT deaths, injury, and habitat losses in support of the biological goals and objectives of the Washington County HCP (see **Chapter 6.1.2**).

The Development Protocols were expressly adopted for the federally managed portions of the Reserve in the 2009 Omnibus Public Land Management Act, which states: “Nothing in [the RCNCA creation] Section prohibits the authorization of the development of utilities within the National Conservation Area if the development is carried out in accordance with (1) each utility development protocol described in the habitat conservation plan; and (2) any other applicable law (including regulation)” (Public Law 111-11 Sec. 1974(h)). The County and the HCP Partners agree to continue to implement the Development Protocols (or subsequent versions thereof, as may be amended through the adaptive management process in **Chapter 6.3.3**) through the Renewed/Amended ITP Term. The County and the HCP Partners also acknowledge that the various landowners or managers of Reserve lands may impose other requirements or standards on those uses of the Reserve that are not addressed by the Development Protocols, as may be

necessary to fulfil their respective, and in some cases broader, range of responsibilities. **Appendix A** attaches the Development Protocols to this Amended HCP.

The County commits to the following actions related to the implementation of the Development Protocols:

- The County will dedicate HCP staff resources to review and make clearance determinations on project proposals and to coordinate with developers, the HCAC and the TC, and the HCP Partners regarding such determinations.
- Landowners and developers may be required to obtain separate assistance from qualified and permitted biologists for certain aspects of the Development Protocols, such as preconstruction clearance surveys or on-site biological monitors for Covered Activities inside the Reserve.

6.3.2.7 *Recreation Management*

Certain public recreational activities are allowed within the Reserve and are Covered Activities. Responsibility for managing public recreational activities within the Reserve rests with the respective land manager (e.g., the BLM, UDNR) but is closely coordinated with the County through the HCAC. The Red Cliffs Desert Reserve Public Use Plan (PUP; Washington County HCP Administration 2000; see **Appendix B**) provides the primary guidance for managing public recreation in the Reserve. The PUP is the result of a highly collaborative process, prepared with the close coordination of the HCP Partners and the public and was approved by the Washington County Commission in 2000. This Amended HCP adopts the PUP (or subsequent versions, as may be amended) as guidance for managing public recreational activities on public lands within the Reserve.

As of the preparation of this Amended HCP, the current version of the PUP states:

The purpose of the Red Cliffs Desert Reserve Public Use Plan is to refine management prescriptions for recreation and other public uses compatible with habitat preservation within the Reserve. Although the Washington County Habitat Conservation Plan (HCP) provides general parameters for recreation within, and management of, the Reserve, it does not provide specific trail designation, access points, or prescriptions for the Reserve. Therefore, the Public Use Planning Team, designated by Washington County, was formed to develop specific recreational and management prescriptions while still working within the parameters and requirements of the HCP.

The comprehensive PUP addresses on- and off-trail uses, trail etiquette, campfires and firewood collecting, parking, damage to rocks and plants, day-use parks and user facilities, pets, motorized vehicle use, signage, and commercial or organized competitive recreational activities (e.g., guided activities, instructional programs, filmmaking, races). The PUP also provides activity-specific guidance for hiking, camping, bicycling, equestrian use, rock climbing and sport rappelling, rock scrambling, hunting, and other nonconsumptive recreational uses. Notably, the PUP expressly prohibits some recreation-related activities within the Reserve, such as paintball and golf. The PUP minimizes the impacts of allowed recreation uses of the Reserve, consistent with the 2011 MDT Recovery Plan strategic element of Protect[ing] Existing Populations and Habitat.

In addition to activity-specific guidance, the PUP also establishes a robust and interagency program for adaptive management to ensure that the conservation (i.e., biological) goals (see **Chapter 6.1.2**) of the Reserve are achieved. The PUP-specific adaptive management process identifies criteria for making adaptive changes to the PUP that consist of a recommendation from the HCAC, no exceedance of the amount of authorized incidental take authorized (whether through the Washington County HCP or other instrument), no significant impact to other resources, consistency with the goals and objectives of this

HCP and related documents, reliance on the best available information, and conformance with all applicable rules and laws.

The County commits to support the implementation of the PUP on non-federal lands within the Reserve through its recreation management, law enforcement, and community education and outreach actions. The County will also engage in the adaptive management process contemplated in the PUP through continued facilitation of the HCAC and planning support for PUP amendments. The County anticipates using HCP staff resources for PUP-related planning support.

As an expansion of its obligations under the 1995 HCP, the County launched a Trail Stewards Program to recruit, train, and support qualified volunteers in monitoring trail conditions, conducting minor trail maintenance, providing visitor information, and reporting instances of vandalism and noncompliance with Reserve regulations. Trail Stewards regularly traverse designated trails within the Reserve, prepare and submit written reports to the HCP Administrator, and (when appropriate) assist with fence maintenance, trash removal, and invasive plant management. The County supports the Trail Stewards Program through the duties of HCP-related staff and with financial support for the volunteer program.

The County intends to continue the Trail Stewards Program for the Renewed/Amended ITP Term, with the dedication of staff resources and funding at a level that fits within with the budget shown in **Chapter 8.1**, subject to other priorities as determined through the Annual Work Plan and adaptive management processes.

Recreational activities and authorized recreation-related uses on BLM-managed Reserve lands are managed under the goals, objectives, and management decisions from the RCNCA RMP. However, the HCP Partners will use the PUP and the adaptive management process through the HCAC as tools to harmonize recreation management in areas where there is no indication when property ownership changes.

6.3.2.8 *Reserve Habitat and Fire Management Guidelines*

As an adaptive management action, the TC and HCAC recommended adoption of guidelines for addressing wildfire events and post-fire habitat restoration in the Reserve (i.e., the Red Cliffs Desert Reserve Habitat and Fire Management Guidelines, adopted by the HCAC in October 2019, **Appendix D**; TC 2019b). While not a part of the 1995 HCP, this Amended HCP adopts the Reserve Habitat and Fire Management Guidelines to help set priorities for Reserve management during the Annual Work Plan process and to provide guidance to the County, the HCP Partners, and fire crews for addressing wildfire-related threats within the Reserve. This Amended HCP also acknowledges that fire management activities pertaining to BLM-managed lands within the Reserve are also subject to the management goals, objectives, and decisions of the RCNCA RMP and other federal laws, regulations, and agency policies, as applicable.

The Reserve Habitat and Fire Management Guidelines contribute to the 2011 MDT Recovery Plan strategic element of Protect[ing] Existing Populations and Habitat (see **Table 12**) and UVRRU recovery action priorities for restoring habitat (Priority #2) and fire management planning and implementation (Priority #17) (see **Table 13**). These guidelines also contribute to elements of the biological goals and objectives of the Washington County HCP (see **Chapter 6.1.2**).

The County notes that habitat restoration within the Reserve is a long-term management activity for which the BLM and UDNR have primary responsibility. However, the County allocated up to \$30,000 for fire-related incidents in its 2020 HCP budget. Due to the significant impacts of the 2020 wildfires on

Reserve Zone 3, the County intends to spend the entirety of those funds towards restoration efforts or other fire-preventative measures, as advised by the HCAC through the adaptive management process.

For the Renewed/Amended ITP Term, the County commits to the following actions related to the Reserve Habitat and Fire Management Guidelines:

- The County will establish an adaptive management fund to help support planning, monitoring, and responses for fire management within the Reserve boundary.
- In response to the wildfires that occurred in the Reserve in July 2020, the County has worked with the HCP Partners to evaluate the effects on MDT and reiterates its commitment to the adaptive management program described in **Chapter 6.3.3.1** to determine the appropriate conservation actions and management responses.
- The County anticipates that its contributions to fire prevention and post-fire habitat restoration activities may be used anywhere within the Reserve and will be leveraged with resources from other HCP Partners. However, preference will be given to County, municipal, private, and SITLA-owned lands for use of the allocated fire management funds until those properties are acquired by the HCP Partners.
- The County will use these habitat and fire management funds with HCAC recommendation and Washington County Commission approval. Unused funds at the end of the ITP Term may be transferred to the HCP Partners upon completion of Reserve land acquisitions.

6.3.3 Adaptive Management and Monitoring

6.3.3.1 *Adaptive Management Program*

Adaptive management is an iterative process for improving effectiveness and reducing uncertainty in conservation programs. The 1995 HCP created a robust committee process for adaptive management through the workings of the HCAC and the TC. This committee process established by the 1995 HCP and coordinated by the County for the original ITP Term has proven highly successful at identifying and solving issues regarding the HCP's conservation program. For example, the HCAC and the TC jointly created the Development Protocols and the PUP to provide efficient and consistent minimization measures for Covered Activities, have overseen the success of the translocation program, have proposed and acted on new conservation measures to restore parts of the Reserve damaged by wildfire, established a pilot raven monitoring program, and found innovative ways to evaluate and manage recreation impacts through human impact monitoring and the use of volunteer Trail Stewards.

Southern Utah University (SUU) has conducted recreation impact monitoring within the Reserve since 2013 to assess and classify trails based on the amount of visual disturbances (e.g., social trails, erosion) that are caused by recreation and to assess changes in their condition. Findings from this monitoring assist in identifying trails that show greater impacts from recreation and what desired trail conditions are or are not being met on these trails (Eastep 2017; Eastep et al. 2018; Eastep et al. 2019). For example, the most recent monitoring report identified Pioneer Hills, Pioneer Rim, and Brook's Nature as trails that have shown the most visual disturbances since 2015. These trails showed a proliferation of social trails at all sites and two-track trails at Pioneer Rim (Eastep et al. 2019). By frequently assessing the trails, the researchers were able to make recommendations and identify problem areas to focus additional efforts (e.g., additional trail signage, natural deterrents, trail repairs/maintenance, suggestions for new targeted trails to reduce the proliferation of social trails) (Eastep 2017; Eastep et al. 2018; Eastep et al. 2019).

The community and biological goals and objectives of this Amended HCP will continue to provide vision and direction for the ongoing implementation of the conservation program (see **Chapter 6.1.2**). Adaptive

management actions will consider the results of monitoring studies and other best available science. The various roles and responsibilities of the County and the HCP Partners, the list of Covered Activities allowed inside the Reserve, the funding plan, and the regulatory assurances of the USFWS through the No Surprises rule provide the sideboards for making adaptive management decisions.

Given the demonstrated success of the committee process for addressing uncertainty and ensuring progress toward achieving the biological goals and objectives, this Amended HCP will continue to rely on the deliberations of the HCAC and the TC for adaptive management recommendations. As described in **Chapter 7.3.1**, the HCAC is composed of representatives of the HCP Partners and other community stakeholders and the TC is composed of biologists and other conservation or technical professionals. These committees meet regularly to review actions taken to implement the conservation program. Any of the HCP Partners may request that the HCAC meet to discuss appropriate changes to the implementation of the conservation program. If necessary, the HCAC may request input from the TC or a qualified science advisor for biological information or advice related to natural resources within the Reserve. The HCAC makes recommendations or proposed amendments, including funding expenditures, to the Washington County Commission (**Chapters 7.3**).

For the Renewed/Amended ITP Term, the County commits to support adaptive management of the Reserve through the continued engagement of the HCP Biologist and the HCP Administrator. The HCP Biologist serves on the TC and contributes technical expertise and labor to the management of the Reserve. Washington County estimates that a portion of the HCP Biologist's time will be dedicated to monitoring and adaptive management activities within the Reserve. Similarly, the HCP Administrator also contributes to monitoring and adaptive management activities within the Reserve by providing support to the HCAC and the TC in the form of coordination and planning assistance.

6.3.3.2 *Biological Monitoring Program*

6.3.3.2.1 BASELINE RESERVE POPULATION MONITORING

The biological goals and objectives of this Amended HCP reflect in the recovery objectives for the UVRRU. The 2011 MDT Recovery Plan recommends long-term monitoring to help determine population trends at a time scale equivalent with a single MDT generation (i.e., approximately 25 years) (USFWS 2011). The 1995 HCP provided for such monitoring within the Reserve over the original ITP Term, funded primarily by the County and implemented with the technical support of UDWR.

Methods and findings since monitoring began in 1999 are summarized in McLuckie et al. (2018). McLuckie et al. (2018) describes the objectives of this monitoring program as "to: 1) obtain precise and accurate density and abundance estimates, and 2) assess long-term density and abundance trends over a 25-year period." As stated in the executive summary of McLuckie et al. (2018), this baseline monitoring within the Reserve reveals the following:

Since 2007, tortoise populations within the Red Cliffs Desert Reserve appear to have stabilized and there is no evidence of further declines in tortoise densities. We estimate there are 2,250 adult tortoises throughout the Reserve, with the majority found in Management Zone 3. Densities in the Reserve are much higher than Mojave desert tortoise populations range wide (2017 Range wide density estimates = 1.3 to 9.4 tortoise per sq km; USFWS 2018). Stable populations are likely a result of recovery actions implemented as part of the Washington County Habitat Conservation Plan, including protection of existing habitat, restoration of degraded habitat (e.g., disturbed, burned), tortoise fencing on the perimeter of the Reserve, community education programs, and law enforcement presence. In addition, National Conservation Area designation in 2009

offers additional regulations and oversight to protect tortoises and their habitat within the Reserve.

The County exceeded its commitments under the 1995 HCP to support monitoring activities within the Reserve (see **Table 14**). Under the 1995 HCP, the County provided substantial funding to support baseline monitoring by UDWR and BLM that demonstrated the efficacy of the conservation program and ITP compliance. Under the Amended HCP, MDT monitoring responsibility on acquired Reserve lands is a responsibility of UDWR and BLM.

Continued baseline monitoring of the Reserve for long-term recovery planning purposes will be completed primarily by the BLM and/or UDWR with the use of their supplementary funds, when available. The County will provide limited additional financial support for the Renewed/Amended ITP Term to assist with these monitoring activities on Reserve lands yet to be acquired, to help attain the biological goals and objectives of this Amended HCP. Through the HCAC, the County and HCP Partners will coordinate monitoring efforts and share results to measure the effectiveness and coordinate adaptive measures (see Monitoring and Adaptive Management Planning in **Table 20** for the County's funding commitments for implementing adaptive management).

6.3.3.2.2 SPECIAL TOPIC MONITORING

As part of the adaptive management program, the HCAC may occasionally recommend monitoring studies on specific topics, such as new threats to the MDT within the Reserve or the effectiveness of Reserve adaptive management activities implemented in response to such threats. The County, through action by the Washington County Commission, may allocate funds for recommended special topic monitoring studies using funds budgeted for Contingencies and Changed Circumstances (see **Chapter 8.1**), if

- it determines that such monitoring is consistent with the County's role and responsibilities under this Amended HCP (e.g., does such monitoring relate to the effectiveness of the minimization and mitigation measures specified in **Chapter 6.3.2**, to the tracking and reporting of information related to the County's commitments for implementing this Amended HCP, or to the identification of Changed Circumstances); and
- it determines that the funding for such monitoring will not preclude the County's ability to fully fund and carry out its commitments for implementing this Amended HCP.

In any case, the amount of funding that the County will commit to special topic monitoring will be consistent with the funds budgeted for Contingencies and Changed Circumstances and will only be applied to special topic monitoring studies recommended by the HCAC. Specific scopes of work and budgets will be addressed through the Annual Work Plan process (see **Chapter 7.6.1**). Washington County will fund, in whole or in part, special topic monitoring studies at levels consistent with the budget provided in **Chapter 8.1** through the Renewed/Amended ITP Term.

For example, in recent years, this category of monitoring has included studies to monitor recreation use and raven activity within the Reserve. These special topic monitoring studies provided the basis for estimating a practicable budget for such activities through the Renewed/Amended ITP Term.

- **Raven Monitoring**—In 2015, HCP staff began monitoring raven activity in the Reserve and adjacent areas. The surveys have shown that overall raven predation on MDT in the Permit Area is likely low overall but may be high locally at specific nesting sites. The County anticipates continuing to search raven nests, utility structures, and other roosts sites for MDT remains. The County will also track the overall growth of the raven population surrounding the Reserve. The monitoring approach will be adaptive in nature as the Desert Tortoise Recovery Office provides

new recommendations to help identify data gaps and management needs. The results from the raven monitoring will be reviewed annually by the HCAC. The raven monitoring study is an example of special topic monitoring funded by the County that is not related directly to its commitments for implementing minimization or mitigation measures (e.g., understanding raven use of the Reserve and effects on the MDT is more closely associated with the long-term management commitments of the BLM and UDNR) but is consistent with the biological goals and objectives of this Amended HCP and is consistent with available funding. The USFWS is currently evaluating raven management issues in the western United States, including predation on the desert tortoise. The County has submitted its raven monitoring reports to the USFWS through its online reporting site (<https://www.fws.gov/regulations/raven/>) and is awaiting further guidance from the USFWS on how to best manage raven predation. When the USFWS evaluation is complete, the County will consider any guidance received and engage the HCAC and the TC, as appropriate, to formulate specific plans for addressing threats posed by raven predation.

- **Recreation Impact Monitoring**—The County has provided funding for monitoring the impact of human recreation use of the Reserve since 2006. As of the preparation of this Amended HCP, this monitoring is led by the SUU Outdoor Recreation Program (Eastep 2017, Eastep et al. 2018, Eastep et al. 2019). Each year since 2013, students and SUU staff hike the Reserve trails and collect specific data and photographs at various waypoints along the way. The data includes trail width, depth, erosion, and several off-trail impacts from illegal trails, bikes, horses, OHVs, fires, litter, etc. The data is also entered into a geographic information system database to provide a spatial analysis of problem areas along the trails and where trails have improved after corrective management actions. Based on the results of the findings each year, a location is selected for specific trail maintenance or improvement. SUU students, HCP staff, and other volunteers work collaboratively to restore or improve the trails in the problem area. SUU students and staff are reimbursed for their travel and per diems, but most of the work is volunteer based. Recreation monitoring is a special topic monitoring study funded by the County that directly relates to the effects of Covered Activities within the Reserve and the effectiveness of recreation management actions described in **Chapter 6.3.2**.

The examples provided above are to illustrate the nature and scope of special topic monitoring activities that are already a part of how the County and the HCP Partners approach adaptive management. Continuation of these specific studies is not required by this Amended HCP.

6.4 IMPACTS OF TAKE FULLY OFFSET

The impacts of take authorized with the Original ITP and reauthorized with the Extended/Amended ITP are fully offset by the conservation program of the 1995 HCP (see **Chapter 6.2.1**). This conservation program is carried forward and expanded in this Amended HCP. The conservation benefits to the MDT attained by the County and the HCP Partners through the completion of the measures described in Chapter 6.2 fully offset the impacts of the amount of authorized take. These completed actions have included the establishment of the Reserve, the implementation of the translocation program, and the management and monitoring activities of the County and the HCP Partners—inside and outside of the Reserve and regardless of Reserve land acquisition status.

With this Amended HCP, the County and the HCP Partners have agreed to implement the conservation measures described herein, within the limits of their individual authorities and obligations. These commitments are reiterated in the updated Implementation Agreement signed by each of the HCP Partners, including SITLA as a new HCP Partner.

The conservation benefits to the MDT that are anticipated during the Renewed/Amended ITP Term further the attainment of the recovery-based biological goals and objectives of this Amended HCP (i.e., actions associated with the acquisition and long-term management of the Reserve primarily by the BLM with support from UDNR and USFWS) and/or address the impacts of the temporal extension of take authorization (i.e., the commitments of the County, SITLA, Ivins, and the Municipal Partners).

In light of No Surprises assurances and the limited scope of the substantive amendments contained within this Amended HCP, the County believes that its proposed amendments to the 1995 HCP: 1) address the scope of amendments contemplated in the 2016 HCP Handbook for an ITP renewal; and 2) do not substantively alter the terms and conditions of the 1995 HCP in such a way that would trigger the need for a new analysis of the HCP against the statutory ITP issuance criteria (particularly with respect to the issuance criteria addressing the maximum extent practicable standard). Nonetheless, this Amended HCP continues to fully offset the impacts of the reauthorized incidental take through the completed conservation measures during the Original ITP Term (see **Table 14**) and the new conservation commitments over the Renewed/Amended ITP Term.

The following subchapters review how the conservation program of the Washington County HCP is consistent with the recommendations for recovery of the MDT in the UVRRU, highlight the conservation benefits achieved by the County and the HCP Partners that exceeded the expectations of the 1995 HCP (thereby generating additional conservation value not previously considered), and summarize the net effects of the Amended HCP including the value of the new conservation commitments proposed for the Renewed/Amended ITP Term.

6.4.1 Consistency with Recovery Recommendations

This Amended HCP continues to support conservation actions identified by the USFWS in the 2011 MDT Recovery Plan as strategic elements and actions for recovery of the MDT (USFWS 2011:x–xi; see **Table 12**). The following list briefly describes some ways this Amended HCP specifically incorporates the six major strategic elements of the 2011 MDT Recovery Plan in support of the species' recovery.

- 1. Develop, support, and build partnerships to facilitate recovery:** This Amended HCP continues to engage federal, state, and local governments, as well as private landowners, through its administrative body, the HCAC. This committee represents an array of landownership types, each with their own regulations and goals and objectives, facilitating communications and the conservation actions between separate agencies and institutions within each Recovery Unit.
- 2. Protect existing populations and habitat:** The 1995 HCP established an approximately 61,000-acre Reserve for the conservation of the MDT that is consistent with the lands identified as necessary for recovery in the MDT Recovery Plan. In addition, implementation during the original ITP Term expanded the acreage of the reserve by approximately 1,000 acres.
- 3. Augment depleted populations:** The previously experimental translocation program has demonstrated that it is effective in repopulating previously unoccupied or underoccupied areas of habitat (McLuckie et al. 2019). The translocation program will continue but may expand to other locations in the UVRRU as deemed appropriate by the USFWS and through the adaptive management process. As funding permits, head-starting, and strategic population augmentation will also be considered by the Amended HCP through adaptive management and the Changed Circumstances contingency funding.
- 4. Monitor progress toward recovery:** This Amended HCP continues to support a biological monitoring program established in the 1995 HCP. Additional special topic monitoring and studies support adaptive management. These aspects of the biological monitoring program will provide

information on the current status of the MDT and provide valuable information on threats to the species and support adaptive management responses.

5. **Conduct applied research and modeling in support of recovery efforts within a strategic framework:** In addition to the expanded biological monitoring program, which provides valuable regional information on the species, this Amended HCP continues to support advances in MDT habitat restoration (e.g., wildfire recovery and restoration projects following the 2005 fires in the Reserve).
6. **Implement an adaptive management program:** This Amended HCP continues to support regional recovery and management through the actions of the HCAC and the TC. These committees utilize information collected through each of their partnering agencies as well as information collected through the HCP's biological monitoring program. This Amended HCP includes specific guidance on the Adaptive Management process and how the HCAC and the TC utilize and incorporate this information through an iterative process.

6.4.2 Conservation Benefits Not Previously Considered

This Amended HCP identifies conservation benefits achieved during the Original ITP Term that were not previously considered by the USFWS. These unanticipated conservation benefits, together with the additional conservation benefits anticipated from the expanded commitments in this Amended HCP, ensure that the impacts of the authorized incidental take remain fully offset through the Renewed/Amended ITP Term. The additional conservation benefits generated during through 2019, but not previously considered by the USFWS in the evaluation of ITP issuance criteria, include:

- **Expansion of the Reserve**—The County and the HCP Partners acted on several opportunities to expand the size of the Reserve that were not otherwise associated with an offset for allowed activities in the Reserve or a minor boundary adjustment. These opportunistic acquisitions added approximately 1,240 acres to the Reserve, for a net increase in Reserve size of approximately 987 acres (see **Chapter 6.3.1.1.1**).
- **Repopulation of Reserve Zone 4**—The translocation program of the 1995 HCP was experimental with a 5-year implementation commitment. Ultimate success of the translocation efforts was neither assured nor required. The MDT entered into the translocation program were considered fully taken for the purposes of the 1995 HCP. However, the translocation program proved to be a success and resulted in the repopulation of Reserve Zone 4, which was not known to be occupied by MDT at the time of the 1995 HCP was approved (see **Chapter 6.3.2.4**). While Reserve Zone 4 was part of the original Reserve boundary established in the 1995 HCP, the extended and ultimately successful translocation program repopulated 3,753 acres of previously unoccupied MDT Habitat with a “persistent and viable population” (McLuckie et al. 2019).
- **Expanded Funding for Conservation Actions**—The County’s commitments to the 1995 HCP were measured in terms of the funding spent on various types of conservation actions, with those financial commitments capped at specified levels. The County spent 170% of its specified financial commitment towards implementation of the 1995 HCP, exceeding the activity-specific caps for most categories of actions. This expanded financial contribution supported on-the-ground actions by the County itself and its HCP Partners, particularly UDNR, related to education and outreach, law enforcement, adaptive management, and monitoring (see **Chapter 6.2.1**). The USFWS previously determined that these extra conservation actions, which were beyond the required commitments of the 1995 HCP, were more than sufficient to release all of the incidental take authorization under the 1995 HCP and resulted in an excess release of 3,017 acre-credits of take (see **Table 14**).

- **Temporal Benefit of Conservation Actions Ahead of Takings**— As of 2019, only 26% of the incidental take authorization has been used. While the Reserve is not yet fully acquired, the County and the HCP Partners have nonetheless established, used, managed, and monitored the Reserve for the duration Original ITP Term regardless of acquisition status. Therefore, the MDT has been receiving the full benefit of the conservation program for the Original ITP Term plus the period of extension while the ITP renewal was being processed. The realization of these conservation benefits in advance of the completion of the authorized take creates a temporal conservation benefit for the MDT. In essence, the MDT has been receiving the full benefit of the 1995 HCP for 25 years but has only experienced 26% of the authorized take.

In summary, the efforts of the County and the HCP Partners have generated the equivalent of 7,757 acres of conservation credit value for the MDT in excess of that contemplated by the 1995 HCP and ensured that the MDT has had the benefit of 1995 HCP conservation program well in advance of nearly three-quarters of the authorized takings. The magnitude of the temporal conservation benefits, considering only the continuation of the 1995 HCP conservation program during the period of ITP renewal (i.e., 2016 through 2020), is difficult to quantify. However, this temporal conservation benefit may be roughly approximated by the number of “tortoise years” gained by each MDT in the Permit Area outside the Reserve that was not taken during the Original ITP Term and the period of ITP renewal and each MDT that benefited from Reserve management by the County that is above and beyond the commitments of the 1995 HCP.

6.4.3 Net Effects Summary

Table 18 summarizes the ways in which the MDT is likely to be affected by the Covered Activities, how those effects result in take of individual MDT, and the conservation measures that are applied to offset the impacts of the reauthorized take.

Table 18. Net Effect Summary of Covered Activities on Mojave Desert Tortoise (MDT)

Activity Sub-Activity Area of Effects	Exposure* Stressor – Frequency and Duration – Resource or Individuals (if direct) Affected – Life History Form	Response to Stressor Form of Take	Conservation Measures	Net Effects Summary
Inside Reserve				
Recreation Uses and Related Facilities <i>130 miles of designated trails within the Reserve (see Chapter 5.1.2)</i>	1. Human presence; year-round, intermittent; individual MDT; all life stages (i.e., adults, juveniles, and eggs) 2. Continued trampling and compaction of soils on trails; associated with human presence (see #1); individual MDT; adult MDT 3. Trash and litter on trails and in parking areas; associated with human presence (see #1); individual MDT; all life stages	1. Avoidance <i>Indirect loss of potential habitat</i> 2. Avoidance <i>Indirect loss of potential habitat</i> 3. Predation <i>Direct killing or wounding of MDT</i>	The County has organized efforts to control litter and minimize raven and other predator attractants inside and outside the Reserve. See Chapter 6.3 (Desert Tortoise Conservation Measures) for detailed information <ul style="list-style-type: none"> • Law Enforcement (see Chapter 6.3.2.2) • Community Education and Outreach (see Chapter 6.3.2.3) • Recreation Management (see Chapter 6.2.3.7) 	Human presence may disrupt normal MDT behavior patterns (Bowles et al. 1999; Tuma et al. 2016). Accumulation of trash and litter on trails and in parking areas has the potential to attract predators (e.g., coyotes, ravens), thus increasing the vulnerability of MDT (Kristan and Boarman 2003). Continued trampling and compaction of soils on designated trails not in prime habitat for MDT is not expected to negatively affect habitat. MDT that cross the designated trails while humans are present may be affected by foot traffic; however, this is unlikely due to the unsuitable nature of the trails and adjacent areas. Benefits: Trail signage and the Reserve visitor center provide MDT awareness, protection, and the collection of community science data (BLM 2016b; Rognan and Schijf 2018; Rognan et al. 2017).
Recreation Uses and Related Facilities <i>An unknown area of effects</i>	1. Human presence; year-round, intermittent; individual MDT; all life stages 2. Trampling and compaction of soils in prime MDT habitat; associated with human presence (see #1); individual MDT and habitat (nesting, burrows, overwintering); adult MDT 3. Trash and litter discarded in prime MDT habitat; associated with human presence (see #1); individual MDT; all life stages	1. Avoidance <i>Indirect loss of habitat used by MDT</i> 2. Avoidance and modification of prime MDT habitat (nesting, burrows, overwintering) <i>Indirect harm to MDT, potential direct wounding or killing by crushing of MDT within burrows</i> 3. Predation <i>Direct killing or wounding of MDT</i>	The County has organized efforts to control litter and minimize raven and other predator attractants inside and outside the Reserve. See Chapter 6.3 (Desert Tortoise Conservation Measures) for detailed information <ul style="list-style-type: none"> • Community Education and Outreach (see Chapter 6.3.2.3) • Recreation Management (see Chapter 6.2.3.7) 	Trampling and compaction of soils may alter prime MDT habitat when taking place off designated trails, affecting the nesting behaviors of MDT, which require suitable substrates and soil conditions for burrowing, nesting, and overwintering. There may also be an increased likelihood of encountering an MDT when in prime habitat and thus disruption of normal MDT behavior patterns may be possible. Accumulation of trash and litter in prime MDT habitat when off the designated trails and in parking areas may attract predators (e.g., coyotes, ravens), thus increasing the vulnerability of MDT (Kristan and Boarman 2003). Benefits: Community education and outreach (e.g., visitor center, parking area signage) present within recreational areas provide MDT awareness, protection, and the collection of community science data (BLM 2016b; Rognan and Schijf 2018; Rognan et al. 2017).

Activity Sub-Activity <i>Area of Effects</i>	Exposure* Stressor – Frequency and Duration – Resource or Individuals (if direct) Affected – Life History Form	Response to Stressor <i>Form of Take</i>	Conservation Measures	Net Effects Summary
Recreation Uses and Related Facilities Designated area-restricted recreational activities (i.e., camping, hunting) <i>An unknown area of effects</i>	1. Human presence; year-round, intermittent; individual MDT; all life stages 2. Trash and litter in campsites and in parking areas; associated with human presence (see #1); individual MDT; all life stages	1. Avoidance <i>Indirect loss of potential habitat</i> 2. Predation <i>Direct killing or wounding of MDT</i>	The County has organized efforts to control litter and minimize raven and other predator attractants inside and outside the Reserve. See Chapter 6.3 (Desert Tortoise Conservation Measures) for detailed information <ul style="list-style-type: none"> • Law Enforcement (see Chapter 6.3.2.2) • Community Education and Outreach (see Chapter 6.3.2.3) • Recreation Management (see Chapter 6.2.3.7) 	Camping and hunting are restricted to designated areas within the Reserve; law enforcement prevents illegal camping and hunting outside of these areas. Human presence within campsites and hunting grounds may disrupt normal MDT behavior patterns (Bowles 1999; Tuma et al. 2016). Accumulation of trash and litter within these designated areas and associated parking lots may attract predators (e.g., coyotes, ravens), thus increasing the vulnerability of MDT (Kristan and Boarman 2003). Benefits: Community education and outreach (e.g., visitor center, parking area signage) present within recreational areas provide MDT awareness, protection, and the collection of community science data (BLM 2016b; Rognan and Schijf 2018; Rognan et al. 2017).
Recreation Uses and Related Facilities Emergency search and rescue operations <i>61,022 acres (the area encompassing the Reserve)</i>	1. Human presence; rare in the event of an emergency; individual MDT; all life stages 2. Use of motorized vehicles (soil compaction, habitat modification); rare in event of emergency; individual MDT & habitat (nesting, burrows, overwintering, and foraging); all life stages	1. Avoidance <i>Indirect loss of prime habitat used by MDT</i> 2. Avoidance, modification of prime MDT habitat (nesting, burrows, overwintering, foraging), collision with motorized vehicles <i>Indirect loss of prime habitat used by MDT, direct killing or wounding of MDT</i>	See Chapter 6.3 (Desert Tortoise Conservation Measures) for detailed information	Off-highway vehicle activity within the Reserve and outside of designated roads and parking lots may directly kill, wound, or harm any MDT from collision with vehicles (USFWS 2019e). Additionally, noise and vibrations associated with vehicle use in the desert may disturb MDT and alter normal behavior patterns (Berry and Murphy 2019; Bowles 1999; Tuma et al. 2016). Habitat may be modified by the compaction and erosion of soils and the trampling of native vegetation (thus encouraging invasive plant growth) within the vehicles' path; use of vehicles in MDT habitat may also collapse burrows (some of which may be occupied) (Bury and Luckenbach 2002; Keith et al. 2008). However, emergency search and rescue operations will only take place in the rare event that an emergency takes place within the Reserve.

Activity Sub-Activity Area of Effects	Exposure* Stressor – Frequency and Duration – Resource or Individuals (if direct) Affected – Life History Form	Response to Stressor Form of Take	Conservation Measures	Net Effects Summary
Utilities, Access Roads, Water Development, and Flood Control Construction and installation of new utilities; mining and drilling; operation and maintenance <i>Up to 100 acres (see Chapter 5.3.2)</i>	<p>1. Removal of native vegetation; years to possible decade(s), potentially permanent alteration; individual MDT and/or habitat; all life stages</p> <p>2. Ground disturbance (e.g., trenching, use of motorized vehicles, placing temporary or permanent access roads); Years to possible decade(s), potentially permanent alteration; individual MDT and/or habitat; all life stages</p> <p>3. Use of motorized vehicles; during construction and installation, associated with human presence; individual MDT and/or habitat; all life stages</p> <p>4. Noise, dust, and vibrations associated with human presence and activity; during construction and installation, associated with human presence; individual MDT; all life stages</p> <p>5. Installation of overhead utility lines; permanent alteration; individual MDT; juveniles</p> <p>6. Installation of communication towers; permanent alteration; individual MDT; juveniles</p> <p>7. Possible water leaks associated with water utilities; possibly rare in occurrence, duration while standing water persists; individual MDT; adults and juveniles</p> <p>8. Toxic byproducts (from mining and drilling); possibly rare in occurrence, duration is years to possible decade(s), potentially permanent alteration; habitat; not applicable (N/A)</p>	<p>1. Reduction of forage potential, reduction in available cover, encourage invasive plant establishment <i>Indirect loss of prime habitat used by MDT</i></p> <p>2. Direct mortality and/or injury of MDT, modification of MDT habitat, encourage invasive plant establishment <i>Indirect loss of prime habitat used by MDT, direct killing or wounding of MDT</i></p> <p>3. Collision <i>Direct killing or wounding of MDT</i></p> <p>4. Leave/avoid construction site, alter behavior patterns <i>Indirect loss of prime habitat used by MDT</i></p> <p>5. Predation (raven roosting on lines) <i>Direct killing or wounding of MDT</i></p> <p>6. Predation (raven nesting in towers) <i>Direct killing or wounding of MDT</i></p> <p>7. Predation (water draws both MDT and predators to site) <i>Direct killing or wounding of MDT</i></p> <p>8. Introduction of heavy metals, changes in soil chemistry <i>Indirect loss of prime habitat used by MDT</i></p>	<p>See Chapter 6.3 (Desert Tortoise Conservation Measures) for detailed information</p> <ul style="list-style-type: none"> • Development Protocols (see Chapter 6.3.2.6) 	<p>Ground disturbance by means of trenching, vehicle use, and the placing of access roads may alter prime MDT habitat by compacting soils, collapsing burrows, eliminating native forage, and thus encouraging nonnative grass production.</p> <p>The use of motorized vehicles may directly kill, wound, or harm any MDT by collision with vehicles. Noise, dust, and vibrations associated with vehicle use and human presence may disturb MDT and alter normal behavior patterns (Berry and Murphy 2019; Bowles 1999; Tuma et al. 2016). Mining and drilling may cause the introduction of potentially toxic byproducts (e.g., heavy metals) that may change the soil chemistry within MDT habitat (Chaffee and Berry 2006; Lovich and Bainbridge 1999).</p> <p>Large utility projects may cause the introduction of nonnative invasive species, thus reducing the forage potential and available cover for MDT; the introduction of these invasive grasses alters the natural fire regime (Boarman 2002; Esque et al. 2003; Fenstermaker 2012), resulting in larger catastrophic fires, affecting the long-term recovery and management of MDT, and may cause direct mortality or injury to MDT (Cameron et al. 2012; Lovich and Ennen 2011, 2013).</p> <p>Ravens are a known predator of primarily young MDT (Berry et al. 2013; Lovich et al. 2011). The installation of communications towers and overhead utility lines provide ravens with nesting and roosting habitat, respectively (Boarman et al. 2006).</p>
General Reserve Management See Chapter 2.2 (Covered Activities Inside of the Reserve) <i>61,022 acres (the Reserve)</i>	<p>1. Vegetation management; as needed, intermittent, throughout ITP Term; habitat; N/A</p> <p>2. Invasive species control (e.g., herbicides/ pesticides); as needed, intermittent, throughout ITP Term; habitat; N/A</p> <p>3. Firefighting and controlled burns; as needed, intermittent, throughout ITP Term; individual MDT and habitat; all life stages</p> <p>4. Predator control; as needed, intermittent, throughout ITP Term; individual MDT; all life stages</p> <p>5. Recreation management; as needed, intermittent, throughout ITP term; habitat; N/A</p> <p>6. Installation and maintenance of tortoise control fencing; as needed, intermittent, throughout ITP Term; individual MDT and habitat; adults and juveniles</p>	<p>1. Temporary alteration of MDT habitat <i>Indirect effects and/or benefits to habitat used by MDT</i></p> <p>2. Reduction in nonnative species, growth of native species, potential chemicals released to MDT habitat <i>Benefits to habitat used by MDT</i></p> <p>3. Direct mortality and/or injury to MDT individuals, temporary alteration of habitat <i>Indirect loss of habitat used by MDT, direct killing or wounding of MDT</i></p> <p>4. Reduction of predation <i>Benefits to individual MDT</i></p> <p>5. Temporary (and minimal) alteration of MDT habitat <i>Indirect loss of habitat used by MDT</i></p> <p>6. Habitat fragmentation (via physical barriers); behavioral alteration <i>Indirect loss of habitat used by MDT</i></p>	<p>See Chapter 6.3 (Desert Tortoise Conservation Measures) for detailed information</p> <ul style="list-style-type: none"> • Law Enforcement (see Chapter 6.3.2.2) • Community Education and Outreach (see Chapter 6.3.2.3) • Recreation Management (see Chapter 6.3.2.7) • Reserve Habitat and Fire Management Guidelines (see Chapter 6.3.2.8) 	<p>Benefits: The Covered Activities associated with general reserve management are mainly beneficial to MDT (excluding firefighting to abate public nuisance and protect life and property). Vegetation management, invasive species control, and controlled fires are all management techniques that ensure that native species are present for available forage and cover for MDT. Predator control will decrease the vulnerability of MDT present on the Reserve. Recreation management provides education and outreach for the MDT. And lastly, tortoise control fencing ensures the safety of MDT within the Reserve (see Chapter 6.3.2.1).</p> <p>In some instances, these activities, although largely beneficial, may cause incidental take of MDT. For example, performing firefighting activities and controlled burns may cause direct mortality to MDT by means of injuries from fire contact, dehydration exposure, or smoke inhalation (Esque et al. 2003). Indirect effects to MDT habitat from fire may include the introduction and spread of nonnative grasses (BLM 2015; Brooks 1999; Brooks and Esque 2002), adding to the fuel load potential (Esque et al. 2003; Fenstermaker 2012).</p>
Outside Reserve				

Activity Sub-Activity Area of Effects	Exposure* Stressor – Frequency and Duration – Resource or Individuals (if direct) Affected – Life History Form	Response to Stressor <i>Form of Take</i>	Conservation Measures	Net Effects Summary
Activities that may cause direct loss of MDT See Chapter 2.1 (Covered Activities Outside of the Reserve)	<ol style="list-style-type: none"> 1. Domestic pets; year-round, permanent; individual MDT; all life stages 2. Vehicle use; year-round, permanent; individual MDT; adults and juveniles 3. Land clearing and ground disturbance; as needed, intermittent, throughout ITP Term; all life stages 4. Firefighting; rare in event of emergency; individual MDT; all life stages 5. Grazing by livestock; year-round, possible seasonal rotations of livestock; individual MDT; all life stages 6. Any other lawful activity 	<ol style="list-style-type: none"> 1. Predation <i>Direct mortality and/or injury to MDT adults, juveniles, or eggs</i> 2. Collision <i>Direct mortality and/or injury to MDT adults and/or juveniles</i> 3. Collision and/or crushing of individuals <i>Direct mortality and/or injury to MDT adults, juveniles, or eggs</i> 4. Fire contact, dehydration exposure, or smoke inhalation <i>Direct mortality and/or injury to MDT adults, juveniles, or eggs</i> 5. Trample MDT adults and juveniles, crushing of individual MDT (all life stages) within burrows <i>Direct mortality and/or injury to MDT adults, juveniles, or eggs</i> 	<p>See Chapter 6.3 (Desert Tortoise Conservation Measures) for detailed information</p> <ul style="list-style-type: none"> • Red Cliffs Desert Reserve (see Chapter 6.3.1) • Community Education and Outreach (See Chapter 6.3.2.3) • Tortoise Translocation (see Chapter 6.3.2.4) • Development Protocols (see Chapter 6.3.2.6) 	<p>Covered Activities include any and all otherwise lawful land development and land use activities on non-federal lands outside of the Reserve (see Chapter 6.3.1). Activities that may cause direct loss of MDT individuals include development activities that involve clearing and ground disturbance, use of vehicles, firefighting, and the keeping of domestic pets. These effects have been discussed in the above effects analyses for MDT.</p> <p>However, there are robust Desert Tortoise Conservation Measures (see Chapter 6.3) in place that minimize the likelihood of incidental take by means of direct mortality and/or injury to MDT from these Covered Activities outside the Reserve.</p>
Activities that may cause habitat loss or fragmentation See Chapter 2.1 (Covered Activities Outside of the Reserve)	<p>The resource affected for the below stressors is potential or known MDT habitat (nesting, burrows, overwintering, and/or foraging) outside of the Reserve.</p> <ol style="list-style-type: none"> 1. Land clearing and ground disturbance; years to possible decade(s), potentially permanent alteration 2. Noise, dust, and vibrations associated with human presence; year-round, intermittent, during periods of human presence 3. Recreation activities (e.g., hiking, camping); year-round, intermittent 4. Utility construction, operation, and maintenance; at an unknown frequency, effects lasting years to possible decade(s) with the potential for permanent alteration 5. Mining and drilling; at an unknown frequency, effects lasting years to possible decade(s) with the potential for permanent alteration 6. Agriculture (land management, crop harvest, herbicides/pesticides, irrigation, grazing); year-round activities and/or seasonal rotation of crops and livestock, effects years to possible decade(s) 7. Firefighting 8. Any other lawful activity 	<p>Habitat loss, fragmentation, or alteration <i>Indirect loss of habitat used, or that has the potential to be used, by MDT</i></p>	<p>See Chapter 6.3 (Desert Tortoise Conservation Measures) for detailed information</p> <ul style="list-style-type: none"> • Red Cliffs Desert Reserve (see Chapter 6.3.1) • Community Education and Outreach (see Chapter 6.3.2.3) • Tortoise Translocation (see Chapter 6.3.2.4) • Development Protocols (see Chapter 6.3.2.6) 	<p>Covered Activities include any and all otherwise lawful land development and land use activities on non-federal lands outside the Reserve (see Chapter 6.3.1). Activities that may result in habitat loss or fragmentation are wide ranging and may include construction of utilities, recreational activities, agricultural practices, fire control, and more. Much of these effects have been discussed in the above effects summaries.</p> <p>However, robust Desert Tortoise Conservation Measures (see Chapter 6.3) in place that will minimize the effects of habitat loss or fragmentation to MDT.</p>

* The “exposure” of activities and sub-activities are conceptual, potential effect pathways, in the absence of conservation measures. With the addition of robust conservation measures (see Chapter 6.3), effects on MDT are reduced.

6.5 CONSERVATION MEASURES FOR OTHER SPECIES

The 1995 HCP integrated conservation actions for other species into the conservation program, including: \$1.95 million in funding for other species enhancement; fencing to protect sensitive plant areas; law enforcement to guard Reserve integrity; acquisition support for the long-term protection of species' habitat; support for other conservation plans for Considered Species (e.g., Virgin River Resource Management and Recovery Program [VRRMRP]) and adaptive management provided by the HCAC and the TC (1995 HCP:97–99, 102–104).

The following points summarize the conservation actions that the County, the HCP Partners, and/or the Municipal Partners (as applicable) propose to implement for the benefit of the Considered Species through the Renewed/Amended ITP Term:

- **Virgin River Basin Fishes:** This species group contains the woundfin and Virgin River chub, species that are restricted to aquatic environments of the Virgin River Basin. The Implementation Agreement for the 1995 HCP directed plan participants to draft various conservation and management plans by assigning a responsible agency, establishing a time frame, and designating funding responsibilities. The VRRMRP developed from this effort, establishing a multiagency cooperative program to implement recovery and conservation actions for native species and habitats in the Virgin River Basin (UDNR 2002). The VRRMRP also directly implements recovery actions such as the hatchery raising and stocking of woundfin and Virgin River chub; removal and eradication of nonnative fish; fish population monitoring; and educational outreach (Virgin River Program 2019).

Under the umbrella of the VRRMRP and associated management plans (UDNR–UDWR 1995 revised 2002; USFWS 1995; Washington County Water Conservancy District [WCWCD] 1999), Washington County and municipal partners revised their General Plans to adopt zoning restrictions and regulations to protect aquatic and riparian habitats and species within the Virgin River Basin (UDNR 2002). In addition to protecting aquatic and riparian habitats from development, the VRRMRP coordinates and manages the competing uses of land and water resources throughout the Virgin River Basin. These efforts include enhancing and maintaining the water supply for wildlife, including acquiring and maintaining instream flow and restoring and maintaining water flow conditions necessary to sustain fish life and habitat (UDNR 2002; WCWCD 1999). For example, the WCWCD (1999) reestablished population maintenance flows in four Virgin River segments totaling 26 miles of previously dry river and increased the flow in an additional 2 miles of poor habitat. These actions, particularly the restoration of instream flow, directly contributed to the *Conservation Agreement and Strategy for Virgin Spinedace* and reduced threats to the species to the degree it was precluded from listing under the ESA (UDNR–UDWR 1995, revised 2002).

See Appendix C of this Amended HCP for further details. The County and the Municipal Partners will continue to observe previous conservation agreements and will not issue development permits within the 100-year floodplains or riparian vegetation adjacent to the Virgin and Santa Clara Rivers (Washington County 2012). These zoning restrictions protect sensitive aquatic and riparian habitats as well as the species within the Virgin River Basin in the County.

- **Riparian Birds:** This species group contains the southwestern willow flycatcher and the western yellow-billed cuckoo. These species utilize riparian habitats that may include vegetated areas in flood-prone areas surrounding stream segments. Under the VRRMRP and associated management plans (UDNR–UDWR 1995, revised 2002; USFWS 1995; WCWCD 1999), the County and the Municipal Partners revised their General Plans to adopt zoning restrictions and

regulations to protect aquatic and riparian habitats and species within the Virgin River Basin (UDNR 2002). The VRMRP supports the recovery of the southwestern willow flycatcher and other riparian birds by restoring and creating new riparian habitat and reducing the threats from predators and avian parasites (i.e., the brown-headed cowbird [*Molothrus ater*], a brood parasite) (Virgin River Program 2019). Additionally, the County has provided HCP funds to UDNR to support southwestern willow flycatcher monitoring, riparian habitat restoration, and brown-headed cowbird management (1995 HCP; Capone 2016). These actions directly support the recovery of the southwestern willow flycatcher; the habitat protection and enhancement additionally benefit the western yellow-billed cuckoo as it may occupy the same habitat.

The County and the Municipal Partners will continue to observe previous conservation agreements and will not issue development permits within riparian vegetation adjacent to the Virgin and Santa Clara Rivers or their associated 100-year floodplains (Washington County 2012). These zoning restrictions protect sensitive aquatic and riparian habitats as well as species within the Virgin River Basin. See **Appendix C** of this Amended HCP for further details.

- **Holmgren Milkvetch:** SITLA, USFWS, UDNR, and the County commit to implement the following actions for the benefit of the Holmgren milkvetch.
 - SITLA will coordinate with USFWS and relevant private-sector partners to identify acreage to support a viable population of Holmgren milkvetch in the Central Valley Critical Habitat Unit 1c in southern Washington County. The proposed conservation area will be set aside with the goal to protect the viable population in perpetuity. The acreage identified will further be limited to critical habitat and the acreage may be in one location or split into more than one conservation area. SITLA will use its lease authority to prohibit development within the conservation area(s) until it is acquired and protected in perpetuity by a conservation entity.
 - Within 5 years of reaching agreement with USFWS on the location of the Central Valley conservation area(s), SITLA and its private-sector partners will work with the HCP Administrator and the HCAC to prepare a management plan for the Central Valley conservation area with the goal of maintaining or enhancing the current population of Holmgren milkvetch. The management plan will address the establishment, monitoring, and long-term management of the conservation area(s), and may provide for recreational uses of the conservation area(s) that are compatible with the conservation of the species. The County will use resources available for adaptive management planning (i.e., HCP Administrator and HCP Biologist labor) to assist SITLA and its private-sector partners with the preparation of this plan. SITLA and its private-sector partners will seek separate USFWS approval for the management plan.
 - SITLA and its private-sector partners will manage the Central Valley conservation area(s) in accordance with the management plan, subject to available funding, until the lands are acquired by a conservation entity and protected in perpetuity for the conservation of the Holmgren milkvetch. Upon acquisition by a conservation entity, responsibility for implementation of the management plan (including any funding commitments) will transfer to the conservation entity.
 - The County and USFWS will assist SITLA and its private-sector partners with identifying and securing funding to implement the management plan and establish permanent protections for the Central Valley conservation area(s). Potential sources of funding may include, but are not limited to: the Washington County HCP Trust Fund, the USFWS Cooperative Endangered Species Conservation Fund (also known as ESA Section 6 funds), the Utah Endangered Species Mitigation Fund, the LeRay McAllister

Critical Lands Conservation Fund administered by the Utah Governor's Office of Management and Budget, or other available sources.

- UDNR will coordinate with the County, through the HCP Administrator, to plan for and perform surveys for the Holmgren milkvetch in areas of suitable or occupied habitat for this species. The County and UDNR will seek, when practicable, to implement such surveys concurrent with MDT clearance surveys prior to the conduct of Covered Activities. UDNR will report the findings of any such surveys to the County and USFWS. This commitment is subject to available funding, state-wide priorities, and HCP Partner support. At this time, UDNR anticipates that funding for this activity may become available through the agency's Endangered Species Mitigation Fund, which has an annual earmark of \$150,000 for work with sensitive and listed plants, insect, and mollusks that is allocated based on priorities identified by the Endangered Species Mitigation Fund program and its advisory committee (Christopher Keleher, UDNR Recovery Programs Director, personal communication to Cameron Rognan, Washington County HCP Administrator, via letter dated May 7, 2020).
- **Other Listed Plants:** In the event that the Changed Circumstance for the proposed Northern Corridor is triggered (see **Chapter 9.1.1**), thereby triggering the dedication of additional resources for the implementation of this Amended HCP, the County and the HCP Partners will routinely coordinate through the deliberations of the HCAC on matters pertaining to the conservation of listed plant species and implement the following activities:
 - Within 5 years of the triggering the proposed Northern Corridor Changed Circumstance, the County and the HCP Partners will develop a survey, seed collection, and plant salvage plan for listed plant species within the Plan Area. The plan would only apply to lands subject to Covered Activities or within the Reserve. UDNR has indicated its willingness to participate in these efforts, subject to available funding (Christopher Keleher, UDNR Recovery Programs Director, personal communication to Cameron Rognan, Washington County HCP Administrator, via letter dated May 7, 2020).
 - Upon triggering the proposed Northern Corridor Changed Circumstance, the County and HCP Partners will implement adaptive management planning to protect listed plants in Reserve Zone 6 through deliberations with the HCAC, TC, and other experts. To the extent practicable, Covered Activities on non-federal lands in Reserve Zone 6 such as utility development or conservation measures such as fence construction, recreation management, and habitat restoration will include protective measures for plants similar to those required on adjacent federally managed lands.
 - Coordinate with landowners to also seek access for UDNR to perform seed collection or salvage activities for listed plant species, concurrent with any clearance or other surveys for MDT provided for under this Amended HCP.
 - Seek supplemental funding or volunteer support, as may be available, to implement the survey, seed collection, and plant salvage plan. Potential sources of funding may include, but are not limited to, the Washington County HCP Trust Fund, the USFWS Cooperative Endangered Species Conservation Fund (also known as ESA Section 6 funds), Utah's Endangered Species Mitigation Fund (the LeRay McAllister Critical Lands Conservation Fund administered by the Utah Governor's Office of Management and Budget), or other available sources.
 - Include in the Annual Reports to the USFWS a summary of actions taken to benefit listed plant species as part of this Amended HCP.

CHAPTER 7. HABITAT CONSERVATION PLAN ADMINISTRATION

7.1 IMPLEMENTATION MILESTONES

Over the Renewed/Amended ITP Term, the County expects that one or more key milestones will occur that trigger a change in the County's responsibilities under this Amended HCP. Namely, these milestones are as follows:

- **Full clearance of lands subject to the clearance protocols:** This milestone represents the completion of the requirement to survey for, collect, and translocate MDT from certain areas subject to Covered Activities outside the Reserve. Clearances may be completed either in association with a specific development activity or, with the approval of the landowner, in advance of development activities. If this milestone is reached, the County may cease its activities associated with the Development Protocols outside the Reserve. All remaining MDT Habitat subject to incidental take outside the Reserve would be automatically cleared for Covered Activities without advanced coordination with the HCP Administrator.
- **Complete acquisition of the remaining private and SITLA lands within the Reserve:** This milestone represents the completion of the Reserve acquisitions and full transition of management responsibility for Reserve lands to the BLM and UDNR, excepting those portions of the Reserve that remain under the jurisdiction of Ivins City, St. George City, Washington City, the County, or other entities related to specific allowed uses of the Reserve. When acquisitions are complete, the County may cease activities related to recreation management, law enforcement, and baseline population monitoring within the Reserve, as well as any remaining responsibilities related to Reserve acquisition support. These long-term management activities are the responsibility of the BLM and/or UDNR.
- **End of Renewed/Amended ITP Term:** The County will continue to implement activities related to HCP administration (which serve an important coordination function relevant to adaptive management), community education and outreach, and adaptive management (i.e., special topic monitoring and related contingency actions) through the end of the Renewed/Amended ITP Term, even if other milestones have been achieved. At the end of the Renewed/Amended ITP Term, the County's obligations to the Amended HCP will cease, subject to another renewal of the ITP. Any ongoing activities related to the acquisition, management, and monitoring of the Reserve will shift entirely to the BLM and UDNR, in accordance with the roles and responsibilities of these HCP Partners (see **Table 1**).

7.2 WASHINGTON COUNTY

7.2.1 Washington County Legislative and Executive Bodies

The County is the ITP permittee and is responsible for administering this Amended HCP and complying with the terms and conditions of the ITP. The actions of the County are made through the deliberations and actions of the respective County legislative and executive bodies. At the time this Amended HCP is adopted, these duties are combined with the Washington County Commission, but county voters could change the form of county government. Currently, the Washington County Commission provides final approval for all actions taken on behalf of the County pertaining to this Amended HCP.

7.2.2 Habitat Conservation Plan Administrator

The County has created and will continue to fund a staff position for the HCP Administrator, supervised by the Washington County Executive entity. This position will continue through the Renewed/Amended ITP Term. The HCP Administrator has the following roles and responsibilities, which include, but may not be limited to:

- managing the day-to-day administration of Amended HCP and the implementation of the County's responsibilities under this Amended HCP, as directed by the Washington County Commission;
- advising the Washington County Commission on matters pertaining to this Amended HCP;
- supervising and directing the activities of other HCP staff;
- serving as the liaison between the Washington County Commission and the advisory committees (i.e., HCAC and TC);
- coordinating and facilitating meetings of the HCAC;
- chairing meetings of the TC and coordinating the activities and assignments of the TC;
- representing the County when interacting with the public and stakeholders on matters pertaining to this Amended HCP;
- receiving and processing requests for clearance of Covered Activities under the Development Protocols;
- preparing quarterly reports, which may be written or verbal, of activities taken by the County to implement this Amended HCP for delivery to the HCAC; and
- preparing the Annual Work Plan and Annual Report for Washington County Commission review and approval.

7.2.3 Habitat Conservation Plan Biologist

The County has created and will continue to fund a staff position for the HCP Biologist, supervised by the HCP Administrator. This position will continue through the Renewed/Amended ITP Term. The HCP Biologist has the following roles and responsibilities, which include, but may not be limited to:

- representing the County on the TC and collaborating with other HCP Partners regarding technical aspects of the conservation of the MDT in the UVRRU;
- assisting the HCP Administrator with activities related to the general administration and implementation of this Amended HCP, at the direction of the HCP Administrator;
- performing, documenting, and reporting on surveys for the MDT on lands subject to Covered Activities, in accordance with the Development Protocols;
- monitoring, documenting, and reporting on the implementation of the Development Protocols associated with Covered Activities within the Reserve (limited to private, municipal, or SITLA-owned lands);
- providing training to construction workers and developers regarding MDT awareness and the requirements of the Development Protocols;
- managing recreation use of the non-acquired lands of the Reserve in accordance with the PUP;

- tracking and providing annual reports to the HCP Administrator on the extent and location of incidental take associated with the Covered Activities, including (but not limited to) utility development projects within the Reserve;
- coordinating and participating in biological and special topic monitoring activities within the Reserve, in coordination with the HCP;
- documenting and reporting observations of unauthorized activities contrary to this Amended HCP to the County and relevant law enforcement personnel;
- identifying and recommending practicable conservation measures for other federally listed, candidate, and state sensitive species in the Plan Area; and
- attending and participating in appropriate professional conferences and workshops regarding the conservation of the MDT.

The HCP Biologist must have the appropriate experience and demonstrated expertise to conduct presence/absence and search and removal surveys for the MDT, and be covered by an Enhancement of Survival Permits that may be issued by the USFWS in accordance with Section 10(a)(1)(A) of the ESA or other appropriate agreement.

7.2.4 Other Discretionary Habitat Conservation Plan Staff Support

The County may at its discretion create other staff positions to support this Amended HCP when it determines that additional support is warranted and sufficient funding is available. For example, in 2019, the County's HCP-related staffing also included an Outreach Coordinator, a Field Technician, an Administrative Assistant, and a Volunteer Coordinator to support the day-to-day implementation of this Amended HCP. Other HCP staff positions are supervised and directed by the HCP Administrator.

7.3 ADVISORY COMMITTEES

The HCAC and the TC are advisory committees appointed by the Washington County Commission to oversee and provide guidance on the implementation of the Washington County HCP. Members of the HCAC and the TC serve on these committees at the discretion of the Washington County Commission. These committees provide adaptive management recommendations to the County, through the HCP Administrator, for addressing new information and uncertainty regarding the effectiveness of the conservation program. The HCAC and the TC also create a platform for ongoing communication and coordination among the HCP Partners, other stakeholder groups, and the public.

7.3.1 Habitat Conservation Advisory Committee

The HCAC oversees the administration of the Washington County HCP and serves in an advisory capacity to the Washington County Commission regarding county-wide protected species matters. When necessary, the HCAC will function as interpreters of the HCP document, subject to the final review and approval of the Washington County Commission. It will review and approve the Annual Work Plan and Annual Report. All deficiencies in the reports identified by the HCAC will be addressed by the HCP Administrator. The HCAC will also oversee the expenditure of HCP funds, review and make recommendations regarding the appropriateness of proposed adaptive management actions and amendments to the HCP, and advise the HCP Administrator.

The HCAC will be composed of one representative from each of the following HCP Partners and stakeholder groups:

- USFWS
- BLM
- UDNR
- Municipalities, nominated by the Washington County Mayor's Association
- Environmental organizations, nominated by the Washington County Commission
- Land development interests, nominated by the Washington County Commission
- Citizen-at-Large, nominated by the governing board of the most populous participating municipality
- Citizen-at-Large, nominated by the Washington County Commission¹⁸

The representative agency or organization will nominate a specific person to the HCAC to represent its interests. Nominees must be appointed to the HCAC by the Washington County Commission before they can serve. If an HCAC member is unable to attend a meeting, the representative agency or organization may designate, in writing, a proxy to participate in that meeting on behalf of the appointed HCAC member. However, after three such proxy designations within a 12-month period, the County may request that the representative agency or organization nominate a different person to its HCAC seat. HCAC members representing the local agencies or organizations (i.e., not the USFWS, the BLM, or UDNR) will serve for terms of no more than 4 years, with staggered expirations. There is no limit on the number of terms any member of the HCAC may be appointed to serve.

The deliberations and actions of the HCAC are subject to all applicable open meetings and records laws. The HCAC will generally meet every other month. The Chairperson of the HCAC will be determined by a vote of the HCAC members and, consistent with the guidance of the HCP Handbook, should be a non-federal representative. In the case of a tie vote on any matter over which the HCAC has decision-making authority, the HCAC will present the rationale for both positions to the Washington County Commission for consideration.

7.3.2 Technical Committee

The TC provides technical guidance to the HCAC and HCP Administrator on matters related to the biology and conservation of the MDT and other protected species occurring in the Plan Area. The activities of the TC will be directed by requests from the HCAC (following a motion and majority vote of the body) or the HCP Administrator. The TC will also provide input on the Annual Work Plan, specifically regarding specific scopes of work and budgets related to adaptive management activities.

The TC will be composed of the HCP Biologist and one representative from each of the following entities:

- USFWS
- BLM
- UDWR
- UDNR-Snow Canyon State Park

¹⁸ This Amended HCP adds this position to expand the size of the HCAC to eight members, pending nomination and appointment of the second Citizen-at-Large member.

- Local biologist, nominated by the Washington County Commission
- Biologist-at-Large, nominated by the HCAC

The representative entity will nominate a specific person to the TC to represent its interests. Nominees must be appointed to the TC by the Washington County Commission before they can serve. If a TC member is unable to attend a meeting of the TC, the representative agency or organization may designate, in writing, a proxy to participate in that meeting on behalf of the appointed TC member, if the proxy has sufficient expertise to meaningfully participate in the meeting. However, after three such proxy designations within a 12-month period, the County may request that the representative agency or organization nominate a different person to its TC seat.

The deliberations and actions of the TC are subject to all applicable open meeting and records laws. The TC will meet at least annually and as necessary to complete the HCAC or HCP Administrator assignments and operate by consensus. If consensus is not achieved, the HCP Biologist will present to the HCAC majority and minority recommendations or opinions. The HCP Administrator is the Chairperson of the TC but serves in a nonvoting capacity.

7.4 INTERAGENCY AGREEMENTS

The HCP Partners reiterate their commitment to implement the Amended HCP, commensurate with their respective roles, responsibilities, and authorities, by signing the Implementation Agreement. The Implementation Agreement is a written agreement that establishes direct control by the County, as the ITP permittee, over the Covered Activities of the non-federal HCP Partners (i.e., SITLA, UDNR, and Ivins) for the purpose of the Amended HCP.

Each of the Municipal Partners has entered into an Interlocal Agreement with the County regarding the city's role in the implementation of the Washington County HCP. The Interlocal Agreements are a written agreement that establishes direct control by the County, as the ITP permittee, over the Covered Activities of the Municipal Partners for the purposes of the Washington County HCP. Most of the cities within the County have already entered into such agreements, which carry forward without the need for amendment to the Renewed/Amended ITP Term. Cities which elect not to execute an Interlocal Agreement with the County or do not comply with an existing Interlocal Agreement will not be entitled to the benefits of the ITP (1995 HCP:117). The County will respond to this Changed Circumstance as specified in **Chapter 9.1.8**.

Municipal Partners with Interlocal Agreements with the County as of the date of this Amended HCP are:

- Washington City, executed December 8, 1993
- Town of Ivins (also known as Ivins City), executed November 11, 1993
- La Verkin City, executed May 16, 2006
- Town of Rockville, executed December 15, 1993
- City of Santa Clara, executed December 22, 1993
- Town of Springdale, executed March 3, 1994
- City of St. George, executed December 9, 1993

- Toquerville City, executed May 16, 2006.

The County anticipates working with the Municipal Partners to update these Interlocal Agreements as soon as practicable following issuance of the Renewed/Amended ITP to ensure consistency with the language of the Amended HCP.

7.5 PARTICIPATION AGREEMENTS AND CERTIFICATES OF INCLUSION

This Amended HCP creates a new provision to explicitly establish direct control over Covered Activities that are not already subject to the regulatory jurisdiction of the County, a non-federal HCP Partner, or a Municipal Partner. The County may enter into Participation Agreements with the proponents of Covered Activities to ensure that the County, as the ITP permittee, has direct control over the actions of the project proponent. An executed Participation Agreement will function as a Certificate of Inclusion allowing non-federal project proponents to opt-in to the incidental take coverage provided by this Amended HCP and Renewed/Amended ITP with a commitment, enforceable by the County and the USFWS, to abide by the applicable provisions of this Amended HCP and the applicable terms and conditions of the Renewed/Amended ITP. The County and the HCP Partners anticipate that this Participation Agreement/Certificate of Inclusion process will be most applicable to proponents of Covered Activities in local jurisdictions that are not Municipal Partners (see **Chapter 9.1.8**) or to state agencies that are not HCP Partners (e.g., UDOT).

The Participation Agreement/Certificate of Inclusion will include a requirement to abide by all applicable provisions, terms, and conditions of the Amended HCP, such as compliance with the Development Protocols or the payment of HCP fees, for the incidental take authorization of the Renewed/Amended ITP to be valid.

The County will notify the USFWS if a Certificate holder fails to comply with the requirements of its Certificate of Inclusion. The USFWS will determine if the Certificate holder has engaged in an unauthorized taking of a listed species and may pursue enforcement action against the Certificate holder. Neither the County nor the HCP Partners, the Municipal Partners, or other Certificate holders will be deemed out of compliance with the terms and conditions of the Renewed/Amended ITP for a failure of another party to comply with its obligations.

For those Covered Activities that are performed by or regulated by the County, a non-federal HCP Partner, or a Municipal Partner, or a project proponent under the regulatory authority of one of these entities, the Participation Agreement/Certificate of Inclusion will not be necessary for reliance on the assurances of the Renewed/Amended ITP. In such instances, compliance with any applicable terms and conditions of the HCP is already required by the Implementation Agreement, Interlocal Agreements, or local ordinances.

A template for the Participation Agreement/Certificate of Inclusion form is provided in **Appendix F**.

7.6 REPORTING

7.6.1 Annual Work Plan

The HCP Administrator drafts the Annual Work Plan that identifies proposed major goals and tasks, general target dates for completion, and required funding. The Annual Work Plan may be in the form of the next year's proposed budget, outlining the annual planning and budgeting for the upcoming year. The

HCP Administrator will work collaboratively with the TC and the HCAC to develop the Annual Work Plan. Following HCAC review and approval, the Annual Work Plan will be submitted to the Washington County Commission for final approval. The final Annual Work Plan will be submitted to the USFWS by December 31 of the preceding year. **Table 19** presents the process and responsibilities for developing the Annual Work Plan and associated budget (1995 HCP:104, 105).

Table 19. Process and Responsibilities for Developing the Annual Work Plan

Task No.	Task Responsibility	Task
1	Habitat Conservation Plan (HCP) Administrator	Establish initial draft budget
2	HCP Administrator	Identify non-discretionary budget items
3	HCP Administrator	Provide Technical Committee (TC) with a discretionary budget amount for adaptive management
4	TC	Identify adaptive management priorities within the draft budget limits and make recommendations to the HCP Administrator
5	HCP Administrator	Prepare draft budget for Habitat Conservation Advisory Committee (HCAC) review
6	HCAC	Recommend any revisions to the draft budget
7	HCP Administrator	Prepare draft Annual Work Plan
8	HCAC	Review draft Annual Work Plan and provide comments
9	HCP Administrator	Prepare final Annual Work Plan
10	HCAC	Review final Annual Work Plan and sign to recommend to the Washington County Commission
11	HCP Administrator	Present final Annual Work Plan to the Washington County (County) Commission
12	County Commission	Approve final Annual Work Plan (or return to Task #9 if changes are necessary)
13	HCP Administrator	Forward final Annual Work Plan to the U.S. Fish and Wildlife Service

7.6.2 Annual Reporting

The administrative process of this Amended HCP is designed to deal with projects and issues as they arise through a collaborative process between the County and the HCP Partners. The HCP Administrator will prepare and submit a year-end report compiling in written form the information delivered to the HCAC in its regular meetings as well as the status of the year's goals and tasks set in the previous Annual Work Plan. This Annual Report will be filed with the USFWS following review and approval by the HCAC and the Washington County Commission by March 1 for the preceding year. Compliance monitoring of the HCP will continue through oral reports at quarterly HCAC meetings and in the Annual Report.

7.7 AMENDMENTS, RENEWALS, AND TRANSFERS

7.7.1 Amendments

From time to time, the County may need to clarify or amend the HCP, ITP, or related documents (e.g., Development Protocols). The HCP Handbook contemplates different levels of changes to an HCP, an ITP, or related documents; and a change to one document may or may not require changes to other documents (HCP Handbook:17-6). The County and the USFWS must agree in writing to any changes to the HCP and HCP-related documents. As specified at 50 CFR §12.23(b), the USFWS may make changes to the ITP "for just cause at any time during its term, upon written finding of necessity" without the

concurrence of the County. However, most changes to the ITP will also require the approval or concurrence of the County. In each case, the USFWS must evaluate each requested change to the HCP, the ITP, or related documents in relation to the analyses that supported the original approval of the HCP and issuance of the ITP (i.e., the USFWS's NEPA analysis and ESA Section 7 Biological Opinion).

The County or the USFWS may request in writing the consideration of a formal amendment by the parties and indicate the specific text to be changed, the proposed new text, the reason for the change, the intended effects of the change, and justification for the change. In accordance with the No Surprises assurances (50 CFR §17.22, §17.32, §222.2), the County may decline a request by the USFWS to consider a formal amendment if it is in compliance with the terms and conditions of its ITP. However, like an initial application for an ITP, the USFWS must consider all such requests from the County. Formal amendments may require the USFWS to consider the change under the same standards and process as a new ITP application, with public notice and comment, NEPA analysis, and ESA Section 7 analysis. However, only those portions of the HCP, the ITP, and related documents that are related to the requested change will be subject to such additional review—the formal amendment will not trigger a new review of unrelated and previously approved aspects of these documents. Formal amendments result in the issuance of an amended version of the changed document, either in whole or in part, that will replace the prior version in County and USFWS records.

7.7.2 Permit Term, Renewals, and Suspensions or Revocations

The County holds a renewable ITP from the USFWS and seeks an extended term of 25 years from the date of reissuance. The County requests that the USFWS indicate on the Renewed/Amended ITP that the ITP is renewable. If the County files a request for an ITP renewal 30 days prior to the expiration of the ITP, the ITP will remain valid while the USFWS processes the request (50 CFR §13.22). If the County fails to file a renewal request at least 30 days prior to ITP expiration, the ITP will become invalid on the stated expiration date. The County anticipates that the USFWS will publicly notice any ITP renewals in the *Federal Register* for at least 30 days.

CHAPTER 8. BUDGET AND FUNDING ASSURANCES

The County and the HCP Partners estimated a budget for implementing the 1995 HCP that anticipated costs associated with implementing conservation measures and administering the Washington County HCP during the Original ITP Term. The budget estimates in the 1995 HCP have proved to be reliable and consistent with actual funding needs and revenue generation over the Original ITP term. The County was able to meet and exceed its financial commitments toward implementing the 1995 HCP (see **Chapter 6.2**). Therefore, as suggested in the HCP Handbook, the implementation of the 1995 HCP provides a reliable case study by which to estimate the costs for implementing this Amended HCP (HCP Handbook:11-3). The mix of funding sources specified in the 1995 HCP have proven to be sufficient for covering the costs of implementation over time (HCP Handbook:11-6). The County and the HCP Partners have demonstrated their ability to reliably collect and disperse such funds to effectively implement the HCP as planned (HCP Handbook:11-15). As of January 2020, the Washington County HCP had a balance of approximately \$7 million in available funds to implement this Amended HCP.

8.1 IMPLEMENTATION COSTS

8.1.1 Washington County

Table 20 provides the County's budget estimates for implementing its commitments to the ongoing conservation program and administration of this Amended HCP (see **Chapter 6**) and for addressing Changed Circumstances (see **Chapter 9.1**) for the Renewed/Amended ITP Term. Other HCP Partners (i.e., the BLM and UDNR) provide additional resources to fulfil their respective commitments toward achieving the biological goals and objectives of this Amended HCP (see **Chapter 8.1.2**).

The County estimated its implementation costs based on a review of the original budget in the 1995 HCP, recent Annual Work Plan budgets recommended by the HCAC and approved by the Washington County Commission, and considerations for adaptive management and Changed Circumstances. The County has also provided estimates for how HCP-related staff labor contributes resources to applicable budget line items for specific conservation actions, so that funds spent on staffing can be directly tied to the implementation of conservation actions. It is important to note that the allocations of staff time and funding to the budget line items shown in **Table 20** are illustrative. Actual budgeting for the implementation of this Amended HCP will occur through the Annual Work Plan process (see **Chapter 7.6.1**). Therefore, both the budget line items and their associated costs in any given year may change (increase or decrease) over the course of the Renewed/Amended ITP Term. All annual budgeting decisions will be made in coordination with the HCAC and the TC through the Annual Work Plan process and are subject to approval by the Washington County Commission. Nevertheless, the County assures that funding will be available to implement this Amended HCP up to the level approximated in **Table 20**.

Overall, the County's estimated budget to implement its commitments to this Amended HCP is approximately \$852,230 per year (2020 dollar value). Over the 25-year Renewed/Amended ITP Term, the County commits to spend up to \$27,680,957 on the implementation of this Amended HCP, assuming that the Changed Circumstances are triggered, none of the implementation milestones in **Chapter 7.1** have been met (thereby reducing the nature of the County's ongoing commitments), and considering an annual rate of inflation consistent with the average for the 25-year period between 1994 and 2019 (2.1%, U.S. Bureau of Labor Statistics 2020) (see **Table 20**). The County does not commit to spend more than this total amount but is also not required to spend the total estimated amount if its commitments made under this Amended HCP are otherwise met.

Table 20. Washington County Habitat Conservation Plan (HCP) Estimated Budget

General Budget Item and Description	HCP Administration and Standard Conservation Program			Northern Corridor Changed Circumstance			Other Changed Circumstances		
	Percentage of Staff Duties (%)	Average Annual Expenses (2020 value)	Total Expenses (future value with inflation)	Percentage of Staff Duties (%)	Average Annual Expenses (2020 value)	Total Expenses (future value with inflation)	Percentage of Staff Duties (%)	Average Annual Expenses (2020 value)	Total Expenses (future value with inflation)
Administration									
Staff salaries and benefits (full-time HCP Administrator and HCP Biologist; other staff positions associated with Changed Circumstances)	HCP Administrator 25%, HCP Biologist 15%	\$190,000	\$6,164,085	Outreach Coordinator 16%, Field Technician 8%, Administrative Assistant 100%	\$190,000	\$6,164,085	—	—	—
Office and administrative expenses (office supplies and furniture replacements, copy machine lease and associated expenses, computers, printers, software, building utilities and maintenance, telecommunications, printing services, bank and credit card fees, insurance, etc.)	—	\$17,000	\$551,523	—	—	—	—	—	—
Meetings and training expenses (registration fees, meals and lodging, travel expenses, etc.)	—	\$5,000	\$162,213	—	—	—	—	—	—
Vehicle operation and replacement expenses (fuel, maintenance, repairs, annualized replacement cost, etc.)	—	\$12,000	\$389,311	—	\$8,000	\$259,540	—	—	—
Subtotal Administration	HCP Administrator 25%, HCP Biologist 15%	\$224,000	\$7,267,131	Outreach Coordinator 16%, Field Technician 8%, Administrative Assistant 100%	\$198,000	\$6,423,625	—	—	—

General Budget Item and Description	HCP Administration and Standard Conservation Program			Northern Corridor Changed Circumstance			Other Changed Circumstances		
	Percentage of Staff Duties (%)	Average Annual Expenses (2020 value)	Total Expenses (future value with inflation)	Percentage of Staff Duties (%)	Average Annual Expenses (2020 value)	Total Expenses (future value with inflation)	Percentage of Staff Duties (%)	Average Annual Expenses (2020 value)	Total Expenses (future value with inflation)
Land Acquisition									
Reserve land acquisition real estate transaction costs (appraisals, surveys, title searches, recording fees, etc.)	HCP Administrator 10%	\$20,000	\$648,851	—	—	—	—	—	—
Reserve Zone 6 land acquisition (estimated as 450 acres with a non-federal valuation of approximately \$5,000/acre)	—	—	—	—	\$73,225	\$2,375,606	—	—	—
Subtotal Land Acquisition	HCP Administrator 10%	\$20,000	\$648,551	—	\$73,225	\$2,375,606	—	—	—
Other Conservation Measures									
Reserve fencing (installation, inspection, replacement, maintenance, and repair; contractor support)	HCP Biologist 10%	\$2,000	\$64,885	Field Technician 20%	\$11,000	\$356,868	—	\$300	\$9,733
Law enforcement (financial support for County Sheriff Deputy patrols)	—	\$30,000	\$973,277	—	\$85,000	\$2,757,617	—	\$4,500	\$145,991
Community education and outreach (videos, advertising, handouts, community engagement, contractor training, volunteer coordination, etc.)	HCP Administrator 10%, HCP Biologist 10%	\$3,000	\$97,328	Outreach Coordinator 60%	\$12,000	\$389,311	—	\$450	\$16,221

General Budget Item and Description	HCP Administration and Standard Conservation Program			Northern Corridor Changed Circumstance			Other Changed Circumstances		
	Percentage of Staff Duties (%)	Average Annual Expenses (2020 value)	Total Expenses (future value with inflation)	Percentage of Staff Duties (%)	Average Annual Expenses (2020 value)	Total Expenses (future value with inflation)	Percentage of Staff Duties (%)	Average Annual Expenses (2020 value)	Total Expenses (future value with inflation)
Community education and outreach-new education center (new facility contemplated in 1995 HCP; annualized cost over Renewed/Amended ITP Term)	—	\$30,850	\$1,000,853	—	—	—	—	—	—
Mojave desert tortoise (MDT) translocation (temporary captive care, veterinary services and fees, and support for releases)	HCP Administrator 10%, HCP Biologist 5%	\$3,000	\$97,328	Field Technician 20%	—	—	—	\$450	\$16,221
Grazing permit acquisition and retirement	—	—	—	—	\$8,000	\$259,540	—	—	—
Development Protocols (clearance surveys, professional and technical services related to boundary surveys, design consultants, etc.)	HCP Administrator 10%, HCP Biologist 10%	—	—	Field Technician 20%	—	—	—	—	—
Recreation management (signs, kiosks, trail maintenance and enhancement, restrooms and parking lots, grant matching funds, volunteer coordination, etc.)	HCP Administrator 5%, HCP Biologist 10%	\$1,500	\$48,664	Outreach Coordinator 25%	\$3,000	\$97,328	—	\$225	\$7,300

General Budget Item and Description	HCP Administration and Standard Conservation Program			Northern Corridor Changed Circumstance			Other Changed Circumstances		
	Percentage of Staff Duties (%)	Average Annual Expenses (2020 value)	Total Expenses (future value with inflation)	Percentage of Staff Duties (%)	Average Annual Expenses (2020 value)	Total Expenses (future value with inflation)	Percentage of Staff Duties (%)	Average Annual Expenses (2020 value)	Total Expenses (future value with inflation)
Reserve habitat and fire management (management of Utah State Institutional Trust Lands Administration (SITLA)-owned Reserve lands; financial support for HCP Partners with long-term management responsibility)	HCP Administrator 10%, HCP Biologist 10%	\$5,000	\$162,213	Field Technician 20%	\$10,000	\$324,426	-	\$750	\$24,332
Cottonwood Road connectivity improvements	-	-	-	-	\$4,650	\$150,858	-	-	-
Subtotal Other Conservation Measures									
	HCP Administrator 45%, HCP Biologist 60%	\$75,350	\$2,444,546	Outreach Coordinator 85%, Field Technician 80%	\$133,650	\$4,335,947	-	\$6,675	\$216,554
Monitoring and Adaptive Management Planning									
Baseline Reserve population monitoring (support for baseline monitoring by the Utah Department of Natural Resources–Utah Division of Wildlife Resources or other qualified contractor on SITLA-owned lands within the Reserve boundary)	-	\$20,000	\$648,851	-	\$70,000	\$2,270,979	-	\$3,000	\$97,328
Special topic monitoring and studies (monitoring and research to support adaptive management of the Reserve)	HCP Biologist 15%	\$5,000	\$162,213	Field Technician 15%	\$10,000	\$324,426	-	\$750	\$24,332
Planning and implementation support	HCP Administrator	\$11,575	\$375,523	-	-	-	-	-	-

General Budget Item and Description	HCP Administration and Standard Conservation Program			Northern Corridor Changed Circumstance			Other Changed Circumstances		
	Percentage of Staff Duties (%)	Average Annual Expenses (2020 value)	Total Expenses (future value with inflation)	Percentage of Staff Duties (%)	Average Annual Expenses (2020 value)	Total Expenses (future value with inflation)	Percentage of Staff Duties (%)	Average Annual Expenses (2020 value)	Total Expenses (future value with inflation)
for adaptive management and Changed Circumstance	20%, HCP Biologist 10%								
Subtotal Monitoring and Adaptive Management Planning	HCP Administrator 20%, HCP Biologist 25%	\$36,575	\$1,186,586	Field Technician 15%	\$80,000	\$2,595,404	–	\$3,750	\$121,660
Total Estimated Budget		\$355,925	\$11,547,115		\$484,875	\$15,730,582		\$10,425	\$338,214

8.1.2 Other Habitat Conservation Plan Partners

The BLM and UDNR are responsible for Reserve land acquisitions and long-term management and monitoring toward achieving the recovery-focused biological goals and objectives of this Amended HCP. The 1995 HCP did not estimate the funding needed to acquire the Reserve lands nor provide a detailed budget for the long-term management or monitoring of the Reserve. However, the budget for the 1995 HCP suggested the following long-term costs (from 1995 HCP:Table 6-3):

- BLM spending of approximately \$50,000 per year on Reserve management (approximately \$98,700 in inflation-adjusted 2020 dollars), and
- UDWR spending approximately \$60,000 every 5 years on monitoring and research activities in the Reserve (approximately \$20,253 per year in inflation-adjusted 2020 dollars); however, UDWR notes that actual spending in recent years has been in the range of \$50,000 to \$70,000 annually (personal communication, Kathleen Clarke, UDNR, letter to Cameron Rognan, HCP Administrator, February 26, 2020).

Since Reserve land acquisitions by the BLM may be achieved by any of several available methods, including land exchanges or donations, the amount of funding that may be needed to complete the acquisitions is uncertain. SITLA estimates that the value of its remaining lands within the Reserve may roughly total approximately \$60 to \$70 million (personal communication, Kyle Pasley, SITLA, January 8, 2020).

Actual spending by the HCP Partners on Reserve land acquisitions and long-term management and monitoring in support of the biological goals and objectives of this Amended HCP will ultimately be at the discretion of these entities, in accordance with their individual authorities (such as the federal Antideficiency Act) and available resources.

8.2 FUNDING SOURCES AND DISBURSEMENTS

8.2.1 Washington County

The County and the Municipal Partners instituted a fee on new building permits issued for residential, commercial, or industrial construction projects within their jurisdictions to raise the funding for the County's commitments established in the 1995 HCP.¹⁹ The 1995 HCP initially set this fee at 0.2% of the estimated construction cost of each project approved by the County or a Municipal Partner.

The Municipal Partners transfer assessed fees to the Washington County Treasurer on a quarterly basis. The County created an interest-bearing HCP Trust Fund to collect the transferred fees and other funds made available for implementation of the Washington County HCP (e.g., grant funds). As of January 2020, the HCP Trust Fund had a balance of approximately \$7 million (personal communication, Kim Hafen, Washington County Clerk). As of November 2019, the County spent \$6,344,254 more than originally budgeted for implementation of the 1995 HCP (70% more). These additional expenditures and surplus monies collected demonstrate that this funding mechanism is more than enough for generating the necessary monies to implement this Amended HCP.

¹⁹ The 1995 HCP also established a fee assessed by the Municipal Partners on new plat approvals for subdivision, condominium, town home, or public utility district developments. The 1995 HCP set this fee at \$250 per platted acre. However, this platting flat fee did not adjust with inflation and only generated approximately 10% of the HCP revenue collected over the term of the Original ITP. The County has simplified the funding mechanism for this Amended HCP by eliminating the assessment of this flat fee, in favor of relying on the 0.2% fee on building permits.

The County may reduce the amount of the fee assessed on new building permits to account for a surplus balance in the HCP Trust Fund, provided the surplus amount is equivalent to at least 3 years of HCP implementation at the inflation-adjusted average annual budget estimate. Conversely, the County, largely through its Municipal Partners, will increase the amount of the fee if the balance of the HCP Trust Fund is not sufficient to cover the inflation-adjusted average annual budget estimate for the following year. Changes in these HCP-related fees will require the approval of the Washington County Commission and the Municipal Partners.

The County will only use funds deposited into the HCP Trust Fund for the purposes of implementing this Amended HCP or for expenditures that are otherwise consistent with the conservation or recovery of the MDT.

8.2.2 Bureau of Land Management

The RCNCA designation directs funding to the BLM to support actions that contribute to the biological goals and objectives of this Amended HCP. For example, the BLM reported a budget of \$3,549,300 in Fiscal Year 2018 for the RCNCA and a level of staffing equivalent to approximately 3.3 full-time positions across a variety of disciplines (i.e., park ranger, wildlife biologist, outdoor recreation planner, landscape architect, GIS specialist, and archaeologist) (BLM 2019b).

8.2.3 Utah Department of Natural Resources

UDNR provides support for the Washington County HCP through funding and resources allocated to the UDWR and Division of Parks and Recreation (i.e., Snow Canyon State Park). Resources that support the implementation of the Washington County HCP include wildlife biologists, recreation specialists, and law enforcement officers. UDNR also assists with the acquisition of non-federal lands within the Reserve through ESA Section 6 grant proposals and administration. Funds to assist with MDT recovery may also be available through the states Endangered Species Mitigation Fund (ESMF) and Watershed Restoration Initiative (WRI).

8.2.4 Federal and State Grants

The County and the HCP Partners have also obtained grant funding from the Land and Water Conservation Fund and the Cooperative Endangered Species Conservation Fund (also known as ESA Section 6 grant funds) to help acquire Reserve lands. As Reserve land acquisition and long-term management activities are actions that enhance the implementation of the Amended HCP, these sources of funding may be The County and the HCP Partners expect to continue seeking additional grant support for HCP implementation in the future as opportunities become available.

8.3 FUNDING ASSURANCES

It is important to note that the funding provided by the County for this Amended HCP is in excess of (i.e., more than doubles) the funding that the County committed to providing for the incidental take originally authorized with the approval of the 1995 HCP. As described in **Chapter 6**, many of the County's commitments during the Renewed/Amended ITP Term are intended to help achieve the goals and objectives of this Amended HCP—above and beyond the actions and resources needed to demonstrate that it has minimized and mitigated the impacts of the authorized incidental take to the maximum extent practicable. Nonetheless, the County assures that the general level and distribution of funding illustrated in **Table 20** will be available to implement its commitments under this Amended HCP through the Renewed/Amended ITP Term.

The County and the Municipal Partners have implemented local regulations to assess and collect the fees described in **Chapter 8.2.1** related to the issuance of building permits. Municipal Partners have Interlocal Agreements with the County, which require that each collect the impact fees described in **Chapter 8.2.1**, and transfer these fees to the County's HCP Trust Fund. Individuals performing Covered Activities that are not addressed by an Interlocal Agreement with a Municipal Partner may enter into a Participation Agreement/Certificate of Participation directly with the County, which will include any applicable funding commitments. Therefore, the assessment, collection, and transfer of funding for implementation of this Amended HCP is assured.

In the event that the County is unable to meet all or part of its funding obligation, the County will enter into discussions with USFWS to discuss feasible alternatives which can accomplish the requirements as stated in this Amended HCP. In the event that funding cannot continue at committed levels, then an amendment procedure may be initiated to reduce the scope of this Amended HCP. In the event that the County cannot continue to make payments as specified in this Amended HCP or worked out through an amendment procedure, then the County's obligation to fund the HCP as described in **Chapter 8.1** shall terminate and the County shall thereafter have no obligation to make further payments and the USFWS may initiate action to revoke the ITP.

The commitments of SITLA and UDNR related to the conservation of listed plants in the Plan Area (particularly the Holmgren milkvetch) are addressed through the commitments of HCP Partners, since the Amended HCP does not include listed plants as covered species. While strict assurances are not required, the HCP Partners, through the Implementation Agreement, commit within the limits of their roles, responsibilities, authorities, and available resources, to implement the conservation measures of this Amended HCP.

Likewise, the commitments of the BLM, USFWS, and UDNR are enhancements to the Amended HCP that help achieve the recovery-based biological goals and objectives. Funding assurances for these enhancement activities are not required to meet the ITP issuance criteria. The USFWS and BLM intend to fulfill their responsibilities completely and expeditiously, as confirmed with the execution of the Implementation Agreement. Both BLM and USFWS will, to the maximum extent practicable, allocate sufficient staff and financial resources as may be necessary to accomplish these responsibilities. USFWS shall include in annual budget requests sufficient funds to fulfill its obligations under this Amended HCP. BLM shall likewise include in annual budget requests sufficient funds to fulfill its obligations under the Implementation Agreement and this Amended HCP.

CHAPTER 9. NO SURPRISES ASSURANCES

An important incentive for implementing an HCP is the assurance provided by the USFWS that “a deal is a deal” (Department of the Interior Office of the Secretary 1994), known as “No Surprises” assurances. The 1995 HCP was approved and implemented under the USFWS No Surprises Policy issued in 1994 and reiterated by the USFWS in the original Implementation Agreement. The No Surprises Policy was subsequently codified, with minor amendments, in the ESA’s implementing regulations (63 FR 8859 and 50 CFR §17.22, §17.32, §222.2). The Amended HCP will be subject to the No Surprises Rule.

No Surprises Rule (and the policy before it) provides that, so long as an approved HCP is being properly implemented, no additional land use restrictions or financial compensation will be required of the permittee with respect to the HCP’s Covered Species, even if Unforeseen Circumstances arise after the permit is issued indicating that additional mitigation is needed.

The No Surprises Rule recognizes that the permittee and the USFWS can reasonably anticipate and plan for some changes in circumstances affecting a species or geographic area covered by an HCP (e.g., the listing of additional species as threatened or endangered or a natural catastrophic event in areas prone to such events). To the extent that Changed Circumstances are provided for in the HCP, the permittee must implement the specified measures in response to the Changed Circumstances if and when they occur.

This chapter describes the specific Changed Circumstances anticipated by the County and provided for in this HCP and explains the USFWS’s assurances to the County with respect to any Unforeseen Circumstances.

9.1 CHANGED CIRCUMSTANCES

USFWS regulations define Changed Circumstances as “changes in circumstances affecting a species or geographic area covered by a conservation plan or agreement that can reasonably be anticipated by plan or agreement developers and the Service [USFWS] and that can be planned for (e.g., the listing of new species, or a fire or other natural catastrophic event in areas prone to such events)” (50 CFR §17.3). To the extent that an ITP permittee provides for a Changed Circumstance in the HCP, the permittee must implement the prescribed response to the Changed Circumstance, if it occurs, to remain eligible for the assurances of the No Surprises Rule.

The County, working with USFWS, has identified the following Changed Circumstances that may occur over the Renewed/Amended ITP Term and the responsive actions required of the County to address each Changed Circumstance. The County is not responsible for addressing circumstances not provided for in this HCP. Changed Circumstances require written acknowledgement by both the County and the USFWS to trigger the responses prescribed below.

9.1.1 Approval of the Northern Corridor across the Reserve

The Northern Corridor is a new roadway proposed by UDOT that, if approved, would connect Washington Parkway in Washington City to Red Hills Parkway in St. George. The County identified the Northern Corridor as an important piece of local infrastructure in transportation planning documents since the mid-1980s (Washington County 2012) and Congress directed the consideration of such a corridor in the 2009 Omnibus Public Land Bill (PL 111-11).

The proposed Northern Corridor is described in a Plan of Development submitted to the BLM with an application for a ROW across BLM-managed lands within Reserve Zone 3. The Northern Corridor would also cross non-federal lands within Reserve Zone 3. These lands are part of the RCNCA, are designated

Critical Habitat for the MDT, and some have been acquired for conservation purposes by UDNR with the assistance of USFWS ESA Section 6 grant funds. Because of the location of federal lands managed by the BLM and termini for the Northern Corridor, the roadway cannot be completed without ROW authorization from the BLM. Proposed federal actions pertaining to the Northern Corridor ROW application, related modifications to BLM RMPs, and a range of reasonable alternatives within and outside the Reserve will be evaluated in an EIS prepared in accordance with NEPA. Federal decisions regarding the Northern Corridor will consider the input, analysis, and conclusions of the NEPA process.

Since construction of the proposed Northern Corridor requires federal agency action by the BLM, the Northern Corridor has a federal nexus that triggers ESA Section 7 interagency consultation. Therefore, the effects of the Northern Corridor on listed species and designated Critical Habitat will be reviewed and addressed under the framework of an interagency consultation. Incidental take of MDT that may be reasonably certain to occur as a result of the Northern Corridor is not a Covered Activity of this Amended HCP. Nonetheless, the County acknowledges that approval and subsequent construction of the Northern Corridor would affect the use, management, and conservation value of the Reserve; affect individual MDT and their population dynamics; and represent a change in circumstances affecting a species or geographic area covered by a conservation plan or agreement that can reasonably be anticipated and planned for.

Construction of the Northern Corridor would introduce additional fragmentation to Zone 3 of the Reserve and would result in the loss of approximately 275 acres of MDT Habitat and the fragmentation and degradation of approximately 2,335 additional acres. Although direct impacts from construction of the Northern Corridor would be the responsibility of UDOT and the BLM, the Northern Corridor would have impacts to the conservation value of the Reserve and the effectiveness of the conservation program of the Amended HCP. In order to help maintain the integrity of the conservation program, Washington County has significant additional conservation measures as detailed below.

This Changed Circumstance accommodates the possibility that the proposed Northern Corridor will be approved and constructed across Reserve Zone 3. This Changed Circumstance will trigger upon BLM approval of a ROW for the Northern Corridor across Reserve Zone 3 and USFWS issuance of a Biological Opinion that addresses incidental take of MDT associated with the Northern Corridor. However, if the Northern Corridor does not receive these federal agency approvals or if an alternative route for the Northern Corridor that does not result in a new road crossing the Reserve is ultimately selected and approved, then this Changed Circumstance will not be triggered. The approval of a Northern Corridor alternative that is an expansion or alteration of an existing roadway, such as the expansion of the existing Red Cliffs Parkway through Reserve Zone 3, would not trigger this Changed Circumstance.

In response to this Changed Circumstance, the County and the HCP Partners will implement the following additional conservation measures, which are described in more detail in the following subchapters:

- The County and the HCP Partners would establish a new Reserve Zone 6 in the vicinity of the former Bloomington incidental take area located to the west of Interstate 15 and south of the Santa Clara River. The new Reserve Zone 6 would include approximately 6,813 acres of primarily SITLA-owned or BLM-managed lands.
- The County would fund the acquisition of a portion of the non-federal lands within Reserve Zone 6. The funding would be enough to acquire three times the acreage of land within the proposed Northern Corridor roadway ROW. This commitment would be satisfied prior to the start of construction. The remainder of the non-federal lands within the new Reserve Zone 6 would be subject to acquisition following the acquisition strategy identified for Reserve Zones 1 through 5. In the interim, the remaining non-federal lands would be managed by the County to promote the

conservation of the MDT until such time that they are acquired. The intent of the County and the HCP Partners is that these other acquisitions will be completed, to the maximum extent practicable, within the Renewed/Amended ITP Term.

- The County would reduce the Covered Activities applicable to Reserve Zone 6 from the broad list of activities applicable to non-federal lands outside the Reserve to the limited list of activities applicable to lands inside the Reserve. The County and the HCP Partners would establish a limited set of allowed uses of Reserve Zone 6 that would be recognized as Covered Activities inside the Reserve. In doing so, the County would relinquish a portion of its authorized incidental take associated with the non-federal lands of Reserve Zone 6, retaining only so much as to address Covered Activities inside the Reserve.
- The County would fund and/or implement a variety of conservation measures within Reserve Zone 6 over the Renewed/Amended ITP Term to benefit the MDT in a manner consistent with the goals and objectives of this Amended HCP.
- The County would provide funding for the addition of tortoise passages across Cottonwood Road within Reserve Zone 3 that restore the potential for MDT movement across this preexisting internal barrier.

In response to this Changed Circumstance, the HCP Partners will, among other things, increase the size of the Reserve by more than 10%. The County will perform or fund conservation activities in this area similar to the activities completed in Reserve Zone 3 between 1996 and 2016. It is estimated that these activities will cost approximately \$16 million over the Renewed/Amended ITP Term. The County and the HCP Partners also anticipate that other conservation actions will accompany an approval of the proposed Northern Corridor across Reserve Zone 3. These other conservation actions would be described in other related documents, such as (but not necessarily limited to) the Plan of Development and/or Biological Assessment for the proposed Northern Corridor, the BLM ROW grant, the USFWS Biological Opinion, or the NEPA review document. However, these other conservation actions are not an obligation of the County or the HCP Partners under this Amended HCP.

The County intends for and believes that its commitments made in response to the Northern Corridor Changed Circumstance fully offset the impacts of the Northern Corridor on the conservation value of Reserve Zone 3. Appendix G provides the County's analysis of this offset presented as the balance of likely impacts and anticipated benefits. The County's assumptions about impacts to Reserve Zone 3 are based on information about the proposed Northern Corridor (including conservation measures to be included in the project design) described in the June 2020 draft NEPA review document prepared by BLM and USFWS for the federal actions involving the Northern Corridor and requested ITP renewal (BLM and USFWS 2020), as well as subsequent discussions between the County and USFWS. However, the County does not believe that it is obligated by the ITP issuance criteria to demonstrate or achieve the full offset of impacts arising from this or any other Changed Circumstance. The ITP issuance criteria only require the County to assure that funding will be available to implement its committed responses to Changed Circumstances, which it has done in Chapter 8.

The County, the BLM, and the other HCP Partners acknowledge that actions pertaining to the use and management of BLM-managed lands in Reserve Zone 6 will ultimately require amendment of the St. George Field Office RMP and trigger planning and NEPA review processes with opportunities for public involvement. Federal actions would also trigger compliance with Section 7 of the ESA, which may be streamlined by the conservation commitments and analysis provided by this Amended HCP.

9.1.1.1 Establish Reserve Zone 6

9.1.1.1.1 BOUNDARY AND EXISTING CONDITIONS

Design and Existing Ownership or Management Entity

The proposed boundary for Reserve Zone 6 contains 6,813 acres (**Figure 13**). As of January 2020, these lands are owned or managed by the following:

- SITLA—3,229 acres, which are subject to future land development with incidental take of the MDT previously authorized by the 1995 HCP and Original ITP and reauthorized by this Amended HCP and Renewed/Amended ITP
- BLM—3,472 acres, of which 2,345 acres are designated as an ACEC with an emphasis on the conservation of the dwarf bear-poppy and erodible soil resources (BLM 2015)
- UDOT—70 acres
- Local governments and private owners—42 acres

The non-federal lands within the proposed Reserve Zone 6 are 3,341 acres and represent 49% of the total.

Existing Uses and Disturbances

Generally, existing land uses within the proposed Reserve Zone 6 included a variety of motorized and non-motorized recreation, cattle grazing, and limited utility infrastructure. The proposed Reserve Zone 6 contains approximately 150 miles of roads and trails, including 13 miles of unpaved roads, 35 miles of two-track vehicle trails, 26 miles of single-track non-motorized trails, and 78 miles of other trails (see **Figure 13**). Mountain biking is allowed on designated trails on both the SITLA-owned and BLM-managed lands within this area (SITLA 2020a; BLM 2020a). The SITLA-owned lands also support extensive OHV use and camping. Other notable existing disturbances in the proposed Reserve Zone 6 that could be eliminated with Reserve designation include recreational shooting and illegal dumping.

Existing land uses within the SITLA-owned portion of the proposed Reserve Zone 6 include mountain biking, hiking, OHV travel, competitive and groups events (e.g., mountain bike races, jamborees, and festivals), authorized with a valid right-of-entry permit; easements for a county road (approximately 350 acres), utilities (two power lines and one fiber-optic communications cable; approximately 32 acres), water tanks, and the Bear Claw Poppy Trailhead (approximately 4 acres); rock climbing and bouldering (e.g., Moe's Valley Climbing Area); and approximately 1,462 acres are currently under active grazing leases in the southern portion of this area (SITLA 2020a, 2020b).

Existing land uses within the BLM-managed portion of the proposed Reserve Zone 6 include hiking, touring, camping, hunting, picnicking, sightseeing, rock hounding, mountain biking, equestrian use, swimming, fishing, rafting/kayaking, rock climbing, target shooting, and various forms of motorized recreation except as otherwise prescribed. Grazing also occurs within the Curly Hollow and Box Canyon grazing allotments and the Gap Trailhead access point (BLM 2020a). The BLM-managed portion of the proposed Reserve Zone 6 is part of the Red Bluff ACEC that is closed to mineral extraction and is a ROW avoidance area. The City of St. George also leases 5.34 acres of BLM-managed lands for a water facility and associated infrastructure. This lease began in 1999 and expires December 31, 2030 (BLM 2020b).

Existing Habitat and Mojave Desert Tortoise Use

In 2017, the County and UDNR conducted MDT surveys on approximately 3,000 acres of SITLA-owned land and 2,150 acres of BLM-managed land in the vicinity of the proposed Reserve Zone 6 (Rognan et al. 2017). This survey addressed most of the lands proposed for inclusion in Reserve Zone 6. During the development of the 1995 HCP, most of this area was not considered MDT habitat and was thought to contain only a small population of the species (1995 HCP:Figures 1.1, 2.2, and 4.1). Habitat mapping from the 1995 HCP indicates that approximately 106 acres of the former Bloomington incidental take area was believed to be occupied by MDT (1995 HCP:83-85).

However, the 2017 survey results demonstrated that a much larger population of MDT exists in this area, with an estimated population of approximately 468 MDT across the 5,150 acres included in the survey, and a density of approximately 22.5 MDT per square kilometer (58.2 per square mile) (Rognan et al. 2017). If this density is consistent in the unsurveyed acres of the proposed Reserve Zone 6, then the estimated population exceeds 600 MDT. It is reasonable to expect similar densities because citizen science reports and other observational data indicate that MDT occurrences continue north and west of the 2017 survey area on the Red Bluff ACEC and BLM-managed Santa Clara River Reserve lands (Rognan et al. 2017).

The density of MDT in this area is among the highest recorded for the species anywhere across its range (USFWS 2011:Table 1) and is only surpassed by MDT densities within other portions of the Reserve (McLuckie et al. 2018).

Potential habitat connectivity between Reserve Zones 1 through 5 and MDT Habitat in other parts of the Permit Area or the Northeastern Mojave Recovery Unit extremely limited (see **Figure 2**). Reserve Zone 6, however, is contiguous with MDT Habitat modeled by USGS (Nussear et al. 2019) to the south of Washington County, which connects to the Northeastern Mojave Recovery Unit along the Virgin River floodplain in Mohave County, Arizona (see inset **Figure 2**). Therefore, Reserve Zone 6 provides an opportunity to conserve MDT in the UVRRU that have the potential to interact naturally through dispersal with members of the species in other recovery units.

9.1.1.2 ACQUISITION STRATEGY

The County and the HCP Partners will expand the target acquisition area for the Reserve to include the proposed Reserve Zone 6. The County and the HCP Partners intend, to the maximum extent practicable, that the acquisition of non-federal lands in the proposed Reserve Zone 6 will be completed during the Renewed/Amended ITP Term. The County and the HCP Partners intend and agree to prioritize opportunities for the SITLA-owned lands to be acquired by the County or other conservation entities to support the recovery of the MDT. In general, the County intends to prioritize the acquisition Zone 3 lands before Zone 6 lands. However, the County does not intend this prioritization scheme to inhibit opportunistic acquisitions should they arise. The County and the HCP Partners anticipate that the acquisition of SITLA-owned lands within Reserve Zone 6 will use the same mechanisms and be subject to the same provisions as described in **Chapter 6.3.1.2**. Titles of acquired lands will be held by the County, an HCP Partner, or other entity approved by the USFWS in advance of the acquisition.

Acquisitions of land within the proposed Reserve Zone 6 may also be supported by funding from the Washington County HCP Trust Fund, the USFWS Cooperative Endangered Species Conservation Fund (also known as ESA Section 6 funds), Utah's Endangered Species Mitigation Fund (the LeRay McAllister Critical Lands Conservation Fund administered by the Utah Governor's Office of Management and Budget), or other available sources. The County and the USFWS acknowledge that the use of ESA Section 6 funds to support the acquisition of Reserve Zone 6 is an acceptable use of this federal grant

program, since this conservation measure is in response to a Changed Circumstance affecting the conservation value of the original Reserve, rather than a mitigation measure necessary to address incidental take from a Covered Activity.

9.1.1.3 ALLOWED USES

Upon triggering this Changed Circumstance, the County and the HCP Partners will restrict the Covered Activities applicable to Reserve Zone 6 to the Reserve-wide allowed uses described in **Chapter 2.2**. In addition, the following zone-specific allowed uses will be established for the proposed Reserve Zone 6:

- existing state and local government infrastructure and uses; and
- competitive use events that have the approval of a special recreation permit issued by the appropriate land management entity or the HCP Administrator, as applicable.

The allowed uses of the proposed Reserve Zone 6 will remain Covered Activities of this Amended HCP. Any incidental take of the MDT associated with these allowed uses will be reauthorized by the Renewed/Amended ITP and the provisions of **Chapter 5.3** pertaining to the application of reauthorized take authorization inside the Reserve will apply. When allowed uses of the proposed Reserve Zone 6 occur on federal lands, the provisions of **Chapter 2.3** will apply.

9.1.1.4 CONSERVATION ACTIONS

Upon triggering this Changed Circumstance, or as otherwise specified below, the County will implement the following conservation actions associated with the addition of Reserve Zone 6. **Table 20** provides estimates of the approximate distribution of staff duties and costs for each conservation action listed below.

- **Reserve Administration:** The County will provide additional funding for increased staffing and administrative costs associated with the designation of the new Reserve Zone 6 and the implementation of these conservation actions. The County will add up to three full-time HCP support staff to include an Outreach Coordinator, Field Technician, and Administrative Assistant. These additional HCP support staff positions will be supervised and directed by the HCP Administrator. Estimated cost over 25 years = \$6,423,625.
- **Reserve Land Acquisition:** The County commits to fund the acquisition of a portion of Reserve Zone 6 lands in an amount equal to three times the acreage contained within the limits of the ROW for the Northern Corridor. For the purposes of estimating the scale of this commitment, the County notes that the length of the Northern Corridor route proposed by UDOT is approximately 4.1 miles long and has a proposed ROW width of 300 feet. The area contained by this proposed ROW would be approximately 150 acres. Therefore, the County commits to fund the acquisition of approximately 450 acres of SITLA-owned lands within proposed Reserve Zone 6 prior to the start of construction of the Northern Corridor. The actual acquisition acreage will depend on the final size of the ROW approved for the Northern Corridor and future replacements of Reserve lands acquired with the assistance of ESA Section 6 grant funding. The County does not include in this commitment additional acreage for any adjacent ROW for other utility or infrastructure uses that may be approved in concert with the proposed Northern Corridor. The County intends that the lands acquired with these funds be considered, in full or in part as determined through negotiations between USFWS and UDWR, to be compensation for the lost conservation value of affected lands in Reserve Zone 3 that were acquired with the support of ESA Section 6 grant funds. Estimated cost over 25 years = \$2,375,606.
- **Reserve Fencing:** Within 5 years of triggering this Changed Circumstance, the County will install Foot Traffic and Tortoise Fencing along the eastern parts of Reserve Zone 6 boundary and

along the Navajo Road corridor to prevent motorized access outside the road ROW, and Range Fencing to enhance protections for listed plant species within Reserve Zone 6. Fencing will not be installed along the western or northern parts of the boundary that are contiguous with BLM-managed lands, so that connectivity with other MDT Habitats is maintained. The preliminary Reserve Zone 6 fencing plan is shown in **Figure 13**. Maintenance and monitoring of Reserve Zone 6 fencing will become the responsibility of the associated landowner, with the County retaining responsibility for fencing on lands owned by SITLA. As in other Reserve Zones, the County will perform annual inspections of the fence in Reserve Zone 6 (see **Chapter 6.3.2.1**). The County and the HCP Partners will finalize and implement the fencing plan for Reserve Zone 6 prior to construction of the proposed Northern Corridor, if approved. Estimated cost over 25 years = \$356,868.

- **Law Enforcement:** The County will provide additional funding for Washington County Sheriff Deputy patrols within the Reserve. Law enforcement will support Reserve integrity, help manage allowed uses of the Reserve, and minimize impacts on MDT and listed plants within Reserve Zone 6. Estimated cost over 25 years = \$2,757,617.
- **Community Education and Outreach:** The County will provide additional funding for education and outreach efforts that may include videos, advertising, handouts, community engagement, contractor training, and volunteer coordination. The County currently supports outreach programs promoting interest in the MDT and other listed species in the Plan Area, the Mojave Desert ecosystem, and related natural and cultural resources and would utilize these funds to expand these programs. The additional funding will help existing users of lands within Reserve Zone 6 understand and abide by new recreation and use restrictions. Estimated cost over 25 years = \$389,311.
- **Grazing Permit Acquisition and Retirement:** The County and the HCP Partners will coordinate with the holders of active grazing permits applicable to Reserve Zone 6 and negotiate the acquisition of such grazing permits from willing sellers. However, like Reserve land acquisitions, no entity will be required or compelled to sell, donate, transfer, purchase, or receive interest in lands for the purpose of this Amended HCP. Nor does this establish a timetable for completing grazing permit acquisitions for Reserve Zone 6. Nevertheless, the County and the HCP Partners have demonstrated the ability to successfully and expeditiously negotiate such transactions. This conservation action will benefit both MDT and listed plants within Reserve Zone 6. Estimated cost over 25 years = \$259,540.
- **Development Protocols:** The County and the HCP Partners will subject the allowed uses of Reserve Zone 6 to the applicable provisions of the Development Protocols. The County and the HCP Partners will apply those portions of the Development Protocols that pertain to lands within the Reserve to the new Reserve Zone 6.
- **Recreation Management:** Recreational uses within the Reserve are an allowed use of Reserve Zone 6, including competitive use events that have the approval of a special recreation permit issued by the appropriate land management entity.

Within 5 years of triggering this Changed Circumstance, the County, the BLM, and the other HCP Partners agree to reduce the total mileage of designated recreation access routes within Reserve Zone 6 to approximately 50 miles of primarily non-motorized trails—a two-thirds reduction in the total mileage of existing trails. Consideration will be retained for some motorized access as necessary and appropriate to facilitate efficient management of Reserve Zone 6 and to provide appropriate opportunities for motorized recreational access west of Reserve Zone 6. The targeted reduction in designated trails within Reserve Zone 6 is expected to provide significant conservation benefit to the local population of MDT by improving or restoring habitat conditions,

reducing habitat fragmentation, and reducing direct mortality from motorized access and recreation.

The County and the HCP Partners will amend the PUP, with public participation, to create a final trail plan that implements the targeted level of trail reduction within Reserve Zone 6. The County will act within its discretion to complete these PUP amendments within the first 5 years after this Changed Circumstance is triggered. HCP staff will also coordinate with the County's Community Development and Tourism Departments to seek assistance for recreation planning and trails management.

The County also commits to funding recreation management activities within Reserve Zone 6, such as the installation of signs, trail maintenance or enhancement, parking improvements, and similar actions. Funds provided by the County may be used on trail management projects anywhere within Reserve Zone 6, including BLM-managed and SITLA-owned lands, based on the priorities set collaboratively by the County and the HCP Partners through the adaptive management process. Estimated cost over 25 years = \$97,328.

- **Reserve Habitat and Fire Management:** The County will provide additional funds to support the habitat restoration and fire management of SITLA-owned lands in Reserve Zone 6 for the benefit of MDT and listed plant species. These additional funds may also be used by the HCP Partners for long-term management of Reserve Zone 6. The activities performed with these funds will be consistent with the priorities established in the Reserve Habitat and Fire Management Guidelines and the Annual Work Plan. Estimated cost over 25 years = \$324,426.
- **Monitoring and Adaptive Management Planning:** The County and the HCP Partners will expand the biological monitoring program described in **Chapter 6.3.3.2** to Reserve Zone 6. To support this expansion, the County will provide additional funding for baseline Reserve population monitoring and special topic monitoring for use by UDWR or other qualified contractor, with a focus on actions pertaining to SITLA-owned lands in the Reserve. However, these funds may be used elsewhere within the Reserve, including on federal lands, subject to decisions made in accordance with the adaptive management program. Estimated cost over 25 years = \$2,595,404.

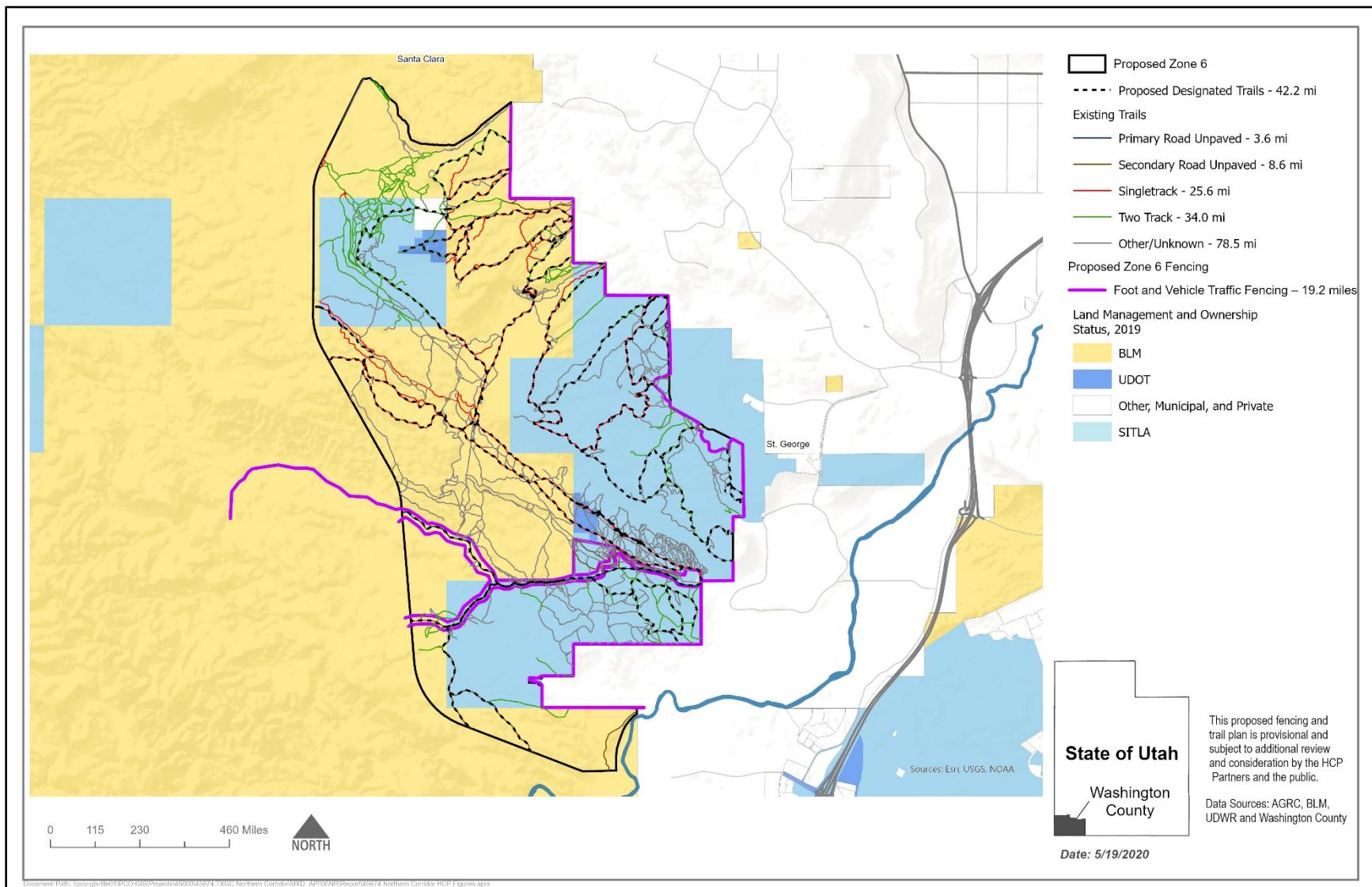


Figure 13. Proposed Reserve Zone 6 fencing and preliminary trail plan.

9.1.1.1 *Retire Previously Authorized Incidental Take*

Upon the triggering of this Changed Circumstance, the County will retire approximately 3,341 acres of incidental take previously authorized by the USFWS and otherwise renewed with this Amended HCP and Renewed/Amended ITP. This amount of incidental take authorization is equivalent to the acres of non-federal within Reserve Zone 6. The retirement of reauthorized incidental take creates a conservation benefit that is in addition to the conservation benefit of any uplift created by the conservation actions described in **Chapter 9.1.1.1**, as it reduces the total amount of incidental take (and therefore the impacts of the taking) covered by this Amended HCP. The County intends that the conservation value of this retired incidental take authorization be applied to help offset the adverse effects of the proposed Northern Corridor on the conservation value of Reserve Zone 3.

In addition to conservation benefit to the MDT, the retirement of approximately 3,341 acres previously authorized for incidental take will benefit the endangered dwarf bear-poppy, which co-occurs with MDT on these lands (see **Appendix C**). Recent surveys within the proposed Reserve Zone 6 observed approximately 3,000 dwarf bear-poppy plants within this area, with many individuals observed on SITLA-owned lands that would otherwise be subject to Covered Activities of this Amended HCP (McCormick and Wheeler 2018). The retirement of this previously authorized incidental take would also benefit the Parry's sandpaper plant (*Petalonyx parryi*), which occurs on SITLA-owned lands within the proposed Reserve Zone 6 and is designated a sensitive status plant by the BLM (McCormick and Wheeler 2018).

9.1.1.2 *Cottonwood Road Tortoise Passages*

Cottonwood Road within Reserve Zone 3 is currently fenced to prevent MDT from crossing the road and being exposed to road mortality. However, this conservation measure also creates a barrier to MDT movement across the Reserve. To compensate for fragmentation effects of the proposed Northern Corridor, the County and the HCP Partners will provide technical assistance for the design and construction of tortoise-crossing culverts under Cottonwood Road within Reserve Zone 3. BLM and USFWS research efforts determined that desert tortoises are one of many species that benefit from passages across roadways, and found that "Mojave Desert tortoises use culverts for shelter and safe passage underneath the roadways that stand between them and additional habitat, mates and food" (Balduini 2018). Further studies by these agencies have provided information suggesting that desert tortoises may prefer to use smaller diameter, corrugated metal culverts, based on a presumed structural similarity to natural burrows (Deffner and Myers 2019). Under-roadway crossing structures are already present along Red Hills Parkway inside the Reserve, although there has only been a few documented crossings (USFWS 2019f).

The County will provide funding to support the construction, maintenance, and/or monitoring of tortoise passages across Cottonwood Road to restore connectivity between the east and west portions of Reserve Zone 3. The County acknowledges that the specific number, design, location, installation, maintenance provisions, and monitoring protocols for these tortoise passages will be based on biological criteria to increase connectivity within the Reserve. The specific biological criteria for this conservation measure will be subject to additional consideration and coordination among the HCP Partners (through the HCAC as part of the adaptive management process) and the Desert Tortoise Recovery Office, or other experts. An estimate of three to five crossing structures have been proposed based on currently available information. A final number and design will be determined through adaptive management to ensure the biological outcomes for MDT are achieved.

The County will make approximately \$150,000 available within 5 years of this Changed Circumstance being triggered to be used for improving connectivity across Cottonwood Road through the addition of

passages. The County and the HCP Partners also commit to seek other sources of funding to help improve connectivity within the Reserve. For example, UDNR may be able to augment this funding with monies from the Utah Endangered Species Mitigation Fund, pending availability. Alternately, with the mutual agreement of the County and the HCP Partners, these funds may instead be adaptively redirected to support postconstruction monitoring, improvements or adjustments, and/or maintenance of these or other tortoise passages in Washington County. The County and the HCP Partners acknowledge that the actual construction of tortoise passages across Cottonwood Road would require additional review and authorization by the BLM and the County and would be completed in accordance with all applicable federal and state regulations. Furthermore, the County and the HCP Partners anticipate that spending of the committed funds may occur in stages so that adaptive management can improve biological outcomes.

9.1.2 Delisting of Mojave Desert Tortoise or 4(d) Rule Exempting Certain Take

The USFWS may remove species from the federal list of threatened and endangered species due to recovery, extinction, or error. The USFWS may also publish a special rule for the MDT under Section 4(d) of the ESA that has the effect of exempting some or all of the prohibitions on take for the MDT. This Changed Circumstance would be triggered when a final rule to remove the MDT from the list of threatened and endangered species or a final rule modifying the prohibitions on take becomes effective after publication in the *Federal Register*. The USFWS would notify the County of the occurrence of this Changed Circumstance.

In response to this Changed Circumstance, the USFWS agrees that the County may, in its discretion, cease implementing this Amended HCP for Covered Activities that occur outside the Reserve and cease support for future Reserve land acquisitions. However, the County will continue to implement its conservation commitments for managing Covered Activities within acquired lands of the Reserve through the Renewed/Amended ITP Term. The County and those HCP Partners with long-term management responsibility for acquired Reserve lands will also continue to manage those lands in accordance with this Amended HCP.

The USFWS and the County agree that changes to this Amended HCP, Renewed/Amended ITP, and related documents that pertain to delisting of the MDT do not require amendments to this Amended HCP but may be completed as an informal amendment without additional public comment, NEPA analysis, or ESA Section 7 analysis. However, the USFWS may publish public notice of the amendment on its website and/or in the *Federal Register*.

9.1.3 New Listed Species or Critical Habitat Changes

The USFWS occasionally adds new species to the federal list of threatened and endangered species or designates new or revises existing areas of Critical Habitat. This Changed Circumstance will be triggered when the USFWS publishes a Proposed Rule in the *Federal Register* that creates a new listed species or designates or revises Critical Habitat within the Plan Area. The USFWS will notify the County of the occurrence of this Changed Circumstance. The County may seek to amend the HCP, ITP, and related documents to add new species to the list of Covered Species, either because of this Changed Circumstance or for other reasons.

Within 90 days of notification, the County will meet and confer with the USFWS to determine if incidental take of the newly listed species in the Plan Area is reasonably certain to occur from Covered Activities, or if destruction or adverse modification of Critical Habitat is reasonably certain to occur from Covered Activities. The USFWS may provide technical guidance to the County as it considers whether an amendment is warranted. Regardless of this Changed Circumstance, the County reserves the discretion to

seek an amendment to add a Covered Species to the Washington County HCP, ITP, and related documents. Amendments could include, but are not limited to, adding a new Covered Species, adding conservation measures to avoid take of a newly listed species, or adding conservation measures to avoid destroying or adversely modifying new or changed designations of Critical Habitat. **Chapter 7.7** describes the general process and other considerations for such amendments. Alternately, and depending on the circumstances, the County may have other means for addressing new listings or changes to designated Critical Habitat, such as a separate HCP and ITP or ESA Section 7 interagency consultation. However, consistent with the No Surprises rule, so long as the Washington County HCP is being properly implemented, no additional land use restrictions or financial compensation will be required of the County with respect to the MDT.

9.1.4 Wildfire in Reserve

Fire is an increasing threat to desert tortoises and their habitat. Fire fuels have increased with the introduction and spread of nonnative invasive plants, such as red brome, cheatgrass, and split grass that fill in the otherwise empty space between native shrubs (BLM 2015; Brooks 1999; Brooks and Esque 2002). Nonnative invasive species often add to the fuel load potential compared to native vegetation that presents more resistance to the established, local fire regime (Esque et al. 2003; Fenstermaker 2012). After a fire, nonnative vegetation is likely to take over due to the absence and slow-growing nature of native species, causing further habitat degradation (Boarman 2002). Increase of nonnative and invasive plants has been shown to occur as edge effects increase from natural areas being fragmented by development (Alston and Richardson 2006). The increased threat of larger catastrophic wildfires is a continued concern for tortoise recovery and management. Impacts from wildfires can be variable (Esque et al. 2003), with direct mortality or injuries from contact with fire, dehydration exposure to high temperatures, or smoke inhalation as well as loss of forage, change in ecotypes and hydrology, and damage to soil and burrows.

Approximately 10,557 acres of critical habitat and 7,885 acres of MDT Habitat within the Reserve burned during the summer of 2005 (McLuckie et al. 2018; USFWS 2008d, 2018f). It is estimated that about 15% of adult MDT within Reserve Zone 3 and 37.5% of adult MDT across the entire Reserve died due to wildfires that year (McLuckie et al. 2007). Not only was mortality directly attributed to fire, but fire also caused the loss of resources within the home ranges of local MDT (McLuckie et al. 2016). According to the BLM, “warmer annual temperatures, prolonged droughts punctuated by years of above-average fall-winter precipitation, and the proliferation of invasive annual grasses are fueling an annual burn-reburn wildfire cycle in the Red Cliffs NCA” (BLM 2015). The BLM considers every dominant ecological system (vegetation community) within the NCA to be *highly departed* from its natural composition. Vegetation communities are now dominated by nonnative annual grasses (typically red brome and cheatgrass), which increase fire frequency and intensity (The Nature Conservancy [TNC] 2011). Exotic annual grasses and forbs reach almost every area of the NCA, ranging from 5% to 30% coverage within the landscape (BLM 2015).

In 2020 through mid-October, three wildfires burned a combined 11,754 acres within Reserve Zone 3, of which 8,814 acres were designated MDT Critical Habitat, and 2,526 acres were previously unburned. . Initial post-fire surveys detected significant mortality of MDT (i.e., the remains of 25 dead MDT and 5 live but visibly injured MDT were detected in a 618-acre survey area within the Cottonwood Trail Fire boundary). Like the 2005 wildfires, it is expected that the 2020 fires will result in significant habitat changes, including altered foraging conditions, loss of cover from predators, loss of thermal refugia, and other community changes (Kellam 2020).

Wildfire frequency, extent, and intensity within the Reserve has increased as a result of the increase in exotic invasive annual grasses and forbs. Invasive plants alter fire regimes from their natural range and

create a feedback loop of decreasing habitat quality and increasing fire frequency as invasive fire-adapted species replace native plants that are not fire adapted. Previously burned areas may support fire-return intervals as short as 5 years in heavily affected areas where wildfire was previously scarce or absent (Hood and Miller 2007).

This Changed Circumstance will be triggered when a wildfire occurs on any non-acquired Reserve lands. Wildfire events on already acquired lands will be addressed by the agency that has management/ownership over that land, each with its own funding sources and wildfire response. However, wildfire on unacquired Reserve lands will require the County and the HCP Partners to convene, through the HCAC, to identify funding sources and create a plan to address the specific wildfire event. The County may be able to contribute emergency funds from the HCP budget to apply to wildfire events that take place on non-acquired Reserve lands. Regardless of landownership and acquisition, wildfire response will follow the guidance and priorities established in the Reserve Habitat and Fire Management Guidelines for the Reserve (**Appendix D**).

In response to this Changed Circumstance, the County and the HCP Partners will prepare an initial restoration plan for the affected Reserve lands. The County and the HCP Partners will complete the initial restoration plan within 90 days of the end of the wildfire event. The initial restoration plan may be amended or supplemented in accordance with the Reserve Habitat and Fire Management Guidelines under the adaptive management program of this Amended HCP. The County will dedicate funds budgeted for implementing conservation actions associated with Reserve habitat and fire management to actions prescribed in the initial restoration plan for the ITP term following this Changed Circumstance, after which this funding may be applied in accordance with other priorities consistent with this category of spending. In the event of multiple fires over several years and budgeted monies expended, the County will work with the HCP Partners to identify other funding opportunities to continue to support this commitment. However, no party will be at fault if additional funding is not obtained after good-faith efforts to seek additional sources.

9.1.5 Exceptional Drought

Extended periods of drought have the potential to affect desert tortoises and their habitats through physiological effects to individuals (i.e., stress) and limited forage availability. Short-term droughts can result in elevated levels of mortality of desert tortoises and long-term droughts could have significant consequences on MDT populations (USFWS 2018f). Drought conditions will reduce water availability, promote invasive annual grasses, and decrease native forb growth, which could directly affect the ability of a tortoise to satisfy its nutritional needs (refer to **Chapter 4.2.3**).

Droughts are a frequent and natural part of Utah's climate (Frankson et al. 2017); however, drought conditions may impact MDT and its habitat depending on the severity and duration of the drought. This Changed Circumstance will be triggered when the United States Drought Monitor (USDM) indicates that any portion of the Reserve is within the D4—Exceptional Drought phase. Since the USDM began approximately 20 years ago, the County has experienced a single duration of drought (April 2001 to October 2006) that reached the Exceptional Drought phase (**Figure 14**; National Drought Mitigation Center [NDMC] 2019a). Therefore, the occurrence of Exceptional Drought within the Plan Area can be reasonably anticipated by this HCP and planned for during the permit term.

Exceptional Drought (Category D4) is the most severe drought classification used by the USDM and indicates that an area is experiencing severe and widespread water shortages that result in water emergencies and crop losses (NDMC 2019b). The County will review USDM index maps (e.g., maps available through <https://www.drought.gov/drought/states/utah>) during Exceptional Droughts and notify the USFWS of this Changed Circumstance as soon as practicable.

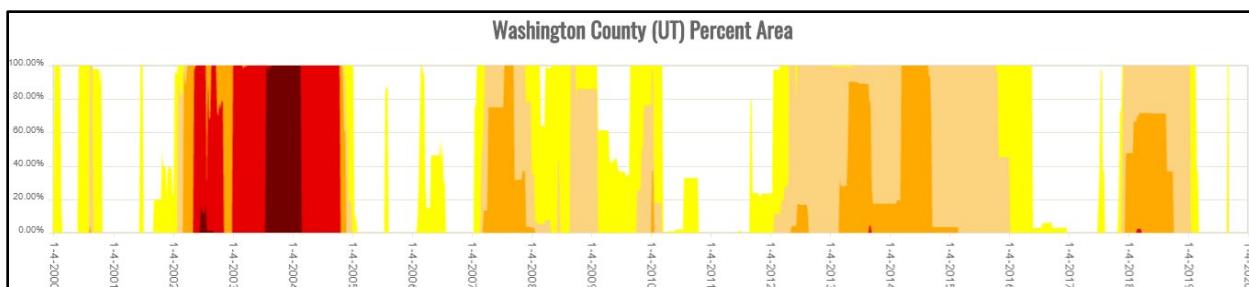


Figure 14. United States Drought Monitor Drought Classification for Washington County, Utah (2000–2019).

Within 30 days of notification, the County will meet and confer with the USFWS and UDWR to determine what, if any, modifications to the conservation program may be prudent. This meeting should address the MDT translocation program, specifically whether translocations should be conducted or suspended; whether any current suspensions should continue; and whether any changes should be made to increase holding times or find alternate disposition for translocated MDTs.

If the County, the USFWS, and UDWR determine that a temporary suspension of MDT translocation is prudent, the County shall direct its HCP Partners to temporarily suspend MDT translocations. This temporary suspension of MDT translocations will stay in effect until drought conditions abate below the threshold or upon receiving clearance from the USFWS to resume translocation activities. At any point during this Changed Circumstance, the County, the USFWS, or UDWR may meet and confer to update their response to this Changed Circumstance. The temporary suspension of MDT translocation and approval to resume translocation activities does not require a formal agreement between the County, USFWS, and UDWR and is not considered a formal amendment to the HCP as described in **Chapter 7.7**. This measure is intended to reduce impacts to MDT handled through the translocation program, the actual need for this response will be determined by the County, the USFWS, and UDWR based on current conditions and may not be necessary, even when portions of the Reserve are within the D4—Exceptional Drought phase.

This meeting should also include discussion of prudent measure to address the threat of wildfire. However, clearance surveys from areas subject to Covered Activities outside of the Reserve shall be allowed to continue during this Changed Circumstance. Any MDT removed during clearance surveys will be held and cared for by the County until translocation activities are authorized to resume. However, if the capacity for the County to hold and care for MDT individuals collected from these clearances has been exceeded, any additional clearances shall be suspended; thus, some Covered Activities will also be suspended.

9.1.6 Mojave Desert Tortoise Disease

The USFWS emergency listing of the MDT as a threatened species was prompted, in part, by population declines resulting from URTD (1995 HCP:14). In 2018, approximately 11% of MDT within the Reserve showed apparent clinical signs of URTD (McLuckie et al. 2018); however, similar clinical signs can also occur from cheatgrass lodged in the nares or eyes of the tortoise (Drake et al. 2016).

Two mycoplasmas, *M. agassizii* and *M. testudineum*, are the primary causative agents of tortoise mycoplasmosis (i.e., a disease caused by a *Mycoplasma* spp.; e.g., URTD) in multiple gopher tortoise species in the United States (e.g., *G. agassizii*, *G. polyphemus*, and *G. morafkai*) (Jacobson et al. 2014). Although tortoises with subclinical infections may transmit *Mycoplasma* spp., transmission is more likely to occur when the infected tortoise exhibits clinical signs (Jacobson et al. 1995). Research on URTD

dynamics demonstrate that the rate of transmission of *M. agassizii* is directly related to seroprevalence (i.e., the level of a pathogen occurring in a population), where study sites with ($\geq 25\%$) seroprevalence had higher force of infection (i.e., probability per year of a susceptible tortoise becoming infected) than sites with low ($<25\%$) seroprevalence (Ozgul et al., 2009). Disease transmission models indicate that, in most situations, high transmission rates of URTD are limited to extensive contact between hosts over multiple days and based on studies of wild tortoises, such extensive contacts were rare events, suggesting that under normal conditions transmission risk is low. However, these transmission models indicate that less contact may be needed if the infected host has a particularly high load of *Mycoplasma* spp. (i.e., a more severe infection) (Aiello 2018).

Studies suggest that host infectiousness varies; hosts with clinical signs of URTD are more likely to transmit the disease; and transmission rates of *M. agassizii* are directly related to seroprevalence in a population (Aiello 2018; Jacobson et al. 1995; Jacobson et al. 2014; Ozgul et al., 2009). Therefore, this Changed Circumstance will be triggered if a previously unreported disease of the UVRRU population of MDT is detected within the Plan Area or if the observed incidence of URTD among MDT Reserve-wide exceeds 25% of the population. In response to this Changed Circumstance, the County will consult with the USFWS and UDWR about the necessity of suspending MDT translocations into the Reserve. The County, UDWR, and the USFWS will meet and confer to discuss alternative translocation options and possible treatment for affected tortoises, subject to financial constraints and practicability.

9.1.7 Private Lands in Reserve Become Developed

It is possible that a private landowner or SITLA may seek alternative means of ESA compliance, other than through this Amended HCP, and ultimately develop lands within the Reserve. Private development of lands within the Reserve is not a Covered Activity of this HCP. Therefore, a private landowner would need to seek an alternative form of compliance with the ESA for incidental take resulting from their activities. The County anticipates that such independent permitting actions would generate mitigation provided by the private landowner in the form of additional conservation lands in the Plan Area or additional funds for supporting the conservation, management, and monitoring of MDT in the Plan Area. This Changed Circumstance will be triggered if a private landowner develops privately held lands within the Reserve boundary (see **Figure 8**, or as amended). The USFWS will notify the County of the occurrence of this Changed Circumstance.

In response to this Changed Circumstance, the County and the HCP Partners, through the HCAC, may consider amendments or modifications to this Amended HCP that may be appropriate to accommodate any mitigation lands or funds provided by the private landowner through such independent action inside the Reserve. This may include amendments to the Reserve boundary to include the third-party mitigation lands or modifications to the funding program to coordinate the use of third-party mitigation funds for Reserve management and monitoring. As this Changed Circumstance necessarily involves actions occurring outside the scope of this Amended HCP, the HCAC has no control over the amount or forms of potential third-party mitigation. In response to this Changed Circumstance, the HCAC may meet and confer with the USFWS to discuss the potential disposition of any forms of mitigations (e.g., funds or lands), as they relate to this Amended HCP and its conservation program's goals and objectives. The County retains final authorization of any such agreements pending USFWS approval.

9.1.8 Non-Participating Municipalities

This Amended HCP assumes all municipalities within the County will fully participate as intended and that participation fees are collected by participating municipalities. However, it is possible that at least one municipality may choose to opt out of participation in the HCP or that a Municipal Partner fails to abide by the terms of its interlocal agreement with the County. Municipality nonparticipation could

reduce income for the HCP by precluding fee collection for otherwise Covered Activities and may increase risk of take for entities operating without the incidental take coverage afforded under the HCP. This Changed Circumstance will be triggered if any municipality in the Permit Area opts to not support the Washington County HCP or a Municipal Partner ceases to meet its funding obligations as established through an executed partnering agreement, such as an MOU, Interlocal Agreement, or Implementation Agreement. The County will notify the USFWS within 30 days of the occurrence of this Changed Circumstance.

The 1995 HCP stated that a municipality that does not execute a binding interlocal agreement with the County to establish its role in the implementation of the Washington County HCP will not be entitled to the benefits of the ITP (1995 HCP:117). This Amended HCP clarifies that the incidental take authorization provided by this Amended HCP and Renewed/Amended ITP will not apply automatically to lands within the full-purpose jurisdictional limits of non-participating municipalities.

In its partnering agreements (e.g., Interlocal Agreements), the County provides protocols and remedies for addressing noncompliance issues with its Municipal Partners. If any Municipal Partner fails to meet its funding obligations as set forth in its partnering agreement, and that municipality is unable to provide a satisfactory solution, the incidental take authorization provided by the Renewed/Amended ITP will cease to automatically apply to non-federal lands within the jurisdiction of that municipality. A municipality that loses its benefits under the Amended HCP may restore them but will be required to pay the County all previous fees that would have otherwise been paid prior to reentering the Amended HCP or receiving its benefits. If this Changed Circumstance is triggered, and the municipality that lost its benefits under the permit is unwilling or unable to return to a compliant state, the County will meet and confer with the USFWS within 90 days of the initial notification to determine what, if any, modifications to the conservation program may be prudent.

However, individual project proponents within a nonparticipating or noncompliant municipality's jurisdiction may seek their own means of ESA compliance or individually enroll a project in this Amended HCP. The County may allow for individual developers to sign Participation Agreements/Certificates of Inclusion directly with County, regardless of their municipality's participation. The developer would send any fees associated with their application or participation in this Amended HCP directly to the County. The individual developer would be responsible for complying with all minimization and mitigation measures detailed within their Participation Agreement/Certificate of Inclusion. Violation of these measures would incur the same penalties as others that operate in participating municipalities. Upon execution of an individual Participation Agreement/Certificate of Inclusion and payment of the appropriate fees, the incidental take authorization of the Renewed/Amended ITP will be deemed to apply to the limits of individually enrolled property.

Applications for individual enrollment may be made to the HCP Administrator and must include information identifying the limits of the proposed Covered Activity, the nature and type of the Covered Activity, and other information consistent with a request for clearance under the Development Protocols. The County will coordinate with the individual project proponent to execute an appropriate agreement for the individually enrolled property. Individual enrollments will be subject to approval by the Washington County Commission.

9.2 UNFORESEEN CIRCUMSTANCES

Unforeseen Circumstances are changes in circumstances affecting a species or geographic area covered by an HCP that could not reasonably have been anticipated by the ITP applicant and the USFWS at the time of the HCP's development and that result in a substantial and adverse change in the status of any Covered Species (50 CFR §17.3). The USFWS will have the burden of demonstrating that Unforeseen

Circumstances exist and must base the determination on the best scientific and commercial data available. The USFWS shall notify the County in writing of any Unforeseen Circumstances the USFWS believes to exist.

The No Surprises rule states that the USFWS may require additional conservation measures of an incidental take permittee because of Unforeseen Circumstances “only if such measures are limited to modifications within conserved habitat areas, if any, or to the conservation plan’s operating conservation program for the affected species, and maintain the original terms of the conservation plan to the maximum extent possible.” No Surprises assurances apply only to the species adequately covered by the HCP and only to those permittees who are in full compliance with the terms of their plan, permit, and other supporting documents, as applicable.

CHAPTER 10. ALTERNATIVES TO THE TAKING

Section 10(a)(2)(A) of the ESA requires that HCPs include a description of the “alternative actions to such taking the Applicant considered and the reasons why such alternatives are not being utilized.” The following sections discuss the alternatives to this Amended HCP considered by the County.

10.1 NO INCIDENTAL TAKE PERMIT EXTENSION

Under the No ITP Extension Alternative, the County would not seek an Renewed/Amended ITP Term and would not continue implementing the 1995 HCP. The ITP would expire and the County would cease to expend resources on implementation of the 1995 HCP, including support for implementing the 2006 Development Protocols (such as performing MDT clearance surveys and translocations). The Reserve boundary would remain in its current configuration, without the addition of Zone 6. However, the County would not provide funding to facilitate future Reserve land acquisitions, monitoring, tortoise removals, fence maintenance, law enforcement, outreach, recreation management, or other tortoise conservation actions in the Plan Area. The County staff positions created to support HCP implementation would be terminated and the HCAC and the TC would be dissolved. Management decisions and activities on lands within the Reserve would remain the responsibility of the respective landowner, but regular coordination and collaborative adaptive management would no longer be supported by the County.

Incidental take of the MDT arising from Covered Activities would no longer be authorized through a streamlined, programmatic HCP and ITP. Instead, project proponents performing non-federal land use or land development activities in the Plan Area, including on lands within the Reserve not already acquired by the BLM or UDNR, would have the responsibility to comply with the ESA on a project-by-project basis or through a separate programmatic approach. Prior to initiating a non-federal activity, each non-federal project proponent would have the responsibility to review its own activities to determine if the activity is reasonably certain to result in the incidental take of a listed species. If incidental take is likely, the project proponent could either modify the activity to avoid the reasonable certainty of take or seek authorization for such take from the USFWS. Project-specific permitting increases the processing time and staffing burden on both project proponents and the USFWS. Given the uncertainty associated with processing times for HCPs, project proponents, may be at risk for significant project delays. For the County and the HCP Partners, the absence of a streamlined mechanism for obtaining incidental take authorization could have significant implications for their constituents, particularly in the case of local government HCP Partners with an obligation to provide adequate public utilities.

The County would also relinquish the remaining previously authorized but unused incidental take authorization in a No ITP Extension Alternative. The County earned the release of 100% of its authorized take through the incremental release schedule of the 1995 HCP, through a combination of its spending on various conservation actions and the acquisition of Reserve lands. This alternative would waste many millions of dollars collected from the community and spent on conservation actions towards the good-faith implementation of the 1995 HCP.

The 1995 HCP was designed to offset the impacts of take through implementation of the recovery objectives of the MDT Recovery Plan for the Upper Virgin River population of MDT (1995 HCP:9, 120; USFWS 1994a, 2011). This alternative might make it more difficult for USFWS to manage the Upper Virgin River MDT population in pursuit of its recovery objectives, since ITP applicants are only required to offset the impacts of authorized take to the maximum extent practicable and do not have an obligation to advance the recovery of listed species.

The County and the HCP Partners desire to continue the successful implementation of the Washington County HCP, since this programmatic approach to ESA compliance for most non-federal activities in the Plan Area supports the fulfillment of its community goals and objectives. The County and the Municipal Partners also have a duty to the public to continue to provide access to fully released incidental take authorization. The No ITP Extension Alternative does not satisfy the County's community goals and objectives (see **Chapter 6.1.1**), which is the purpose and need for the Washington County HCP.

10.2 NORTHERN CORRIDOR AS A COVERED ACTIVITY

The County considered an alternative to this Amended HCP that would address the proposed Northern Corridor as a Covered Activity. This alternative would continue to include the proposed addition and management of Zone 6 to the Reserve, specifically as mitigation for the Northern Corridor. The County assumes that, under this alternative, the BLM would acknowledge in the Implementation Agreement that the Northern Corridor would be an allowed use of the Reserve. With respect to the BLM's actions related to the proposed Northern Corridor, it would (to the extent appropriate) also agree to adopt the analysis of the alternative Amended HCP related to the effects, the amount of incidental take, and the minimization measures associated with the Northern Corridor. Finally, recognizing that the BLM may nonetheless make decisions that are contrary to intent of the alternative Amended HCP, the alternative Amended HCP would continue to include the Changed Circumstance for Northern Corridor Non-Entitlement, that ties the conservation measures associated with this new Covered Activity to actual approval of the project with a route that crosses Reserve Zone 3.

While the Northern Corridor is an activity proposed by a non-federal applicant (i.e., UDOT) and would be routed partially on lands that, as of the preparation of this Amended HCP, are under non-federal ownership, the proposed Northern Corridor also involves some federal lands and federal approvals through the BLM. Therefore, even under this alternative, the Northern Corridor involves federal actions that may affect, and would be likely to adversely effect, the MDT (with incidental take) and would trigger the need for formal interagency consultation under Section 7 of the ESA.

Given the proposed Northern Corridor's federal nexus, the County rejected this alternative on the basis that any incidental take of MDT associated with the Northern Corridor would more properly be addressed through the required interagency consultation process. This approach is supported by regulations finalized in 2019 by the USFWS clarifying the scope of "effects of the action" that must be addressed in ESA Section 7 interagency consultation and providing a means to address responsibilities of federal agencies and non-federal applicants in a Biological Opinion and Incidental Take Statement (84 FR 44976). Through interagency consultation, the BLM would bear the responsibility to evaluate the effects of the Northern Corridor across both federal and non-federal lands, estimate the amount of incidental take of the MDT, and propose reasonable and prudent measures to minimize the take—thereby vesting with the federal agency a stronger role in the development of conservation measures associated with the Northern Corridor. Therefore, the County does not need to add the Northern Corridor as a Covered Activity or request incidental take authorization for the MDT through the ITP, as these actions are more appropriately addressed through interagency consultation.

10.3 REDUCED PERMIT AREA

At the suggestion of the USFWS, the County considered alternatives to this Amended HCP that would reduce the size of the Permit Area to either the remaining undeveloped portions of the incidental take areas delineated in the 1995 HCP or the updated areas of Occupied MDT Habitat that are on non-federal and non-Tribal lands. In either alternative the Reserve itself would be retained in the Permit Area to allow take authorization for the Covered Activities inside the Reserve.

This reduced Permit Area alternative would have the effect of reducing the amount of incidental take reauthorized under the renewed ITP. The County would give up the previously authorized, but unutilized, take authorization associated with areas of potential MDT habitat and other lands in the UVRRU that may be suitable for use by MDT. The reduced Permit Area also leaves many non-federal project proponents in Washington County without a ready means to address ESA compliance for the MDT, which is problematic given the history of MDT being easily collected and transported to areas where they have not previously been known to occur.

The County and the Municipal Partners have completed in full the conservation measures required of them in return for the incidental take authorized under the 1995 HCP and Original ITP, providing funding for the implementation of conservation measures in excess of the required amounts (see **Chapter 6.2.1**). These prior conservation actions released the full amount of previously authorized incidental take under the Original ITP. The County and the Municipal Partners have a duty to the public to continue to provide access to fully released incidental take authorization, which is contrary to the outcome of this alternative. The reduced Permit Area alternative does not satisfy the County's community goals and objectives (see **Chapter 6.1.1**), which is the purpose and need for the Washington County HCP.

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APPENDIX A

Development Protocols

DEVELOPMENT PROTOCOLS FOR PROJECTS WITHIN THE RED CLIFFS DESERT RESERVE AND/OR INCIDENTAL TAKE AREAS

This revision to the protocols was recommended by the
Habitat Conservation Advisory Committee and approved by the
Washington County Commission August 1, 2006

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OVERVIEW

“Utility development protocols” were developed and adopted as a part of the Washington County Habitat Conservation Plan (HCP) to avoid take and minimize potential adverse impacts to the Mojave desert tortoise in the Red Cliffs Desert Reserve from utility and road right-of-way projects, such as the installation and maintenance of water, sewer, and electric lines and roadway maintenance, while still enabling utilities to be placed within the Reserve. The protocols also provide protection to desert tortoise habitat and other sensitive species. The Reserve will be considered an avoidance area for the location of new utilities. This means new utilities will be encouraged to co-locate along existing infrastructure when practical. The HCAC will review other new utilities routes to assure minimum habitat disturbance.

Since the Reserve is the central element in the County’s effort to stabilize and recover local tortoise populations, proposals that are wholly or partially within the boundaries of the Reserve are carefully evaluated. Once a proposed project receives HCP and, if necessary, other appropriate approvals, then the project proponent works with the HCP Administration to implement these Protocols. Protocols vary depending upon whether the project is proceeding during the inactive or active tortoise season. The inactive season is from December 1 to February 14 each year; the active season is from February 15 to November 30. The Protocols are more accommodating to construction during the inactive season. Plan ahead.

While this document provides the information required to comply with the regulatory requirements for protection of desert tortoises in most project situations, there may be cases where more specific information is required. An agency contact list is provided at the end of this document for further assistance.

REVIEW PROCESSES FOR DEVELOPMENT/MAINTENANCE PROPOSALS IN TORTOISE HABITAT

1. Proposals for utility development/maintenance inside the boundaries of the Red Cliffs Desert Reserve: This process is described in the HCP Reserve **Utility Development Protocols** section.
2. Clearances for lands proposed to be graded or developed within an officially designated incidental take area (see maps, pages 16-23): This process is described in the **Incidental Take and Potential Habitat Area Review and Protocols** section.
3. Proposals for utility development/maintenance inside the Kayenta Development: see HCP Administration.

If desert tortoises are encountered on private property elsewhere in the County, contact the HCP Administration so that Washington County can remove them. If a proposed action will occur on private lands on the Beaver Dam Slope contact the U.S. Fish and Wildlife Service. If a proposed action will occur on land managed by the Bureau of Land Management (BLM), contact BLM.

Adherence to these protocols does not constitute consultation with the U.S. Fish and Wildlife Service, which is required if the project has a federal nexus.¹ Other required municipal, state or federal approval processes must be independently addressed with the appropriate authority.

Regardless of whether a proponent is seeking approval for a project within the Reserve or in an incidental take area, the first step is to contact the HCP Administration Office, 10 North 100 East in St. George, Utah, 84770 (telephone [435] 634-5759). This creates a good opportunity to preliminarily discuss a proposal with HCP staff and to ask initial questions about the applicable review process.

PENALTIES FOR FAILURE TO FOLLOW LEGALLY REQUIRED PROTOCOLS

Failure to comply with the requirements of the Endangered Species Act of 1973, the Habitat Conservation Plan, current Development Protocols, and conditions of project approvals are punishable offenses and may trigger federal and state law enforcement actions. Washington County is required per the HCP permit to notify law enforcement authorities of violations. Only through compliance with HCP processes does a project proponent receive the benefits and protections of the Incidental Take Permit. Unresolved issues from an entity's previous projects should be resolved prior to that entity proceeding with the construction phase of a new project.

HCP INCIDENTAL TAKE AND POTENTIAL HABITAT AREA REVIEW & PROTOCOLS

Incidental take and potential habitat areas (hereafter collectively "incidental take areas") are privately-owned areas of tortoise habitat where surface disturbance and development can legally proceed after coordination with the Washington County HCP Administration. Incidental take areas are shown on the maps beginning on page 16.

Review of Proposals in Incidental Take and Potential Habitat Areas. Clearance request forms are available at the HCP Administration Office, 10 N. 100 E. in St. George. The County conducts tortoise clearances two times a year, spring and fall, during official clearance windows which are March 15-May 15 and August 20-October 20 respectively. Clearances outside the preferred windows may be possible in exceptional circumstances. Projects within incidental

¹A federal nexus is likely to exist if the project is in any part authorized (including any federal permits), funded or carried out by the federal government. Federal review can be triggered on private property when a project, such as a powerline or waterline, crosses both private and federally owned property under the policy of "interrelated-interdependent." The HCP process may, on occasion, proceed concurrently with the federal review; however, any approval granted by the HCP Administration, the Habitat Conservation Advisory Committee and the Washington County Commission is subject to final federal review and approval. In particular, if the proposal has a federal nexus, the project may be required to undergo consultation with the U.S. Fish and Wildlife Service. (If unsure, contact USFWS at (801) 975-3330)

take areas can proceed once appropriate measures to clear and remove tortoises have been taken, and a release form has been signed. The HCP Administration will work with the proponent to determine necessary protective measures. Once a property has been officially released by the County, the proponent is protected under the terms of the HCP. HCP Administration release does not substitute for other required municipal, state or federal approval processes.

INCIDENTAL TAKE AND POTENTIAL HABITAT AREA PROTOCOLS

- ITP-1 Clearance request form is completed and turned into the HCP Administration Office.
- ITP-2 HCP Administrator determines if a clearance is required. If a clearance is not required, HCP Administrator can issue a release. If clearance is required, it is scheduled appropriately. The County conducts a full clearance of the property at no cost to the land owner.
- ITP-3 If the clearance request is for property immediately adjacent to the Red Cliffs Desert Reserve, a fencing/containment plan is required per city and county ordinances. This plan must be reviewed and approved by the HCP Administrator prior to surface disturbance. If the clearance request is for property which is not adjacent to the Reserve, the HCP Administrator will determine if fencing is necessary to protect tortoises from harm.
- ITP 4 If the clearance request is for a utility easement crossing through undeveloped property in a take area, clearances will only be required within the boundaries of the utility easement. Measures such as barrier fencing, tortoise education or a biological monitor may be required to avoid harm to tortoises without requiring the land owner to meet all of the requirements for a full release of the property. The costs of these measures are borne by the project proponent. The determination of which measures apply is based on the actual risk of harm to tortoises in the specific project area (e.g., density, activity season, adjacency to the reserve). If the determination is made that there is a need for a biological monitor, UDWR will supply one at no additional cost to the proponent.
- ITP-5 After the landowner has met all applicable requirements, the County shall issue a release for the property. The release will specify the deadline by which construction on the property must commence. Should construction fail to commence by this date, the cost of future clearances shall be the responsibility of the land owner. This deadline may be waived by the HCP Administrator if arrangements are made for fencing.

HCP RESERVE REVIEW & PROTOCOLS

Review of Proposals Inside the Boundaries of the Red Cliffs Desert Reserve. Proponents are required to bring preliminary proposals to the HCP Administrator for discussion prior to being placed on the Habitat Conservation Advisory Committee's (HCAC) Agenda. The HCP Administrator may refer the proposal back to the proponent for further clarification, to the Technical Committee(TC) for review, or to the HCAC for discussion, based upon consultation with the project proponent. At the project proponent's request, the item will be placed on the HCAC Agenda. Proposals are reviewed by the HCAC once a month at their regularly scheduled meeting. The TC meets monthly. When the TC completes its review, it submits a report to the HCAC for consideration. The TC report includes findings on the proposal's potential impacts to tortoises, tortoise habitat, and the viability of the tortoise population within the Reserve, and may include recommended measures to offset these impacts. The HCAC considers the TC report, relevant input from the HCP goals and objectives, and relevant HCP guidelines. HCAC review may extend over several months. The HCAC's recommended motion is forwarded to the Washington County Commission for consideration and approval.

Once a proposed project receives HCP and, if necessary, local and federal approvals, then the project proponent works with the HCP Biologist to follow protocols outlined in this document.

To achieve the objectives of the HCP, some flexibility in the application of these protocols may at times be appropriate. Therefore, deviations from these protocols may be allowed if jointly approved by the U.S. Fish and Wildlife Service, the HCP Administration, UDWR and the project proponent. Of primary concern in approving a deviation from the Protocols, the deviation must not result in additional impact to tortoises or tortoise habitat.

Activity Seasons. There are two annual activity seasons; an inactive and active season. Tortoise activity is greatly reduced during the inactive season when tortoises have retreated to winter dens. The inactive season is from December 1 to February 14. **All construction and maintenance activities are encouraged to be scheduled during this period when potential harm to tortoises is minimized**, and therefore, several requirements may be relaxed (e.g., temporary tortoise fencing, on-site biological monitor). The active season is from February 15 to November 30. Additional precautions must be taken during the active season as outlined in the protocols to reduce the risk of animals being harmed by construction and maintenance activities.

Who Can Legally Handle Tortoises? Only individuals with the appropriate USFWS and UDWR tortoise handling permits can legally handle desert tortoises. This includes qualified private, state, and federal biologists, and the HCP Administrator and staff.

PRECONSTRUCTION PROTOCOLS

These protocols apply to the site preparation and construction phases of ALL approved projects, regardless of activity season:

- PC-1 A contact person from the project proponent shall act as the contact representative to the HCP Administrator. He/she will be responsible for overseeing compliance with these protective protocols.

- PC-2 Following County approval but prior to any construction activity within the Reserve, the contact person will meet with the HCP Biologist (or his/her authorized alternate) to review the plans for the project. The HCP Biologist, in consultation with the TC, will carefully review alignment, pole spacing, clearing limits, blasting plans, burrow locations, and other specific project plans and other information which have the potential to affect the desert tortoise. The HCP Biologist may recommend project modifications to further avoid or minimize potential impacts to Mojave desert tortoise, tortoise habitat, and other sensitive species and to better meet this protocol.
- PC-3 A qualified biologist shall conduct preconstruction clearance surveys of all areas potentially disturbed by the proposed project. All winter dens, burrows, scat, tracks, live animals and animal remains discovered during the preconstruction survey shall be documented. The survey shall be submitted to the HCP Biologist as part of plan review.
- PC-4 Site mitigation criteria shall be determined in the preconstruction phase, including but not limited to: barrier fences, winter den or burrow relocation, laydown/staging areas and restoration planning, and will be reviewed by the HCP Biologist in consultation with the TC prior to implementation.
- PC-5 The project proponent will work with the HCP Administration to identify disturbance areas. The construction area shall be clearly fenced, marked, or flagged at the outer boundaries to define the limits of construction activities. The right-of-way shall normally not exceed 50 feet in width for standard pipeline corridors, access roads and transmission corridors, and should be minimized to the maximum extent practicable. Existing access roads should be used to the maximum extent possible. Rights-of-way for new access roads should normally be kept to 20 feet or less except for turn-around areas. Permanent disturbance from such roads should be kept to the minimum necessary to accommodate long-term maintenance. Other construction areas, including well sites, storage tank sites, substation sites, turnarounds, and laydown/staging sites which require larger areas, will be determined in the preconstruction phase. All construction workers shall be instructed that their activities shall be confined to locations within the fenced, flagged, or marked areas.
- PC-6 A worker education program, conducted by Washington County, shall be implemented prior to the onset of each construction project. ***All construction employees shall be required to attend a tortoise education class and read an educational brochure prior to site entry.*** The class will describe the sensitive species which may be found in the area, the purpose of the Reserve, and the appropriate measures to take upon discovery of a sensitive species. It will also cover construction techniques to minimize potential adverse impacts. For each project, all project personnel shall sign an affidavit that they have read and understand the material presented in the brochure and class. Washington County will maintain all records of affidavits.
- PC-7 All preconstruction activities which could take tortoises in any manner (e.g., surface disturbance, driving off an established road, clearing vegetation, etc.) shall occur under

the oversight of a qualified biologist after coordination with the HCP Biologist.

- PC-8 If there are unresolvable conflicts between the HCP Biologist and the contact person, the matter will be arbitrated by the HCAC and, if necessary, by the County Commission.

Additional Active Season Preconstruction Protocols: The active season is from February 15 to November 30.

- PCA-1 An on-site biological monitor may be required to be present during preconstruction activities that involve surface disturbance, or that may otherwise endanger tortoises, to ensure compliance with protocols.
- PCA-2 The construction area shall be temporarily fenced using tortoise-proof fencing at the outer boundaries to define the limits of construction activities.
- PCA-3 Work areas shall be inspected for desert tortoises within 24 hours of the onset of construction. To facilitate implementation of this condition, winter den or burrow inspection and excavation may begin no more than seven (7) days in advance of construction activities, as long as a final check for desert tortoises is conducted at the time of construction.
- PCA-4 Any hazards to tortoises created by preconstruction activities shall be checked three times a day for desert tortoises. These hazards shall be eliminated each day prior to the work crew leaving the site, which may include installing a barrier that will preclude entry by tortoises.

GENERAL CONSTRUCTION PROTOCOLS

These protocols apply to the construction phases of ALL approved projects, regardless of activity season:

- GC-1 A qualified biologist shall oversee construction activities to ensure compliance with the protective stipulations for the desert tortoise.
- GC-2 If desert tortoises are found above ground inside the project area during the inactive season, they shall be moved out of harm's way as directed by a qualified biologist. The project proponent shall contact the HCP Biologist who will coordinate final disposition of the tortoise with UDWR and USFWS.
- GC-3 No handling of tortoises will occur when the air temperature at 6 inches (15 centimeters) above ground exceeds 90° Fahrenheit (32° C).
- GC-4 Desert tortoise winter dens and burrows shall be avoided to the maximum extent feasible. Tortoises are not to be removed from winter dens or burrows until appropriate action is determined by the HCP Biologist in coordination with USFWS and/or UDWR. The response shall be carried out as soon as feasible, not to exceed 72 hours. A qualified biologist shall excavate any winter dens or burrows which the HCP Biologist

has concluded cannot be avoided and will be disturbed by construction. Winter den or burrow excavation shall be conducted with the use of hand tools only.

- GC-5 Winter dens and burrows outside the approved limits of clearing and surface disturbance shall not be excavated. Winter dens and burrows outside these limits, but at risk from accidental crushing, shall be protected by the placement of deterrent barrier fencing between the winter den or burrow and the construction area. Barrier fencing shall be installed to direct the tortoise leaving the burrow away from the construction area. Installation and removal of such barrier fencing shall be under the direction of a biological monitor.
- GC-6 Blasting generally is not permissible within 100 feet of an occupied tortoise burrow.
- GC-7 All trenches, pits, or other excavations shall be inspected for tortoises by a qualified biologist or a biological monitor prior to filling.
- GC-8 Equipment maintenance and staging areas, and storage areas for pipes, wires, etc., will be located outside of reserve areas, unless the HCP Biologist determines that impacts will be reduced by using a previously disturbed location within habitat. All culverts and pipes located within desert tortoise habitat (except within a permanently fenced right-of-way) shall have both ends capped or otherwise be inaccessible to prevent entry by desert tortoises. All open ended culvert or pipeline segments that are welded in place shall be capped during periods of construction inactivity to prevent entry by desert tortoises.
- GC-9 All trash and food items shall be promptly contained and removed daily from the project site to reduce the attractiveness of the area to ravens and other desert tortoise predators.
- GC-10 Construction activities which occur between dusk and dawn shall be limited to areas which have already been cleared of desert tortoises by the qualified biologist and graded or located in fenced construction areas.
- GC-11 The area shall be restored as determined during the preconstruction process, consistent with restoration/reclamation standards approved by the Washington County Commission. [Document in progress]

Additional Active Season General Construction Protocols: The active season is from February 15 to November 30.

- GCA-1 An on-site biological monitor will be assigned to each group of construction equipment, operating in discrete (spatially disjunct) areas.
- GCA-2 If a tortoise is found above ground within the project area during construction, it shall be moved out of harm's way by a qualified biologist and placed in a winter den, burrow or other sheltered location within 250 feet from where it was found. If a tortoise is found to be within a burrow or winter den within the construction area, refer to GC-4.

- GCA-3 All open trenches, pits or other excavations shall be checked three times a day by the biological monitor for trapped desert tortoises. If a desert tortoise is found, the biological monitor shall notify a qualified biologist who will remove the animal as soon as possible.
- GCA-4 Open trenches, pits or other excavations will be backfilled within 72 hours, whenever possible. A 3:1 slope shall be left at the end of every open trench to allow trapped desert tortoises to escape. Trenches not backfilled within 72 hours shall have a barrier installed around them to preclude entry by desert tortoises. All trenches, pits, or other excavations shall be inspected for tortoises by the biological monitor prior to filling.

ACTIVITY SPECIFIC PROTOCOLS

These protocols are activity specific, and must be followed in addition to the pre-construction and general construction protocols.

TRAIL CONSTRUCTION AND IMPROVEMENTS

- TC-1 Access for trail maintenance beyond R-1, R-2, and R-3 roads shall be non-motorized.
- TC-2 Construction and improvements of trails shall normally be accomplished with hand tools only.
- TC-3 Removal of vegetation and rock shall be minimized to the fullest extent possible and is only allowable to make trails safe and passable for appropriate uses. Not all trails will be conducive to all permitted uses.
- TC-4 Maintenance activities on trails shall be coordinated with the HCP Biologist to reduce potential impacts to tortoises. Trails shall generally be maintained in a primitive but passable condition.

WATER EXPLORATION AND CONSTRUCTION

- W-1 All test pump water will be routed to the most appropriate wash or natural drainage to minimize impacts. Prior to pumping, the drainage area expected to be impacted will be surveyed by a qualified biologist or biological monitor. If tortoises are found in the drainage area and are determined to be in harm's way, a qualified biologist will move the tortoises to a sheltered location within 250 feet outside the wash.
- W-2 Powerlines associated with water development, such as to provide power for pumps, should be buried underground within the access road right-of-way with a minimum separation allowed by applicable safety standards and a desired separation of five (5) feet from water pipes. All above ground structures deemed to be necessary shall be equipped with functional anti-perching devices that would prevent their use by ravens and other predatory birds. To prevent bird electrocutions, all above ground structures shall be equipped with raptor-safe devices that comply with standards outlined in

"Suggested Practices for Raptor Protection on Power Lines: the State of the Art in 1996," or a more recent version, if or when one is developed. This document was written by the Avian Line Interaction Committee (APLIC).

ELECTRIC POWER LINE CONSTRUCTION

- E- 1 Poles or other above ground structures necessary for electrical transmission or distribution shall be minimized as much as possible. All new or upgraded above ground structures shall be equipped with functional anti-perching devices that would prevent their use by ravens and other predatory birds. To prevent bird electrocutions, all above ground structures shall be equipped with raptor-safe devices that comply with standards outlined in "Suggested Practices for Raptor Protection on Power Lines: the State of the Art in 1996" or a more recent version, if or when one is developed.
- E- 2 All disturbance areas around poles or concrete pads will be reduced to a size just large enough for the construction activity.

MAINTENANCE PROTOCOLS

- M-1 Access for maintenance (see Glossary) may occur only on R-1, R-2, and R-3 roads (see map, Appendix B, Page 23). Coordination with the HCP administration is required prior to travel off these roads.
- M-2 In order to perform routine utility operation and maintenance tasks within the Reserve, employees shall receive desert tortoise education training. A training/refresher course will be provided annually and by arrangement for those personnel not previously trained. Washington County will provide the training at no cost; however, it will be the responsibility of the municipality or utility to schedule annual training. The training will include at a minimum the following: identification of tortoises, activity patterns, winter dens, burrows, and other sign; and instructions on installing and maintaining tortoise barrier fencing. Untrained employees and those who have not regularly attended refresher courses may not perform maintenance operations within the Reserve. During the course of operation and maintenance, desert tortoises encountered in the road or in the project area must be avoided. If necessary, workers should contact the HCP Biologist.
- M-3 Maintenance that creates surface disturbance must be coordinated with the HCP Administration except when located within facilities or roadways where authorized barrier fencing has been installed and maintained. Maintenance that does not create surface disturbance and is in compliance with these protocols does not need to be coordinated.

ROAD MAINTENANCE AND IMPROVEMENTS

The following road maintenance and improvement protocols correspond to categories of roads

(R-1, R-2, R-3, R-4) described and mapped in Appendix B, page 23.

- R-1 Maintenance and improvement work may be conducted without coordination with the HCP Administration on I-15, Highway 18, Tuacahn Road, Snow Canyon State Park Road and Red Hills Parkway (Skyline Drive) when and if permanent barrier fencing has been installed and maintained in accordance with HCP procedures.
- R-2 Maintenance of Babylon, Cottonwood and Turkey Farm roads may be conducted without coordination with the HCP Administration if they create no surface disturbance outside of the existing traveled surface. Grading may be conducted on these roads during the inactive season without coordination with the HCP.
- R-3 Maintenance of gated utility access roads may be conducted without coordination with the HCP Administration if they create no surface disturbance outside of the existing traveled surface. Grading or improvements to R-3 roads must be coordinated.
- R-4 Maintenance for the limited purpose of allowing vehicle access during emergencies may be conducted after coordination with the HCP Administration.

EMERGENCY WORK (See Glossary)

Preliminary repair during emergency work is exempt from the stipulations outlined in these protocols. A contact representative from the entity performing the repair must contact the HCP Administration within 24 hours to minimize impacts and coordinate post-emergency response. Day and nighttime phone numbers are included in the Addresses and Contacts section. Long-term surface disturbing construction associated with the emergency work must follow the appropriate protocols.

DISPOSITION OF SICK, INJURED, OR DEAD SPECIMENS

Upon locating dead, injured, or sick desert tortoises during any utility or road project, initial notification by the contact representative or qualified biologist must be made to the USFWS or UDWR within three working days of its finding. Written notification must be made within five calendar days with the following information: date; time; location of the carcass; photograph of the carcass; and any other pertinent information. Care must be taken in handling sick or injured animals to ensure effective treatment and care. Injured animals shall be taken care of by the qualified biologist. Should any treated tortoises survive, USFWS or UDWR should be contacted regarding the final disposition of the animals.

GLOSSARY

Barrier fence - A fence designed to protect the desert tortoise and its habitat from harm.

Biological monitor - A person serving in the capacity of biological monitor is responsible to assist a project proponent and/or contractor to avoid accidental or intentional take of tortoises or unauthorized take of tortoise habitat. The biological monitor has a specific training on the biology and habits of the desert tortoise. The individual need not have a degree, but previous experience in the field is generally required. This person's responsibility is to oversee construction activities for compliance with Utility Development Protocols. A qualified biological monitor is a person who would be reasonably expected to notice and identify tortoises and tortoise signs, including: dens/burrows/pallets; scat; tracks; egg shells; and probable tortoise nests. The person should be proficient at recognizing when there is a reasonable probability of tortoises in the area. This person should be observant and responsible. The person need not have state or federal handling permits, but must know who to contact to move any tortoises encountered. (Individuals must have appropriate federal and state permits to handle tortoises or tortoise eggs.)

Burrow - A cover site in soil that the desert tortoise excavates.

Coordination - Communication between the project proponent and the HCP Administration to ensure a proposed action is consistent with the requirements of the UDP and the HCP Incidental Take Permit.

Emergency work - A sudden, unexpected occurrence demanding immediate action or attention. Examples of emergency scenarios include downed power lines, structural fire, ruptured water lines, and flooded roadways.

Exigencies - Unanticipated events.

Habitat Conservation Advisory Committee (HCAC) - The HCAC is the committee charged with overseeing the administration of the HCP and serves in an advisory capacity to the County Commission. The committee includes representation from the Utah Department of Natural Resources (UDNR), BLM, USFWS, a conservation organization, local government, local development, and a citizen at large.

Habitat Conservation Plan (HCP) - The HCP is the guiding document that establishes the Red Cliffs Desert Reserve, outlines obligations to protect species and habitat, and identifies incidental take areas and outlines the incidental take process. The HCP was signed and went into effect in February 1996.

HCP Administration - Washington County employs the HCP Administrator, the HCP Biologist, and their staff to meet the obligations outlined in the HCP.

Maintenance - Any physical act of upkeep or repair of wear or damage whether from natural or

other causes. Examples include: inspecting and repairing power lines (e.g., damaged conductors and cross arms, insulators, rotten poles, and transformer repair); waterlines (e.g., valve and airvac replacement, and joint repair); water wells and tanks (e.g., maintaining well oil and gravel pack levels, replacing pump, motor, or bowls, replacing sand filter and other apparatuses, and pulling the column tube and shaft for camera purposes); substation equipment (e.g., inspection and replacement of fuses, insulators and switches, painting the structure, and fence repair).

Primitive Condition - The condition of having a natural surface with vegetation growing closely along the side of the road or trail. Surface may be rough and minimally improved to meet the need for which the access is designed. However, the access should be passable and generally safe, and should be designed to minimize long-term maintenance problems by reducing the risk of erosion (improvements may include culverts, cement dips, surface cap, etc., as required).

Qualified biologist - As a general rule, a qualified desert tortoise biologist is defined as a person with a bachelors degree or graduate degree in biology, ecology, wildlife biology, herpetology, or related fields. He/she must have demonstrated prior field experience using accepted resource agency techniques to survey for desert tortoises. Field experience may mean a minimum of 60 days field experience searching for tortoises and tortoise sign. The qualified biologist must have appropriate federal and state tortoise handling permits. In some circumstances, HCP Administration staff or local state or federal biologists may be available to serve this function. Contract qualified biologists must report to and coordinate with the HCP Biologist.

Red Cliffs Desert Reserve (Reserve) - An area of protected habitat set aside for the protection of desert tortoise and other species with the implementation of the Washington County Habitat Conservation Plan.

Red Cliffs Desert Reserve Restoration/Reclamation Standards - Available by contacting the HCP Administration at (435) 634-5759.

Sensitive Species - Wildlife species, whose populations have been greatly depleted, and/or are declining in numbers, distribution, and/or habitat.

Take - To harass, harm, pursue, hunt, shoot, would, kill, trap, capture, or collect, or to attempt to engage in any such conduct. The term "harm" is further defined to include acts that may result in significant habitat modification or degradation where it actually kills or injures wildlife by significantly impairing essential behavioral patterns, including breeding, feeding, or sheltering.

Technical Committee (TC) - A committee established by the HCP to provide biological information on endangered, threatened, and candidate species to the HCP Administrator and the HCAC.

Winter den - A permanent structure that is inhabited by desert tortoise during hibernation. The winter den is either in solid rock or soil.

ADDRESSES AND CONTACTS

U.S. FISH AND WILDLIFE SERVICE

Utah Field Supervisor
U.S. Fish and Wildlife Service
2369 West Orton Circle
West Valley City, Utah 84119
PH: 801 975-3330
FX: 801-975-3331

BUREAU OF LAND MANAGEMENT

Bob Douglas, Biologist
St. George Field Office
345 E. Riverside Drive
St. George, UT 84790
PH: 435-688-3204

UTAH DIVISION OF WILDLIFE RESOURCES

Richard A. Fridell, Wildlife Biologist
Ann M. McLuckie, Wildlife Biologist
Utah Division of Wildlife Resources
344 East Sunland Drive, # 8
St. George, Utah 84790
PH: 435-688-1426
C: 435-680-1062
FX: 435-688-1427

WASHINGTON COUNTY

Bill Mader, HCP Administrator
PH: 435-634-5759 ext.3

Lori Rose, HCP Biologist
Washington County HCP Administration
197 East Tabernacle Street
St. George, Utah 84770
PH: 435-634-5759 ext.2
Home: 435-635-1024
C: 435-467-5759
FX: 435-634-5758

Justin Neighbor, HCP Field Assistant
C: 435-467-5766

Clearance Protocol: Amendment to Attachment A, Revised April 8, 2008

Attachment A also includes details on handling eggs, tortoise facility, etc.

Changes since 1997 to the agreed upon protocol for clearances in desert tortoises incidental take areas within Washington County:

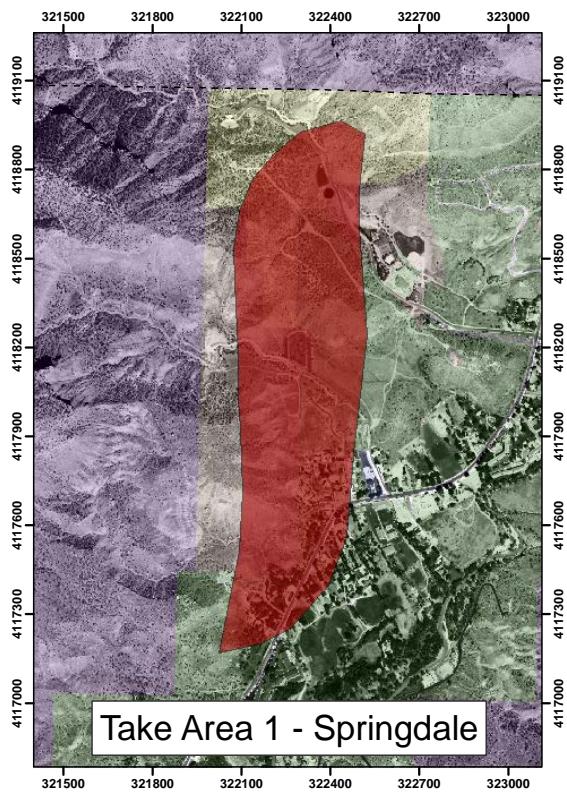
- Clearances in take areas not adjacent to the Reserve are voluntary and have no mandatory protocols.
- Presence/Absence and Search and Removal surveys will be completed prior to habitat alteration during clearance windows (3/15-5/15 and 8/20-10/20) and will be valid for up to 90 days and are extended indefinitely if fencing is installed per an approved fencing agreement.
- Presence/Absence surveys will be completed for all clearances in take areas adjacent to the Reserve (e.g. Winchester Hills, North Washington, etc.). Current Presence/Absence survey protocols include:
 - a. 100% coverage of the survey area (parallel passes) in addition to a zone of influence transect 200 feet from the perimeter of the survey area.
 - b. If fresh sign (less than one year old, Class 1 to 4¹) is found in either the zone of influence transect or the survey area, removal survey protocols will be initiated. The effort expended on the Presence/Absence survey will count toward the first pass on the removal survey.
 - c. The zone of influence transect is not required in areas with fenced perimeters.
 - d. If no sign is found in either the Presence/Absence survey area or zone of influence, removal surveys are required.
- Removal surveys are required when Presence/Absence surveys reveal the presence of tortoises. Removal surveys are mandatory for all clearances in incidental take areas bordering the Reserve. Current Removal protocols include:
 - a. Clearances will be conducted by observers walking parallel transects to obtain complete (100%) coverage of the area. Each 100% coverage is considered one pass.

¹ The relative age of tortoise scat is estimated using a condition classification based on visual observations (USFWS, 1992. Field Survey protocol for any federal and non-federal action that may occur within the range of the desert tortoise, Reno, Nevada, 22 pp). Class 1 includes scat that is still wet (not from rain or dew) or freshly dried (<1 week). Class 2 scat is dried with glaze and dark brown (<1 month). Class 3 scat is dry with no glaze, partially bleached (light brown), and consists of tightly packed material (1 to 6 months). Class 4 includes scat that is dry, light brown to pale yellow in color, consists of loose material, and has a scaly appearance (6 months to 1 year). Class 5 scat is completely bleached and consists only of plant fiber (1-2 years).

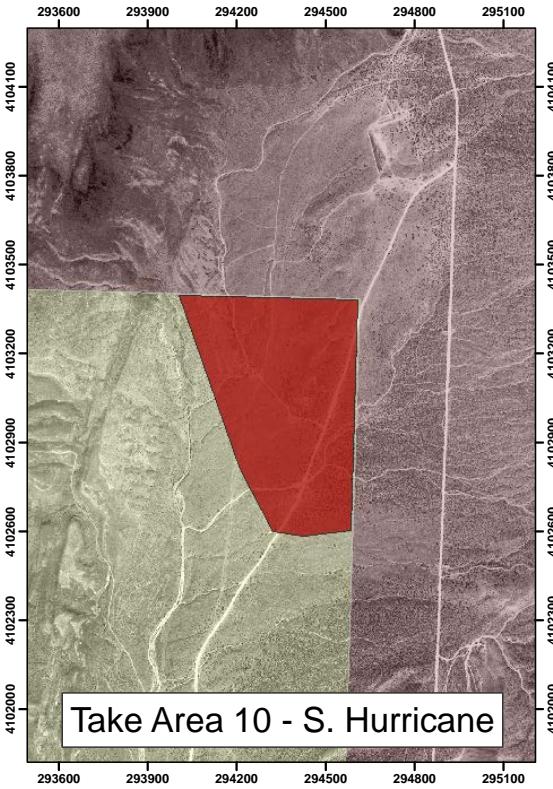
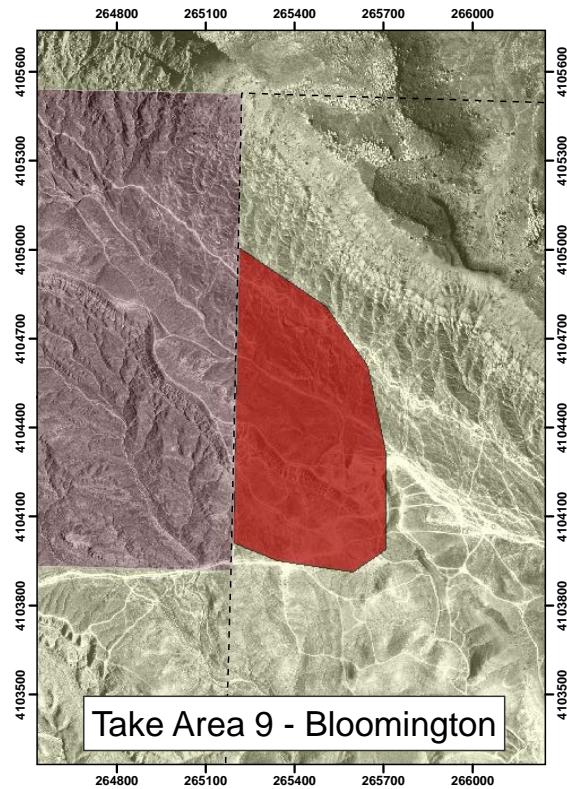
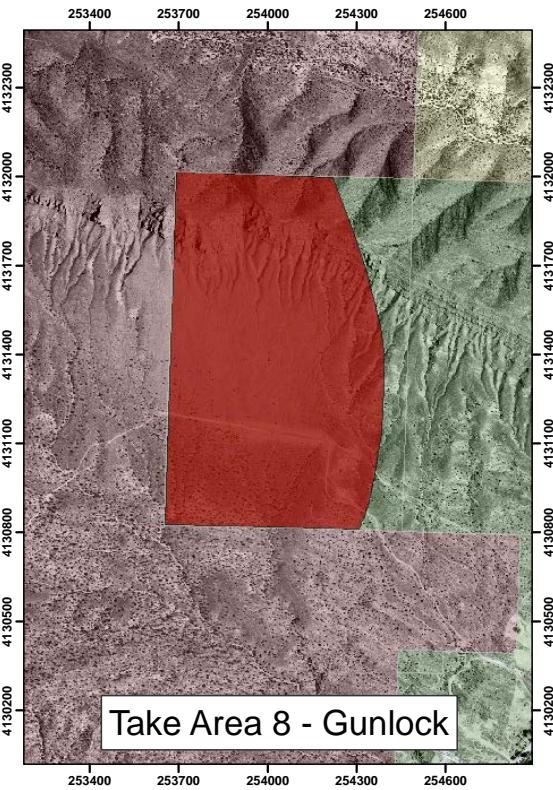
- b. Each successive pass must be conducted during different desert tortoise activity periods (morning v. afternoon).
- c. A minimum of two complete passes will be conducted on all take areas.
- d. Additional passes will be completed until at least one of the passes results in a "Zero" pass, a pass where no live tortoises greater than 180 mm in midline carapace length (MCL) are found.
- e. All tortoises encountered on take areas during clearances will be removed to the Washington County Temporary Holding Facility and held in isolation pending disease testing.

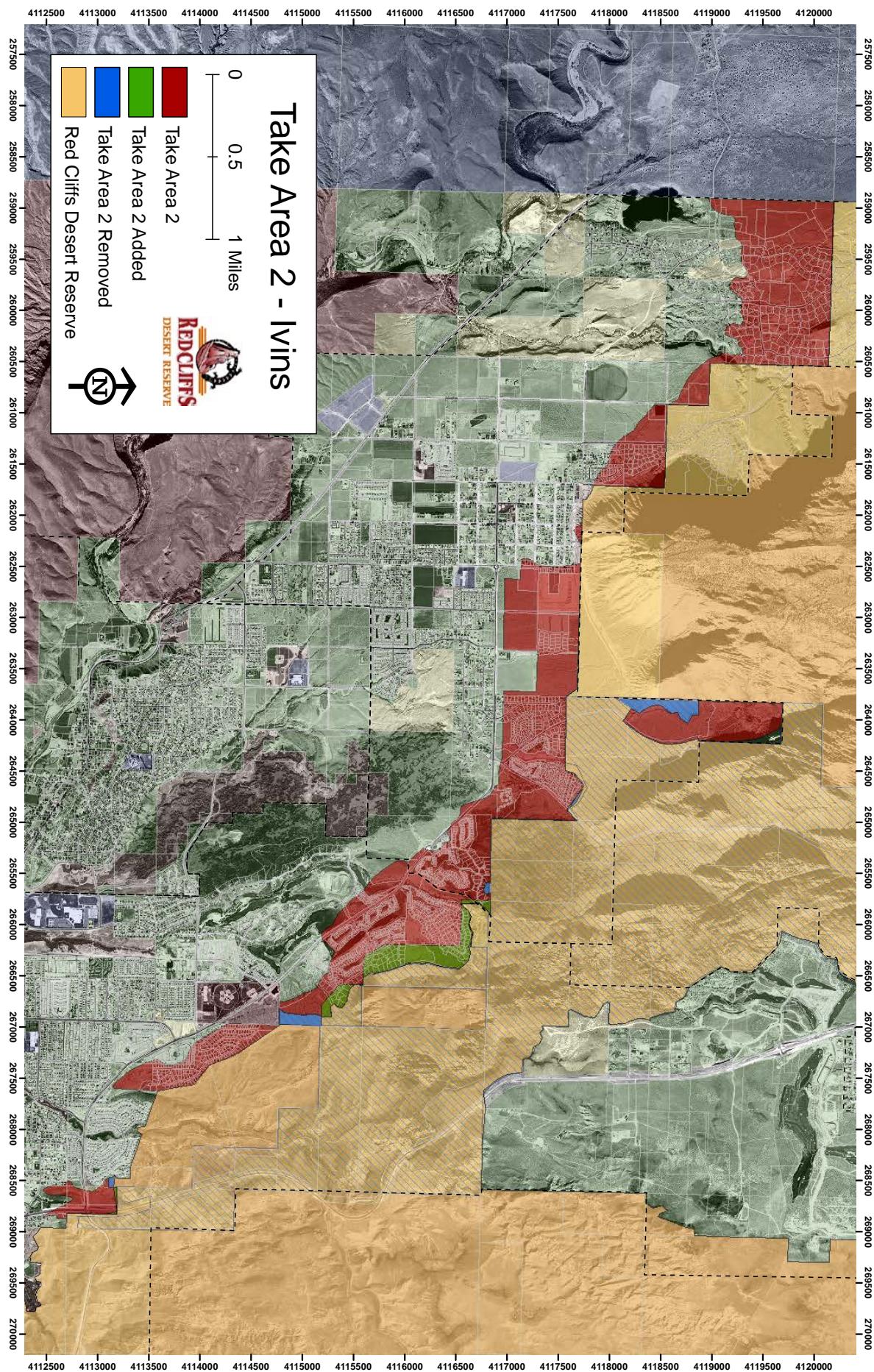


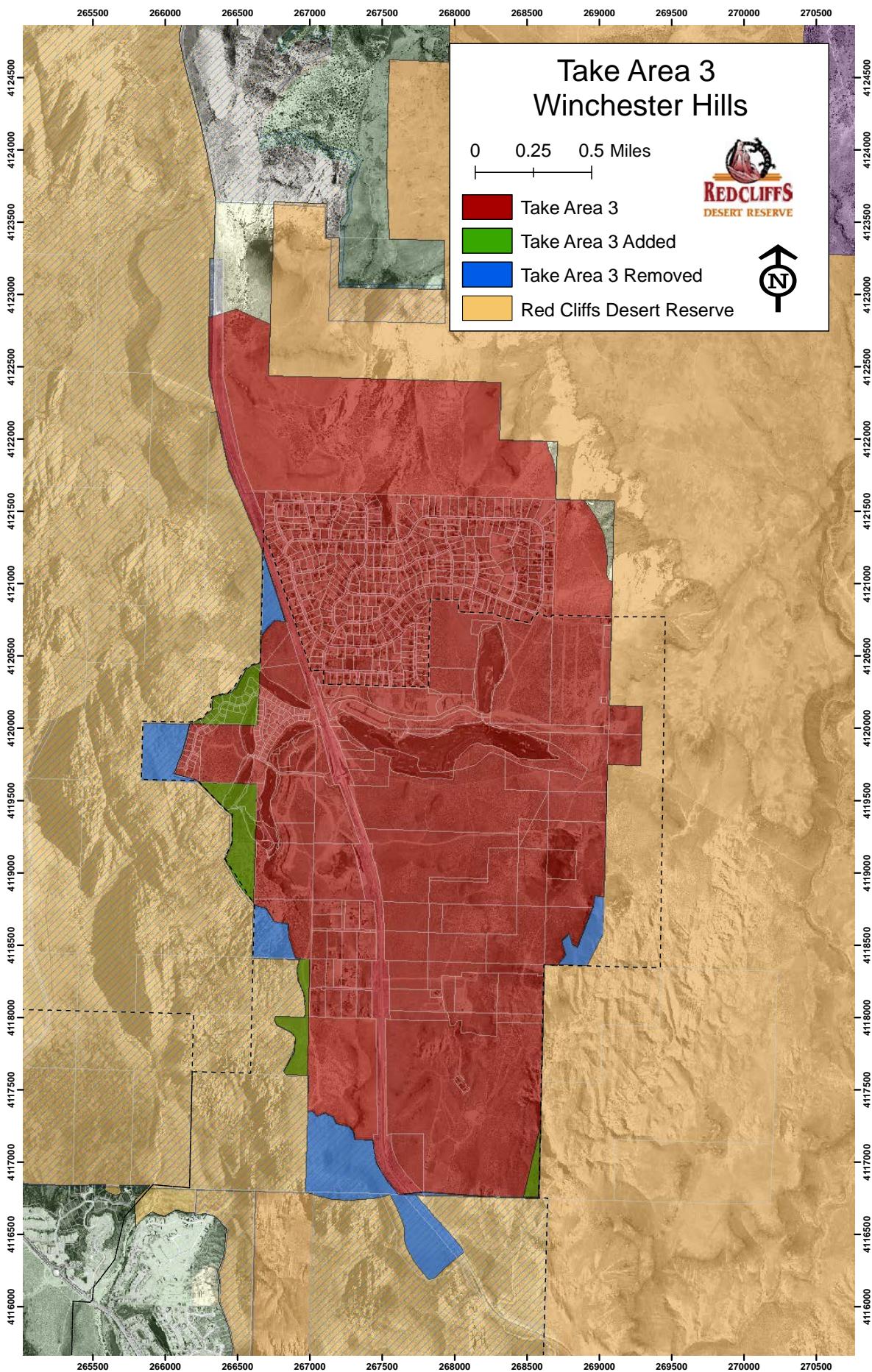
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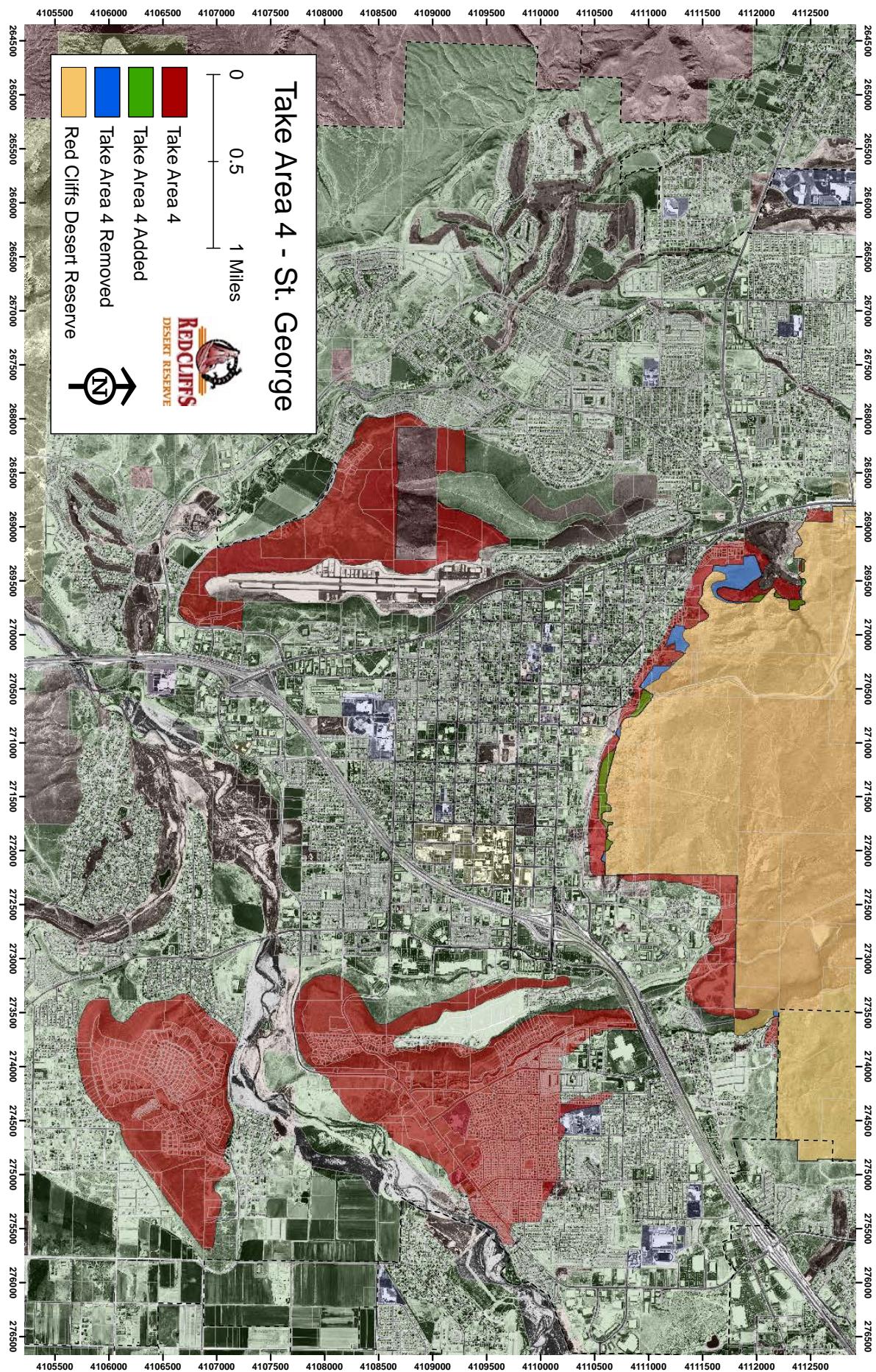


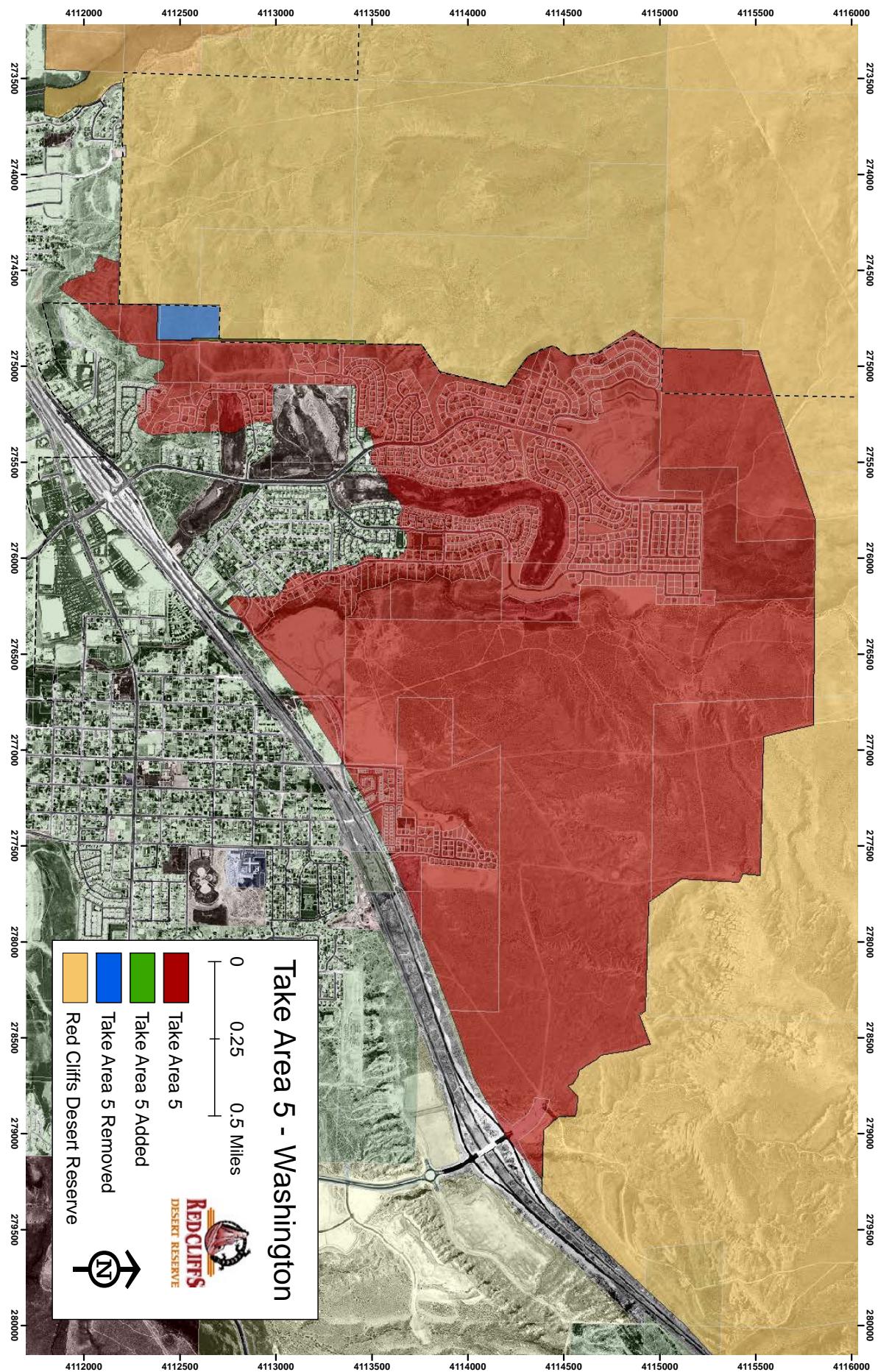
Take Areas 1 & 8 - 10

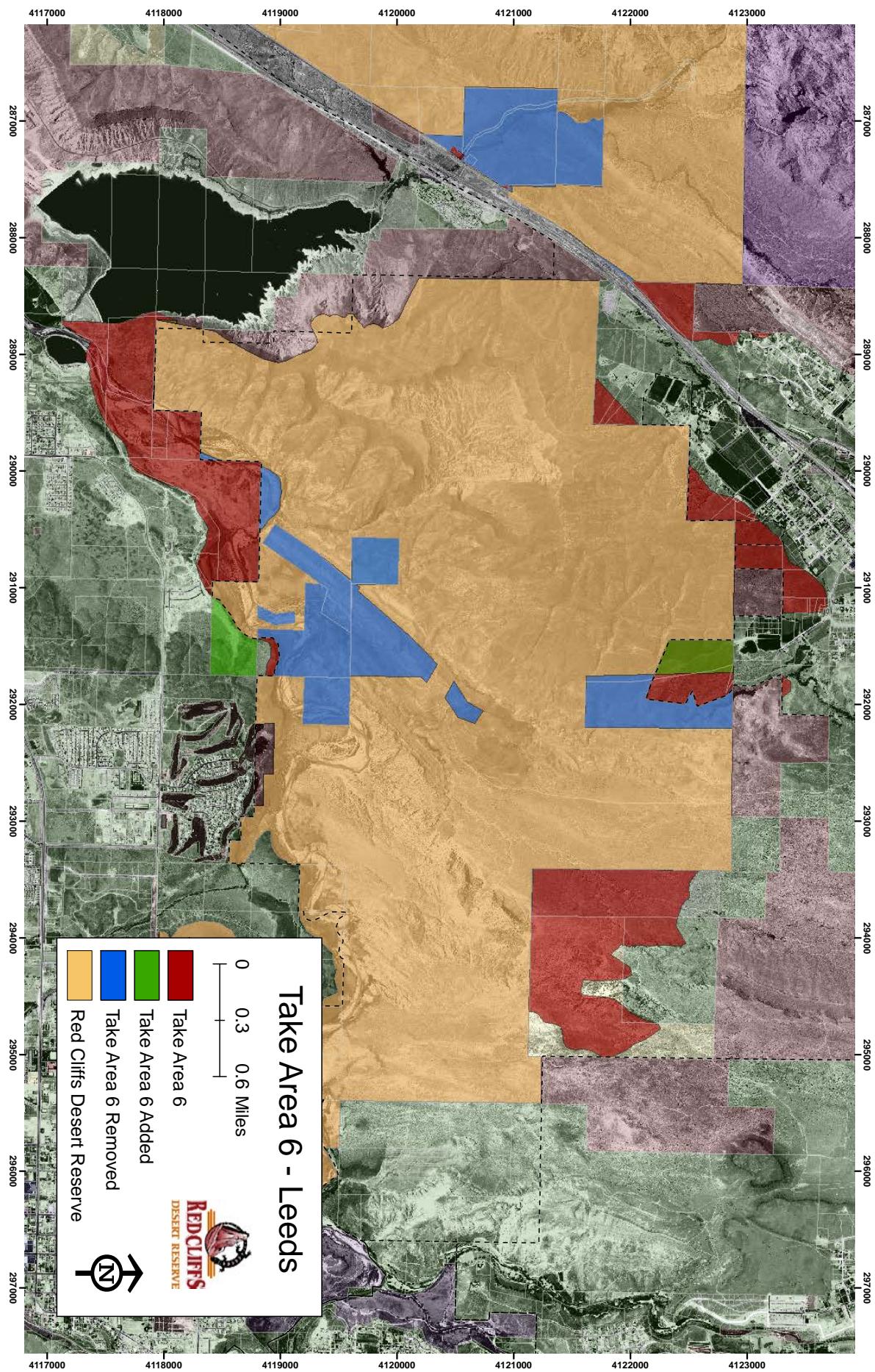


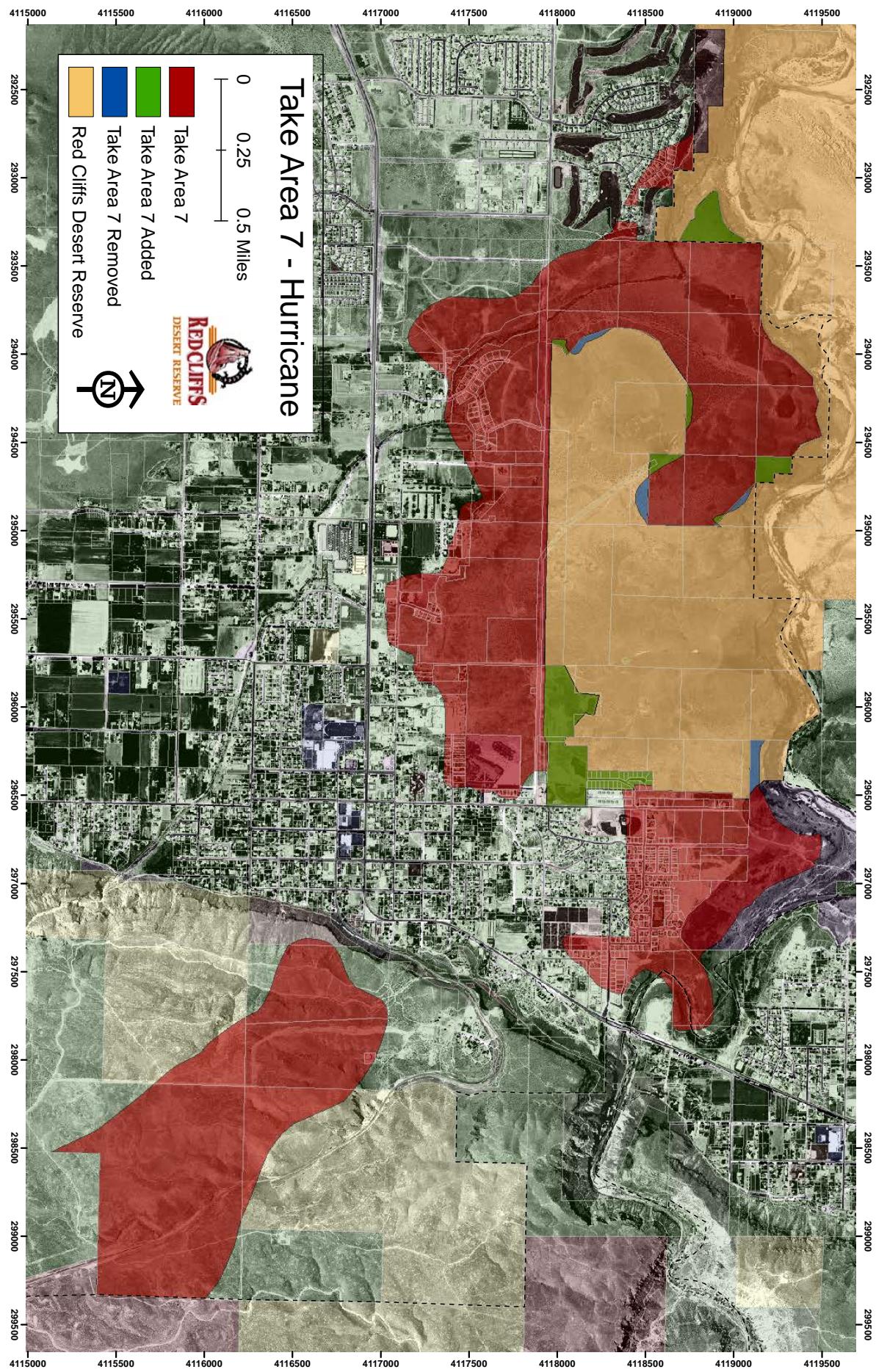




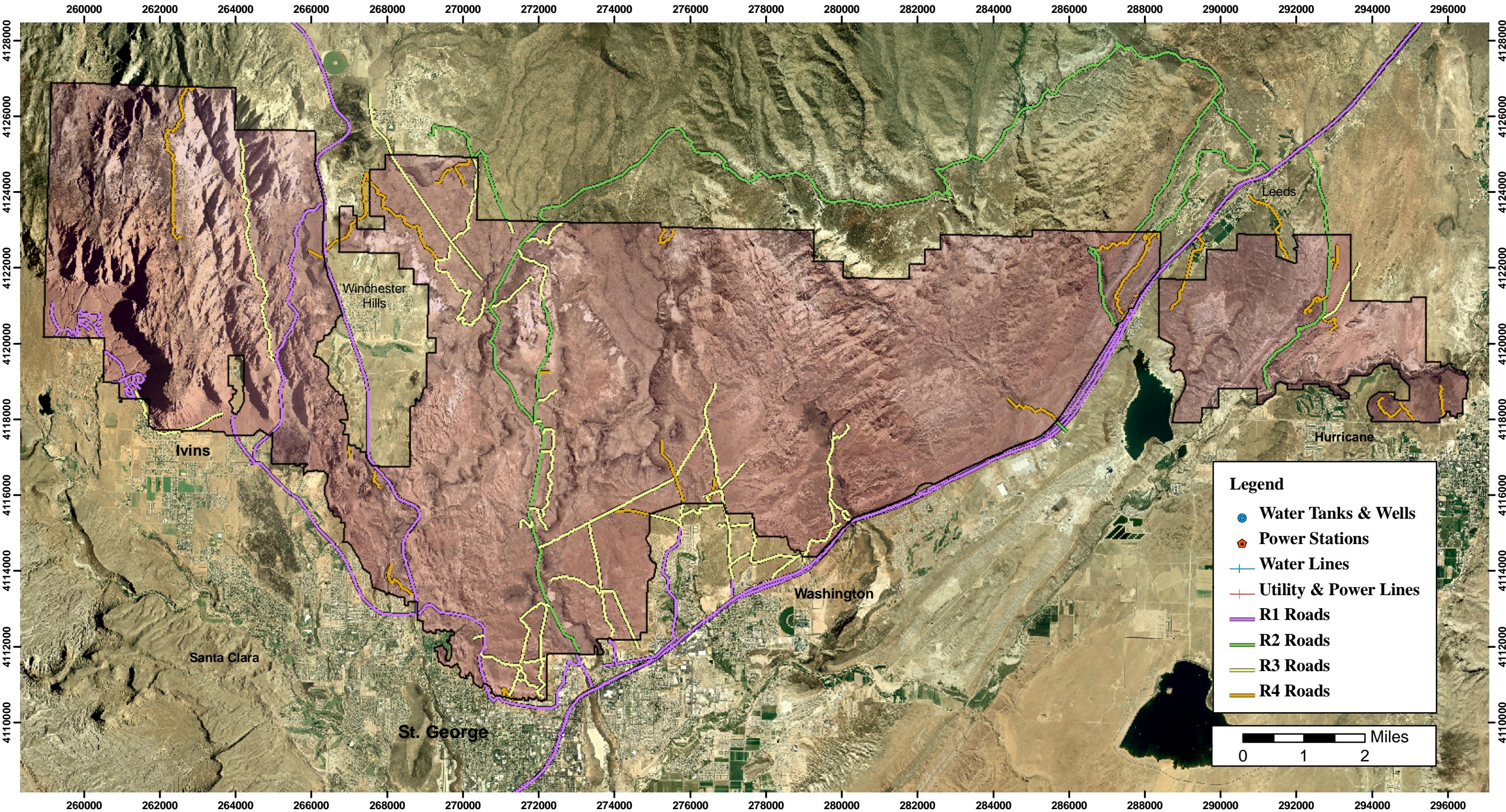
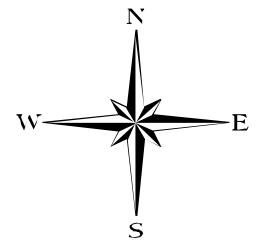








UTILITY CORRIDORS & ACCESS ROADS IN THE RED CLIFFS DESERT RESERVE



APPENDIX B

Public Use Plan

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Red Cliffs Desert Reserve



**Public Use Plan
Approved by the
Washington County
Commission
June 12, 2000**

**Washington County HCP Administration
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Acknowledgments

The creation of this plan would not have been possible without the assistance of the numerous individuals whose commitment, integrity and patience made the process work.

Although it is impossible to thank each and every person who contributed to this plan, Washington County would like to express deep gratitude to the following:

The general public, too numerous to list;

The climbing community, the Back Country Horsemen of Washington County, the Outback Club, the mountain bike community, and all of the individual recreationists who worked so hard to identify trails and to help the team to develop defensible proposals for uses within the Reserve;

The OHV community, for their cooperation;

The Public Use Planning Team, who gave so much time and so much of themselves;

Amber Cook, BLM GIS technician;

The BLM, Utah Division of Wildlife Resources, USGS Biological Survey, and the U.S. Fish and Wildlife Service who placed trust in a collaborative public process and the HCP County Administration to facilitate the development of a quality plan; and

The HCAC for their oversight and guidance.

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Part I: Introduction

The Red Cliffs Desert Reserve

What is the Red Cliffs Desert Reserve?

The Red Cliffs Desert Reserve (RCDR) is a 61,000-acre scenic desert area largely north of St. George, Utah dedicated to the protection of the threatened Mojave desert tortoise and other rare or sensitive species of wildlife. The Reserve contains the blending of, and transition between, three ecosystems in the western United States: the Mojave Desert, the Great Basin Desert, and the Colorado Plateau. This merging of ecosystems, often referred to as an "ecotone", has representative life forms from each contributing region. For example, it contains the northernmost populations known in the U.S. for Gila monsters, sidewinder rattlesnakes, and chuckwallas—reptiles typically associated with hotter and more southerly deserts like the Mojave. However, a significant portion of the shrubs in this area, such as blackbrush, are more commonly associated with the Great Basin Desert, which spans all of west central and northern Utah. The Reserve also includes a five-mile stretch of the Virgin River and its accompanying riparian habitat.

The Reserve benefits not only tortoises and a unique array of animals and plants seldom seen in one place, but also provides opportunities for assorted recreational users. Within the Reserve there are over 130 miles of multi-use trails for hiking, horseback riding and mountain biking. Hunting is allowed during prescribed seasons, and improved roads with the Reserve—including the Cottonwood-Danish Ranch Road and the Babylon Road—offer scenic vistas for motorized travel.

The Reserve includes a mix of private, state, municipal, and public lands. State lands include land managed by Snow Canyon State Park and the State Institutional Trust Lands Administration

**What is the Red Cliffs
Desert Reserve?,
continued...**

(SITLA). Public lands are administered by the Bureau of Land Management (BLM). Non-federal lands, except for lands within Snow Canyon State Park, will be acquired by BLM where agreements have been reached with willing land owners. All areas of the Reserve will be managed collaboratively by a consortium of managers, principally Washington County, BLM, and State of Utah Division of Parks and Recreation.

The Red Cliffs Desert Reserve is the largest HCP in Utah and the largest administered by a county in the western United States.

**What is a Habitat Conservation Plan and
Incidental Take Permit?**

"HCP" is the acronym used to refer to a species conservation tool known as a "habitat conservation plan". A provision in the Endangered Species Act allows for an entity to be granted a permit for "incidental take" of a listed species if an HCP is prepared and approved. An HCP will typically address the needs of a species at the habitat level; a typical HCP establishes or contributes to an area of protected habitat large enough to fulfill the anticipated needs of the affected species. Measures in an HCP will also seek to minimize and mitigate impacts to the species of concern.

Incidental take permits are required when non-federal activities (e.g. local growth and development) will result in "take" of threatened or endangered species. To "take" means to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct. The term "harm" is further defined to include acts that may result in significant habitat modification or degradation where it actually kills or injures wildlife by significantly impairing essential behavioral patterns, including breeding, feeding, or sheltering.

What is a Habitat Conservation Plan and Incidental Take Permit?, continued...

The Washington County Habitat Conservation Plan was the result of the USFWS listing the desert tortoise as a threatened species in April of 1990 and identifying its associated critical habitat needs across Washington County.

History of the Washington County HCP

On April 2, 1990, the Mojave population of the desert tortoise was listed as threatened under the Endangered Species Act. Primary reasons for listing this population included deterioration and loss of habitat, collection for pets or other purposes, elevated levels of predation, loss of desert tortoises from disease, and the inadequacy of existing regulatory mechanisms to protect desert tortoises and their habitat.

In February, 1994, the U.S. Fish and Wildlife Service designated 129,100 acres of critical habitat for desert tortoise in Washington County; 89,400 acres managed by BLM, 27,600 acres of state land, 1,600 acres of Indian Tribal land, and 10,500 acres of private land. Critical habitat is defined as areas that contain the primary constituent elements necessary for recovery and subsequent removal from the list of federally threatened or endangered species.

Following the tortoise's designation as a threatened species, it became obvious that much of the rapid development around St. George and several other Washington County towns was occurring in occupied desert tortoise habitat, and that tortoises were being "taken" as defined by the Endangered Species Act. As a service to its residential and business communities, Washington County officials sought an incidental take permit. Following years of difficult negotiations, the U.S. Fish and Wildlife Service issued Washington County an incidental take permit in March, 1996 authorizing take of an estimated 1,169 tortoises associated with development of 12,264 acres of desert tortoise habitat on private land outside of the Reserve.

History of the Washington County HCP, continued...

One requirement for issuance of an incidental take permit is the submission of a plan, often referred to as a Habitat Conservation Plan or HCP, which specifies the impact which will likely result from the taking, what steps the applicant will take to minimize and mitigate the impacts, how these actions will be funded, and possible alternatives to the taking. The HCP is the document which outlines how the applicant (Washington County) will mitigate the impacts permitted under its incidental take permit.

The plan itself was formally approved and signed by Washington County, BLM, USFWS, Utah Department of Natural Resources and the City of Ivins in February of 1996. The goal of the HCP is to provide a mechanism to allow orderly growth and development in Washington County without further jeopardizing the status of Federally listed or candidate species, focusing on protection of the desert tortoise. The HCP has four objectives:

- Provide adequate protection for desert tortoises by implementing aspects of the Desert Tortoise Recovery Plan through the creation and management of the Red Cliffs Desert Reserve;
- Provide protection for other listed and candidate species and their habitats;
- Meet the growth and development needs of the County; and
- Create a framework within the County to deal with current and future listed species.

Underlying these objectives are three guiding principles intended to influence conservation actions in the Reserve: preservation of existing ecological values; preservation of existing biodiversity; and reliance on preservation. Ecological values include native species, the desert vegetation that provides food and cover for these species, and the relatively

History of the Washington County HCP, continued...

undisturbed landscape that provides a dramatic scenic backdrop for the area. Biodiversity is clearly reflected in the multitude of species that make the Reserve their home. Diversity is related to ecological stability. Reliance on preservation, to the extent possible, is considered preferable to attempting to recreate these conditions after disturbance. However, restoration and enhancement of ecological conditions will be needed in areas of the Reserve which have been heavily impacted by grazing, roads, off-road vehicle use, and other disturbances.

The central element and primary mitigation measure in Washington County's HCP is the establishment and management of the Red Cliffs Desert Reserve, a 61,000-acre reserve, approximately 38,000 acres of which is occupied desert tortoise habitat. The Bureau of Land Management and Utah State Parks and Recreation, through cash purchases and exchanges, were charged with acquiring 18,600 acres of private or state land for the Reserve, of which 4,300 acres have been acquired to date. Washington County is charged with joint management responsibility and has expended significant resources fencing the Reserve to prevent unauthorized activities, acquiring and retiring grazing permits, funding law enforcement and monitoring activities, and providing information and education to local entities. Many historical uses, such as off-road vehicle use, mining, and grazing, have been significantly reduced or eliminated throughout the Reserve in order to offset impacts to tortoises and tortoise habitat elsewhere.

Without the need to protect tortoise habitat in Washington County, roughly 18,600 privately-owned acres within what is now the RCDR would never have been brought into public ownership, and would presumably have been developed as housing subdivisions and commercial areas. For example, Paradise Canyon which was formerly privately owned and was recently acquired by the BLM, was

History of the Washington County HCP, continued...

originally slated to be developed as a golf course community. This canyon has overstory riparian habitat and dense populations of tortoise. It is also a popular area for recreationists.

Although the Reserve has been established, serious threats to the tortoise population remain, including habitat deterioration, collection, elevated predation levels (including purposeful and accidental killing of tortoises), disease, and unlimited human access. Recreational access, if not properly managed, has the opportunity to degrade critical tortoise habitat or directly contribute to mortality and lowered reproductive rates. (see Appendix D).

Why A Plan For Public Use?

The purpose of the Red Cliffs Desert Reserve Public Use Plan is to refine management prescriptions for recreation and other public uses compatible with habitat preservation within the Reserve. Although the Washington County Habitat Conservation Plan (HCP) provides general parameters for recreation within, and management of, the Reserve, it does not provide specific trail designation, access points, or prescriptions for the Reserve. Therefore, the Public Use Planning Team, designated by Washington County, was formed to develop specific recreational and management prescriptions while still working within the parameters and requirements of the HCP. The development of the Public Use Plan—an activity-level management plan—is anticipated by the HCP and is required by the BLM to provide specific prescriptions for management of public lands within the Reserve.

The Team Process

In August 1998, the Washington County Commission approved a proposal to complete the Red Cliffs Desert Reserve Public Use Plan using a broad-based collaborative team process. Nominations for team membership were solicited

**The Team Process,
continued...**

from stakeholders and the general public. Following the closure of nominations, the Commission appointed a nine-member team which represented diverse interests. Their initial meeting was on October 28, 1998. The team members included:

Glenn Ames, Red Rock Bicycle
Rick Arial, Congressman Jim Hansen
Tim Duck, St. George BLM Field Office
Rick Fridell, Utah Division of Wildlife Resources
G. Scott Hansen, Outback Club
Scott Hirschi, Washington County Economic Development Council
John Ibach, Snow Canyon State Park
Bob Nicholson, St. George City Community Development Director
John Rex, Backcountry Horsemen of Washington County
Lori Rose, Facilitator
Chrissy Stauffer, Plan Writer
Bill Mader, HCP Administrator

Throughout the planning process, members of the public and agency representatives attended planning meetings to provide the team with input.

The plan's ultimate goal is to protect the resources necessary to ensure the long-term survival of the desert tortoise while providing recreational opportunities as provided in the HCP. When designating trails in the Reserve, the team adopted guidelines for preferred routes. Consideration was given to designating trails that would provide: east/west, north/south access between different areas; perimeter trails that avoided critical "core" habitat areas; rim trails or upland trails which also avoided critical tortoise habitat; and trails along existing roads to mitigate further impact. Also, existing utility corridors, such as those in Mill Creek and Paradise Canyon, were utilized to minimize impacts.

In order to prevent the arbitrary consideration of

The Team Process, continued...

some uses over other uses, the planning team thought it necessary to develop a standardized approach for every use proposed within the Reserve. Therefore, a process was devised to systematically evaluate existing and proposed uses. The planning team identified six specific checkpoints through which all recreational uses, either existing or proposed, were filtered. Using systematic checks and balances strongly reduced the possibility of reaching decisions based purely on emotional or arbitrary value. Protecting habitat for the desert tortoise and other species of special concern was paramount when developing the systematic process.

The checkpoints designated by the RCDR Planning Team included:

- recognize the restrictions and goals of the Habitat Conservation Plan (HCP);
- develop a range of alternatives based on HCP parameters with supporting evidence and logic;
- designate a preferred alternative for each recreational use in the reserve; based on the evidence and logic;
- develop management prescriptions for the preferred alternatives;
- identify support needs (i.e. signage, staging areas, trailheads, etc.); and
- utilize scientific monitoring to ensure the continued protection of critical habitat in the reserve.

The Public Process

From its inception, the Red Cliffs Desert Reserve Public Use Planning Process was, and continues to be by way of adaptive management, a collaborative

**The Public Process,
continued...**

and dynamic effort involving community, city, county, state and federal entities. Community consideration and participation was a crucial component in the planning team's decision-making process.

The planning team met monthly for over a year, from October 1998 to January 2000. Public involvement was encouraged by: publishing notices of team meetings in the newspaper; holding meetings with user groups; numerous news articles; holding three open houses; and staffing a booth at the County fair. These efforts shared information on the purpose of the Plan, the Reserve's location, history and objectives, and provided opportunities for comments and input.

During the public comment period on the first draft, August 24-October 1, 1999, the County aggressively publicized the plan to generate public discussion and comment. The plan was featured during an hour-long talk radio segment, and highlights of the plan and the fact that public input was being sought were the subject of front page newspaper articles and a guest column by the Reserve Administrator. Copies of the draft plan were given to local recreation retailers (Hurst Ben Franklin, Outdoor Outlet, Dixie Gun and Fish, A.A. Callisters, and IFA) for review and display. In addition, presentations were made to the following groups:

Kiwanis Club
Exchange Club
Backcountry Horsemen of Washington County
Rock Climbing community
Audubon Society
Hurricane City Council
Leeds City Council
St. George Planning Commission
St. George City Council
Washington City Council
American Society of Civil Engineers

The Public Process, continued...

Thirty-nine (39) written comments were received on the draft plan prior to the Planning Team's October 21, 1999 meeting to consider public comment and to revise the plan appropriately. After revisions, the draft was again publicly advertised and circulated, and written comment was received from March 14-April 14, 2000. The Habitat Conservation Advisory Committee (HCAC) held a public hearing on March 28, 2000 which was attended by over 50 people. Following up on public comments, the HCP Administration met with concerned individuals and user groups to work through remaining issues. The HCAC then made final revisions to the draft and recommended its adoption to the County Commission on May 23, 2000.

Reserve Management into the Future

The Red Cliffs Desert Reserve Public Use Plan is designed to be flexible and subject to revision through adaptive management. After management prescriptions are implemented, monitoring will ensure the success of habitat management by evaluating and updating prescriptions when necessary to continue to meet conservation goals. If the Plan fails to meet conservation goals, the County, BLM and Reserve administrators will assess and refine management prescriptions using adaptive management provisions on page 17.

Plan Parameters

Creation of the Public Use Plan required consideration of other related plans. These plans included the Desert Tortoise Recovery Plan (1994), BLM's St. George (formerly *Dixie*) Resource Management Plan (1998), the Washington County General Plan (1997), the Coordination Plan for Washington County's Urbanizing Region (1997), and the Virgin River Management Plan (1999). The HCP (1996) was especially important because it provided the guiding principles for management prescriptions that would ensure the continued protection of threatened or endangered species and habitat for all species found within the 61,000-acre Reserve.

Part II: Plan Administration

Interagency Cooperation

Reserve Managers

The Red Cliffs Desert Reserve is managed as a collaborative partnership between Washington County, the Bureau of Land Management, Utah Division of Parks and Recreation, Utah Division of Wildlife Resources, participating municipalities, and those landowners with private holdings within the Reserve. This structure exists both out of necessity because the area within the Reserve is owned by multiple entities and because it creates a beneficial sharing of responsibilities and resources. References to "Reserve managers" found in this plan generally refer to this partnership, though primary responsibility for specific actions may be assigned to or otherwise understood to be held by a particular agency or landowner.

For those public lands within the Reserve managed by BLM, the BLM will work collaboratively with the local, state, and federal HCP partners to accomplish the goals and the objectives of the HCP.

Implementation of the Plan

Implementation of the plan will be the joint responsibility of Washington County and BLM working with the cooperation and assistance of other local, state, and federal HCP partners. In implementing the Public Use Plan, Washington County and the BLM intend to focus their resources on highest-priority issues such as immediate habitat protection enforcement.

Interim Management

Until such time as the BLM issues a Record of Decision for the RCDR Public Use Plan, Washington County and the BLM will continue to manage the lands in the Reserve in a manner compatible with existing plans (HCP, BLM Resource Management Plan and Virgin River Management Plan).

Enforcement of Management Prescriptions

Public support for the Reserve is noticeably increasing, and the long-term success of the Reserve relies on community pride and a growing sense of responsibility for protecting tortoises and the open space they use.

It follows that reasonable approaches to law enforcement matters should be taken which will continue to build cooperation and good will between Reserve managers and the public. To this end, any enforcement approach will start with education. Users found to be in violation of prescriptions, for example traveling off of designated trails where it is prohibited, will be informed of the regulation and advised to stay on the trail. It is anticipated that user groups or individuals who are frequently in the Reserve could be recruited as volunteers to help extend the reach of the education program. However, appropriate law enforcement action, including citation and prosecution, will be taken in cases where groups or individuals are: 1) willfully or carelessly destroying or degrading natural resources or habitat; 2) harassing or harming protected wildlife within the Reserve; and 3) in repeated violation of Reserve regulations.

Land Ownership and the Applicability of This Plan

At the time that this plan was written, land ownership within the current boundaries of the Reserve consisted of a mix of interests, including private property owners. Also, the exact boundaries of the Reserve remain somewhat dynamic, within the limits imposed by the HCP.

The plan is intended to apply only to property currently owned *or later acquired* by the Bureau of Land Management, State of Utah Division of Parks and Recreation, Washington County, or other properties for which access agreements have been negotiated within the boundaries of the Reserve. Use of all other property within the boundaries of the Reserve requires compliance with generally applicable law, including, where applicable,

Land Ownership and the Applicability of This Plan, continued...

permission from the landowner. This plan is not intended to imply that permission has been granted for use of any property not owned by the Bureau of Land Management or State of Utah Division of Parks and Recreation.

As additional properties are acquired and added to the Reserve, land use prescriptions called for in the HCP, as supplemented by this Public Use Plan, will be applied consistent with prescriptions for similar, adjacent lands. Final determinations will be made by the applicable Reserve managers.

Like the HCP, the Public Use Plan will have no legal effect on private property and the PUP will place no restrictions on private land use within the Reserve.

Adaptive Management

This section describes the manner by which this plan could be modified in the future. While the plan is intended to comprehensively address human activities within the RCDR, it acknowledges that management needs and practices might change over time. New information will become available, regulations or policies evolve, and other changes occur that make some flexibility necessary if this plan is to continue to be a workable, "living" document.

In order for this plan to be most effective it must be proactive, not reactive, and rely on objective scientific information. To this end, adaptive management and monitoring are interdependent. The adaptive management protocol will be used to refine management prescriptions in response to information revealed through monitoring and other sources. The monitoring program will seek to evaluate direct and indirect impacts to tortoises and their habitat that result from permitted recreational uses inside of the Reserve.

The Adaptive Management protocol is included in the plan as a structured way to allow continual

Adaptive Management, continued...

refinement of the plan, within bounds, and when and where it is appropriate. The protocol establishes the criteria that will direct future plan adaptations.

Adaptive Management Protocol: Three Paths

There are three paths that can be followed to make changes to this plan:

1 Formal Amendment: A plan amendment would be used to change goals or objectives or to address issues that cannot be addressed appropriately under this current plan. Under this process BLM would prepare documentation in compliance with the National Environmental Policy Act (NEPA). Consultation would occur with the Fish and Wildlife Service under Section 7 of the Endangered Species Act (ESA). The NEPA process provides for public participation.

2 Adaptive Management: Under this process Reserve managers would administratively determine that the proposed change would occur using the criteria and process described below.

3 Emergency Measure: Reserve managers could, in cooperation and consultation with the Washington County HCP Administrator, modify management prescriptions on an emergency basis in order to prevent significant or irreversible damage to the Reserve without prior consultation with, or approval from, the HCAC. As soon as practical, any emergency action would be reviewed using Path #1 or #2.

Path #2, Adaptive Management, is the preferred method for making changes. Path #3, Emergency Measures, is an option available only in emergency situations, and requires follow-up review. Path #1, Formal Amendment, is to be used only when it is

**Adaptive Management,
continued...**

deemed inappropriate to use the Adaptive Management Path.

Criteria for Adaptive Management Path

Reserve Managers may use the preferred method, Adaptive Management, when all of the following criteria are met:

- the Habitat Conservation Advisory Committee (HCAC) has recommended the change;
- there will not be an increase in the amount or level of authorized "take" of any federally listed species and no adverse modification of critical habitat;
- there will not be a significant impact to other resources;
- the change is consistent with the goals and objectives of the HCP, applicable land use plans, and the goals and objectives of the Public Use Plan;
- the change is based upon the best available information; and
- the change is in accordance with all applicable ordinances, laws, and regulations.

Each criterion is examined more closely to provide clear guidance on the process:

Criterion: The HCAC has recommended the change.

Under normal circumstances, the HCAC would recommend adaptations to the plan after consulting with local residents, the Technical Committee (TC), experts on the subject, BLM, and the Fish and Wildlife Service. The County Commission would need to formally approve the HCAC recommendation.

Criteria for Adaptive Management Path, continued...

Criterion: There will not be an increase in the amount or level of authorized "take" of any federally-listed species and no adverse modification of critical habitat. "Take" is defined by the ESA as hunting, wounding, shooting, killing, harming, capturing, collecting, harassing a species, or attempting to engage in any of these activities against a species listed by the Fish and Wildlife Service as threatened or endangered. Take is prohibited by Section 9 of the ESA, unless a permit has been issued by the Fish and Wildlife Service. No take is currently authorized within the RCDR, though it is anticipated that with the issuance of a Biological Opinion on this use plan by the Fish and Wildlife Service, a small amount of incidental take may be authorized.

Criterion: There will not be a significant impact to other resources. In addition to federally-listed species, there are a number of species existing within the Reserve considered by the State of Utah to be sensitive. (A complete listing of species of concern can be found in the HCP document.) There are also important watershed, viewshed, and ecosystem resources within the RCDR that need to be protected. Additionally, there is a variety of human uses, also considered resources, ranging from utility development and flood control to recreation that must be considered when making decisions.

Examples of "significant impacts" which would not qualify for Adaptive Management:

- Elimination of a population of plants or animals, or the reduction in a species population or habitat below the point of viability.
- Drastic reductions to human activities that are allowed under the Public Use Plan (e.g. a prohibition of all mountain biking).

Criteria for Adaptive Management Path, continued...

- Creation of a situation where the goals and objectives of the HCP are unattainable or that results in a financial burden for the Reserve managers that is unsustainable.

Criterion: The change is consistent with the goals and objectives of the HCP, applicable land use plans, and the goals and objectives of the Public Use Plan. The goals and objectives of the HCP are defined on page 9 of the Washington County, Utah, Desert Tortoise Incidental Take Permit Application and are reiterated here:

- Provide adequate protection for desert tortoises by implementing aspects of the Desert Tortoise Recovery Plan through the creation and management of the RCDR
- Provide protection for other listed and candidate species and their habitats
- Meet the growth and development needs of the county
- Create a framework to address current and future listed species

Criterion: The change is based upon the best available information. In addition to the Desert Tortoise Recovery Plan, there are other studies and articles that provide important information across a wide range of topics including: geology, ecology, and human use. Adaptations to the Public Use Plan will be evaluated in light of this information, and new information as it becomes available. Decisions must be consistent with the best available information. There must be a correlation between the proposed change and desired result, as well as an indication that the change will not violate the goals and objectives of the HCP.

Criteria for Adaptive Management Path, continued...

Criterion: The change is in accordance with all applicable ordinances, laws, and regulations.

Adaptations of Reserve management must include a review of the proposed change in regard to all applicable ordinances and laws. For example, it would be inappropriate to authorize the discharge of firearms within an area of the Reserve where a city ordinance prohibits such a discharge.

Process to Propose Changes to the Plan

A proposal to modify the Public Use Plan could originate from a variety of sources. An agency may discover that unacceptable impacts are occurring, a user group may make a proposal for additional access, or a new law may be passed that requires a management response that may not be authorized in the Plan. The Plan may be silent on certain activities proposed in the future and management prescriptions will need to be developed to ensure that those activities are acceptable in light of the Plan objectives and decisions.

For all but emergency actions, the proposal would be reviewed first by the HCAC. The HCAC has the option of assigning technical review of the proposal to the Technical Committee. The Fish and Wildlife Service, Utah Division of Wildlife Resources (UDWR), BLM, and private citizens have representation on the HCAC. Following its review, the HCAC would recommend to the County Commission either that the plan/management strategies be modified, and to what extent, or that the plan/strategies remain unchanged. The HCAC would recommend the "path" to be used to make any proposed changes.

The choice of path #1 would lead to a formal amendment of this Plan that is consistent with the HCP and the County's incidental take permit. The choice of Path #2, Adaptive Management, could lead to modification in management prescriptions but would not rise to the level of a formal amendment. In either case, BLM and the County

**Process to Propose
Changes to the Plan,
continued...**

would cooperate to encourage public participation in the process.

Where public lands are involved, BLM would document the adaptation to the Plan through a decision record or determination of NEPA adequacy which would then be incorporated into the HCAC minutes at the next opportunity. Once a proposal is adopted, Reserve managers and Washington County would cooperate to implement the proposal, including an information and education program where necessary.

Following emergency actions, the HCP administrator and affected Reserve managers shall present a summary of the action to the HCAC for review. The HCAC shall determine whether the action taken: 1) was supported by the current plan, 2) was not justifiable and requires mitigation, 3) meets the criteria for adaptive management, or 4) was necessary due to a situation that requires a significant modification to the plan by formal amendment. Where public lands are involved, federal law and regulations require BLM to coordinate with the Fish and Wildlife Service.

Reserve Monitoring

The Red Cliffs Desert Reserve is a unique and scenic ecosystem dependent on interrelationships between soils, plants, animals, people and water. Human activities can affect key attributes within such a system including its functional ability (energy and nutrient cycles) as well as its structure and ultimately its composition and diversity of organisms. Significant human impacts can not only impact sensitive animals and plants but also negatively impact the quality of recreational opportunities by the simple fact that people want to see wildlife and plants in natural settings untarnished by human disturbance.

The degree of human impact can be dependent on a number of ecosystem factors including its

Reserve Monitoring, continued...

elevation, volume of rainfall, latitude, and timing of impact (Hammitt and Cole 1998). Most everyone would agree that monitoring the "health" of such a system is a prudent initiative especially when threatened and sensitive species are involved. For example, Clark et. al's (1994) book *Endangered Species Recovery, Finding the Lessons, Improving the Process* makes it clear that ongoing monitoring of not just target species but their environment is highly desirable. They make the point that such programs can best be accomplished through partnerships that minimize bureaucracy. The County has funded the Utah Division of Wildlife Resources in their efforts to establish a systematic, scientific monitoring program for tortoises inside the Reserve. In its fourth year, this program will help determine whether tortoise populations are stable, declining or increasing. Although highly important, this monitoring provides only one dimension of a needed two-dimensional approach. Monitoring must also assess the condition of the habitat in question and preferably source causes of change. Not surprisingly, the National Research Council (1995) in their book *Science and the Endangered Species Act* came to the same conclusion.

To monitor human impacts on an ecosystem such as the Reserve, the big challenge comes in determining: (A) the precise goal and objectives of the monitoring, (B) how it will be done, (C) how it will be funded, and (D) defining a mechanism to facilitate adaptive management decisions pertaining to recreation. This type of monitoring is distinct from monitoring tortoise populations and in effect targets a different series of questions more concerned with the broad "health" of the system at hand. In the last decade or so, monitoring of human recreational impacts has started to evolve into its own discipline. Recently entire books have been written on the subject including Hammitt and Cole's *Wildland Recreation* (1998) and *Wildlife and Recreationists* by Knight and Gutzwiller (1995).

**Reserve Monitoring,
continued...**

Members of the Technical Committee and the Public Use Planning Team have recognized and recommended that a human impact monitoring plan be launched after careful analysis and design that both quantifies and documents human impacts in the Reserve. In terms of design, it is recognized that the project should not be taken lightly because not all such monitoring programs have worked in the past. Classic mistakes include quantifying either the wrong targets or simply quantifying too much beyond what is actually necessary. Furthermore, past evaluations of conservation threats, including those that attempted to measure human impacts, have not always been cost effective and some have had inconclusive results, raising the question of whether the whole exercise was worth the effort (Salafsky and Margoluis, 1999).

Although Washington County's initiative to start monitoring is hampered by the fact that the 20-year HCP budget sets aside no funds for this activity, Washington County, UDNR, and BLM will lead efforts to obtain outside funding. The Habitat Conservation Advisory Committee (HCAC) may also choose to propose an amendment to the HCP budget, subject to County approval, which would transfer existing funds to this new line item.

The goal of the monitoring plan will be to quantify recreational impacts, how such impacts change over time and limits of change thought acceptable. If possible, their relationship to populations of certain species will also be ascertained. The goal will require a scientific design that samples biological and physical resources in the Reserve, most principally vegetation, soil, and possibly selected vertebrates that could be used as indicator species. The variety and amount of human use and how these uses change over time will also need to be documented. Baseline documentation will be compiled utilizing Reserve-wide, up-to-date aerial photographs, historic photographs, ground level photos of identified sampling points in the Reserve

**Reserve Monitoring,
continued...**

depicting current conditions, and other objective and descriptive data. Photographic documentation of "baseline" plant communities and existing recreational impacts will start in the year 2000. Already, in the four years since the incidental take permit was signed, impacts have been reduced—by eliminating damaging activities—and reversed by reclamation, including the purchase of grazing rights, installation of fencing to restrict motorized vehicle access, the collection and removal of trash, and reseeding. These improvements, some of which were substantial, may be difficult to document in the baseline but should not be ignored.

Monitoring will be done in two phases. The first phase, during the years 2000-2001, will focus on compiling baseline documentation. Particular attention will be paid to sensitive areas such as City Creek and Paradise Canyon. Data of a general nature will be gathered on key trails. The second phase of the monitoring program will start about two to three years out, after funding has been secured, and will focus on implementing a scientifically based sampling program to quantify current and changing levels of human impacts to vegetation communities and where possible wildlife, within the Reserve.

After consultation with a human-impact researcher from the Northern Arizona University (NAU), it has been concluded that much of the expertise necessary to design such a program is probably available locally in southern Utah. Numerous universities in the west have staff and/or graduate students who can act as peer reviewers of the proposed program, and who may be willing to work with Reserve managers to conduct research and monitoring activities within the Reserve. The County HCP Administration and BLM may make on site field trips to other areas to understand first hand the lessons learned in conducting human impact studies in preparation for finalizing our own program tailored to the Reserve's needs.

Reserve Monitoring, continued...

In summary, although the goal of developing a human impact monitoring program is clear, its precise approach is not. It is anticipated that a small team of individuals representing different agencies and expertise will draft a concise plan, for review and approval by the HCAC and County Commission that meets the long term needs of the Reserve and facilitates adaptive management.

Habitat Reclamation

The reclamation of deserts in the West that have been disturbed by off-road vehicles and related traffic is considered vital to stabilizing sensitive ecosystems before they are further impacted by erosion and become unrecoverable. The Reserve has many old dirt roads and trails which were in use prior to its establishment. Some of these will be closed while others will remain open to recreational users. Many of the closed roads and trails can be reclaimed by tilling and/or reseeding with native seed mixtures that complement natural communities. Indeed, Washington County has already started this process in areas north of St. George. Although this is a useful start, reclamation will be done over the next several years to help areas recover before even more serious erosion starts. Reseeding in the Reserve will be concentrated in the fall to spring time frames, optimum times for rainfall and seed germination. Key areas identified for reclamation include Paradise Canyon, City Creek, and Pioneer Park. Disturbed areas not designated by this Plan as roads or trails will be targeted for reclamation.

Protection of Biological Soil Crusts

Scientific studies of biological soil crusts, including "cryptobiotic" or "cryptogamic" soils, consistently identify 3 primary and important roles played by these organisms; stabilization of soils, increased soil fertility and moisture retention. Unlike physical soil crusts, which increase surface water runoff and prohibit seed germination, biological crusts are considered a visible indicator of rangeland health.

Protection of Biological Soil Crusts, continued...

Biological crusts are fragile, but new research demonstrates that the cyanobacterial structure of the crust can recover from trampling more quickly than previously thought, generally in 5 years. Some of the biological processes of these crusts are slower to recover. It is estimated to take the symbiotic lichens an additional 5 years and the mosses 65 years to fully recover. More damaging than scattered trampling is concentrated, expansive loss of crusts over a large area. When areas of crust are entirely destroyed, due to vehicle use, concentrated trampling or other mechanism, they are noticeably slower to re-establish, but this still occurs more rapidly than previously thought, taking an estimated 14 years. The associated lichens and mosses will take an estimated 56 years and 375 years respectively. (Belnap, et al. 1999)

Many areas of the Red Cliffs Desert Reserve have well established communities of biological soil crusts. Recreational use of the Reserve does not have to overly impact established crusts. Concentrating the majority of travel on designated trails limits impacts to occasional trampling. Thoughtful location of trailhead facilities and well-contained campsites or viewpoints in heavily-used areas can avoid damage to large areas of crusts.

Problems associated with crust damage include; 1) increased water erosion along heavily-trampled paths, and 2) wind erosion, loss of soil, and loss of other crust benefits in areas where soil crusts have been removed by excessive impacts. Dispersed trampling is generally not a problem, though continued use over the same area will become rapidly visible as a new trail and will likely attract other users.

Unlike biological crusts, physical soil crusts are considered by many range managers to be a problem associated with desertification because they form hard soil layers, impermeable to water. Holistic range management practices advocate

Protection of Biological Soil Crusts, continued...

short-term, concentrated grazing of ‘brittle environment grassland communities’ to break up these kinds of crusts, thereby increasing water retention, and encouraging seed germination. This theory promotes the concept that such communities have evolved with the presence of large numbers of migrating ungulates, and that “over resting” rangelands only increase the dominance of bare soil crusts (Savory 1999).

Since biological crusts are fragile and can be difficult to re-establish, protection of existing crusts is generally easier and more effective. Reserve managers will continue to document the distribution of biological crusts in the Reserve; these crusts are common in the Reserve and they play a key role in ecosystem stability and health. The primary strategy utilized in this plan to reduce recreational impacts to cryptobiotic soils is to encourage the use of trails.

Control of Predators and Other Detrimental Species

The HCP Administrator, in coordination with Reserve managers, USFWS, UDWR, and Wildlife Services, can authorize appropriate persons or groups to conduct programs to manage predators, nuisance animals, and exotic, noxious plant and wildlife species. Examples include authorizing qualified hunters to control coyote, mountain lion, raven and beaver populations, or authorizing the use of herbicides for noxious weed control. Administrative control of certain species is important for protecting tortoise populations, protecting other beneficial wildlife and plant species, and for human safety reasons.

Wildfire Suppression

In the Reserve, BLM will suppress wildfires in accordance with the guidelines in *Fighting Wildfire in Desert Tortoise Habitat: Consideration for Land Managers* (Duck et al, 1994). Generally, the guidelines call for applying the principle of “minimum tool”. Under this concept, BLM will

Wildfire Suppression, continued...

coordinate with the county and city fire department to use the least disruptive approach to fire suppression while meeting other resource objectives for the area. Qualified resource advisors will be on-site whenever possible during fire suppression to guide activities so as to minimize harm to tortoises and their habitats.

Wilderness Study Areas

The Red Mountain and Cottonwood Wilderness Study Areas (WSA) lie within the Red Cliffs Desert Reserve; additional management restrictions are enforced within WSA's as a result of BLM's obligations under federal laws pertaining to the designation and management of wilderness areas. The BLM Manual, *Interim Management Policy for Lands Under Wilderness Review* (IMP), provides guidance for specific activities in Wilderness Study Areas.

The IMP states "The general standard for interim management is that lands under wilderness review must be managed so as not to impair their suitability for preservation as wilderness."

Perhaps the most noticeable restrictions, in addition to those created under Washington County's Habitat Conservation Plan, include the closure of these areas for mountain bike use and the increased restrictions on motorized access, even in emergency situations. Refer to the BLM Resource Management Plan for further details on mountain bike management in WSAs.

Cultural Resources

Any historical art, sites, and artifacts located on federally managed lands, whether Native American or other, are protected by federal law. Disturbance or removal of any artifacts is prohibited.

Service Access

Because there are numerous municipal utility developments in the Reserve, including water wells, water lines and electrical transmission lines, it is necessary for certain authorized individuals to access service roads which may be otherwise closed to public use. To control service access, access roads shall be posted, fenced and locked. All service access, new developments and maintenance activities must be in accordance with adopted utility development protocols, as outlined in the HCP and, if the project is located on BLM managed lands, with the current Biological Opinion issued by the U.S. Fish and Wildlife Service.

Examples of service access permitted after coordination with HCP/BLM utility protocols where applicable:

- inspecting, constructing, or maintaining facilities
- conducting official government business
- law enforcement
- fire suppression
- search & rescue
- monitoring of plants, wildlife, soils, human activities, etc.
- predator control and other authorized wildlife management activities, as required

Search and Rescue

Within the boundaries of the Red Cliffs Desert Reserve, it is anticipated that search and rescue situations could occur necessitating emergency access to locate missing persons, to assist injured recreationists, or to rescue people from downed aircraft. It is the goal of the Reserve managers, particularly Washington County and the BLM, to work closely with the Washington County Sheriff's

**Search and Rescue,
continued...**

Office and local search and rescue volunteers to encourage that all reasonable precautions are taken to minimize impacts to wildlife and habitat that might result from a search and rescue operation.

In emergency situations where human health and safety are in jeopardy, wildlife and habitat protection goals are secondary. However, with prior planning and training of emergency personnel, impacts to wildlife and habitat can be reduced.

To this end, strategies to be implemented shall focus on 1) training and providing S&R dispatch with critical information regarding ecological sensitivity of the Reserve, and 2) building and maintaining a cooperative relationship between Reserve and Search and Rescue managers. The Washington County HCP administration will work closely with the Washington County Sheriff's Office to structure and schedule training for S&R personnel and to develop a "Rescue Pre-Plan" for activities within the Reserve. Examples of actions that could be part of a plan for emergency rescue operations inside the Reserve include 1) emphasizing the use of designated emergency roads and trails; 2) placing maps of emergency roads and trails on file at the Washington County Sheriff's Office for easy reference; 3) providing keys to locked Reserve gates to rescue personnel; 4) holding seminars for rescue teams on tortoise biology to reduce risks to these animals; and 5) holding joint meetings periodically between Reserve managers and Rescue personnel to keep key parties informed and coordinated on rescue matters.

Through this cooperative relationship and pre-planning, search protocol can be developed that reduces impacts to the Reserve, including an emphasis on aerial search and the use of mountain bikes and equestrians to minimize ground impacts.

Part III: Use Management—Strategies and Prescriptions

General Provisions

The Red Cliffs Desert Reserve provides myriad opportunities for public use, recreational use in particular. However, direct and indirect take of tortoise and other species, trail erosion, trampling of vegetation and delicate soil crusts, and habitat disturbance are the main concerns regarding use in the Reserve. The Reserve has an abundance of slow-growing desert scrub vegetation and fragile ephemeral species which take advantage of seasonal moisture. Therefore, trails are located in a manner which reduces impacts on Reserve vegetation and concentrates use through thoughtfully placed, well-defined trails, some of which are utility maintenance roads. Well-placed trails reduce the tendency for short-cutting, reduce erosion from poor drainage and steep slopes, and reduce the creation of redundant trails, all of which contribute to greater environmental degradation.

To ensure the health and viability of the habitat, specific considerations must be taken when traveling in the Reserve. These provisions apply to activities (exceptions noted) in all areas:

Upland and Lowland Zones. Within the Reserve there are a variety of habitats, ranging from lower elevation Mojave desert communities to pinyon-juniper woodlands to rugged slickrock canyons. The biological sensitivity, ecological durability and resiliency of these habitats also vary. To account for these differences, but in keeping with the commitments of the HCP, the Reserve has been divided into management zones. Specific boundaries of these zones are depicted on the Reserve map. Generally speaking, the Upland Zone is less biologically sensitive and more ecologically

**General Provisions,
continued...**

durable, whereas the Lowland Zone is more sensitive (particularly for Mojave desert species) and less durable.

The boundary between these two zones was located by balancing biological requirements with social practicality; areas of highly sensitive habitat needed to be protected yet the location of the boundary needed to be easily identifiable to user groups so that enforcement was reasonable.

The Upland Zone accommodates recreational users who desire the freedom to responsibly travel off-trail. Hikers and equestrians are free to travel across country where the terrain permits, or they may utilize the trails within the zone which access the most popular areas. Camping and campfires are also allowed, with some limitations, in the Upland Zone (see *camping* section for more detailed explanation). The Lowland Zone protects sensitive species and their habitat by restricting travel to designated trails and by limiting camping and campfires to designated campgrounds.

Areas within the Upland Zone include: the majority of Red Mountain, the higher elevations below the National Forest, the rocky canyons of the proposed Cottonwood Wilderness Area, and the Babylon/Sandstone Mountain area.

Stay On Designated Trails. Because the Reserve was established to protect the tortoise and its habitat, off-trail use is prohibited, except within the Upland Zone (see map). Much of the habitat traversed is delicate, and off-trail travel interrupts fragile ecosystems. For example, cryptobiotic soil, the black "crust" visible in much of the Reserve, is actually a living organism that prevents erosion and increases soil humidity and nutrients; off-trail travel tramples this crust and leaves soils more susceptible to erosion. The established trails provide access into the Reserve and create links between geographic areas and trailheads. The trail system in

**General Provisions,
continued...**

the Reserve, over 130 miles in length and ranging from 2200 feet to 5500 feet in elevation, provides a diverse, high quality outdoor experience for user groups.

However, persons who: 1) are licensed or permitted under state, county, or federal law and regulation are permitted to go off trail east of the Cottonwood Road where necessary to accomplish the purposes for which the license or permit was issued (researchers, educators, hunters, etc.); and 2) in the performance of their official duties must travel off-trail (Reserve managers, law enforcement officers, emergency personnel, etc.) are permitted to travel off-trail in the Reserve as necessary.

Trail Etiquette. Shared-use trail systems require that the different types of users understand and follow a simple right-of-way formula that has been adopted throughout the country. Within the Reserve, the following trail right-of-way will be used:

Horses always have the right-of-way. Hikers and bikers should move to the downhill side of the trail.

Hikers have the right-of-way over everyone except horses

Mountain bikers yield to both horses and hikers

When two users approach, the right-of-way generally belongs to the traveler moving uphill (except in the case of horses, who always have the right-of-way). Mountain bikers, which can move very quickly and quietly, should warn equestrians and hikers of their presence to avoid startling them.

Campfires. In the Lowland Zone of the Reserve, campfires are restricted to established fire rings within official campgrounds. In the Upland Zone, which is dominated by pinyon-juniper habitat,

**General Provisions,
continued...**

campfires are allowed subject to closures for high fire danger. Wood gathering is prohibited in the Lowland Zone; in the Upland Zone wood gathering is restricted to dead and down wood only. For areas outside of official campgrounds, camp stoves are strongly encouraged.

Parking. Many people wishing to recreate in the Reserve will travel to specific Reserve trailheads by automobile. This plan anticipates the need to establish trailheads with adequate vehicle parking to accommodate this demand, including the parking of trucks with horse trailers. Proposed locations for access points and parking areas are included in this plan. Where geography and habitat does not allow the location of parking areas within the boundaries of the Reserve, it may be necessary to negotiate for parking opportunities with neighboring landowners, public or private.

To minimize impacts to the Reserve, parking is allowed in designated staging areas only and staging areas will be carefully located. Overnight parking for backcountry camping, hunting, or shuttling is permitted, but in established staging areas only. No camping is permitted in the staging areas. Whenever possible, parking areas located within the Reserve will be restricted to previously disturbed areas, located on a developed boundary, or will otherwise not result in a reduction of habitat.

Altering Rock Surfaces and Damage to Vegetation. Damaging practices such as removing, chipping rock or destroying vegetation to enhance a trail are prohibited. Reserve managers may need to minimally damage or alter rock surfaces and vegetation in order to maintain trails or to install signs; in both of these instances, such action is intended to reduce overall impacts to the Reserve. Marking trails should be accomplished in the least obtrusive way possible to achieve the desired result.

**General Provisions,
continued...**

Snow Canyon. Snow Canyon State Park is located almost entirely within the boundaries of the Reserve, and generally Reserve management prescriptions apply to activities inside the Park. Recreational uses within the Park are restricted to designated trails, to slickrock areas, or to designated rock climbing areas, and the same concerns for impacts to desert tortoise and their habitat apply. Some State Park designated trails may not appear on the Red Cliffs Desert Reserve Public Use Plan map. Additional Utah State Parks and Recreation regulations may also apply, including entrance fees which are required and can be paid at the ranger station. The 1998 Snow Canyon State Park Resource Management Plan details management objectives for the park. For comprehensive information regarding uses within Snow Canyon call (435) 628-2255.

Pioneer Park. Pioneer Park is a municipal park operated by the City of St. George within the boundaries of the Reserve. For the purpose of this plan, the park is bounded on the north by the Pioneer Rim Trail, on the west by Turtle Road, on the south by Skyline Drive and on the east by municipal government facilities. Existing uses within the developed area may continue, such as picnicking, hiking, rock scrambling, and rappelling. The park's master plan, adopted in 1977, identifies park roads and facilities. The park will continue to be managed by the City of St. George who, as an HCP participant, has committed to support the goals and objectives of the HCP. Proposed changes in use or new development must be coordinated through the HCP Administration and the HCAC.

Day Use Limits. Maximum use numbers could be established in the future to protect Reserve resources and visitor experiences. No limits are proposed at this time. Should limits be considered, they will be consistent with the following criteria:

- Limits would be imposed only as necessary to

General Provisions, continued...

protect important resources and achieve HCP goals;

- Limits would be applied to the minimum area necessary to achieve goals;
- A 30-day public notice and comment period would be provided; and

Fees. Except for commercial activities or authorized competitive events, no fees to access the Reserve are required at this time, outside of Snow Canyon State Park.

Pets in the Reserve. All pets in the Reserve must be on a leash to prevent habitat and wildlife disturbance and to avoid user conflicts. Hunting dogs are allowed to travel off-leash with a licensed hunter in the act of hunting during official hunting seasons.

Motorized Vehicle Use. Motorized vehicles are permitted in the Reserve on designated roads only. Motorized vehicle use on surfaces other than designated roads is prohibited; this includes recreational vehicles such as three-wheelers, four-wheelers, other four-wheel-drive vehicles, motorcycles, all-terrain vehicles, trucks, and automobiles.

Oiled roads, such as Turtle Road, Highway 18, Tuacahn Road, and the Snow Canyon road, may not be compatible with all motorized vehicles. ATV's and certain types of motorcycles may not be licensed to operate on oiled roads.

Special Provisions

Stay on designated roads. Using roads specifically designated for motorized vehicle use lessens impacts to soil, vegetation and animals. A comprehensive list of all designated roads

**General Provisions,
continued...**

within the Reserve open for public use can be found in Appendix A. Much of the habitat is delicate, and off-road travel interrupts fragile ecosystems; therefore, motor vehicle travel off of designated roads is prohibited. Designated roads for motorized vehicles include:

- Snow Canyon Road
- Snow Canyon Parkway
- Tuacahn Road
- SR 18
- Turtle Road (Snow Canyon Parkway extension, a.k.a. "Skyline Drive")
- The *Cottonwood Road/Danish Ranch Road* is accessed north of the St. George Industrial Park. This is an oil and dirt road that also passes through Forest Service property and ends in Silver Reef, north of Leeds, Utah.
- *Turkey Farms Road* is accessed off of the east side of Cottonwood Road and services the active turkey farm located in that area. Public use of this road is discouraged.
- The main *Babylon Road* in Leeds is accessed north of the town of Leeds. This road is sandy and provides access to the Virgin River and an old mill site.
- The *Toquerville Cutoff* is a proposed 4WD vehicle link along the north boundary of the Reserve near the Town of Leeds which provides the community of Toquerville more direct access to the Babylon Road.
- The *Sand Cove Spur* allows vehicles to park at the Sand Cove campground on the west side of Sandstone Mountain.
- A short trail, *The Sandstone Mountain Link*, is located on the north end of Sandstone

**General Provisions,
continued...**

Mountain outside of Toquerville. This trail is near the Reserve Boundary, and allows continued travel on a popular OHV trail.

All-Terrain Vehicles (ATV's). Vehicle access in the Reserve is limited to designated roads; however, these roads may not be compatible with ATV use. It is the vehicle operator's responsibility to know regulations governing the use of these vehicles on public roads.

Practice proper etiquette. Motorized vehicles yield right-of-way to all other user groups in the Reserve. Drivers should remain alert to others in the area and reduce speed when approaching others, particularly equestrians.

Motor Vehicle Events within BLM Managed Lands. The BLM Resource Management Plan (RMP) and the current Biological Opinion issued by the U.S. Fish and Wildlife Service on the RMP restrict motor vehicle events on BLM lands within the Reserve. Motorized speed events are explicitly prohibited. The following additional regulations apply to any non-speed vehicle events (or non-speed portions of speed events) requiring permitting by the BLM:

1. No organized non-speed events shall occur from March 15 through October 15;
2. Permits shall be required for events with 50 or more participants;
3. No more than 400 motorcycles or all terrain vehicles, or 300 three- or four-wheeled vehicles shall be allowed in any one event; and
4. Events shall have enough monitors to ensure compliance with regulations

**General Provisions,
continued...**

Other Vehicles. Buggies, wagons, or other animal-drawn vehicles are limited to travel on designated roads, and are prohibited from single-track trails where their passage would create new surface disturbance.

Wheelchair Access. Although much of the Reserve's backcountry is difficult to access by wheelchair, some areas of the Reserve are wheelchair accessible, such as portions of Pioneer Park and Snow Canyon State Park. Paved municipal trails within the Reserve also offer some opportunity to enjoy the scenic beauty of the area; currently there is a paved trail along Highway 18. In the future, there may be an opportunity to pave a trail within the right-of-way along Turtle Road when and if it is widened and improved, or to provide vehicle pull-outs here and elsewhere in the Reserve, including Cottonwood Road.

In the event that an education center and visitor facilities are constructed to service the Reserve, they will be constructed to meet the requirements of the Americans with Disabilities Act (ADA).

User Facilities. Amenities such as picnic tables, restrooms, trash receptacles, bridges over riparian areas, and hitching posts may be necessary additions to contain, concentrate, and reduce user impacts. Each facility shall be approved by Reserve management and placed strategically in areas of popular use, such as trailheads and along specific trails. Care shall be taken to install facilities that do not contribute to the proliferation of predators; for example, trash receptacles shall be designed to be inaccessible to wildlife. Providing user facilities will mitigate user impacts such as tethering horses to scrub vegetation or dispersing randomly for picnicking. Water development in the future may include spigots placed in popular-use areas such as trailheads.

**General Provisions,
continued...**

Signing. At all trailheads Washington County will install or coordinate the installation of signs that inform users of their responsibilities and provide information on route locations and distances. Signs will be developed in coordination with (where applicable): the HCP Administrator, Snow Canyon State Park, cooperating cities, BLM, Utah Department of Transportation, Utah Division of Wildlife Resources, and the U.S. Fish and Wildlife Service. Reserve signage shall be readily identifiable, with consistent design elements.

Signs may be installed at trail junctions. Interpretive signing may be developed for trails and at locations in the Reserve as recommended by the HCP Administrator and/or BLM. Signs will be installed at rock climbing areas and in other activity concentration areas to provide information and reinforce restrictions.

Leave No Trace (LNT) Principles. Reserve management has adopted the principles of low-impact recreational use as outlined by the Leave No Trace Program. These principles were revised in the spring of 1999, and the newly-completed list follows:

General Considerations of Leave No Trace

(LNT) Use: These considerations apply when traveling in the Reserve via horse, bicycle, or foot.

- *Plan ahead and prepare.* Know the area in which travel is planned. Knowing terrain and possible challenges helps determine which provisions reduce impacts and lessen the chance of hasty decisions regarding water, campsites, parking, etc.
- *Travel and camp on durable surfaces.* Avoid areas of delicate soil and vegetation. Use designated trails. In areas of heavy use, camp in established areas to avoid creating another campsite. Disperse use in remote areas;

**General Provisions,
continued...**

spread out and avoid areas where impacts are just beginning.

- *Dispose of waste properly.* Pack out what was packed in. If there are no restrooms available, use areas away from water, trails, and campsites. Practice good sanitation, which includes burying human waste.
- *Leave what you find.* Unless it's garbage that can be packed out, leave in the Reserve what you find in the Reserve. Natural objects and cultural artifacts must remain in the Reserve.
- *Minimize campfire impacts.* Although efficient and easy-to-use camp stoves are popular, some still feel a traditional campfire is part of an enjoyable outdoor experience. However, in the Reserve, campfires are restricted. See the campfire section, pg. 35, for more information.
- *Respect wildlife.* Although it may be tempting to approach wildlife, doing so can disrupt feeding, increase stress and harm individuals. View wildlife from a distance, and resist the temptation to offer food. It is a violation of the Endangered Species Act to pick up a tortoise (unless you are removing it from harm's way), harass, or kill it, or attempt to do any of these acts.
- *Be considerate of other visitors.* Most people are using the Reserve for a peaceful recreational experience in beautiful surroundings; therefore be conscientious of noise level, proximity to others, and trail etiquette.

A more comprehensive listing of LNT principles can be obtained by contacting the BLM office located at 345 E. Riverside Drive, St. George, Utah.

Research and Educational Programs

With the signing of the Washington County HCP, Reserve managers acknowledged the opportunity to develop educational programs that both inform the public about the purpose of the Reserve and offer general nature education for the community.

Regional Education Center. References within the HCP briefly suggest the vision of a regional educational center located within the Reserve and identify environmental education as both a management goal and a mitigation measure. The HCP states that the county has committed \$500,000 of discretionary funds over twenty years to the envisioned education center. The HCP further states that "the education center will be part of a larger organization, which as of yet is undefined."

More groundwork by the Habitat Conservation Advisory Committee (HCAC) refined the vision to include Snow Canyon State Park (SCSP) as a cooperator with Washington County and its other partners in the construction and operation of the facility. This would help State Parks, which is in need of a visitor center and administrative offices. A prominent location at the mouth of Snow Canyon is being acquired by the park and has received conceptual approval as the preferred location for the visitor education center.

The County will continue to work cooperatively with its partners to fully develop a joint vision for the facility, to analyze the financial feasibility of such a venture, and to propose an educational curricula that meets the goals of the HCP.

Educational Programs. The Reserve provides educational opportunities for a broad range of age groups. Scientific field studies of wildlife at both the graduate and undergraduate levels can provide Reserve managers with valuable data that could expand current understanding of the Reserve's wildlife and plant communities and can help managers recognize when recreational impacts

Research and Educational Programs, continued...

significantly affect Reserve resources.

Other examples of the potential components of a successful educational program include the following: experiential field opportunities for primary, secondary, and high school students; on-site classrooms; outreach; volunteer opportunities (naturalists, docents, etc.); publications; interpretive signing; guided nature hikes; and elder hostel programs.

An education committee was appointed by the County to help design educational programming and materials, including interpretive displays.

Scientific Research and Collection. Educational and research uses of the Reserve may require, on occasion, special access so individuals or groups can visit sensitive areas of the Reserve. Special access permits will be arranged with the County HCP Administration and coordinated with other Reserve managers as necessary. Without a special access permit, educational or research groups shall follow the same regulations required of other Reserve users. Collection of scientific specimens requires appropriate USFWS/UDWR permits, as well as coordination with the HCP Administrator. Collection of specimens without a permit is prohibited.

Commercial Uses in the Reserve

Commercial uses within the Reserve, such as guided activities, instructional programs, or commercial film making, require a commercial use permit issued by the BLM or State Parks in coordination with the HCP Administrator. Application forms and other information are available through the Bureau of Land Management, St. George Field Office, located at 345 E. Riverside Drive, St. George, Utah.

With the exception of the Education Center in Snow Canyon, commercial uses requiring on-site facilities within the Reserve are not permitted.

Organized & Competitive Events

Organized competitive and recreational sporting events found to be low-impact to habitat are only permitted in the Reserve with a special use permit issued by the BLM or State Parks in coordination with the HCP Administrator. An organized recreational activity is any scheduled event with a specific planned purpose. Those organized recreational activities which conflict with the intended protection of the desert tortoise or, due to the nature of the event, are unable to provide the degree of supervision necessary to prevent harm to desert tortoises or prevent damage to habitat will not be permitted within the Reserve. These activities and events should generally be staged on designated roads only. Monitoring for previous-use impacts, habitat density and quality, numbers of spectators and participants, and time of year will all be factors in the decision to issue/re-issue a permit.

All requests to use the Reserve shall be first screened by the HCP Administrator to determine conformance with the HCP and this Plan. The Administrator shall advise the proponent where conformance cannot be achieved and, in the absence of suitable remedy, shall deny the request. Any entity denied permission to use the Reserve can appeal the Administrator's decision to the HCAC. The HCAC shall make an initial review of the appeal and, where necessary, shall forward its recommendations to the appropriate Reserve manager(s) with jurisdiction over the area(s) in question for a final determination. Agency procedures for administrative review vary and the process can take several months.

Activities: Introduction

The Red Cliffs Desert Reserve provides an opportunity for a high-quality outdoor experience for a variety of user groups. In addition to the historic use of the Reserve by equestrians, hikers, and hunters, more "modern" uses such as mountain biking and rock climbing have also gained popularity in recent years. The diverse recreational

Activities Introduction, continued...

opportunities within the Reserve ensure people of all ages, abilities, and interests can enjoy what this unique area has to offer. The trail system in the Reserve, the result of careful planning, provides access into some of the most spectacular areas southern Utah has to offer while protecting the habitat crucial to threatened and endangered species and the many other plants and animals in the Reserve.

Hiking

Because hikers and trail runners can access all designated trails in the Reserve--whether sandy, rocky, steep, or narrow--and they are able to scramble through the Upland Zone's rugged terrain, pedestrian use provides myriad opportunities to experience the Reserve's diversity.

Activities such as birdwatching and photography are popular with hikers. However, leaving the designated trail to do so is prohibited, except in the Upland Zone. Wildlife should be observed from a distance; disturbing animals may force the animal to flee preferred habitat. A good pair of binoculars or a telephoto lens can assist in observing wildlife "up close" while preventing habitat disturbance. Respecting wildlife and habitat is important to the overall health of the Reserve.

Special Provisions

Off-Trail Use Areas. Although trails have been designated in most of the Reserve, there remain some areas where off-trail use is permitted. In the Upland Zone, trails are designated, but off-trail travel is permitted. Areas within the Upland Zone include: the majority of Red Mountain, the higher elevations below the National Forest, the rocky canyons of the proposed Cottonwood Wilderness Area, and the Babylon/Sandstone Mountain area.

Camping

Camping overnight in sensitive habitat areas generally disturbs wildlife more than the occasional user passing by on a trail. Therefore, within the Reserve camping is restricted as follows:

Lands Managed by the BLM: Camping is limited to no more than 7 consecutive days in any one area. In addition, Upland/Lowland Zone restrictions apply.

Upland Zone: Camping is allowed within the Upland Zone. In the Babylon/Sandstone Mountain area, camping is restricted to the Sand Cove primitive campground. In addition, this plan envisions a designated campground near the Virgin River close to the Babylon mill site. At this time, camping in other areas of the Upland Zone is not restricted to designated sites. However, Reserve managers anticipate that as use in the Reserve increases, a transition to designated camping is likely to occur throughout the zone. When necessary, consistent with the goals of the HCP and this plan, Reserve managers may designate suitable areas for camping in high-use areas and restrict camping to these sites.

This plan designates a primitive campground at Sand Cove (near Sandstone Mountain). Camping at this popular group site shall require a permit issued by the appropriate Reserve Manager. In the future, primitive facilities may be installed to service the area (e.g. a sanitary toilet) and a use fee may be charged to support facility maintenance.

Lowland Zone: Camping is limited to designated campgrounds. At this time, the only designated campground within the Lowland Zone is the drive-in campground in Snow Canyon State Park. The campground at Red Cliffs Recreation Area is just outside of the Reserve boundary, but does provide access to

Camping, continued...

the Quail Creek drainage inside of the Reserve.

Special Provisions

Water. With a few exceptions, water is largely unavailable in most of the Reserve, so drinking water should be packed in when camping in the Reserve.

Campfires. In the Lowland Zone of the Reserve, campfires are restricted to established fire rings within official campgrounds. In the Upland Zone, which is dominated by pinyon-juniper habitat, campfires are allowed subject to closures for high fire danger.

Wood gathering is prohibited in the Lowland Zone; in the Upland Zone wood gathering is restricted to dead and down wood only. For areas outside of official campgrounds, camp stoves are strongly encouraged.

"Leave No Trace" Principles. To promote outdoor ethics and the preservation of the Reserve's biologic, scenic, and natural resources, LNT principles must be utilized.

Off-Trail Travel. In the Red Cliffs Desert Reserve, off-trail travel is permitted within the Upland Zone. These areas are largely out of critical tortoise habitat and may be traversed without causing significant impacts. In the Upland Zone, trails are designated, but off-trail travel is permitted.

Bicycling

Bicycling is a popular recreational use in the Reserve. The spectacular scenery and varied terrain provide cyclists with unique opportunities aesthetically and technically. There is a need to effectively manage the natural resources of the Reserve, especially in association with its various sensitive species, while still providing a scenic and

Bicycling, continued...

enjoyable recreational experience.

Mitigation of vegetation trampling and soil erosion will occur by designating, signing, and maintaining designated bicycling trails in the Reserve. Bicycles are prohibited off of designated trails. Maintenance of the trails will be a cooperative effort among the Reserve, riding organizations, and local groups. Where erosion, vegetation damage, habitat disturbance, or cultural site impact is significant, trail closure or restricted access may be necessary.

Special Provisions

Stay on Designated Trails. Because of the growing popularity of mountain bike use in the Reserve, the impacts of off-trail mountain bikes to delicate desert soils, and the likelihood of newly developed mountain bike trails if the expansion of this use is not restricted, bicycles shall be restricted to designated trails regardless of whether they are traveling in the Upland or Lowland Zone of the Reserve.

WSA Restrictions. Public lands within the Red Mountain and Cottonwood Wilderness Study Areas (WSA) are closed to mountain bike use by the BLM's Resource Management Plan for the St. George Field Office, March 1999.

Slickrock Group Stops. To mitigate trampling of vegetation and trail erosion, all group discussions and/or stops must occur in slickrock areas whenever possible. If slickrock is not available, groups must stay in a single-file fashion so trails are not widened over time.

Trail Erosion. To protect trails and prevent erosion, riders should avoid "skidding" stops and/or skidding around corners. Riders should not spin tires when climbing. In single-track areas, riders should travel single-file to avoid widening single-track trails.

Bicycling, continued...

Weather Conditions. Riders should avoid riding in muddy conditions. Bicycling on muddy trails accelerates erosion. Trail closures to mitigate erosion may occur in areas determined to be impacted.

Trail Signing. The signing of trails will be done by Reserve management. The painting of rocks or otherwise altering rocks and/or vegetation to designate trails is prohibited, except as authorized by Reserve managers.

Trail Etiquette. Most trails in the Reserve are shared-use, so trail etiquette must be used. Bicyclists yield right-of-way to pedestrians and equestrians. When encountering other cyclists, downhill riders yield to uphill riders. When approaching blind corners, speed should be reduced to avoid startling hikers and horses. Also, verbal cues should be used to announce the presence of cyclists on trails.

Equestrian Use

The management of the Red Cliffs Desert Reserve considers the long-term partnership with horse users to be critical to an effective equestrian management program.

Horseback riding in the Reserve has primarily taken two forms--short trail rides and extended backcountry travel by individuals and small groups who use the Reserve because of the unique riding opportunities it provides. Strategies such as those outlined in the Leave No Trace backcountry horse use guide offer minimal impact suggestions that must be followed for equestrians using the trails in the Reserve.

Mitigation of vegetation trampling and soil erosion will occur by designating, signing, and maintaining horse-use trails through the Reserve. Maintenance of the trails will be a cooperative effort among the Reserve, riding organizations, and local groups.

**Equestrian Use,
continued...**

Where erosion, vegetation damage, habitat disturbance, or cultural site impact is significant, trail closure or restricted access may be necessary.

Special Provisions

Camping. Camping with horses is permitted only in the Upland Zone of the Reserve. Also, with a few exceptions, water is largely unavailable in most of the Reserve. When camping in the upper reaches of the Reserve, minimal impact Leave No Trace guidelines must be followed. No off-trail and/or overnight horse use is permitted in Snow Canyon.

Confinement of Horses When Camping. Ideally, horses should spend the shortest amount of time possible in camp. Horses should be checked frequently to ensure as little damage as possible to the environment. Observing behavior can help minimize impacts as well. Once an area has been identified as camp, there are several ways to confine horses to the area for the night that reduce impacts.

Weed-Free Hay. Users of BLM-administered lands in Utah, including the Red Cliffs Desert Reserve, are now required to use only certified noxious weed-free hay, straw or mulch. Approved products for livestock feed on public lands include pellets, hay cubes, processed and certified hay. For more information regarding use of weed-free hay on public lands in Washington County, contact the Range Conservationist at the St. George BLM office (435) 688-3200.

Hobbling. Hobbling causes little environmental impact. The idea behind hobbling horses is to give them freedom to graze yet restrict their travel to the general area near camp. It is necessary to frequently check the location of hobbled horses, as some horses may be more agile in hobbles than expected.

Equestrian Use, continued...

Pickets. Picketed horses require good feed, as they cannot roam to graze. It is necessary to move pickets frequently to prevent overgrazing in one area and trampling. Picketing is often hard on vegetation and soil because of the concentrated movement of the horse in one area. The picket line can also "rub" the ground and damage vegetation.

Highlines. Highlines are another option when large trees are available. A highline consists of a rope running between two trees, providing a place to tie horses that does not "rope rub" vegetation.

Tree Tying. Because tree tying horses has substantial vegetation impacts, it is not permitted in the Reserve.

A complete guide to Equestrian LNT principles can be obtained by contacting the Backcountry Horsemen of Washington County, P.O. Box 3174, St. George, UT 84771.

Rock Climbing and Sport Rappelling

Within the Red Cliffs Desert Reserve there are three areas where authorized rock climbing and rappelling activities occur: Snow Canyon State Park, Paradise Canyon, and Pioneer Park. Climbing and rappelling outside of designated areas is prohibited.

The Snow Canyon Climbing Management Plan provides the framework to manage the habitat and safety concerns related to climbing use in Snow Canyon. Some of the provisions in this plan will be expanded to include concerns in Paradise Canyon and Pioneer Park, specifically the provisions which apply to visual aesthetics, hardware or bolt replacement, webbing and chalk, trails/erosion, and wildlife. The climbing advisory team (CAT) may be utilized to address the issue of replacement

Rock Climbing and Sport Rappelling, continued...

hardware; however, since no new routes are allowed to be developed in Paradise Canyon, this function of the CAT will not be extended outside of the State Park. There are four climbing areas in Paradise Canyon: Chuckwalla, Black Rocks, Turtle Wall, and Cougar Cliffs.

Trail erosion, trampling of vegetation, animal behavior modification and habitat disturbance are the main concerns regarding climbing in the Reserve. Access to the base of many climbs in the Reserve requires hiking through high quality tortoise habitat and fragile desert scrub vegetation. Climbing routes can negatively impact cliff-dwelling species, such as nesting raptors.

Vegetation trampling and soil erosion is mitigated by designating and maintaining approach trails from staging areas to the base of the cliffs. Braided trails will be consolidated and signed to reduce impacts. Trail maintenance will be a cooperative effort among the RCDR staff, Snow Canyon staff, BLM, and local climbing groups.

Climbing Access

Approved climbing routes in the Reserve occur in Paradise Canyon, Snow Canyon, and Pioneer Park. Access to climbs will be on designated trails. Outside of Snow Canyon State Park, climbing and rappelling is allowed on established routes in approved areas only.

Paradise Canyon. Climbing and rappelling areas in Paradise Canyon are accessed from well-established staging areas along Highway 18:

Chuckwalla is located just west of Highway 18 at milepost 3. It is the climbing area most easily accessed and provides sandstone routes ranging in difficulty from 5.10 to 5.12 .

Turtle Wall is located northwest of Chuckwalla in the bottom of Paradise

Rock Climbing and Sport Rappelling, continued...

Canyon. The wall, which faces east, offers the most technical routes established in Paradise Canyon. Turtle Wall is accessed from the same staging area as Chuckwalla and can be found by following the well-established trail along the canyon floor.

Black Rocks is located west of Highway 18 at milepost 5 and is accessed from a staging area along Highway 18. A short trail provides easy access to all climbs in this small area; these routes provide premier winter climbing as the sun warms the dark rock during the colder months. This area provides basalt routes ranging in difficulty from 5.9 to 5.11.

Because of additional concerns regarding habitat connectivity in this area, the Black Rocks climbing area will be seasonally closed from March 15-June 30 during the peak spring tortoise activity period.

Cougar Cliffs is the northernmost of the four areas. Located west of Highway 18 at milepost 6, Cougar Cliffs is accessed via a staging area on the west side of the road. From there, a trail descends to and continues along the base of the rocks. There are sandstone routes here ranging in difficulty from 5.10-5.12. This is the most popular site for sport rappelling, and is known by many local residents as "movie rocks."

Snow Canyon. For more information about climbing in Snow Canyon State Park, contact Park managers at (435) 628-2255.

Pioneer Park. Climbing, bouldering and rappelling within Pioneer Park is under the management of St. George City. For more information about activities in this municipal park, contact St. George Parks and Open Space Department at (435) 634-5869.

Special Provisions

Seasonal Use. Due to tortoise and habitat concerns in the Black Rocks area, seasonal use will be in effect. The area will be closed for climbing from March 15-June 30 each year.

Route Closures for Raptors. Reserve managers may initiate seasonal route closures in Paradise Canyon if raptors are found to be nesting or attempting to locate nest sites in close proximity to established climbing routes. The period during which raptors lay and incubate eggs and fledge their young is particularly sensitive; disturbance can result in reproductive failure. The most critical time period for most raptors is between February 1 to June 1. Reserve managers will work with the climbing community to implement a reasonable policy for seasonal cliff management using the recommendations outlined in *Raptors and Climbers: Guidance for managing Technical Climbing to Protect Raptor nest Sites* published by the Access Fund.

Camping. Camping is available in the Snow Canyon campground. Overnight camping in Paradise Canyon, where the four climbing areas exist, is not permitted.

Altering Rock Surfaces and Damage to Vegetation. Chipping, drilling, gluing, manufacturing holds, or otherwise altering the rock surface or vegetation is prohibited.

Inclement Weather Climbing in the Reserve. Climbing within 24 hours of significant precipitation is discouraged due to the weakening of sandstone and the increased damage to vegetation that result from moisture in the rock and soil. Both climber safety and reserve resources can be negatively affected.

Rock Scrambling

Less technical than rock climbing or rappelling is the popular activity known as "scrambling." Typically, this implies moving over rocky terrain using one's hands and feet, but no equipment is used for protection. As an activity, it can be dangerous if people do not exercise good judgment and take proper precautions to avoid falling.

It is not the intent of this plan to prevent people from scrambling on rocks—at their own risk—but this activity may only occur in areas where off-trail use is allowed, specifically in the Upland Zone, in Pioneer Park and at Movie Rocks.

Hunting

Hunting is allowed, as described below, within the Red Cliffs Desert Reserve throughout the Upland Zone, and within the Lowland Zone on the east side of Cottonwood Road. Hunting within the Lowland Zone west of Cottonwood Road is prohibited due to human safety concerns and to reduce impacts to tortoises and tortoise habitat in the most sensitive areas of the Reserve. Off-trail use in the Lowland Zone is not allowed for any other user group.

The discharge of firearms in the Reserve is prohibited except in the act of hunting big game and upland game species by licensed hunters in accordance with this Plan, current city and county ordinances, and state laws during prescribed seasons. Big game species include deer and elk. Upland game includes: mourning dove, band-tailed pigeon, Chukar partridge, pheasant, quail (California and Gambel's), and cottontail. Specifically excluded from lawful hunting in the Reserve include all non-game species, furbearers (including coyote and raccoon), jackrabbits, cougar and black bear, except where permitted by the applicable state agency and the HCP Administrator in keeping with this Plan (see *Control of Predators and Other Detrimental Species*, pg. 29).

Hunting, continued...

Because hunting will take place in the Reserve, an area of recreational use, consideration is necessary to ensure the safety of all recreational users. It is expected that hunters will practice caution in all areas of the Reserve since the area is heavily used by recreationists during the hunting season. Educating user groups about the presence of hunting during hunting seasons, from September to the end of February, will help facilitate safety and coexistence among hikers, equestrians, climbers, bicyclists, and other user groups.

Special Provisions

Hunting Dogs. An exception to the general rule that requires pets to be on leash at all times inside of the Reserve, hunting dogs are allowed off-leash in the Reserve when accompanied by a licensed hunter in the act of hunting during official seasons.

City Ordinances. Hunters accessing the Reserve during prescribed seasons must comply with current city ordinances as outlined below or as may be amended from time to time:

St. George: No discharge of firearms within the Reserve inside city limits except by licensed hunters in the act of hunting during prescribed seasons.

Hurricane: No discharge of firearms within the Reserve inside city limits except by licensed hunters in act of hunting during prescribed seasons.

Ivins: No discharge of firearms within city limits.

Washington: No discharge of firearms within the Reserve inside city limits unless expressly proclaimed for that year by the mayor that hunting is allowed, and only by licensed hunters in the act of hunting during proclaimed seasons.

Hunting, continued...

Washington County: No discharge of firearms within the Reserve in the unincorporated parts of the County except by licensed hunters in act of hunting during prescribed season and except areas as designated by the HCP Administrator.

Miscellaneous Sports and Activities

There may be other non-consumptive recreational uses which would be compatible with the goals and objectives of the Red Cliffs Desert Reserve and the Public Use Plan that are not listed or not anticipated at this time. For the purposes of protecting species and habitat, all activities not specifically identified in this Plan are prohibited unless otherwise approved by the HCP Administrator.

Permitted uses, other than those already discussed, include picnicking, wildlife viewing, trail running, walking, backpacking, fishing and swimming.

Other activities are not compatible with the goals and objectives of the Reserve and are expressly prohibited. These sports and activities include, but aren't limited to: target shooting, any off-road motorized equipment, paint ball, inner-tubing, in-line skating and skate boarding (except on paved municipal trails), horseshoes, darts, badminton, golf, tournaments of any kind, remote-controlled aircraft, residential camping, and littering.

Activities such as hot air ballooning, family reunions, other social functions (including weddings), or compatible activities which are not listed above require a special use permit if conducted within (or above) the Reserve. Reserve managers will review the activity before a permit is granted.

Part IV: Maps & Trailheads

Introduction

It is anticipated that in the years ahead, public use of the Reserve is likely to increase as word spreads of the recreational opportunities so conveniently located next to the municipalities of St. George, Washington, Hurricane, and Ivins. Because the County expects this use, and because the public's responsible use and enjoyment of the Reserve relies on them having adequate information about Reserve boundaries and area specific management regulations, when the Plan is finalized, a trails map will be published for public use. As envisioned, this map will include information about the Reserve and will summarize the general provisions and activities discussed in this plan.

For the immediate purpose of this plan—to communicate locations of trails, trailheads, municipal boundaries, WSA's, the Upland and Lowland Zones, and other spatial information—basic maps of the Reserve have been included with this document.

Trailheads

As proposed, there are at least 38 trailheads which access the Reserve: some of these trailheads are "staging areas" where parking is provided (or planned for in the future), and some are simply step-over gates, approximately 20" tall, which allow pedestrians, horses, and those carrying mountain bikes to easily access the Reserve. Equestrian users may want to practice with their horses before attempting to enter the Reserve for the first time.

The map to be produced for public use will give directions on how to reach trailheads, and will describe the facilities which are available and which are proposed, and what the anticipated timeline might be for the installation or improvement of

Trailheads, continued...

facilities such as parking areas or hitching posts.

With the development of the Public Use Plan, the County will be able to install and maintain signs at the trailheads and along the trails so that they are easier to locate and to follow.

Upland/ Lowland Zones

The designation of the **Upland Zone**, which contains areas generally above critical tortoise habitat in which off-trail travel is not likely to result in significant impacts to tortoises or other species of special concern, and the **Lowland Zone**, which contains quality tortoise habitat, is important to note, as it effects uses allowed in each area. Using topography and trails, Reserve managers and biologists were able to designate boundaries between the Upland and Lowland Zones which are easily visible to recreationists. In areas where this boundary may be less distinct, it will be signed.

It is important to review the boundaries of the Upland and Lowland Zones, as well as the municipal boundaries and the boundaries of the WSA's as each is important to understanding Reserve rules for public uses.

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Part VI: Appendices

Appendix A: Designated Roads Within the Red Cliffs Desert Reserve

Appendix B: HCP Directives by Zone

Appendix C: Recreation Ecology and Human Impacts to Resources: A Primer

Appendix D: Ecology of the Desert Tortoise

Appendix E: Impacts of Recreation on the Desert Tortoise and Other Wildlife in the Red Cliffs Desert Reserve

Appendix F: Comments,
Public Use Plan Draft
March 14, 2000

Appendix A. Designated Roads within the Red Cliffs Desert Reserve

	ZONE	LENGTH (MILES)	ACCESSIBILITY TO MOTORIZED VEHICLES	PURPOSE/COMMENTS (Fence=4-strand wire; barrier=tortoise-proof mesh)
Tuacahn Drive	1		Open to the public	Public access to Tuacahn Center for the Arts. Paved/Fenced/Barrier with culverts. Speed Limit =25 MPH
Snow Canyon	1 /2		Open to the public	Public access to Snow Canyon State Park Paved/No fence or barrier. Speed Limit = 25 MPH
West Canyon	2		Locked Gate – Service access only	Service access to West Canyon area in SCSP, including access to water wells and tanks. Graveled/No fence or barrier
Chuckwalla Rd	2		Locked Gate – Service access only	Service access to Paradise Canyon, including access to water wells. Graveled/No fence or barrier.
Alger Hollow Rd	3		Service access only	Service access to wildlife guzzler. Road barricaded beyond this point. Graveled/No fence or barrier.
Turtle Road (Skyline Drive extension)	3		Open to the public	Connects Skyline Drive with Highway 18. Provides access to City Creek Detention Dam. Paved/Partial fence and barrier
St. George Pipeline Rd #1 (W of Cottonwood Rd)	3		Locked Gate –Service access only	Service access along pipeline from Cottonwood Road to Pioneer Park. Dirt/No fence or barrier.
Pioneer Park Loop	3		Open to the public	Public access to picnic area/Pioneer Park Paved/No fence or barrier. Speed Limit = 10 MPH

Cottonwood Road	3		Open to the public	Connects St. George to Forest access (Danish Ranch Rd), and private property access. Partial paved/graveled/fenced, no barrier. Speed Limit=25 MPH
City Creek Well Access Road	3		Locked Gate - Service access only	Access from Cottonwood Road to St. George City water wells Dirt/No fence or barrier
Turkey Farm Road	3		Open to the public	Access to Turkey Farm. Graveled/no fence or barrier. Speed limit=25MPH
UAMPS	3		Locked Gate - Service access only	Access to UAMPS switching yard and powerline Dirt/No fence or barrier
Middleton Powerline (E of Cottonwood Rd)	3		Locked Gate - Service access only	Service access along powerline from Mill Creek water wells to Cottonwood Road. Dirt/No fence or barrier
Middleton Waterline	3		Locked Gate - Service access only	Service access to waterline Dirt/No fence or barrier
Mill Creek Well Road	3		Locked Gate - Service access only	Service access to water wells Dirt/No fence or barrier
Grapevine Well Road	3		Locked Gate - Service access only	Service access to water wells Dirt/No fence or barrier
Babylon Road	4		Open to the public	Public access from Leeds; Dirt/No fence or barrier
Toquerville Cutoff	4		Open to the public	Public access from Toquerville, links to Babylon Rd; 4WD/No fence or barrier
Sandstone Mtn. Link	4		Open to the public	4WD access, continuation of trail located outside of Reserve; Dirt/No fence or barrier
Sand Cove Spur	4		Open to the public	Public access to campsites and picnic area, links to Babylon Rd; 4WD recommended/No fence or barrier

W. Hurricane Cinder Knoll	5		Locked Gate - Service access only	Dirt/No fence or barrier
E. Hurricane Cinder Knoll	5		Locked Gate - Service and private access only	Access to Search and Rescue Headquarters and Radio Tower Paved to Search and Rescue/Dirt/No fence or barrier

Appendix B. Directives from the Washington County Habitat Conservation Plan affecting recreation, service access and other uses by Zone, for the Red Cliffs Desert Reserve.

HCP/RESERVE PRESCRIPTIONS BY ZONE	ZONE 1	ZONE 2	ZONE 3	ZONE 4	ZONE 5
DESCRIPTION OF ZONE	From Paiute Tribal lands to Ivins	From Ivins to Highway 18	From Highway 18 to I-15	From I-15 and Quail Creek Reservoir north of the Virgin River east to the approximate limit of desert tortoise habitat	South of the Virgin River and north of the City of Hurricane, including the two cinder knolls
MANAGEMENT OVERVIEW	Will primarily entail land use restrictions that have been developed to preserve and enhance Mojave desert tortoise habitat	Desert tortoise habitat protection and environmental education	Preservation and enhancement of the Mojave desert tortoise	Similar to the other zones	Desert tortoise reserve
NON-CONSUMPTIVE RECREATION (UNORGANIZED HIKING, MOUNTAIN BIKING, EQUESTRIAN, ROCK CLIMBING)	Not specifically addressed	Hiking, equestrian use, and hunting including other non-consumptive recreational activities should be restricted to designated trails	Non-consumptive recreation should be allowed. Hiking, equestrian use, and camping should be restricted to designated areas Hunting should be restricted to big game or upland birds during official seasons	Non-consumptive recreation should be allowed Hiking, equestrian use, and camping should be allowed Hunting should be allowed	Non-consumptive recreation should be allowed Hiking and equestrian use should be restricted to designated trails
ORGANIZED, COMPETITIVE RECREATION	Not specifically addressed	Organized or competitive sporting or recreational events should not be allowed, although guided or controlled tours to enhance education may be permissible	No organized or competitive sporting or recreational events should be allowed	Not specifically addressed	Not specifically addressed
MAINTENANCE OF EXISTING UTILITIES	Not specifically addressed	Maintenance of existing utilities including roads should be allowed	Maintenance of existing utilities including roads should be allowed	Utility and road corridor maintenance should be allowed.	Utility and road corridor maintenance should be allowed and follow the HCP protocol
EMERGENCY RESPONSE, INCLUDING FIREFIGHTING	Firefighting should be allowed	Firefighting should be allowed	Firefighting should be allowed	Firefighting should be allowed	Firefighting should be allowed
VEHICLES	Not specifically addressed	Speed restrictions on Tuacahn Road should be enforced	Restricted to designated roads	Restricted to designated roads	Restricted to designated roads

IMPORTANT NOTE: The prescriptions on this page are presented to show the basis for the decisions in this plan. Readers should not refer to Table 1 for a detailed listing of prescriptions. Actual management prescriptions from this plan are shown under the section on Access Management.

Appendix C

Recreation Ecology and Human Impacts to Resources

A Primer

Acknowledgments

The field of recreation ecology is growing and evolving as more and more people turn to wildlands for recreation; the impacts caused by so many people using trails and recreation areas is becoming more and more noticeable. Information is needed to help managers respond to the challenges they face. Research is helping managers better understand the complex nature of their task, and is contributing to a body of knowledge that will help shape land management in the future.

Because there are relatively few published review papers for this information, this primer relies heavily on the works of William E. Hammitt and David Cole (1998), and Richard L. Knight and Kevin J. Gutzwiler (1995), experts in their field who have taken the time and effort to consolidate much of the available research into readable volumes. Information on their books can be found in the attached bibliography.

Overview

Each player in the complex web of interrelationships within an ecosystem – whether plant, animal, human or an element of geography – either directly or indirectly impacts the other members. To focus only on one type or source of impact to an ecosystem is to look at only one part of a dynamic equation. Any effort to understand the impacts of human use is further complicated by the dynamic nature of wildlife's potential response to disturbance; the ability—or inability—of species to adapt, relocate, and recover. Human recreational impacts can and do exceed thresholds of species tolerance and can be as significant on the large scale as other sources of impacts, such as extensive flooding, fire and drought.

The significance of recreational impacts is multiplied by the sheer numbers of people seeking relief in natural areas, attempting to escape the rapid pace of the information age by abandoning the city for an hour, a day or a week at a time. The degree of impact is intensified by our technology be it motorized or simple foot travel.

When a need for species stewardship arises requiring habitat preservation, it becomes necessary to manage recreational impacts. Responsible management requires an understanding of social, economic and scientific issues. Responsible managers are knowledgeable, creative, curious, open minded and able to adapt management strategies based on new information. This brief overview of the science and social nature of recreational impacts is intended to be used as a introductory primer to: (1) enhance knowledge and understanding of human recreational impacts to habitat in general, and (2) inform recreational users of the basis for current management decisions intended to protect habitat for species within the Red Cliffs Desert Reserve.

Resources Impacted by Recreation

To understand how habitat is impacted by recreation, it helps to consider four basic components of an ecosystem: soil, vegetation, wildlife and water. Scientists usually refer to wildlife and vegetation as "biotic" components while soil and water are collectively considered "abiotic."

Soil. Soil is the foundation of an ecosystem. Over time, as organic matter breaks down into small particles and mixes with gravel and sand, fertile soil, rich with bacteria and other microorganisms, accumulates and supports the vegetation that feeds and shelters wildlife. Soils with adequate porosity allow air and water to percolate to root systems which in turn helps to hold the soil together, both increasing porosity and decreasing erosion.

The trampling that typically occurs in concentrated recreation use areas—including trails, campsites, picnic areas, and scenic vistas—causes **compaction** of soils and loss of vegetation. These impacts cause a chain of events that lead to reduced water infiltration, increased runoff and increased erosion. **Erosion** results in a rapid loss of soil and can especially damage trails on steep slopes by collecting and channeling water.

Studies have shown that the greatest rate of impact to soils and vegetation occurs with the first repeated use. Increased use surprisingly causes minimal additional impact. Site planning and visitor education can play a significant role in containing such impacts. Techniques and strategies to counter these problems will be discussed further in the management section.

Soil fertility can also be inadvertently reduced by the collection of wood for campfires. The most important organic nutrients in soils come from leaves, needles, and small twigs contained in trees and shrubs. The most serious effects of firewood gathering result from the collection of large pieces of downed wood, those larger than 3 inches in diameter. Decaying wood of this size plays an important role in nutrient recycling that has only recently been appreciated. Moreover, its role cannot be replaced by any other component of the ecosystem. Decaying wood has an unusually high water-holding capacity, making it especially important in southwestern deserts. It also accumulates nitrogen, phosphorus, and sometimes calcium and magnesium. Therefore, collection of this wood for unrestricted campfires could result in ***moisture and nutrient impoverishment***. Also, decaying wood is the preferred growing medium for important microorganisms which improve the ability of plants to extract water and nutrients from soils.

The area disturbed by the burning of firewood in campfires is comparatively small but nevertheless noteworthy on a local scale. For example, studies show that the heat of a campfire will make soils ***sterile*** by altering the organic matter and soil chemistry in the upper layer of soil. In severe cases, this can take 10-15 years to fully recover. Because the effects of campfires are so dramatic, many managers try to concentrate them in one place to avoid excess damage.

Vegetation. Damaged trees or shrubs, exposed roots, bare and eroding soils frequently go unnoticed by recreationists. They notice instead those impacts that decrease the functional use of the site or with unnatural objects left by other parties.

The general health of vegetation in any particular area is determined by analyzing two primary factors—overall vegetative ***cover*** (the total cover provided by all plant species) and the vegetation ***composition*** (individual plant species cover, plant species diversity, and comparative frequency). Also, the presence of exotic species, species that are not native to any given area, is an indicator of disturbance which may be caused by recreation uses. Exotic species become problematic to plants and animals when they out-compete native plants for water and nutrients.

Although recreational impacts to vegetation include the cutting or breaking of limbs and branches, and uprooting by digging or pulling, the most common impacts are caused by ***trampling***. Trampling impacts can alter both cover and composition, and are typically the most severe to ground cover and to small shrubs and saplings, causing breakage, bruising, and crushing. Larger plants are typically more resistant or are simply too large to trample. Plants prone to trampling exhibit reduced abundance, height, vigor, and reproductive capacity on recreation sites. Where trampling is heavy and/or vegetation is fragile, plants are killed outright. Trampling impacts are compounded by the problems of growing and reproducing in

compacted soils. Although these impacts appear minor or even insignificant at first, they can quickly escalate to compaction problems, runoff and total soil loss later, especially in desert environments.

Wildlife. The response of wildlife to recreational disturbance is complex and varied. Different species have different ***tolerances*** for interactions with people; some wildlife species will abandon areas that receive regular, concentrated recreational use. Typically, high order vertebrates such as predators are especially impacted by human traffic because they are often shy or secretive in nature. Their reduction in numbers correspondingly affects prey populations and this in turn alters plant communities. In contrast, other species (e.g. small vertebrates) have been documented to actually increase in numbers, at least on a short term basis. In general, species which are able to tolerate the interaction with humans will move into habitat vacated by those less tolerant to the disturbance.

Even within a species, tolerance for interactions will vary by the time of year, breeding season, animal age, habitat type, and individual animal experiences with recreationists. Scientific studies have also demonstrated that when a species is experiencing stress from limited food sources or other environmental factors, they may be particularly vulnerable to impacts from human contact.

The relationship between amount of recreation use and wildlife impacts is not well understood. Of the few systematic studies that have attempted to glean insight into this area, there is evidence that the effects of human-wildlife interactions depend more on the frequency of human presence than on the amount of total recreational use or on the number of people present at any one time.

Impacts to wildlife are broken down into ***direct impacts*** -- those effects caused by the actual disturbance of the animal -- and ***indirect impacts*** -- those secondary results which follow from impacts to habitat and other environmental factors. Typically, larger game species are more affected by direct impacts and smaller species are more affected by indirect impacts of habitat modification. Recreational impacts may also be classified as ***selective*** versus ***nonselective***. Selective impacts occur when an activity focuses on a particular animal or species, such as nature study, collecting, hunting and fishing. Nonselective impacts result from coincidental interactions by visitors who are enjoying activities such as hiking, camping and picnicking.

Types of Recreation-Wildlife Impacts. The presence of people recreating in natural habitats can cause various types and levels of change in both individual species and their habitat. Figure 1 illustrates a conceptual framework for understanding the major impacts associated with recreational uses.

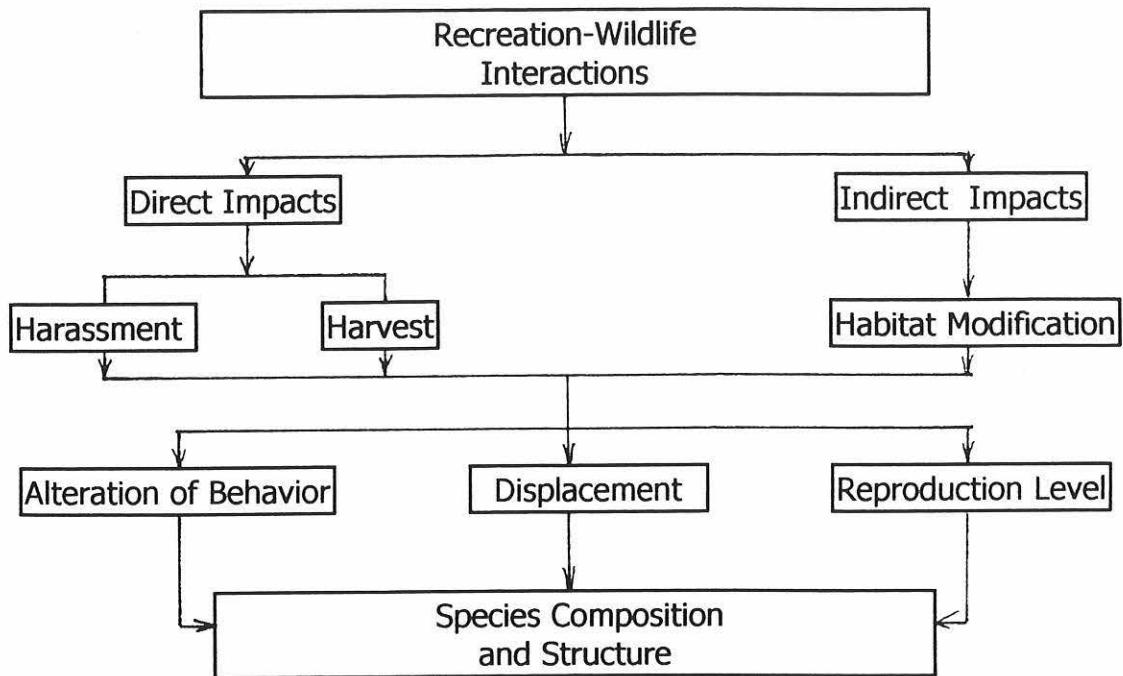


FIGURE 1. Major impacts of recreation-wildlife interactions. (Adapted from Wall and Wright 1977.)

Animal Disturbance and Harassment. Wildlife **harassment** is defined as an intentional or negligent act which creates the likelihood of injury to wildlife by annoying it to such an extent as to significantly disrupt normal behavior patterns thereby reducing the chances of successful reproduction. Although intentional harassment does occur, the major impact is caused by recreationists who unknowingly and innocently produce stressful situations for wildlife. The effects of photographers and bird-watches who seek out secluded species and backcountry campers who camp within critical watering and feeding habitats are examples of unintentional harassment. Land managers commonly refer to passive, nonmotorized recreation as "nonconsumptive" uses. However, harassment is such a common occurrence in human-wildlife interactions that it has led some authors to conclude that there is no such thing as nonconsumptive recreational uses.

Although some species seem to habituate to the presence of humans, others are very stress-prone. Locational harassment impacts can be managed by protecting key areas from roads and trails, by locating campsites in appropriate areas, and by seasonally closing critical breeding habitats. Successful management strategies focus on reducing harassment during critical times of the year and at key locations.

Harvest. Recreational hunting, fishing and trapping can cause some of the most significant impacts to wildlife populations. Based on their past experience, species of animals that are hunted demonstrate the ability to differentiate between human activities and react more intensively to those perceived as threats to their lives. Intensive **harvest** can reduce a species population on a local level to the point where there are no longer enough individuals to sustain a viable breeding population. On the other hand, low to moderate harvesting can actually help some animal populations from experiencing long lasting cyclic declines.

Habitat Modification. Habitat change can affect the behavior, distribution, survivorship, and reproductive ability of individual wildlife. Impacts also occur at the population, community and ecosystem levels over long periods of time. Evidence suggests that a net decrease in animal species-diversity can be expected when an area is exposed to outdoor recreation, in parallel with the decrease in plant species-diversity that occurs.

Habitat modification is the primary impact of humans on insect, amphibian, reptile, bird and small mammal populations. Tunnels and burrows of certain species--including tortoises--are collapsed by off-road vehicles, particularly in the desert (Bury, Wendling, and McCool 1976). Over a 10-year study of off road vehicle impacts at Dove Springs within the California Desert, Berry (1973) documented a loss in the desert tortoise population as well as a reduction in both the density and diversity of small mammals and lizard populations. Not only do the tires of vehicles cause physical damage to animals through the collapse of animal burrows, but they also eliminate their means of escape from extreme desert temperatures and desiccation.

Alteration of Behavior. The frequent presence of people can drastically alter the **behavior** of wild animals. Of particular concern are changes in behavior that result in reduced reproductive success. A classic example of this problem is the incidence of raptors abandoning their nests because of rock climbing activity on cliff faces.

Animals may abandon habitat areas entirely to avoid contact with humans or they may simply modify their daily use patterns, become habituated, or even tame. Habituation most frequently occurs as a result of food availability. Habituated animals can become so dependent on human food sources that they may not survive other seasons of the year when only natural food is available.

Species Displacement and Reproductive Level. Species **displacement** results in an animal moving from a familiar environment into a new habitat. Often, the new location is of poorer quality or has more competing elements than the original area where the animal resided. Because of these factors, displacement is a

more drastic change for wildlife than recreational harassment and habitat modification. The latter two impacts do not require that the animal move from a familiar environment where key resources such as food and water are known. This may particularly impact breeding success, inasmuch as familiar habitat and territory play a key role in wildlife reproduction. Although reproductive levels of wildlife are affected by most recreation-caused impacts, species displacement is likely to have the most drastic effects for the simple reason that it causes direct mortality.

Species Composition and Structure. Long-term impacts of the type discussed result in an alteration of wildlife population composition and structure. In general, the consequence of recreational activities in an area is an overall decrease in species **diversity** and **density**.

Factors Affecting Impacts

There are two primary factors that can increase or decrease the impact of recreation on habitat resources: environmental durability and visitor use.

Environmental Durability. To understand durability, it is important to understand the distinction between **resistance** and **resilience**. Resistance is the ability to tolerate recreational use without changing or being disturbed. It can be quantified as the amount of use a site can absorb before some level of impact is reached. Resilience is the ability to recover from any changes that do occur. It can be quantified as the number of years it takes for a site to recover from impacts to its pre-disturbance condition. Some sites are resistant but not resilient. They can tolerate substantial amount of use; however, once impact occurs, it lasts for a long time. Desert and alpine sites provide good examples. Other sites, such as many riparian areas, are resilient but not resistant. They are rapidly impacted, but recovery is also rapid. On sites designated for long-term recreation use, such as developed campgrounds, resilience may be much less important than resistance. Because these sites will be used in perpetuity, recovery is not an issue. In areas of highly dispersed use, however, resilience is at least as important as resistance because management objectives in such places stress the avoidance of permanently impacts sites. Both resistance and resilience must be considered, and their relative importance varies with management objectives.

The concepts of resistance and resilience can be applied to vegetation, soil, and topography. While there are always exceptions, the following generalizations can be made:

	resistant	sensitive	resilient	slow to recover/erodible
vegetation				
grasses	x		x	
forbs		x	x	
shrubs		x		x
soil				
silt		x		x
fine sand		x		x
clay		x		x
loamy soil	x		x	
course soil	x		x	
shallow soil		x		x
deep soil	x		x	
topography				
slopes <18 degrees	x		x	
slopes >18 degrees		x		x
base of slopes		x		x
mid or high on slope	x		x	
wet soil	x		x	
dry soil	x		x	

FIGURE 2. Resistance and resilience compared between variables.

Visitor Use. In addition to the obvious effect that the amount of use has on patterns and levels of impacts to an area, other characteristics of visitor use also influence the degree, type and distribution of ecological impacts in wildland recreation areas. The potential to cause impact varies with party size (large vs. small), type of user (overnight campers vs. day hikers), behavior (using wood fires vs. camp stoves), and mode of travel (horse users vs. hikers). The potential to cause impact also varies with where users go--use distribution--and various characteristics that can influence behavior, specifically knowledge of low-impact camping techniques, motivations, and experience level.

Conventional wisdom has often held that amount of use is the most important factor influencing amount of impact. Such thinking has been supported by describing the cause of impact with terms like "overuse" and proposing that solutions can be found by prescribing a "carrying capacity." Research shows such thinking to be oversimplified at best and erroneous at worst. The importance of amount of use varies between environments, between activities, and with the importance of specific impacted resources. In addition, effects differ depending on

whether concern is with rate, intensity, or areal extent of change. It is generally agreed that rather than restricting the amount of use, it is initially more effective to concentrate and channel use on a small proportion of any area, with locations carefully selected for their resistance and resiliency.

Party Size and Length of Stay. Parties larger than 8 to 10 members are thought to cause greater impacts to certain aspects of a given resource than smaller parties. Although large parties tend to make up a small proportion of all parties visiting wildland recreation areas, they can contribute a disproportionate amount of certain environmental impacts. Expansion of campsite boundaries is a particular impact attributed to large groups. In addition to needing greater space, larger groups commonly exhibit behavioral use patterns that can lead to greater impacts. Whether a group is large or small, an extended length of stay can often lead to greater amounts of impact to a given area.

User Behavior. Actions of individuals are influenced by their knowledge, experience, and the group context within which an action is carried out. Whether an individual's behavior is appropriate or inappropriate will have bearing on the level of impact they have on their surroundings.

Minimum Impact Knowledge. Most agencies involved with the management of wildland resources have informational programs aimed at educating users about how to reduce resource impacts. An example is the Leave No Trace (LNT) program. The program emphasizes the education and skills necessary to reduce visitor impacts, along with promoting the outdoor ethics and judgment necessary to guide the selection and application of low-impact camping skills. Often, visitors are simply unaware of certain skills and techniques that result in minimum levels of resource disturbance. Education of visitors about wildland resources and their proper use will create a minimum impact ethic that will eventually lead to a permanent behavioral change in visitors.

Common Patterns of Impact

Common social and spatial patterns of recreational behavior create recognizable patterns of resource impacts. Typically, recreation areas are characterized by a distinctive "node and linkage" pattern of use and impact. Nodes of impact occur at destination areas; linkages develop along the routes between nodes. Examples of nodes where use is concentrated include the table and fire ring in developed campsites, a scenic overlook, and trailheads. Typical linkages include hiking and equestrian trails, access trails between individual campsites, and trails from campsites to water sources. Concentration of use means that pronounced impacts, although locally severe, occur in only a small proportion of any recreation

area. Even in popular backcountry areas, recreation impacts will usually disturb less than 1 percent of the resource.

Many factors contribute to this concentration of use. Certain locations attract people over and over again, such as scenic viewpoints, rivers and lakes. Use also concentrates for reasons of safety and ease of use. Many people are more comfortable and feel safer camping or walking in places that obviously have been used before. It is also easier to walk on existing trails and to camp on sites that have already been cleared of brush and rocks.

Spatial Patterns. Impacts in a high use area, such as a campground, are classified in three "zones" for the purposes of design and maintenance; the impact zone, intersite zone and buffer zone. The **impact zone** is the area of highest use, such as an individual campsite, a main trail, or fire ring. Concentration of use will scuff away and compact soil components, leading to loss of vegetation and erosion. However, if the impact zone is carefully designed and maintained as a small, attractive, and clean site, continued use of this heavily impacted zone will actually reduce impacts to other areas.

The **intersite zone** represents secondary trails which link features such as campsites to other use areas. Similar to the impact zone, surface organic materials are lost, vegetation is trampled, and the soil is compacted. But the area of impact is smaller, and other than minor changes to species composition of vegetation and wildlife, the impacts are not severe or long-lasting. As with the impact zone, recreation managers can design and designate secondary trails which serve user needs and discourage the proliferation of excess intersite routes.

Few impacts to vegetation occur in the **buffer zone** other than those resulting from the gathering of firewood and a few hiking trails. Otherwise, this area is relatively natural and it acts as a transition zone between those areas impacted by recreation and those left undisturbed. However, the potential for recreational activities to cause the displacement of animal species exists in all three zones. Larger animals may be affected over large areas if recreational use is concentrated in their preferred habitat or on critical feeding or breeding grounds.

Temporal Patterns. The rate at which impacts occur vary with the type of impacts and the level of use. Vegetation is lost to trampling more rapidly than soil is lost to erosion, and impacts occur most rapidly where use levels are moderate to heavy. Often degenerative impacts occur cumulatively with the first 1-2 years of regular use of an area, then taper off.

Management Alternatives

Impacts to soils, vegetation and wildlife, factors that affect impacts, and typical impact patterns can be managed by modifying visitor use, by designing a site to withstand or limit resource damage, or by combining practices from both strategies.

Visitor Management. Visitor management techniques include regulation, information, and education designed to influence the amount, type and timing of use, visitor behavior, and the extent to which use is dispersed or concentrated. Specific techniques include use limits, length of stay limits, restrictions on the type of use, seasons of use, and group size limits. Information and education programs focus on trailhead signs, brochures, and school or interest group outreach programs. In some cases where it is convenient, managers may encourage group participation in Leave No Trace courses.

Although management of the amount, type and behavior of users is often critical to effective management of recreational impacts, managers must never forget the interests and desires of their recreational clientele. It is important to temper a concern for resource protection with a concern for promoting recreational opportunities. The relative importance of these two concerns will vary from area to area, along with management goals and objectives.

Site Management. Site management techniques attempt to minimize impact by controlling where use occurs and by manipulating the site itself. If use occurs on relatively durable sites and in non-critical habitat areas, impacts will be less pronounced. Alternatively, fragile places can be closed entirely to use. Design and treatment of sites can also do much to keep impact within acceptable limits.

In developing site management plans, it is important to strive to maintain a natural appearance while utilizing engineering solutions if it is the best means for reducing equally unnatural site impacts. The obtrusiveness of site manipulation must be carefully weighted against the obtrusiveness of site impacts and other means of solving problems.

Examples of common site management techniques include locating use on resistant sites, permanent closures of an area, temporary site closures, influencing spatial distribution of use, site hardening, and rehabilitation of closed sites.

Monitoring Recreational Impacts.

Recognizing that change is natural, management does not seek to halt change; rather, it seeks to halt undesirable change. In order for management to

recognize that incremental changes and impacts are occurring and to determine whether or not identified changes are desirable or undesirable, reliable data must be gathered systematically over time. Such data is the product of a monitoring program.

A well-designed and implemented monitoring plan is necessary to re-evaluate management decisions and to adapt management strategies as necessary to successfully achieve habitat preservation goals without overly restricting recreational use. Typically, a framework for management and monitoring would include: 1) statement of the conditions management will maintain or allow to occur (how much impact is acceptable); 2) an inventory of existing conditions to see how they compare with acceptable conditions and set objectives; 3) management actions; and 4) monitoring (re-inventory of existing conditions).

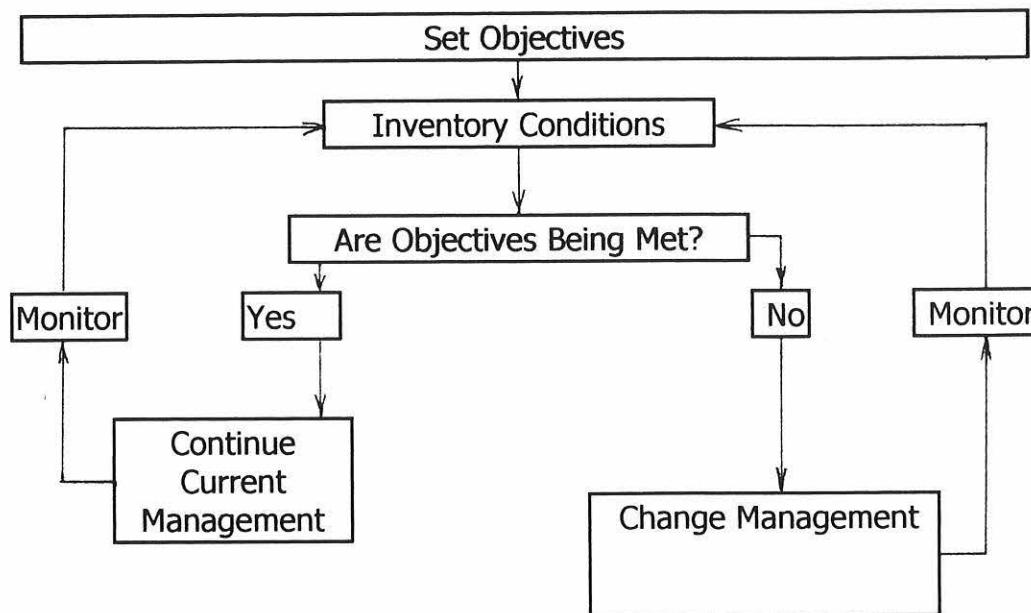


FIGURE 3. A simple planning framework. (*Source:* D.N. Cole)

Summary

Humans, as recreationists, are part of wildland ecosystems. It follows that wildland management is a dual effort to maintain a natural site environment while still allowing for recreational use. Management's role, in general, is not to halt change within wildland areas, but to manage for acceptable levels of change; of particular concern are those changes that effect Federally threatened species such as the desert tortoise. In dealing with recreational impacts, managers must balance

the concerns of ecologists, recreationists, other user groups, and the constraints of legislation and agency policies, and tailor all these to the peculiar situation of the areas they manage.

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Appendix D

ECOLOGY OF THE DESERT TORTOISE

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TORTOISES OF NORTH AMERICA

The desert tortoise (*Gopherus agassizii*) is one of four species of North American tortoises. The gopher tortoise (*Gopherus polyphemus*) lives in the southeastern United States (Auffenburg and Franz 1982). Berlandier's tortoise (*Gopherus berlandieri*) is found in southern Texas and in northeastern Mexico (Rose and Judd 1982). The bolson tortoise (*Gopherus flavomarginatus*) has a small range in north-central Mexico (Morafka 1982). The desert tortoise is found in southwestern Utah, southern Nevada, southeastern California, western and southern Arizona, through most of Sonora, and northern Sinaloa, Mexico.

HABITATS OF THE DESERT TORTOISE

Desert tortoises occupy a wide variety of habitats throughout their range. They live throughout most of the Mojave and Sonoran Deserts, and also in the Sinaloan thornscrub and Sinaloan deciduous forest in Mexico. Tortoises in the Mojave Desert are usually found on valley bottoms and slopes. Tortoises live in hot summer temperatures, cool winter temperatures, low humidity, an average of 4 inches (100 mm) annual precipitation (most of it occurring in the winter). The plant community is dominated by perennial shrubs and annual plants (Germano et al. 1994). The Sonoran Desert receives more precipitation than the Mojave and the rains are generally divided into winter and summer rains. (Germano et al. 1994). The Sonoran Desert has a high abundance of tree and cactus species, especially in upland and mountain areas adjacent to where tortoises are prevalent. The Sinaloan thornscrub is composed of dense shrubby plants on hills and mountain slopes, while the Sinaloan deciduous forest has a closed canopy of trees, also on hills and mountain slopes (Germano et al. 1994). These last two habitats are semi-tropical and receive up to 26 inches (664 mm) of annual precipitation, milder temperatures and higher humidity than the two deserts.

The life history, ecology, and behavior of the desert tortoise varies considerably throughout its range. The rest of this document will concentrate on

tortoises of the northeast Mojave Desert, specifically those of Washington County, Utah. The tortoise population in the Redcliffs Reserve occupy one of the most unique habitats in the Mojave Desert. First, there are areas of limited size that support the highest densities of desert tortoises known to exist (Luckenbach 1982, Corn 1994, Fridell 1995). This region is a transition zone between three different ecoregions. The Mojave Desert, Great Basin Desert, and Colorado Plateau, all with different climates, elevations, geological characteristics, and plant and animal communities, merge in Washington County. Therefore, some plants and animals that are native to these different ecoregions occur in this county. Since this habitat is at the extreme northeastern terminus of the desert tortoise distributions it is colder here than many other places. Tortoises here occupy deep caves in the winter, and as many as 10 individuals may use one cave.

ECOLOGY AND BEHAVIOR

Desert tortoises are widely referred to as being "cold blooded", but this is not an accurate description, as only part of the time is their blood actually "cold". Desert tortoises are actually ectothermic, meaning they regulate their body temperature by using heat from external sources, as they can't produce their own body heat like mammals and birds. Many reptiles, including tortoises, regulate their body temperature behaviorally, to seek preferred temperatures by moving around in their environment (Espinoza and Tracy 1997). In the northern part of their range, tortoises spend a great deal of time underground. Underground shelters (burrows, constructed in soil by tortoises and caves, natural or excavated shelters in rock; both shelter types are half-moon shaped in cross-section) are used for shelter year-round, while pallets (slight depressions dug in soil under shrubs or rock ledges) are used during months that tortoises are active on the surface. It has been estimated that tortoises in the Mojave Desert spend more than 98% of their lives in caves, burrows and pallets (Marlow 1979, Nagy and Medica 1986). The time that they have available above ground, therefore, is very important. A good portion of their below-ground time is during the winter, when tortoises hibernate (seek underground shelter from cold winter temperatures). Tortoises can withstand freezing temperatures, but not for long periods of time, so they need to be in a place where the temperature rarely drops below freezing in the winter. Air temperatures in burrows and caves where tortoises hibernate are more stable than the outside air temperature, and rarely fall below freezing (Haines et al. 1998). Most tortoises hibernate in burrows or caves that are at least 3 feet (1 meter) long, but have been known to be in caves that are up to 30 feet (9.1 meters) long (Woodbury and Hardy 1948). Tortoises spend an average of nearly 5 months hibernating between the months of October and March every year (Haines et al. 1998). Starting in March, when temperatures get warmer, tortoises bask in the sun

or sit on a warm surface to raise their body temperature. To lower their body temperature, tortoises seek the shade of a shrub, ledge, burrow or cave, especially in the summer when it's hot. The temperature inside burrows and caves in the summer is generally cooler than the air temperature outside. If tortoises cannot reach shelter in the summer they can die quickly in the sun. Their lethal body temperature is near 40C, and surface temperatures in the Dixie Valley frequently reach 50C in the summer.

Desert tortoises are herbivorous, meaning they only eat plants. The diet of the desert tortoise in this area consists over 95% annual plants, but they do eat some perennial plants (Esque 1994). Annual plants are the wildflowers and grasses that grow for a short period of time in the spring or late summer and then die, unlike trees and shrubs, which are perennial plants. They also are known to eat other objects (like stones and bones), which supply certain minerals that aren't readily available in the plants they eat (Esque and Peters 1994).

Desert tortoises can survive for quite a while without having a drink of water. Their hard shell and tough, scaly skin allow very little water to escape, and they don't sweat. They also have a large bladder and efficient kidneys that help conserve water (Nagy and Medica 1986). However, while they are adapted to a desert environment, and are equipped to survive long periods of time without consuming water, they must have a drink now and then to be able to survive. Therefore, when they encounter water in the wild (usually after a rain), they may drink a lot, consuming as much as 40 percent of their body weight in water (Bogert and Cowles 1947, Miller 1932).

Desert tortoises mate during all months of the year that they are active on the surface (Luckenbach 1982). We know from long-term studies that the minimum size female tortoises produce eggs is 7 to 7 5/8"(176 to 194) mm in length, and minimum size at first reproduction is from 13 to 15.7 years old (Germano 1994). Until they reach this size, it is difficult or impossible to determine if they are male or female in the field. Female tortoises lay their eggs in a nest that they dig with their hind feet, much like sea turtles. The number of eggs per nest, or clutch, varies from 2 to 14; 5 to 7 is the typical number (Grant 1936, Ernst and Barbour 1972). They lay their eggs mainly from May through July, the incubation varies from 90 to 120 days, and the eggs hatch from August through October (Luckenbach 1982). Desert tortoise eggs have a hard shell, are symmetrical (same size on both ends) and have a dull, pitted surface. This is unlike bird eggs, which are glossy and smooth, and frequently elliptical.

Hatchling tortoises have a carapace (shell) length of almost 2 inches (40

mm) immediately after hatching (Morafka 1994). When tortoises hatch they are exact replicas of adults and fend entirely for themselves. The rates at which tortoises grow vary considerably depending on the quality of their habitat and differences in available resources, so there is not a reliable way to determine the age of a wild desert tortoise. The shell of a tortoise is very soft until the tortoise is about 4 inches (100 mm) long, or until it is 5 to 10 years old, as the shell doesn't have a complete bone structure until then (Luckenbach 1982). Adult desert tortoises can have a carapace length of 14.5 inches (368 mm) (Osorio and Bury 1982), but most adults don't grow much over 12 inches (305 mm) long (Woodbury and Hardy 1948, Fridell 1995). A large male tortoise can weigh as much as 24 pounds (11 kilograms) (Howe 1990), but most adult tortoises weigh between 4.5 and 11 pounds (2 to 5 kilograms). Adult females are generally smaller than adult males (Fitch 1981, Woodbury and Hardy 1948), males have a depression on the bottom of the shell between the rear legs, females have shorter tails, and males have a larger gular (extension of the shell under the head) than females. The maximum age that a desert tortoise can live to is not known, but it is known that tortoises have lived at least 48 to 52 years (Germano 1992).

Tortoises regularly interact with each other when they meet in the wild. Fighting and mating are the most common interactions that are observed (Ruby and Niblick 1994). Fighting is a behavior that includes head bobbing, biting, butting, and trying to flip each other over on their backs (Ruby and Niblick 1994). Males commonly fight, but male-female and female-female aggression has also been observed (Esque, personal observations). These behaviors are interesting to watch, but are easily disrupted by careless observers.

There are many animals that will eat tortoises and their eggs when they get the chance. Gila monsters, badgers, and coachwhip snakes will eat their eggs (Luckenbach 1982). Many predators, including ravens, kit foxes, coyotes, and skunks kill and eat smaller tortoises whose shells are soft (Luckenbach 1982). By the time they are adults, coyotes, mountain lions, bobcats, and badgers are the only natural predators that are able to break open the shell of an adult tortoise (Luckenbach 1982).

Only 50% (Lampkin 1966) to 80% (Morafka 1994) of the eggs laid may be fertile. We know from other turtles that predators may eat between 60-90% of the eggs laid (Congdon and Gibbons 1990; Diemer and Moore 1994). Survivorships of all life stages of desert tortoises in the Mojave Desert have been estimated: 46-93% from eggs laid to hatching, 51% from hatching to one year, 71-89% from one year to maturity, and 75-100% for adults (Germano 1994). Mortality rates, therefore, are quite high before a tortoise reaches adulthood, but low once a

tortoise reaches adulthood. The annual mortality rate of tortoises 180 mm carapace length in Washington County is estimated to be 1.2% (Fridell et al. 1995). Motorized vehicles are probably the greatest source of adult tortoise deaths. Catastrophic losses of tortoises can occur due to disease, wildfire, climate change (i.e., drought), and urbanization.

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DESERT TORTOISE FACT SHEET

Topology

The top of the shell is the carapace - it's what they carry around on their backs
The bottom of the shell is the plastron - it's plastered on the bottom
Desert tortoises have rounded, flat feet like elephants
Each section of their shells is called a scute

Home Range Size

Home ranges size is between 4 and 25 hectares (10 to 62 acres), and may be over a kilometer in length.

Eggs

Eggs have a dull white, hard, pitted surface - not glossy like bird eggs
Average dimensions on 3 eggs from Redcliffs Reserve are 1.76 inches (44mm) by 1.38 inches (34.5mm)
2 - 14 eggs per clutch in the Mojave Desert
On average tortoises laid 4.8 eggs per clutch in the Redcliffs Reserve in 1998.

Nests

Eggs are buried at the entrance to burrows or under shrubs. Eggs are buried about 5 inches deep in soft sand or soil.

Incubation

Eggs are laid in May to July
Eggs hatch in August - October
Eggs take 90 - 120 days to hatch

Size at Hatching

Carapace length on a tortoise is almost 2 inches long (40 mm)

Size and Age to Reproductive Maturity

Minimum size known for females to lay eggs is 7 - 7 5/8 inches (176-194mm)
Tortoise may be 13 - 17.7 years of age before reaching reproductive maturity

Distinguishing Males from Females

Females have a flat carapace, males have a concave carapace to accommodate mating.
Part of the males' plastron protrudes out from under their chins - called a gular
Males have longer, attenuate tails than females, which have stubby tails.
Males have swollen glands on their lower jaws called mental glands, females don't

Diet

>95% spring annual plants. The spring and summer wildflowers we find after good rainfall. Also supplement diets with bones and stones, eggshells and other sources of mineral nutrients.

Shelter

Burrows - excavated in soil by tortoises - always a ½ moon shape

Caves - natural features in sandstone and basalt

Pallet - a flat place scraped out under a shrub - may be used repeatedly for years

Predators

Eggs: kit fox, badger, coyote, gila monster

Juveniles: badger, coyote, ants, ravens

Adults: badger, mountain lion, humans

Mortality Rates

Approximately 1.2% per year of adults desert tortoises in the Redcliffs Reserve.

Generally below 3%. Catastrophic losses can occur due to severe drought, fire, disease, and urbanization

Visual Acuity and Hearing

During over 2000 hours of behavioral observation in the Redcliffs Reserve.

Vision - Excellent, can detect a person walking over a hill at a distance of at least 1/10 of a mile (160m).

Hearing - excellent

Tortoises usually observe human visitors before the humans see them.

Special Adaptations

Hard shell to fend off predators

Crypsis - tortoises are difficult to see and evade predators by sitting still, quietly ceasing movements and moving very deliberately and slowly.

Hibernation - tortoise hibernate to avoid cold temperatures (5-6 months/year in Redcliffs Reserve.

Aestivation - tortoises aestivate to avoid hot temperatures

Auxiliary Bladder - tortoises have an auxiliary bladder filled to hold metabolic waste and avoid losing water through urination. Tortoises would not be a good source of water for a thirsty person. The fluid is hyper-saturated with metabolic waste and is the consistency of thin syrup or cement. They void this substance to scare away potential predators. Sometimes they void when people disturb them or pick them up. The water they void cannot be

replaced until it rains at the particular piece of land where they live. Could take a year or more.

Appendix E:

IMPACTS OF RECREATION ON THE DESERT TORTOISE AND OTHER WILDLIFE IN THE RED CLIFFS DESERT RESERVE

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23 August, 1999

Introduction

With the ever-increasing public desire to participate in outdoor activities comes the need to determine how these activities affect wildlife and wildlife habitats. The demand for outdoor recreation has steadily increased since the 1940's (Flather and Cordell 1995). Non-consumptive activities (observing, photographing, and feeding wildlife) have increased most in popularity among wildlife related recreation in recent years (Flather and Cordell 1995). While the public land base that helps support outdoor recreation in the United States is large, there is a decreasing availability of private lands (which makes up 60% of the land in the U.S.) for recreation (Flather and Cordell 1995). The increase in popularity of outdoor recreation makes the need for understanding impacts on wildlife and wildlife habitat of critical importance. While most people believe that recreation minimally impacts wildlife, research mostly indicates the opposite to be true (Knight 1997). One recent survey determined that outdoor recreation is the second leading reason for declines in species that are federally endangered and threatened (Losos et al. 1995, in Knight 1997).

There has been some criticism of using the term "non-consumptive" with regard to wildlife recreation (Weeden 1976, Wilkes 1977 in Smith 1999). Consumptive recreation includes activities that result in the harvesting (removal) of resources, often wildlife, for food (as in hunting and fishing), shelter or fuel. No harvest occurs during non-consumptive recreation. While technically this is true, it is quite inaccurate to suggest that non-consumptive recreation has no impact on wildlife and wildlife habitats. Boyle and Samson (1985) reviewed 166 research papers on how non-consumptive outdoor recreation affects wildlife, and found that nearly 72 percent of the papers reported negative effects on wildlife. While death of wildlife is the end result of consumptive recreation, non-consumptive recreation

can also cause the death of animals (Knight 1997), and it may only take a casual disturbance by a person walking through the habitat of sensitive species to negatively impact the population (Boyle and Samson 1985).

Knight and Cole (1991 and 1995) suggest that there are four ways that outdoor recreation can impact wildlife—"harvesting, habitat modification, pollution and disturbance". The immediate negative effect of these different impacts on wildlife is either death or a change in behavior that has adverse effects on wildlife.

Most kinds of recreation can impact wildlife either directly or indirectly. Direct impacts are those that have an immediate effects resulting in the loss of individuals or populations of animals. Examples of direct impact of recreation on wildlife are harassment, collection of animals, losses due to expansion of access areas (paving habitat), unintentional disruption of behavior, trampling or wildfires. Indirect impacts include primarily habitat changes (intentional or unintentional) such as starting wildfires, changes in soil and vegetation, and by people leaving behind pollutants (normally garbage).

This document describes negative and positive ways that recreation can impact the desert tortoise population of the Red Cliffs Desert Reserve in Washington County, Utah. Little literature is available specifically on the impact of recreation on desert tortoises and most other western reptiles. We draw from research based on other wildlife and systems where applicable. Some information cited in this document is based on research conducted in the Red Cliffs Desert Reserve from over 2,000 hours of observations of desert tortoises by professional and student researchers in the Red Cliffs Desert Reserve (Esque 1994, DeFalco 1995).

DIRECT IMPACTS

Vandalism (Harassment)

Webster's Dictionary defines vandalism as malicious or ignorant destruction of public or private property, especially of that which is beautiful or artistic (Guralnik 1984). For example bats, which are feared and disliked by some people, have been subjected to frequent persecution and destruction, including being killed with torches or other sources of intentional fire, hit with baseball bats, and shot (Tuttle 1979, Rabinowitz and Tuttle 1980). These people generally weren't aware that the bats had legal protection (Rabinowitz and Tuttle 1980). Unfortunately, there is usually some form of vandalism in public areas. Education is probably the best remedy to reduce the amount of vandalism that occurs. Tortoises and other reptiles have long been subjects of harassment and vandalism, including being shot, intentionally run over on roads, and other acts (Marlow and Bury 1973,

USFWS 1994).

Collecting

People collect wildlife for scientific and recreational purposes to provide animal products like snake skins, the commercial pet trade, food and personal pets. Scientific collections are usually well regulated by state, federal and local ordinances and coordinated through state wildlife agencies. For example, once a scientific collection permit is granted, activities are usually coordinated as to location and timing of activities and each specimen is usually reported.

Although intentional illegal collections of desert tortoises have probably decreased, each spring and fall many desert tortoises are displaced from their native habitats by uninformed individuals that think they are helping the animals by taking them home.

Even though the impact of recreation on desert tortoises is difficult to quantify on a daily basis, one study stands out as an example of the long term impacts of recreation on turtle populations. Two populations of wood turtles were studied in the 2171 acre (1000 ha) watershed of an artificial pond in Connecticut. The area was closed to recreation for 9 years, and subsequently opened to recreation. All environmental factors, including water chemistry and quality, air and water temperatures, size of the forest, and road construction (which was restricted) remained unchanged through the study. When the area was opened to recreation (fishing and hiking), the population of turtles started to decline, and within 10 years no turtles could be found in the area. Garber and Burger (1995) concluded that recreation may lead to extinction of wild wood turtle populations.

Trampling

Trampling can result from encounters with hikers, horses and wheeled vehicles (Weaver and Dale 1978). Trampling of vegetation and wildlife is a fact of any heavily used open spaces. Most trampling of the diffused type can be avoided by well marked trails and education. Trampling of tortoises will be difficult to avoid in a reserve with intensive visitorship such as would be expected in Washington County.

When tortoises are approached they tend to sit still rather than fleeing like other animals. A hiker, horse, or biker could, if not carefully watching the trail, step on or run over a tortoise. While adult tortoises are large and easier to see, hatchling or juvenile tortoises can be quite small and difficult to notice. Trampling between recreationists and adult tortoises would be rare - (after all, how many people step on rocks the size of a football), but hatchling or juvenile tortoises will

certainly be crushed under a foot, bicycle tires, or horse hooves when such encounters occur.

Disrupted Activity (Unintentional Disturbance)

Accidentally disturbing wildlife is probably the primary way that wildlife is impacted during non-consumptive recreation, because it is unintentional and usually unmanaged (Knight and Cole 1995, Knight 1997). Unintentional disturbance of wildlife can occur when photographing wildlife, observing birds, hiking across an animal's home range or territory (Knight and Cole 1991), or any other activity as people pass through habitats such as cycling, hiking, or horseback riding.

Much research has been conducted on recreational impacts to birds. Human disturbance has been found to increase nest abandonment and decrease the hatching success of birds (Andersen et al. 1990; Anderson 1988, Grubb and King 1991, Fernandez 1993). Grubb and King (1991) found that, among different types of recreational disturbance (including motorized and non-motorized watercraft, motorized terrestrial vehicles, gunshots, sonic booms, aircraft, and pedestrian), pedestrian recreation was the most successful at flushing bald eagles from nests. Rock climbing can disturb nesting raptors and other cliff-dwelling species (Boyle and Samson 1985). Displacement of raptors, changes in winter distributions and behavior are also attributed to recreational activities (Andersen et al. 1990, Andersen et al. 1990). It has been speculated that, for some bird species, these impacts can change breeding densities and species composition (Andersen et al. 1990). Bat populations have also suffered declines in caves where recreational cave exploring (spelunking) occurs (Boyle and Samson 1985, Tuttle 1979, Rabinowitz and Tuttle 1980).

It is easy to observe our influence on birds due to their high levels of activity and what we know about their superior vision. Desert tortoises also have excellent visual and audio acuity. Tortoises have been observed to detect a person walking from a distance of 1/10 of a mile (~160 meters). Tortoises usually detect a person approaching them before the person sees them. Tortoises can easily hear people talking, and can detect a person walking near the entrance of their caves or burrows from deep inside the shelter (out of visual range).

Desert tortoises frequently cease activity when disturbed in the wild. Adult tortoises will commonly sit still when disturbed. Most tortoises, both young and old, frequently remain inactive for several minutes to tens of minutes after being disturbed. This change in behavior can directly impact the resources available to tortoises. When disturbed, tortoises may cease feeding, avoid a preferred shelter site, become stressed by extreme temperatures, interrupt interactions with other tortoises, or prevent interactions with nearby tortoises. The ultimate consequences

of these actions may be a change in immediate physiology due to increased levels of stress, or a change in reproductive output by altered mating or nesting behavior.

INDIRECT IMPACTS

Soil and Vegetation (Habitat Modification)

Wildlife can be affected indirectly by trampling that is associated with recreation (Boyle and Samson 1985). Trampling (i.e., hiking, horse riding, biking) can change soil and vegetation characteristics, the most common changes being soil compaction (Liddle and Greg-Smith 1975, Weaver and Dale 1978, Stohlgren and Parsons 1986), and decreased plant cover (Dale and Weaver 1974, Weaver and Dale 1978) and plant diversity (Stohlgren and Parsons 1986).

Trampling impacts plants directly by damaging the foliage, shoots, stems, and surface roots of the plant, and indirectly by alteration of soil characteristics (Burden and Randerson 1972, Kuss 1986). The soil compaction that is associated with trampling can impair nutrient and moisture uptake and root growth (Liddle and Greg-Smith 1975, Kuss 1986). The plants are then more susceptible to water loss, drying of the vegetation, and subsequent loss of vegetation (Burden and Randerson 1972).

Soil compaction can alter soil moisture, oxygen and chemistry. Very fine sandy, silt, or clay soils are highly affected by compaction, causing their water infiltration rates to greatly decrease, sometimes becoming impenetrable by water, which results in decreased soil moisture and oxygen levels (Kuss 1986). Liddle and Greig-Smith (1975) also found that compaction in sand dunes is associated with a lack of oxygen in the soil (which can impair plant respiration). Compacted sandy soils, however, can also have higher volumetric water content than nearby uncompacted soil (Liddle and Greig-Smith 1975). Changes in the soil chemistry and soil organic matter have been observed by Stohlgren and Parsons (1986) in trampled areas. Some plants are more susceptible to trampling than others, which can create a change in the species composition on and around trails (Weaver and Dale 1978, Chappell et al. 1971, Dale and Weaver 1974, Cole 1978). Trampled areas may also have lower densities of arthropods, mollusks, and earthworms (Chappell et al. 1971).

The number and length of trails in both protected and unprotected areas can increase over the years (Kutiel 1999). Trails can have a higher rate of erosion than the surrounding habitat, and a system of trails can contribute to habitat fragmentation (Kutiel 1999). The potential consequences of habitat fragmentation include a lack of communication between animals of the same and of different

species, as well as decreasing the habitat available to animals that naturally have large home ranges (Kutiel 1999).

Trampling is relevant in the Red Cliffs Desert Reserve, because it supports habitats with loose sand, clay formations. Cryptogamic crusts that are well formed in some portions of the Reserve are easily disturbed by trampling and such disturbances can result in increases of exotic plant species (Evans and Belnap 1999).

Tortoises construct burrows (half-moon shaped tunnels) for protection from extreme temperatures and for nesting. The roof of a burrow is delicate and susceptible to collapse. The entrances of these burrows can have a low profile and can be obscured by vegetation, making them difficult to see. The weight of a human is more than sufficient to cause the entrance of a burrow to collapse. This could have one or more consequences: directly harming a tortoise at the entrance, making a burrow inaccessible to a tortoise outside, and/or trapping a tortoise inside the burrow.

Fire and Invasive Plants

Invasions by exotic plants can result in a process known as the grass/fire cycle. One source of exotic plants that should be considered is hay to feed horses. Weed free hay is required in many public recreation areas where weed infestation is a consideration. The grass/fire cycle is detrimental to desert tortoise habitats causing death to tortoises and other wildlife, as well as long term habitat changes (Esque et al. *In Review*). In deserts, people are a leading cause of fires other than natural causes (Swantek 1997). Fires can cause secondary disturbances that are detrimental to desert tortoise populations (Duck et al. 1997).

Pollution (Garbage)

Increased pollution (including air, water, noise, and discarded items) can be attributed to some recreational activities (Boyle and Samson 1985). Some animals, including some small mammals, coyotes and ravens , are attracted by garbage left by recreationists (Boyle and Samson 1985). Garbage is known to indirectly affect some wildlife by altering their behavior and densities (Watson 1979, Boyle and Samson 1985).

An increase in tortoise predation could result from a localized increase in predators (ravens, coyotes) that are attracted to, and whose diets are supplemented by, garbage (W. Boarman pers. communication). Garbage has also been shown to attract alien scavengers (for example dogs and cats) into reserves (Watson 1979).

Human and horse waste (fecal material and urine) cannot be ignored as a source of pollution in areas that allow recreation. Dale and Weaver (1974) stated that nitrogen sources are higher near trails used by animals than surrounding ground, which may cause differential responses of plants between the trail and surrounding habitat and increase exotic plants.

Spectator Impact Areas

Since organized recreational activities in reserves are usually well regulated and planned, their impacts can be minimized and mitigated. It is important to account for the impact of spectator crowds during such activities. The impact from spectators can surpass the impact of the actual organized events.

SPECIAL CONCERNS

Wildlife observers and photographers

Boyle and Samson (1985) speculate that wildlife observation and photography may have more wildlife disruption potential than recreationists randomly encountering wildlife, as they actively look for and approach wildlife (Boyle and Samson 1985). Wildlife viewing is quite popular; a survey of Denver metro area residents by Manfredo and Larson (1993) showed that 60% took trips specifically to view wildlife in 1990, making it Denver's third most popular outdoor recreation (behind picnicking and auto sight-seeing).

Dose

The potential of wildlife (Holmes et al. 1993) and vegetation (Burden and Randerson 1972) being adversely affected by recreation can depend on the frequency and level of the disturbance referred to as dose. The level of impact or disturbance to wildlife can also be related to the distance between recreation and the animal. Anderson (1988) determined that, for brown pelicans on islands off the coast of Mexico, the distance between nests and human disturbance had a direct relationship with how many nests were abandoned. Furthermore, there was a disturbance threshold of about 1,970 feet (600 meters) where, once human activity started occurring less than 600 meters from nests, the nests began to be abandoned. Fraser et al. (1985) determined that bald eagles in Minnesota didn't habituate to repeated disturbances.

Some desert tortoises are thought to habituate to human intrusions better than others. However, even the most habituated individuals respond to loud

talking and quick movements by altering their activities. Some tortoises do not habituate to human disturbance. If a tortoise that does not habituate to this disturbance is repeatedly approached by humans, it may severely restrict that animal's behavior. At this point, there is no published threshold for the distance that tortoises are affected by recreational activity. This type of "threshold distance" knowledge has been used for sensitive wildlife including raptors, marine mammals, and large mammals. It is possible that a similar approach could be utilized in the Reserve and be posted at trailheads.

The change in vegetation along trails and other trampled areas is also related to visitor load and the time over which the impact occurs (Kuss 1986). For example, in a mature salt-marsh habitat, it was estimated that vegetation cover would be completely destroyed by the trampling of 7500 people in one season (Burden and Randerson 1972). Monitoring programs of the type described on page 22 can detect adverse impacts such as trail widening and proliferation of trails.

BENEFITS

A review of 166 research papers conducted by Boyle and Samson (1985) on non-consumptive outdoor recreation concluded that only about six percent of the papers found some kind of positive effect on wildlife. There may be unknown benefits to recreational activities in the Red Cliffs Desert Reserve, and monitoring activities may illuminate those benefits. One benefit that we considered, is that any surface where water collects is a potential watering site for tortoises. Tortoises in the vicinity of trails could benefit from increased numbers of watering holes due to soil compaction on trails. Furthermore, conflicts with trampling would probably be minimized since tortoises usually drink while storms are in progress, and would likely encounter few recreational visitors.

Another benefit of increased recreation in the Reserve would be increased volunteerism. There are many projects associated with management and monitoring of the Reserve that would benefit from a well organized volunteer program.

Visitor Volunteer Services

Some recreational groups may be interested in volunteering their services to help with various aspects of Reserve management, thereby affording a sense of ownership and pride. Volunteers could easily patrol trails, trailheads, and roads to clean up trash, patch holes and fix other problems on fences, spot violations of Reserve restrictions, and keep tabs on other potential problems. Currently there is no established program to facilitate volunteer assistance on the Reserve. It is

reasonable that the support for the Reserve by recreationists will continue to grow and even more people will gain an appreciation for wildlife and be more inclined to help with Reserve protection and maintenance through a volunteer program.

HOW TO BEHAVE IF YOU GET TO SEE A TORTOISE

These recommendations are appropriate for most wildlife in the Reserve:

- 1) When tortoises are seen from a trail in the Reserve, the most important thing to do is stay on the trail. Repeated movements off-trail by recreationists can eventually widen the trail, further impacting the habitat and reducing the vegetative food base for tortoises and other species.
- 2) The easiest way to avoid directly impacting a wild tortoise is to leave it alone. Since their eyesight is very good, you want to keep a good distance away from the tortoise. Binoculars are a good way of observing tortoises without causing unintentional impacts.
- 3) Keeping a shrub or other natural visual obstruction between most of your body and the tortoise is also a good idea (if it's possible while staying on the trail), as they are very good at detecting movement. One can then watch a tortoise and learn more of its habits until it moves out of visual range of the trail.
- 4) If a tortoise is directly on the trail, don't approach it-this disturbs the tortoise by altering its behavior. Tortoises will generally move off the trail in a matter of minutes if left undisturbed.

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Appendix F: Response to Comments on the Draft Red Cliffs Desert Reserve Public Use Plan Draft March 14, 2000

Washington County received comment letters from 13 parties, received or postmarked during the public comment period, which ended on April 14, 2000. Three additional comment letters were received after the closing date, but they were considered by the County and are included herein. These letters are reprinted below in the order in which letters were received and issues were identified in the letters and numbered in their order of appearance. Responses to the comments raised in the letters are presented in the order in which they occur in the letters. Some issues were raised in more than one letter. Where the issue has already been addressed, reference is made to the earlier response.

Some of the comment letters received by the County on the Public Use Plan contained objections to the County's Habitat Conservation Plan (HCP). In particular, objections were expressed to the boundaries and size of the Red Cliffs Desert Reserve, to the manner in which desert tortoises are protected, and to the estimated size of the tortoise population in the Reserve. As the HCP was thoroughly debated and reviewed for six years prior to its approval by the Washington County Commission in February 1996, these comments are acknowledged, but they are not within the scope of the current planning process. The Public Use Plan must conform to the approved HCP; old HCP issues are not being revisited or reconsidered at this time.

Letters were received from:

1. Private parties
2. Private party
3. Private party
4. Private party
5. Private party
6. Ken Sizemore, Five County Association of Governments
7. Private party
8. Private party
9. Gregg McGregor, President, Dixie Wildlife Federation
10. Private party
11. Private party
12. Robert Wells, Board of Directors, Southern Utah Pointing Dog Club
13. Mayor Dan Howard, LaVerkin City
14. Reed Harris, U.S. Fish and Wildlife Service (late)
15. Private party (late)
16. Private party (late)

Comment Response

- 1-1 Thank you for your comment.
- 1-2 The Planning Team intended that the document be changed to reflect vehicle access and parking at Sand Cove at the locations that you depicted on your attached photograph. However, additional roads that extend from these parking areas will be blocked in a manner which contains parking to designated parking areas; this may require that people walk a short distance, perhaps a few hundred feet or so, in to campsites.
- 2-1 Thank you for your comment.
- 2-2 Public support for the Reserve is noticeably increasing, and the long-term success of the Reserve relies on community pride and a growing sense of responsibility for protecting tortoises and the scenic open space they use.
- It follows that reasonable approaches to law enforcement matters should be taken which will continue to build cooperation and good will between Reserve managers and the public. To this end, any enforcement approach will start with education. Users found to be in violation of prescriptions, for example traveling off of designated trails where it is prohibited, will be informed of the regulation and advised to stay on the trail. It is anticipated that user groups or individuals who are frequently in the Reserve could be recruited as volunteers to help extend the reach of the education program. However, appropriate law enforcement action, including citation and prosecution, will be taken in cases where groups or individuals are: 1) willfully or carelessly destroying or degrading natural resources or habitat; 2) harassing or harming protected wildlife within the Reserve; and 3) in repeated violation of Reserve regulations.
- 3-1 With the signing of the Habitat Conservation Plan (HCP), approved by the County Commission in February 1996, use restrictions were placed on motorized and non-motorized travel in the Reserve. Restrictions protect both tortoises and their habitat; one of the primary reasons that tortoises have been listed as Threatened under the Endangered Species Act is due to loss of quality habitat.
- 3-2 The Red Cliffs Desert Reserve was established and tortoise habitat within it protected so that over 12,000 acres of tortoise habitat outside of its boundaries could be developed for private and commercial uses. Tortoises found on incidental take areas located outside of Reserve boundaries are carefully moved and relocated to remote desert locations inside of the Reserve.
- 3-3 The boundaries of the Reserve were established with the signing of the HCP and are outside of the scope of the Public Use Plan.
- 4-1 Where legal access exists to private property within the boundaries of the Reserve, private access is protected, subsequent to the HCP permit. If no legal access to property exists, Reserve managers are willing to work with the landowner to attempt to secure or provide access, though access cannot be guaranteed. Construction of new roads or

other surface disturbance on private property within the Red Cliffs Desert Reserve may be restricted by the US Fish and Wildlife Service as such actions are not covered by the County's Incidental Take Permit.

Comment Response

- 4-2 Scientific evidence suggests that desert tortoises are native to this area, though historically they may not have been present in as high of density as they are now. The Reserve was specifically established so that human activity and use could continue in areas of tortoise habitat outside of the Reserve, however, non-consumptive recreation, including hiking, hunting, horseback riding, camping and bicycling is allowed within the Reserve and are addressed in the Public Use Plan.
- 5-1 Because research has shown that motorized recreational use causes both a significant loss of tortoise habitat and is a documented mortality factor, the HCP restricted motorized access to the Reserve to designated roads.
- 5-2 Throughout the Reserve, bicycles are restricted to designated trails, since trail proliferation is common with this use. Both horseback riding and hiking are allowed to travel off-trail in the Upland Zone, where tortoise habitat is generally lower-quality and tortoises are not typically found, but both of these uses are restricted to designated trails in the Lowland Zone. As use within the Reserve continues to increase, more and more hikers will visit the area. Impacts to animals and habitat significantly increase with the number of users to an area. Also, hikers are more likely to accidentally harass tortoises as they are more likely to see them, and want to follow and observe them.
- 5-3 While hiking, horseback riding and bicycling can occur on designated trails in the lowland zone, hunters simply cannot hunt from trails. The limited hunting that occurs within the Reserve in the Lowland Zone takes place during the months of the year when tortoises are generally inactive. This use has minimal impact on tortoises and tortoise habitat and the HCP protected the right for hunters to hunt within the Reserve for Big Game and Upland Game species during official seasons, consistent with State and Municipal laws. Predator hunting will be conducted as necessary, under the control Reserve Managers, as necessary to control legitimate problems created by predators. The HCP prohibits target shooting.
- 6-1 See response to comment 4-1.
- 6-2 Reference to both the *Washington County General Plan* and the *Coordination Plan for Washington County's Urbanizing Region* has been added.
- 6-3 Thank you for your comment. Further editorial review suggests that the current text is consistent with the rest of the paragraph. Most important is the recognition that everyone agrees that public participation is important.
- 6-4 Comment incorporated.
- 6-5 Text clarified, consistent with comment.

- 6-6 The section has been revised based on updated research provided by commenter.
- 6-7 Text clarified, consistent with comment.
- 6-8 Text clarified, consistent with comment.

Comment Response

- 7-1 The public hearing was announced in a front page article which the Spectrum published on March 14, two weeks prior to the meeting, as well as the front page story on the day of the meeting. Notice was listed in the paper both the day before and the day of the meeting, and the meeting was discussed on talk radio the day prior, with the hopes of helping people to become aware of the meeting and the issues and to encourage them to attend.
- 7-2 See response to comment 3-1. The suggestion about the importance of education is appreciated by the committee and they are in general agreement that education can be very helpful in reducing impacts to tortoises.
- 7-3 See response to comment 3-2.
- 7-4 Thank you for your comment.
- 7-5 Thank you for your comment.
- 8-1 The HCAC reviewed the proposals in the comment and came to the conclusion that it was not the intent of the Plan to prevent off-trail travel in these higher, rugged slickrock areas on the west side of Snow Canyon. However, rather than designating additional trails, the HCAC concluded instead to relocate the Upland Zone boundary to include these areas. Specific access trails to these areas from West Canyon are not designated at this time; Snow Canyon State Park Personnel anticipate that this will be one of the first tasks which will be tackled by its newly appointed advisory committee. The Park has the authority to designate such access trails, even if they are not shown on the Public Use Plan map.
- 9-1 The draft Plan did not intend to eliminate hunting in the Reserve, but had proposed that hunting in the Lowland Zone be prohibited. However, after further consideration, this proposal has been modified to allow off-trail hunting in the Lowland Zone east of Cottonwood Road, in addition to hunting in the Upland Zone. Hunting in the Reserve is restricted by the HCP to big game and upland game species by licensed hunters during official seasons.
- 9-2 Hunters have and continue to make tremendous contributions to the Reserve through volunteer efforts to pick up trash, constructing wildlife enhancements, and by taking an active role in debating wildlife management issues. Reserve managers greatly appreciate these contributions, and look forward to continuing to work with hunters on such projects.
- 9-3 These sentences were not necessary and the offensive language has been eliminated.

- 9-4 See response to comment 9-1.
- 9-5 See response to comment 9-1 and 12-3.
- 9-6 See response to comment 12-2.

Comment Response

- 9-7 The hunting of mountain lions in the area now within the Reserve has historically reduced the lion population and is viewed by hunters as a necessary activity to protect the Pine Valley Mountain wintering deer herd. It is not the intent of the Plan to preclude *predator control*/by precluding the *hunting* of certain species; the planning team intentionally separated the concept of controlling predators from hunting, and treats these as separate activities. The section on predator control has been clarified to include species of concern. Predator control will be directed by Reserve managers and coordinated with the appropriate authorities. Local predator hunters will have the opportunity to work with Reserve managers as volunteers in a program designed to achieve mutual goals as necessary.
- 9-8 The concern for predator control is expanded to include coyotes in this comment. See response to comment 9-7.
- 9-9 See response to comment 9-7.
- 9-10 Both coyotes and ravens are known predators of juvenile tortoises, and these predators can be a factor in increased juvenile mortality. See response to comment 9-7.
- 9-11 The HCAC appreciates the conviction of the Dixie Wildlife Federation and the dedicated hunter program to promote responsible hunting, and agree that education will help hunters to become aware of applicable rules and appropriate behavior inside of the Reserve.
- 9-12 The HCAC is particularly grateful that the Dixie Wildlife Federation is willing to acknowledge that closure of critical areas west of Cottonwood Road–Kayenta, City Creek, Snow Canyon and Paradise Canyon—is reasonable because of safety, wildlife and habitat concerns.
- 9-13 Although it can be challenging to retrieve big game while hunting in remote areas, and the HCAC acknowledges this difficulty, the HCP is clear that motorized vehicles are restricted to designated roads within the Reserve. Horses are allowed off-trail in the Upland Zone, and could arguably be used by a hunter in the act of hunting within the Lowland Zone, to retrieve taken animals.
- 10-1 See response to comment 8-1.
- 10-2 See response to comments 9-1, 12-2, 12-3 and 9-3.
- 10-3 See response to comment 9-7.

- 11-1 The Habitat Conservation Advisory Committee (HCAC) considered this comment, however, this road was not identified in the federal HCP permit for motorized traffic. This historic trail will remain open to horseback riding, mountain biking, and hiking for the public's enjoyment. This decision conforms to the recommendations made in the US Fish and Wildlife Service's Tortoise Recovery Plan. We're sorry that we cannot incorporate this change.

Comment Response

- 12-1 Thank you for your comment.
- 12-2 The Habitat Conservation Advisory Committee (HCAC) considered this comment and concurred with the assertion that it would impossible to exercise the sport of hunting with bird dogs if the dog were required to be on a leash. Although the HCP requires that dogs be on a leash, the document also protects the opportunity to hunt for upland birds by licenced hunters during official seasons. The HCAC determined that, in part because it was assumed that only a few people hunt in the Reserve with dogs, that allowing this specialized use of trained dogs, during the time of year when tortoises are generally inactive, would not cause significant impacts. The document has been changed to reflect this.
- 12-3 The Habitat Conservation Advisory Committee (HCAC) considered this comment and concurred with the assertion that the nature of the sport required hunters to travel off-trail [in the Lowland Zone]. The HCAC determined that, in part because it was assumed that only a few people hunt in the Lowland Zone of the Reserve, that allowing this use, during the time of year when tortoises are generally inactive, would not cause significant impacts. However, after consultation with the user group, it was decided that the area within the Lowland Zone west of Cottonwood Road had additional concerns due to human safety and high quality desert tortoise habitat. Hunter representatives acknowledged these concerns and stated a willingness to abide by a closure to hunting within the Lowland Zone to the west of Cottonwood Road. The document has been changed to reflect this.
- 12-4 The fact that licensed hunting occurs during the winter months was a factor in the HCAC making the above changes to the final document.
- 12-5 Thank you for your comment. Reserve managers look forward to working closely and cooperatively with user groups to improve habitat, maintain trails, and remove trash from the Reserve.
- 13-1 Thank you for your comment.
- 13-2 It is the intent of the Plan to place only reasonable limits on public uses within the Reserve, consistent with the HCP, that prevent undue damage to natural resources, wildlife habitat, and wildlife. In some cases, where scientific evidence is weak or there is insufficient information, the Plan may be more conservative than necessary or too liberal for the situation; as new information is gathered and our understanding of impacts increases over time, the Plan is designed to be adaptable so that the limitations imposed

remain reasonable and appropriate.

- 13-3 Public support for the Reserve is noticeably increasing, and the long-term success of the Reserve relies on community pride and a growing sense of responsibility for protecting tortoises and the open space they use.

It follows that reasonable approaches to law enforcement matters should be taken which will continue to build cooperation and good will between Reserve managers and the public. To this end, any enforcement approach will start with education. Users found to

Comment Response

(13-1 *continued*) be in violation of prescriptions, for example traveling off of designated trails where it is prohibited, will be informed of the regulation and advised to stay on the trail. It is anticipated that user groups or individuals who are frequently in the Reserve could be recruited as volunteers to help extend the reach of the education program. However, appropriate law enforcement action, including citation and prosecution, will be taken in cases where groups or individuals are: 1) willfully or carelessly destroying or degrading natural resources or habitat; 2) harassing or harming protected wildlife within the Reserve; and 3) in repeated violation of Reserve regulations.

- 14-1 The question of whether or not tortoises respond adversely to human presence was debated by the planning team; it is an area where Reserve managers will benefit from additional research. Nevertheless, the Plan respects high density tortoise populations and generally avoids these areas by limiting designated trails in these areas.
- 14-2 These trails have been reviewed several times by the planning team; the HCAC concurs with the team's conclusions that each of these trails has sufficient rationale to remain open year-round, despite the concerns raised by some individuals of the technical committee. Usually, the trail provides critical trail linkages, there are no alternative or better routes, or the trail serves established use in an area where other trails are being eliminated.
- 14-3 The boundary separating the Upland/Lowland Zones in the area of Mill Creek was revised by the HCAC to address these concerns, while being both ecologically defensible and practical for users to locate.
- 14-4 How the provisions of the Plan are enforced is of concern to all Reserve managers. While it is important to achieve the objectives of the plan, it is also important to maintain public confidence and support. See response to comment 13-3.
- 14-5 Comment incorporated. See response to comment 12-3.
- 14-6 Comment incorporated. See response to comments 9-7 and 9-8.
- 14-7 Monitoring is considered important to the ultimate effectiveness of the Public Use Plan by all Reserve managers; funding and implementing the monitoring is a high priority. The County will initiate baseline monitoring, and will work with other Reserve managers to secure funding for the second phase, as outlined on page 26 of the final draft.

15-1 See response to comment 11-1.

16-1 See response to comment 11-1.

APPENDIX C

Species of Concern

CALIFORNIA CONDOR – ENDANGERED AND EXPERIMENTAL POPULATION (NONESSENTIAL)

Background and Status

The USFWS placed the California condor (*Gymnogyps californianus*) on the federal endangered species list in March 1967 (USFWS 1967) and subsequently revised the list and designated the species as endangered in 1975 (USFWS 1975) under the ESA. The USFWS reintroduced California condors into Arizona, Nevada, and Utah in 1996; these introduced groups were classified as nonessential experimental populations (USFWS 1996). Nonessential populations are only subject to Sections 7(a)(1) and 7(a)(4) of the ESA, requiring federal agencies to conserve listed species and confer with the USFWS on actions likely to jeopardize the continued existence of a species (USFWS 1996). In April 2019, the USFWS proposed the establishment of an additional nonessential experimental population in the Pacific Northwest (84 FR 13587). As of the end of 2017, there were 463 living California condors in total, with 290 in the wild and 173 in captivity, with 82 condors in the Arizona-Utah population (USFWS 2017a). Threats to condors include poisoning, consumption of microtrash, predation, power line collision, shooting, habitat destruction, and habituation to people and human-made objects. Lead and other chemicals have continued to be a threat to condors.

Existing Conservation Agreements and Plans

The USFWS originally approved *Recovery Plan for the California Condor* in 1975 (USFWS 1975). In 1979, the USFWS approved the first revisions to the recovery plan, with a second revision approved in 1984, and third revision approved in 1996 (USFWS 1996).

Species Description, Habitat, and Range

The California condor is one of the largest flying land birds in the world; adults weigh 18 to 31 pounds and have a wingspan up to 9.5 feet (USFWS 2013). California condors are long lived; they can live more than 50 years in captivity. California condors are opportunistic scavengers; food is typically found via long-distance reconnaissance flights (USFWS 2013). Telemetry data shows condors cover great distances, including one flight from southern Utah to Wyoming, which was over 400 miles (USFWS 2013). Inland foraging habitat is typically composed of open terrain that supports populations of deer, elk, and cattle; California condors have been observed feeding in more wooded areas as well (USFWS 2013). California condors repeatedly use roosting sites on ridgelines, rocky outcrops, steep canyons, and tall trees or snags near foraging grounds (USFWS 1996). California condors require high perches from which strong updrafts provide the lift needed for flight (USFWS 2013). They are primarily a cavity-nesting species and typically nest in cavities located on steep terrain with rock outcroppings, cliffs, and caves or in the burned-out hollows of old-growth conifers (USFWS 2013).

The USFWS designated final Critical Habitat for the California condor in 1977, including “an area of land, water, and airspace to an elevation of not less than 3,000 feet above the terrain” for several areas within California (USFWS 1977:47841). There is no designated Critical Habitat for this species in the County (Plan Area) or outside the State of California (USFWS 1977).

Tracking data shows a consistent 112 km (~70 mile) radius range for the established experimental Arizona-Utah flock of California condors. Within the Plan Area, the California condor ranges across an area just west of Interstate 15, northeast of St. George, to just north of Cedar City. During spring through fall, California condors concentrate near Zion National Park and the Kolob Plateau to the north. They

typically return to Arizona for the winter (USFWS 2017b) and can fly between Zion National Park and the Grand Canyon in 1 day (UDWR 2019). California condors are most abundant in Utah from June through August (UDWR 2019).

Nesting and roosting habitat for the California condor are distinct—they require steep slopes or cliffs or tall trees to allow for approach and landing and to become airborne again (USFWS 2013)—and do not overlap with terrain that the MDT would inhabit. However, because foraging habitat for the California condor is so extensive, and feeding opportunities are widely dispersed across its range (USFWS 2013), California condors may use MDT habitat for foraging.

Rationale for No Coverage

California condors are known to fly great distances and may forage in areas ranging from northern Arizona to southern Utah, including the County, as well as southern California. There is no Critical Habitat for the California condor in the County. Open hills and shrubland habitats utilized by California condors for foraging may overlap with MDT habitats; however, California condor breeding and roosting habitats do not occur in suitable MDT habitats. Some areas of foraging habitat may be lost with development under Covered Activities; however, the loss of some areas of foraging habitat would not be expected, directly or indirectly, to jeopardize the continued survival and recovery of the California condor due to their extensive flight and foraging range. Additionally, the use of foraging habitat is dependent the ability for a California condor to access an area, which may be impacted seasonal conditions and therefore all areas of foraging habitat are not utilized throughout all portions of the year (USFWS 2013). As the California condor forages widely searching for irregular feeding opportunities, the presence of a California condor in areas subject to Covered Activities is not reasonably certain. Therefore, Covered Activities are not reasonably certain to directly cause take of California condors.

No Critical Habitat would be destroyed or modified. Take of California condors is not reasonably certain to occur, and no take of the species is anticipated under this HCP. For these reasons, the California condor is not included as a Covered Species under this HCP.

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MEXICAN SPOTTED OWL – THREATENED

Background and Status

The USFWS listed the Mexican spotted owl (*Strix occidentalis lucida*) as a threatened species in March 1993 (USFWS 1993). It is found in the southern and eastern parts of Utah on the Colorado Plateau where it is a rare, permanent resident. In the County, Mexican spotted owls are known from Zion National Park. The species is threatened by the risk of stand-replacing wildland fire due to the intensification of drought cycles and overstocked forested habitats that can result in larger and more severe fires (USFWS 2013). Other threats include grazing, recreation, fuels reduction treatments, resource extraction, and development (USFWS 2013).

Species Description, Habitat, and Range

The Mexican spotted owl is a medium-sized owl that is mottled with white spots on a brown abdomen, back, and head (USFWS 2012). They nest, roost, and forage in a wide variety of biotic communities. Mexican spotted owls are nonmigratory. Mexican spotted owls are frequently associated with mature mixed-conifer, pine-oak, and riparian forests (69 FR 53182). In Utah, breeding owls primarily inhabit deep, steep-walled canyons and hanging canyons (USFWS 2012) with access to a water source. Owls are very selective regarding roosting and nesting sites but will forage in a more diverse range of habitats, typically in sites with higher canopy closure, live-tree basal areas, snag density, and fallen logs than random areas (Ganey 1988, as cited in Gutiérrez et al. 1995). One study by Ganey and Balda (1989), radio-marked owls and found that the species utilized unlogged forests more than expected and selectively logged forests less than expected.

According to the USGS Gap Analysis Program data (Boykin et al. 2007; USGS GAP 2007), the range and predicted habitat mapped in Utah is predominantly east of Interstate 15 and northeast of Hurricane, Utah, concentrated in and around Zion National Park (Boykin et al. 2007; USGS GAP 2007). In southern Utah, researchers conducted surveys and modeled habitat for the Mexican spotted owl to determine habitat characteristics associated with owl presence (Lewis 2014). Lewis (2014) found that the most important variables for predicting species presence in southern Utah included surface ratio (i.e., topographic roughness) and curvature (i.e., a measure of tablelands, cliff tops, and canyons across the landscape). Lewis (2014) determined that the probability for owl presence increased with positive surface ratios, indicating a more complex landscape (e.g., canyon formations) and increased with negative curvature values, indicating a preference for steep canyons while avoiding flat areas. Lewis (2014) also compared sites with and without owl presence to determine the variables associated with Mexican spotted owl presence, finding that owl presence occurred at sites with significantly narrower canyon widths, greater canopy cover, and higher vegetation height and density (Lewis 2014).

The USFWS designated final Critical Habitat for the Mexican spotted owl in 2004 (USFWS 2004) encompassing 8.6 million acres of federal lands in Arizona, Colorado, New Mexico, and Utah. Approximately 260,105 acres of Critical Habitat are designated in the County, all east of Interstate 15. The USFWS (2012) reports that 95.5% of all known owl sites documented in the Colorado Plateau Ecological Management Unit (EMU) since 1989 have been documented on NPS-, BLM-, or USFS-managed lands.

Rationale for No Coverage

Mexican spotted owls are known to occur within the County and designated Critical Habitat for the Mexican spotted owl occurs east of Interstate 15, in and surrounding Zion National Park within the County. There is no Critical Habitat for the Mexican spotted owl within the Reserve and nearly all Critical Habitat for the species in the County occurs on federally owned or managed lands that are not subject to Covered Activities. The USFWS (2012) identified physical and biological features of Mexican spotted owl habitat necessary for nesting, roosting, foraging, and dispersing that include the presence of water (often providing a cooler air temperature and often higher humidity than the surrounding areas); clumps or stringers of mixed-conifer, pine-oak, pinyon-juniper, and/or riparian vegetation; canyon walls containing crevices, ledges, or caves; and a high percentage of ground litter and woody debris. Habitats preferred and utilized by MDTs (desert scrub, gravelly soils in which to burrow) are generally dissimilar to those preferred by Mexican spotted owls (moist pockets of forest, steep-walled canyons), and broad areas of these habitats typically would not overlap (USFWS 2012).

Although, some portions of Mexican spotted owl Critical Habitat overlap with Occupied MDT Habitat and modeled Suitable MDT Habitat, Covered Activities are not reasonably certain to cause take of Mexican spotted owls in these areas due to the dissimilar habitat of these species (i.e., Mexican spotted owls and MDT are unlikely to occupy the same habitat within the County as MDT habitat lacks the physical and biological features of owl roosting and foraging habitat). Additionally, 95.5% of known owl sites in the Colorado Plateau EMU occur on federal lands that are not subject to Covered Activities (USFWS 2012). Therefore, Covered Activities are not reasonably certain to cause take of Mexican spotted owls and no destruction or adverse modification of Critical Habitat is anticipated as Covered Activities will occur on MDT habitat that is dissimilar from the preferred roosting and foraging habitat of the Mexican spotted owl. For these reasons, the Mexican spotted owl is not included as a Covered Species under this Amended HCP.

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SOUTHWESTERN WILLOW FLYCATCHER – ENDANGERED

Background and Status

The USFWS listed the southwestern willow flycatcher (*Empidonax trailii extimus*) as endangered under the ESA in February 1995 (USFWS 1995). In Utah, southwestern willow flycatchers are known only from Virgin River riparian habitats. UDWR has conducted surveys in the St. George area since 2008 and has recorded occupied breeding habitat at nine sites along the Virgin River.

In 2018, UDWR observed a total of 16 nesting female flycatchers, the highest number observed since the beginning of UDWR surveys. Current threats to southwestern willow flycatchers include loss of riparian habitat, alteration in stream hydrology (e.g., water withdrawal, impoundments), reservoir management, and brood parasitism by brown-headed cowbirds.

Existing Conservation Agreements and Plans

The Virgin River Resource Management and Recovery Program (VRRMRP; also known as the Virgin River Program) conserves and monitors riparian bird species, including the southwestern willow flycatcher in the Virgin River Basin. The VRRMRP works to enhance riparian habitats and reduce threats to the flycatchers by reducing threats from predators and avian brood parasites (UDNR 2002).

County zoning restrictions protect aquatic and riparian habitats within the Virgin River Basin in unincorporated areas of the County by adopting zoning and ordinances that preserve open spaces within the 100-year floodplain (Washington County 2012). Local municipalities along the Virgin River (St. George, Washington City, La Verkin, and Hurricane) have each adopted zoning restrictions and ordinances that preserve open space within the 100-year floodplain (City of Hurricane 2011, 2019; City of St. George 2002; La Verkin City 2018; Washington City 2017).

Species Description, Habitat, and Range

The southwestern willow flycatcher is one of four recognized subspecies of the willow flycatcher. It is a neotropical bird that grows to approximately 6 inches in length (USFWS 2017). Southwestern willow flycatchers are aerial insectivores that typically fly out from a perch to capture their prey, although other foraging methods are used occasionally. Preferred nesting habitat is mature riparian habitat that consists of cottonwood-willow forests or saltcedar thickets along still or slow-moving watercourses at elevations that range from near sea level to 8,500 feet (USFWS 2002). Usually only one brood is produced per year. All 2018 active nests were built in saltcedar (tamarisk) (UDWR 2018).

The geographic distribution for the southwestern subspecies includes southern Nevada, southern Utah, southern Colorado, Southern California east to western Texas, and extreme northwestern Mexico (USFWS 2002). Southwestern willow flycatchers are migratory, arriving in breeding territories by mid-May, and then migrating to southern wintering grounds in August and September (USFWS 2002).

The USFWS originally designated Critical Habitat for the species in 1997 and after several revisions, finalized it in 2013 (USFWS 2013). Critical Habitat for the southwestern willow flycatcher includes riparian areas and stream segments, the lateral extent of which incorporates the 100-year floodplain or flood-prone areas surrounding the stream segments. A 94.4-mile Critical Habitat unit extends along a segment of the Virgin River beginning at Berry Springs in Hurricane, flowing southwest through Arizona and into Nevada (62 FR 39129–39147, 62 FR 44228). The Virgin River, including this segment, flows

just south of St. George. The Critical Habitat in the Plan Area is located within the Virgin River Management Unit of the larger Lower Colorado Recovery Unit (USFWS 2002).

The habitat for the southwestern willow flycatcher and MDT generally does not overlap, as MDTs are not typically found in dense riparian areas. However, southwestern willow flycatcher and MDT may utilize similar habitats within the 100-year floodplain of the Virgin River Basin (USFWS 2002, 2011).

There is predicted habitat (based on GIS modeling) for southwestern willow flycatcher along riparian corridors mapped throughout the Plan Area; particularly the Virgin River and the Santa Clara River north and south of the Gunlock Reservoir and its tributaries (e.g., Manganese Wash, Magotsu Creek, Moody Wash, Pakoon Spring Wash) (Boykin et al. 2007; USGS GAP 2007). Other predicted habitat areas include Grapevine Wash, tributaries to Leeds Creek, Ash Creek and La Verkin Creek, and North Creek (Boykin et al. 2007; USGS GAP 2007). However, known occupied habitat is limited to the Virgin River (UDNR-UDWR 2018).

Rationale for No Coverage

Habitats used by the southwestern willow flycatcher and MDT do not typically overlap within the Plan Area (USFWS 2002, 2011); therefore, Covered Activities are not reasonably certain to cause take of the southwestern willow flycatcher. Although, some portions of southwestern willow flycatcher Critical Habitat overlap with Occupied MDT Habitat and modeled Suitable MDT Habitat, especially within the 100-year floodplain, Covered Activities are not reasonably certain to cause take of southwestern willow flycatchers in these areas due existing floodplain protection and the dissimilar habitat preferences of these species (i.e., southwestern willow flycatchers and MDT are unlikely to occupy the same habitat within the County because MDT habitat generally lacks the physical and biological features for flycatcher habitat) (62 FR 39129–39147, 62 FR 44228).

County zoning restrictions protect aquatic and riparian habitats within the Virgin River Basin in unincorporated areas of the County by adopting zoning and ordinances that preserve open spaces within the 100-year floodplain (Washington County 2012). Local municipalities along the Virgin River (St. George, Washington City, La Verkin, and Hurricane) have each adopted zoning restrictions and ordinances that preserve open-space within the 100-year floodplain (City of Hurricane 2011, 2019; City of St. George 2002; La Verkin City 2018; Washington City 2017). These zoning restrictions and ordinances, called for in the VRRMRP, protect riparian habitats and water quality for sensitive species in the Virgin River Basin, including species that utilize habitat within the 100-year floodplain (UNDR 2002).

For these reasons, take of southwestern willow flycatchers is not reasonably certain to occur as a result of Covered Activities of this Amended HCP and therefore the flycatcher is not included as a Considered Species.

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YELLOW-BILLED CUCKOO – THREATENED

Background and Status

The USFWS proposed the western population of the yellow-billed cuckoo (*Coccyzus americanus*) for listing in 2013 and listed the species as threatened under the ESA in October 2014 (USFWS 2014). As of the 2013 proposed listing, there were fewer than 10 breeding pairs, and likely no more than 20 pairs of cuckoos identified within the state of Utah. The decline of the yellow-billed cuckoo is a result of riparian habitat loss and degradation (USFWS 2014).

Existing Conservation Agreements and Plans

The Virgin River Resource Management and Recovery Program (VRRMRP; also known as the Virgin River Program) conserves and monitors riparian birds and aquatic species in the Virgin River Basin. The VRRMRP works to enhance riparian habitats and reduce threats to the riparian species by reducing threats from predators and avian brood-parasites (UDNR 2002).

Washington County zoning restrictions protect aquatic and riparian habitats within the Virgin River Basin in unincorporated areas of the County by adopting zoning and ordinances that preserve open-spaces within the 100-year floodplains (Washington County 2012). Local municipalities along the Virgin River (St. George, Washington City, La Verkin, and Hurricane) have each adopted zoning restrictions and ordinances that preserve open-space within the 100-year floodplains (City of Hurricane 2011, 2019; City of St. George 2002; La Verkin City 2018; Washington City 2017).

Species Description, Habitat, and Range

The yellow-billed cuckoo is a neotropical bird that winters in South America and breeds in North America. Yellow-billed cuckoos are a medium-sized bird, about 12 inches in length. Males and females are indistinguishable in the field and the birds are secretive and difficult to detect (USFWS 2014).

According to the 2013 proposed listing (USFWS 2013), the cuckoo nests almost exclusively in low to moderate elevation riparian woodlands that cover 50 acres or more within arid to semiarid areas. The majority of nests are placed in willow trees, but alder, cottonwood, mesquite, walnut, box elder, sycamore, and tamarisk are also used (USFWS 2013). Little is known about the yellow-billed cuckoos' migration; however, it appears that they may be found in smaller riparian patches than what is typically required for nesting (USFWS 2013). Likewise, little information is available regarding foraging activities, but what has been observed indicates that yellow-billed cuckoos tend to forage within riparian habitat with abundant leafy vegetation (USFWS 2013).

The USFWS proposed Critical Habitat for designation on August 15, 2014 (USFWS 2014); however, the designation has not yet been finalized. Proposed Critical Habitat Unit 68: Utah-8 Virgin River 2 is located within the Plan Area and extends over a 1,390 acre 13-mile-long continuous segment of the Virgin River near St. George (USFWS 2014). At the time of the proposed Critical Habitat designation, Unit 68 was known to be consistently occupied by yellow-billed cuckoos (USFWS 2014).

Although there is limited occupied habitat known to exist within Utah, there is *predicted* habitat, based on GIS modeling, mapped throughout the Plan Area along riparian corridors—particularly the Virgin River and the Santa Clara River north and south of the Gunlock Reservoir and its tributaries (e.g., Manganese Wash, Magotsu Creek, Moody Wash, Pakoon Spring Wash) (Boykin et al. 2007; USGS GAP 2007). Other predicted habitat areas include Grapevine Wash, tributaries to Leeds Creek, Ash Creek and La

Verkin Creek, and North Creek. According to UDWR (personal communication, Keith Day, UDWR, Wildlife Biologist, Misha Seguin, Jacobs Engineering Group, February 13, 2019), the yellow-billed cuckoo has been periodically observed in the County. The species has been intermittently detected along the Virgin River and the Beaver Dam Wash, and there is one known detection along the Santa Clara River. However, there are no consistent site-specific locations and no indication or evidence of breeding by the species within the St. George area (personal communication, Keith Day, UDWR, Wildlife Biologist, Misha Seguin, Jacobs Engineering Group, February 13, 2019).

Yellow-billed cuckoo nesting and foraging habitat may be present within larger scale riparian areas within the MDT's range, and these species may utilize the same habitats within the 100-year floodplain of the Virgin River Basin. However, the habitats of the two species generally do not overlap, as MDTs are not typically found in riparian woodland areas and MDT habitat lacks the physical and biological features of the cuckoo (USFWS 2011, 2014). Biological and physical features essential to cuckoo breeding habitat, including woodlands within floodplains with an understory and overstory component, are at least 220 acres in extent and a contiguous or nearly contiguous patch (USFWS 2020). Additionally, local zoning restrictions and ordinances protect habitat of the 100-year floodplain where the two species may co-occur (City of Hurricane 2011, 2019; City of St. George 2002; La Verkin City 2018; Washington City 2017; Washington County 2012).

Rationale for No Coverage

Although MDT and the yellow-billed cuckoo may utilize similar habitat in the 100-year floodplain for foraging, the habitats used by these species generally do not overlap within the Plan Area (USFWS 2011, 2014). Therefore, Covered Activities are not reasonably certain to cause take of the yellow-billed cuckoo. Although, some portions of proposed yellow-billed cuckoo Critical Habitat overlap with Occupied MDT Habitat and modeled Suitable MDT Habitat, Covered Activities are not reasonably certain to cause take of yellow-billed cuckoos in these areas due to the dissimilar habitat preferences of these species (i.e., yellow-billed cuckoos and MDT are unlikely to occupy the same habitat within Washington County because MDT habitat lacks the physical and biological features for cuckoo habitat) (79 FR 48548).

Additionally, County zoning restrictions protect aquatic and riparian habitats within the Virgin River Basin in unincorporated areas of the County by adopting zoning and ordinances that preserve open spaces within the 100-year floodplain (Washington County 2012). Local municipalities along the Virgin River (St. George, Washington City, La Verkin, and Hurricane) have each adopted zoning restrictions and ordinances that preserve open space within the 100-year floodplains (City of Hurricane 2011, 2019; City of St. George 2002; La Verkin City 2018; Washington City 2017). These zoning restrictions and ordinances, called for in the VRRMRP, protect riparian habitats and water quality for sensitive species in the Virgin River Basin, including species that utilize habitat within the 100-year floodplain (UNDR 2002).

For these reasons, take of yellow-billed cuckoos is not reasonably certain to occur as a result of Covered Activities of this Amended HCP and therefore the yellow-billed cuckoo is not included as a Considered Species.

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YUMA RIDGWAY'S [CLAPPER] RAIL – ENDANGERED

Background and Status

The USFWS placed the Yuma Ridgeway's rail, previously Yuma clapper rail, (*Rallus obsoletus [= longirostris] yumanensis*) on the federal endangered species list in March 1967 (USFWS 1967, 2017). Threats to Yuma Ridgeway's rail include loss of habitat through channelization, dredging, and degradation as well as predation from coyotes, raccoons and raptors. This bird is not known to occur in Utah (USFWS 2009).

Species Description, Habitat, and Range

The Yuma Ridgeway's rail is a water bird with long legs and a short tail; it is approximately the size of a chicken with gray-brown and buffy-cinnamon coloring (USFW 2018). Yuma Ridgeway's rails inhabit dense emergent vegetation of freshwater and alkali marshes along rivers, backwaters, and in drains or sumps supported by irrigation water (USFWS 2006). They feed on crayfish, small fish, frogs, and aquatic invertebrates (USFWS 2009).

Historically, Yuma Ridgeway's rail may have been found along the Virgin River in Utah (USFWS 2014) where habitat exists along the margins of the river and wetted floodplain (USFWS 2009). Detection histories show a small number of rails (one to 24 individuals) observed since 1998 along the Virgin River stretch “above Lake Mead.” There are no records upstream of the confluence of the Beaver Dam Wash in Arizona along the Virgin River. According to UDWR, no sightings of Yuma Ridgeway's rail are known from Utah (personal communication, Keith Day, UDWR, Misha Seguin, Jacobs Engineering Group, February 13, 2019).

There is no Critical Habitat designated for this species.

Rationale for No Coverage

Yuma Ridgeway's rail is not known to occur in the County. There is no designated Critical Habitat for this bird species. Habitats preferred and utilized by MDTs (desert scrub, gravelly soils in which to burrow) are generally dissimilar to those preferred by Yuma Ridgeway's rail (dense emergent vegetation of freshwater and alkali marshes) (USFWS 2009, 2011). Covered Activities as described under this plan are not reasonably certain to cause take of the Yuma Ridgeway's rail. No take of Yuma Ridgeway's rail is anticipated under the proposed HCP. For these reasons, the Yuma Ridgeway's rail is not included as a Covered Species under this Amended HCP.

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VIRGIN RIVER CHUB – ENDANGERED; WOUNDFIN – ENDANGERED

The Virgin River chub (*Gila seminuda [robusta]*) and woundfin (*Plagopterus argentissimus*) occupy the same habitat within the Plan Area, so for the purposes of this document they are discussed together.

Background and Status

The USFWS listed the Virgin River chub as endangered in August 1989 (USFWS 1989). The USFWS listed the woundfin as endangered in October 1970 (USFWS 1970) and listed an introduced Gila River population of woundfin as a nonessential experimental population in July 1985 (USFWS 1985). According to the USFWS 5-year review report, there were over a million woundfin in the Virgin River in the 1970s and 1980s, and by 2008, there were only a thousand woundfin at most (USFWS 2008). Sampling from 2007 showed the woundfin population was “functionally extirpated” throughout its Critical Habitat (USFWS 2008). Since 2003, the USFWS and the VRRMRP have stocked approximately 200,000 hatchery-raised woundfin and 40,000 Virgin River chub into the Virgin River (VRP 2019a).

Threats to both species include water development projects that cause flow reductions as well as nonnative fish, specifically the red shiner (USFWS 2008). The Virgin River chub and woundfin have declined in numbers due to the cumulative effects of dewatering from numerous diversion projects; proliferation of nonnative fishes; and alterations to natural flow, temperature, and sediment regimes (65 FR 4140).

Existing Conservation Agreements and Plans

The VRRMRP conserves and monitors riparian and aquatic species, including the Virgin River chub and woundfin within the Virgin River Basin (see HCP Chapter 6.5). The VRRMRP works to enhance riparian and aquatic habitats by acquiring and maintaining the instream flows necessary to support aquatic species and protecting water quality through actions such as land use restrictions within the 100-year floodplain (UDNR 2002). The VRRMRP also controls and eliminates nonnative fish that compete with native fish populations; monitors habitats and populations of fishes; and develops and maintains brood stocks of fishes used to stock native habitats of the Virgin River Basin (UDNR 2002).

County zoning restrictions protect aquatic and riparian habitats within the Virgin River Basin in unincorporated areas of the County by adopting zoning and ordinances that preserve open-spaces within the 100-year floodplain (Washington County 2012). Local municipalities along the Virgin River (St. George, Washington City, La Verkin, and Hurricane) have each adopted zoning restrictions and ordinances that preserve open-space within the 100-year floodplain (City of Hurricane 2011, 2019; City of St. George 2002, 2009; La Verkin City 2018; Washington City 2017).

Species Description, Habitat, and Range

The Virgin River chub is a silvery medium-sized minnow that is endemic to 134 miles of the Virgin River, spanning from southwest Utah to northwest Arizona and into southeast Nevada. At the time of listing, it occurred only in a 50-mile stretch of the Virgin River between Mesquite, Nevada, and Hurricane (USFWS 1989, 1995). The woundfin is a small minnow that historically occurred in Arizona’s Salt River, Gila River, and portions of the Colorado River and the Moapa River in Nevada but currently occurs only in the Virgin River in Utah, Arizona, and Nevada (USFWS 1995).

Woundfin habitat includes runs and quiet water habitats with sand substrates adjacent to riffles (USFWS 1994, 2008). Virgin River chub habitat includes deep runs or pools associated with instream cover (USFWS 1994). Virgin River chub are longer lived than woundfin and grow to 18 inches in length, whereas woundfin grow to 4 inches in length (VRP 2019b).

Virgin River chub are more abundant in the upper river core area (River Mile 97.5-90 near the confluence of Ash Creek, west of Hurricane) than the lower river core area (River Mile 39.5-34 near Beaver Dam Wash) because red shiner and other nonnative fish are absent in the upper river. The population estimated for the Virgin River chub within the upper river core (Utah) was over 8,000 small and large fish, approximately 10 times higher than in the lower river core (Arizona/Nevada) area (USFWS 2008).

Critical Habitat for the Virgin River chub and the woundfin was designated in January 2000 and encompasses 87.5 miles of the Virgin River and its 100-year floodplain in parts of Utah, Arizona, and Nevada (65 FR 4140–4156). Critical habitat for both fish occurs within the Plan Area and within the Reserve in Zones 4 and 5, where it overlaps with designated MDT Critical Habitat (65 FR 4140–4156, 59 FR 5820–5866).

Rationale for No Coverage

The Virgin River chub and woundfin both inhabit the Virgin River in the County (UDNR 2002). The USFWS has designated Critical Habitat for both species of fish within the Virgin River, including its 100-year floodplain, which supports nutrient and food resources for these species. Portions of this critical habitat overlap with Occupied and Potentially Suitable MDT Habitats, and MDT may utilize portions of the Virgin River 100-year floodplain for foraging. However, the aquatic habitats used by Virgin River chub and woundfin generally do not overlap with habitats used by MDT and MDT habitat generally lacks the physical and biological features (e.g., water, instream flow) of Virgin River fish habitats (65 FR 4140–4156).

County zoning restrictions protect aquatic and riparian habitats within the Virgin River Basin in unincorporated areas of the County by adopting zoning and ordinances that preserve open spaces within the 100-year floodplain (Washington County 2012). Local municipalities along the Virgin River (St. George, Washington City, La Verkin, and Hurricane) have each adopted zoning restrictions and ordinances that preserve open space within the 100-year floodplain (City of Hurricane 2011, 2019; City of St. George 2002, 2009; La Verkin City 2018; Washington City 2017). These zoning restrictions and ordinances, called for in the VRMRP, protect riparian habitats and water quality for several sensitive species in the Virgin River Basin, including species that utilize habitat within the 100-year floodplain (UNDR 2002). Therefore, Covered Activities are not reasonably certain to directly cause take of either Virgin River fish species.

Aquatic habitat for Virgin River chub and woundfin generally does not overlap MDT habitat within the Plan Area, and local restrictions protect the 100-year floodplain where their habitats do coincide (City of Hurricane 2011, 2019; City of St. George 2002, 2009; La Verkin City 2018; Washington City 2017; Washington County 2012). Therefore, Covered Activities are not reasonably certain to cause direct take or take via harm (i.e., cause significant habitat modification that significantly alters essential behaviors in a manner that causes actual death or injury to an individual) as the implementation of the HCP would not significantly modify habitats utilized by these Virgin River fish. No take of Virgin River chub or woundfin is anticipated by this Amended HCP. For these reasons, the Virgin River chub and woundfin are not included as a Considered Species.

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DWARF BEAR-POPPY – ENDANGERED

Background and Status

The dwarf bear-poppy (synonym: dwarf bearclaw poppy) was listed as endangered in November 1979 (USFWS 1979). It is endemic to the County and only known to occur in the vicinity of St. George (USFWS 2016). This species has no designated Critical Habitat.

Species Description, Habitat, and Range

The dwarf bear-poppy (*Arctomecon humilis*) is a mound-forming perennial forb in the poppy family. It grows up to 10 inches in diameter and typically produces 20 to 30 flowers per plant, and less commonly, up to 400 flowers per plant (USFWS 2016). Dwarf bear-poppy habitat is restricted to soil types of the geologic Moenkopi Formation that are gypsum rich and highly erosive and located within mixed warm desert shrub with sparse vegetation. It is found at elevations of 2,700 to 3,300 feet (USFWS 2013). It typically occurs on rolling hills with sparse vegetation within mixed warm desert shrub communities (USDA 2013).

There is no Critical Habitat designated for this species. The USFWS completed a Recovery Plan for the species in 1985 (USFWS 1985).

This species is restricted to approximately 11,000 acres of suitable habitat in the vicinity of St. George in the County and the USFWS recognizes nine populations within the Plan Area (USFWS 2020). MDT and dwarf bear-poppy may share similar habitats (USFWS 2016), and MDT have been observed amongst a poppy population at Red Bluff (Nelson and Harper 1991). The larger populations are near Red Bluff Hill, Webb Hill, White Dome, Punchbowl Dome, and Atkinville (USFWS 2016, 2020; Tilley et al. 2010, UNHP GIS). A total of 70% (6,000+ acres) of available habitat for the species is located on federal lands managed by the BLM (USFWS 2016). Including the population in the White Dome area, The Nature Conservancy has protected nearly 95% of the dwarf bear-poppy's habitat on privately owned lands (TNC 2019).

Rationale for No Coverage

The dwarf bear-poppy is endemic to Utah and known to occur within the County. About 9,000 acres of habitat for the dwarf bear-poppy occurs in areas south and east of Interstate 15 and west of N. Bluff Street in the St. George area (USFWS 2016), and the USFWS currently recognizes approximately 11,000 acres of suitable habitat in total (USFWS 2020). Habitats preferred and utilized by MDTs may overlap with those occupied by dwarf bear-poppy (Nelson and Harper 1991; USFWS 2016). Over 70% of dwarf bear-poppy habitat occurs on federal lands and is therefore not subject to take caused by Covered Activities (USFWS 2016). Furthermore, nearly 95% of populations occurring on privately owned lands are protected by TNC (TNC 2019).

Much of the habitat for the dwarf bear-poppy occurs on federal lands not subject to Covered Activities, there is no designated Critical Habitat for this species, and nearly all populations of the species are protected on privately owned lands (TNC 2019; USFWS 2016). Therefore, Covered Activities will not adversely modify Critical Habitat and are not reasonably certain to jeopardize the continued existence of the species or appreciably diminish the ability for the species to recover. For these reasons, the dwarf bear-poppy is not included as a Covered Species in this Amended HCP.

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FICKEISEN PLAINS CACTUS – ENDANGERED

Background and status

The Fickeisen plains cactus (*Pediocactus peeblesianus fickeiseniae*) was listed as endangered on October 31, 2013 (USFWS 2013) with designated critical habitat in September 2016 (USFWS 2016). Critical habitat for the Fickeisen plains cactus is designated in Coconino and Mohave Counties, Arizona. There is no recovery plan for the Fickeisen plains cactus; a 5-year review has been initiated and is planned for September 2020 (USFWS 2019).

Species description, habitat, and range

Fickeisen plains cactus is a small globose cactus with cream-yellow or yellow-green flowers flowering from mid-April to June. Mature plants are 1.0 to 2.6 inches tall and up to 2.2 inches in diameter; most adult individuals are the size of a quarter (Arizona Rare Plant Guide Committee 2001; Heil and Porter 2003; Arizona Game and Fish Department [AGFD] 2011).

The Fickeisen plains cactus is restricted to exposed layers of limestone on the margins of canyon rims, flat terraces, limestone benched, or on the toe of well-drained hills; the species is found in shallow, well-draining, gravelly loam soils formed from limestone alluvium, colluvium, or aeolian deposits of the Harrisburg Member of the Kaibab Formation, Toroweap Formation, Coconino Sandstone, and the Moenkopi Formation (Travis 1987; Arizona Geological Survey 2020). This cactus is found mainly 0 to 5 percent slopes but may also occur on slopes up to 20 percent at elevations between 4,200 to 5,950 feet (Arizona Rare Plant Guide Committee 2001; AGFD 2011). The Fickeisen plains cactus is associated with vegetation types such as plains and the Great Basin grasslands and desert scrub (Benson 1982; NatureServe 2020).

Rationale for no coverage

In Utah, the Fickeisen plains cactus occurs near Hurricane Cliffs on BLM-managed in Washington County (USFWS 2020). Because the only known population of Fickeisen plains cactus is located on federal lands, which are areas that are not subject to Covered Activities, the Covered Activities are not expected to jeopardize the continued existence or recovery of the species. Additionally, the Covered Activities will not adversely modify Critical Habitat for the Fickeisen plains cactus; Critical Habitat for this species occurs outside of the Plan Area in Coconino and Mohave Counties, Arizona. For these reasons, the Fickeisen plains cactus is not included as a Covered Species in this Amended HCP.

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GIERISCH MALLOW – ENDANGERED

Background and Status

The USFWS listed the Gierisch mallow (*Sphaeralcea gierischii*) as an endangered species in August 2013 (USFWS 2013). The USFWS finalized two Critical Habitat Units for this species in August 2013 (USFWS 2013). This plant was recently described; information on it is limited (USFWS 2020).

Species Description, Habitat, and Range

The Gierisch mallow is a perennial flowering plant in the mallow family with dark red-purple stems, bright green glabrous foliage, and orange flowers. Plant stems typically range in height from 1-1/2 to 3-1/2 feet tall. Gierisch mallow is found in warm desert scrub on gypsum outcrops associated with the Harrisburg Member of the Kaibab Formation in northern Mohave County, Arizona, and adjacent Washington County (77 FR 49894). Many are found on hillsides or steep slopes (Tilley et al. 2011).

The Gierisch mallow is endemic to Mohave County and Washington County (USFWS 2013). There are 18 known populations restricted to 460 acres in Arizona and Utah. The Utah population is located within 2 miles of the Arizona-Utah border and falls within designated Critical Habitat boundaries (USFWS 2013). There is only one population known in Utah, and it is estimated to be 5,000 to 8,000 individual plants (USFWS 2013). All reported occurrences of the species are located on BLM-managed lands (UNHP 2019).

The USFS has designated Critical Habitat in Utah and Arizona. Within the County, the Starvation Point Critical Habitat Unit is located along the Utah and Arizona border south of the Virgin River and north of Interstate 15. This Critical Habitat Unit is located within the Plan Area but primarily occurs on federal lands that are not subject to Covered Activities. Approximately 167 acres of the Starvation Point Critical Habitat Unit occurs on SITLA-owned lands that may be subject to Covered Activities of this Amended HCP. However, the species is not known to occur on these lands and there have been no Giersch mallow observations reported (UHHP 2019). MDT and Gierisch mallow may share the same general habitat; however, UNHP records do not show overlap of reported occurrences between the two species (UNHP 2019).

Rationale for No Coverage

Gierisch mallow is known to occur solely on federal lands that are not subject to Covered Activities of this Amended HCP. Although Critical Habitat occurs on approximately 167 acres of SITLA-owned lands that may be subject to Covered Activities of this Amended HCP, the species has not been documented on these lands. Therefore, Covered Activities would not be expected to affect the Gierisch mallow, adversely modify critical habitat, or jeopardize the continued existence or recovery of the species. For these reasons, the Gierisch mallow is not included as a Covered Species in this Amended HCP.

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HOLMGREN MILK-VETCH – ENDANGERED

Background and Status

The USFWS listed the Holmgren milk-vetch (*Astragalus holmgreniorum*; also known as paradox milk-vetch) as an endangered species in September 2001 (USFWS 2001). The Holmgren milk-vetch is known only from Washington County in Utah and Mohave County in Arizona (USDA 2013). The USFWS designated approximately 6,289 acres of Critical Habitat in 2007 (50 CFR 17.12), following a final rulemaking published in 2006 (71 FR 77972–78012).

Species Description, Habitat, and Range

Holmgren milk-vetch is a stemless herbaceous perennial in the pea family. It is mostly prostrate with small purple flowers and ranges in height from 1.5 to 4.5 inches (Tilley 2011). It is associated with geological layers or parent materials found within the Moenkopi Formation. The plant is found at elevations between 2,480 and 2,999 feet and adjacent to, or above, drainages that are tributary to the Santa Clara and Virgin Rivers in areas with less than 15% living cover (USFWS 2007). MDT shares the same general habitat with Holmgren milk-vetch (USFWS 2007, 2011).

As of 2007, the USFWS had documented a total of six populations of Holmgren milk-vetch, all occurring within 10 miles of St. George in Utah and Arizona (USDA 2013; USFWS 2007). The USFWS protected these six populations by designating Critical Habitat for this species in December 2006 (USFWS 2006). These six populations are divided into three Critical Habitat Units: Santa Clara, Purgatory Flat, and Utah-Arizona Border. The Santa Clara Unit is further subdivided into the South Hills and Stucki Spring Subunits. The Utah-Arizona Border Unit is divided into the State Line, Gardner Well, and Central Valley Subunits (USFWS 2006). The Purgatory Flat unit contains only a single population and is not located within MDT Habitat (USFWS 2020). Although the Santa Clara and Purgatory Flat Critical Habitat Units occur entirely within the Plan Area, portions of the Utah-Arizona Border Unit occur outside the Plan Area. Specifically, the Gardner Well Subunit occurs entirely outside the Plan Area and the State Line Subunit occurs partially outside of Utah and the Plan Area (USFWS 2006).

Within the Plan Area, the USFWS has surveyed populations of Holmgren milk-vetch at the South Hills Subunit of the Santa Clara Critical Habitat Unit and within the State Line and Central Valley Subunits of the Utah-Arizona Border Critical Habitat Unit (USFWS 2006, 2007). From these surveys, the USFWS estimated the populations of Holmgren milk-vetch within each unit: the Utah-Arizona Border Unit contains 9,000–10,000 plants distributed patchily; the Santa Clara Unit contains approximately 1,000 plants across two sites; and the Purgatory Flat Unit contains approximately 30 plants (USFWS 2006, 2007).

Recently in 2018, botanists with UDNR discovered a new population east and southeast of the Green Valley Gap and north of Bloomington Hill, along a utility corridor. This population contained 300 individuals; however, the botanists noted that 2018 was generally a poor year for the species and the population is likely larger (McCormick and Wheeler 2018).

Known locations within the Plan Area include two areas south of Santa Clara (within the Stucki Spring and South Hills Critical Habitat Units on federal lands); near Harrisburg Junction (within the Purgatory Flat Critical Habitat Unit on federal lands); south of Atkinville (within the State Line Critical Habitat Unit on federal lands); near White Dome (within the Central Valley Critical Habitat Unit on SITLA-owned lands); and the Green Valley Gap area (under private land ownership within a utility corridor) (UNHP 2019). Of the six known locations within the Plan Area, two are located on privately owned lands that

may be subject to Covered Activities of this Amended HCP, with one of these located within the Central Valley Critical Habitat Unit.

Rationale for no coverage

Holmgren milk-vetch is known to occur in the County and may share the same general habitats as the MDT. However, all but three of the known populations are located on federal lands that are not subject to the Covered Activities of this Amended HCP. The newly discovered Green Valley Gap population of the Holmgren milk-vetch occurs on private land and could potentially be impacted by future development. However, this population is located within an existing utility corridor and this area is already designated as open space in the St. George City General Plan (City of St. George 2002, 2009), which may preserve the open space characteristics of the area and allow it to continue to support the species.

The known population within the Central Valley Critical Habitat Unit occurs on SITLA-owned lands that may be impacted by the Covered Activities of this Amended HCP. The USFWS, SITLA, and a private developer will work collaboratively on development plans and design options to identify approximately 250 acres within the Central Valley area to preserve habitat for the species. As part of this agreement, SITLA and the private developer will agree, through a signed Implementing Agreement, to postpone development on those lands for the term of the permit or until the lands are acquired or exchanged with a conservation entity, whichever comes first (personal communication, Chris Keleher, Utah Department of Natural Resources, Director of Recovery Programs, phone conference, January 9, 2020).

A third population of Holmgren milk-vetch occurs on approximately 166 acres of SITLA-owned lands near the Arizona-Utah border (USFWS 2006). However, this parcel is designated for exchange to the BLM under the Utah Test and Training Range Encroachment Prevention and Temporary Closure Act and is located within the West-15 Preserve established by the USFWS in 2006 for the preservation of this species (Senate Report 114-349, 2016).

The USFWS currently estimates that the population of Holmgren milkvetch is 7,100 adult plants, with the Central Valley population containing 42% of the total population, the State Line population containing 56% of the total population, and the remaining small populations containing 2% of the total population (USFWS 2020).

Because most populations of the Holmgren milk-vetch are located on federal lands, and because known populations on private lands are protected through either open space designations or partnerships with the USFWS, Covered Activities are not expected to jeopardize the continued existence or recovery of the species or adversely modify Critical Habitat for the Holmgren milk-vetch. For these reasons, the Holmgren milk-vetch is not included as a Covered Species in this Amended HCP.

Conservation measures

SITLA, USFWS, UDNR, and the County commit to implement the following actions for the benefit of the Holmgren milkvetch.

- SITLA will coordinate with USFWS and relevant private-sector partners to identify acreage to support a viable population of Holmgren milkvetch in the Central Valley Critical Habitat Unit 1c in southern Washington County. The proposed conservation area will be set aside with the goal to protect the viable population in perpetuity. The acreage identified will further be limited to critical habitat and the acreage may be in one location or split into more than one conservation area. SITLA will use its lease authority to prohibit development within the conservation area(s) until it is acquired and protected in perpetuity by a conservation entity.

- Within 5 years of reaching agreement with USFWS on the location of the Central Valley conservation area(s), SITLA and its private-sector partners will work with the HCP Administrator and the HCAC to prepare a management plan for the Central Valley conservation area with the goal of maintaining or enhancing the current population of Holmgren milkvetch. The management plan will address the establishment, monitoring, and long-term management of the conservation area(s), and may provide for recreational uses of the conservation area(s) that are compatible with the conservation of the species. The County will use resources available for adaptive management planning (i.e., HCP Administrator and HCP Biologist labor) to assist SITLA and its private-sector partners with the preparation of this plan. SITLA and its private-sector partners will seek separate USFWS approval for the management plan.
- SITLA and its private-sector partners will manage the Central Valley conservation area(s) in accordance with the management plan, subject to available funding, until the lands are acquired by a conservation entity and protected in perpetuity for the conservation of the Holmgren milkvetch. Upon acquisition by a conservation entity, responsibility for implementation of the management plan (including any funding commitments) will transfer to the conservation entity.
- The County and USFWS will assist SITLA and its private-sector partners with identifying and securing funding to implement the management plan and establish permanent protections for the Central Valley conservation area(s). Potential sources of funding may include, but are not limited to: the Washington County HCP Trust Fund, the USFWS Cooperative Endangered Species Conservation Fund (also known as ESA Section 6 funds), the Utah Endangered Species Mitigation Fund, the LeRay McAllister Critical Lands Conservation Fund administered by the Utah Governor's Office of Management and Budget, or other available sources.
- UDNR will coordinate with the County, through the HCP Administrator, to plan for and perform surveys for the Holmgren milkvetch in areas of suitable or occupied habitat for this species. The County and UDNR will seek, when practicable, to implement such surveys concurrent with MDT clearance surveys prior to the conduct of Covered Activities. UDNR will report the findings of any such surveys to the County and USFWS. This commitment is subject to available funding, state-wide priorities, and HCP Partner support. At this time, UDNR anticipates that funding for this activity may become available through the agency's Endangered Species Mitigation Fund, which has an annual earmark of \$150,000 for work with sensitive and listed plants, insect, and mollusks that is allocated based on priorities identified by the Endangered Species Mitigation Fund program and its advisory committee (Christopher Keleher, UDNR Recovery Programs Director, personal communication to Cameron Rognan, Washington County HCP Administrator, via letter dated May 7, 2020).

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SHIVWITS MILK-VETCH – ENDANGERED

Background and Status

The USFWS listed the Shiwits milk-vetch (*Astragalus ampullarioides*) as endangered on September 28, 2001 (USFWS 2001) and designated final Critical Habitat for the species on December 27, 2006 (USFWS 2006). Within the Plan Area, there are four Critical Habitat Units for Shiwits milk-vetch: Pahcoon Spring Wash, Coral Canyon, Harrisburg Junction (comprised of the Silver Reef and the Harrisburg Bench & Cottonwood Subunits), and Zion. A sixth population occurs within Tribal lands of the Paiute (Shiwits Band) Indian Reservation; this is the only known population that is not associated with designated Critical Habitat (USFWS 2007).

Species Description, Habitat, and Range

Shiwits milk-vetch is a perennial forb, in the Fabaceae (pea) family and ranges in height from 8 to 26 inches. It has cream yellow flowers in a raceme and pinnately compound leaves (Tilley 2010). Shiwits milk-vetch is found in isolated pockets of purple-hued, soft clay soil found on the Chinle Formation near St. George. This species is found between 3,018 and 4,363 feet in elevation within sparse habitat (approximately 12% cover) (USFWS 2007). Shiwits milk-vetch is known only from Washington County (USDA 2013; USFWS 2006). The Shiwits milk-vetch may share the same general habitat as MDT and therefore may be subject to Covered Activities of this Amended HCP where it occurs on non-federal lands. However, the largest known population of this species, representing 62% of the estimated population, occurs outside of known or modeled MDT habitat within Zion National Park (USFWS 2006).

The USFWS originally proposed five units and 2,421 acres of Critical Habitat for the Shiwits milk-vetch, which would protect six populations and over 95% of the known occupied habitat of the species (USFWS 2006, 2007). The USFWS ultimately designated approximately 2,181 acres of Critical Habitat in four units for the species; only the 240-acre unit on the Paiute (Shiwits Band) Indian Reservation was excluded from Critical Habitat designation.

The USFWS has surveyed each of the six known populations of Shiwits milk-vetch within the Plan Area and produced a population estimate of over 5,000 total plants (USFWS 2006, 2007). Two of these populations—Pahcoon Spring Wash and Zion—are within designated Critical Habitat and occur entirely on federal lands that are not subject to Covered Activities of this Amended HCP. These two populations represent approximately 70 of the estimated population for the species (USFWS 2006). A third population occurs entirely within Tribal lands of the Paiute (Shiwits Band) Indian Reservation that is also not subject to Covered Activities of this Amended HCP (USFWS 2006). The remaining two Critical Habitat Units—Coral Canyon and Harrisburg Junction—represent approximately 11% of the estimated population of Shiwits milk-vetch and as much as 35% of known occupied habitat of the species (USFWS 2006).

The Coral Canyon Critical Habitat Unit occurs on approximately 87 acres of privately owned land; however, the USFWS (2006, 2007) states that this population occupies a site located between a golf course and a County-maintained road and likely occurs over less than 20 acres. This site has undergone multiple land uses and disturbances, including use as a clay pit and as an unauthorized dump site (USFWS 2006). The Coral Canyon Critical Habitat Unit represents approximately 4% of the estimated population of Shiwits milk-vetch (USFWS 2006).

The Harrisburg Junction Critical Habitat Unit is comprised of two geographically separate subunits: Silver Reef and Harrisburg Bench & Cottonwood. The Silver Reef Subunit occurs over approximately

462 acres, the HCAC incorporated approximately 340 acres of this Critical Habitat Unit into the Reserve as part of a boundary amendment (see **Chapter 6.3.1.1** of this Amended HCP). Therefore, portions of this species' Critical Habitat occurs within Zone 3 of the Reserve. Of the approximately 120 acres remaining in the Silver Reef Subunit, approximately 80 acres occur on BLM-managed lands that are not subject to Covered Activities of this Amended HCP. Therefore, only approximately 40 acres of the Silver Reef Critical Habitat Subunit occur on non-federal lands that may be subject to Covered Activities. Together, the Harrisburg Bench & Cottonwood Critical Habitat Subunit represent 297 acres of occupied Shiwits milk-vetch habitat (USFWS 2006). This subunit straddles Interstate 15, with the Cottonwood population occurring within the median of Interstate 15 (USFWS 2006). Approximately 32 acres (11%) of this subunit is privately owned; the remaining area is under BLM management. The entire Harrisburg Junction Critical Habitat Unit represents approximately 7% of the estimated population of Shiwits milk-vetch (USFWS 2006).

The USFWS estimates that approximately 192 plants occur on non-federal lands, which represents 4% of the total population. However, no plants are located on non-federal lands subject to Covered Activities (USFWS 2020). Approximately 75 acres of designated Critical Habitat is subject to Covered Activities.

Rationale for No Coverage

Populations within the Pahcoo Springs Wash and Zion Critical Habitat Units occur on federal lands that are not subject to Covered Activities of this Amended HCP. A sixth population occurs within Paiute (Shiwits Band) Indian Reservation on Tribal lands that are also not subject to Covered Activities (USFWS 2006). In total, these areas represent 71% of the total estimated population for the species and 65% of the known occupied habitat (USFWS 2006).

Two known populations of Shiwits milk-vetch, associated with the Harrisburg Junction and Coral Canyon Critical Habitat Units, may be subject to the Covered Activities of this Amended HCP. These populations represent 846 acres (35%) of the known occupied habitat of the Shiwits milk-vetch in the Plan Area (USFWS 2006). Within the Harrisburg Junction Critical Habitat, only 75 of the 759 acres (approximately 10%) occur on nonfederal lands subject to Covered Activities. Additionally, the Coral Canyon population is likely restricted to approximately 20 acres of non-federal lands of the entire 87-acre Critical Habitat Unit.

A total of approximately 160 acres of known occupied habitat of the Shiwits milk-vetch occurs on lands that may be subject to the Covered Activities of this Amended HCP (this number includes approximately 67 acres within the Coral Canyon Unit that may be unoccupied). These areas represent less than 7% (160 of 2,421 acres) of the known occupied habitat and approximately 7% (160 of 2,181 acres) of the designated Critical Habitat for the species (USFWS 2006). The USFWS estimates that approximately 192 plants occur on non-federal lands, which represents 4% of the total population. However, no plants are located on non-federal lands subject to Covered Activities (USFWS 2020). For these reasons, implementation of this Amended HCP is not reasonably certain to jeopardize the continued existence or recovery of the species, or directly or indirectly destroy or adversely modify its Critical Habitat to the extent that it appreciably diminishes the value of Critical Habitat for the conservation of the species. For these reasons, the Shiwits milk-vetch is not included as a Covered Species in this Amended HCP.

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JONES CYCLADENIA – THREATENED

Background and Status

The USFWS listed the Jones cycladenia, also known as Jones' waxy dogbane, as a threatened species on May 5, 1986 (USFWS 1986). The plant is known from 26 sites spread over four areas in Utah (Joe Hutch Creek, San Rafael, Moab, and Greater Circle Cliffs) and one area in Arizona (Pipe Springs). The total population of the species is estimated at 1,100 individual plants (UFWs 2008). The species is not known to occur in Washington County (USFWS 2008; USDA 2013).

Species Description, Habitat, and Range

Jones cycladenia (*Cycladenia humilis* var. *jonesii*) is an herbaceous perennial forb in the primrose family. It has wide elliptical leaves and whitish, pink to purple trumpet-shaped flowers (USDA 2013). Jones cycladenia is found in mixed desert scrub, juniper, or wild buckwheat-Mormon tea vegetation communities at 4,390 to 6,000 feet in elevation. It is limited to gypsiferous, saline soils of the Cutler, Summerville, and Chinle Formations (UFWs 2008).

There is no Critical Habitat designated for this species.

There is potential for Jones cycladenia habitat to overlap with MDT habitat where they both occur in portions of Kane County, Utah, and northern Arizona (USDA 2013). However, because Jones cycladenia does not occur in the County, there is no overlap with MDT habitats within the Plan Area and the species is therefore not subject to the Covered Activities of this Amended HCP.

Rationale for No Coverage

Jones cycladenia is not known to occur in the County and therefore does not overlap with MDT habitats in the Plan Area and will not be subject to the Covered Activities of this Amended HCP (USDA 2013; UNHP 2019; USFWS 2008). There is also no Critical Habitat designated for this species. Implementation of the Amended HCP will not adversely modify or destroy critical habitat for Jones cycladenia and will not jeopardize the continued existence or recovery of this species. For these reasons, Jones cycladenia is not included as a Covered Species in this Amended HCP.

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SILER PINCUSHION CACTUS – THREATENED

Background and Status

The USFWS listed the Siler pincushion (*Pediocactus [Echinocactus utahia] sileri*) as an endangered species on October 26, 1979 (USFWS 1979). It was reclassified as threatened on December 27, 1993 (USFWS 1993). The USFWS completed the most recent 5-year status review in 2018, estimating that the total population estimate for Siler pincushion cactus is 8,000–10,000 plants comprising 25 populations (USFWS 2018). Two populations occur in Utah and 23 populations occur in Arizona (USFWS 2020). There is no Critical Habitat designated for the species.

Species Description, Habitat, and Range

Siler pincushion is a small globose cactus in the Cactaceae family with yellow petaled flowers with purplish veins (USDA 2013). It grows up to 10 inches tall and 4-1/2 inches wide and has blackish-brown central spines and white radial spines (USDA 2013). Siler pincushion cactus grows in Great Basin Desert shrub, Mohave desert scrub, pinyon-juniper forestlands, and grasslands on gypsiferous clay and sandy soils from the Moenkopi Formation. It is found at elevations between 2,800 and 5,400 feet (USDA 2013). The species is known to Kane and Washington Counties in Utah and Mohave and Coconino Counties in Arizona (USDA 2013). The majority of suitable habitat, approximately 90%, occurs on lands managed by the BLM and the Paiute (Shivwits Band) Indian Tribe, with some habitat occurring on state and private lands (USFWS 2008).

There is potential for MDT and Siler pincushion cactus to share the same general habitat; however, UNHP records only reveal four occurrences of the cactus within the newly modeled Potentially Suitable MDT Habitat. UNHP data document seven locations where the Siler pincushion cactus is known to occur within the Plan Area. However, one of these observations is dated from 1975 and is likely extirpated due to its location within a currently disturbed area of agriculture and development (UNHP 2019). Two other observations occur outside of MDT habitat and on BLM-managed lands and are therefore not subject to Covered Activities of this Amended HCP. Of the remaining four occurrences, two occur on BLM-managed lands that are not subject to Covered Activities, one is partially protected within the Reserve, and the final occurrence is likely extirpated (UNHP 2019). The White Dome population occurs partially on private land that is protected within the boundary of TNC's White Dome Nature Preserve (UNHP 2019; USFWS 2020). Approximately 170 individuals are located on private lands that may be subject to Covered Activities, although no MDT are known to co-occur at this location (USFWS 2020). The final known population occurs on private lands previously managed by the BLM. Prior to the land exchange, the BLM monitored this population of Siler pincushion cactus, documenting only two individuals during the last survey in 1995 and noting increased disturbance in the area (Hreha and Meyer 1994; Armstrong et al. 1995, as cited in UNHP 2019). Therefore, it is likely that only one population of this species occurs on privately owned lands within the Plan Area that may be subject to Covered Activities (UNHP 2019, USFWS 2020).

The USFWS estimated the population size of the species at over 10,000 individuals in 2006 (USFWS 2008). Recent estimates suggest the population may be closer to 8,000 individuals range-wide (USFWS

2020) The Utah population is predominantly located around White Dome, approximately 1 mile from the Utah-Arizona border. One occurrence has been recorded within the Plan Area on private lands that may be subject to Covered Activities; however, the observation is dated from 1995 and documented only two individual plants (UNHP 2019).

Rationale for No Coverage

The Siler pincushion cactus may share the same general habitat as the MDT (UDNR-UDWR 2005; USFWS 2008, 2011, 2018), although this species is only known to occur at two localities within privately owned lands of the Plan Area that may be subject to Covered Activities (Utah Natural Heritage Program 2019). One population was monitored by the BLM prior to a land exchange; however, the BLM only documented two individuals during the last survey in 1995 and documented increased disturbance in the area (Hreha and Meyer 1994; Armstrong et al. 1995, as cited in UNHP 2019). The second locality, associated with the White Dome population, contains approximately 170 individuals and is located on private lands that may be subject to the Covered Activities of this Amended HCP; this population represents approximately 2% of the range-wide population (USFWS 2020). The USFWS is not aware of any Siler pincushion cactus individuals that occur in MDT habitat on non-federal lands in the County (USFWS 2020).

Although Covered Activities may impact the Siler pincushion cactus, implementation of this Amended HCP would not jeopardize the continued existence or recovery of the species. Furthermore, Covered Activities would not adversely modify Critical Habitats because there is none designated for this species. The majority of this species' habitat occurs on BLM-managed lands with only small portions of its habitat occurring on Tribal, state, and private lands (USDA 2013; USFWS 2020). The population of Siler pincushion cactus occurring within the Plan Area and on private lands subject to Covered Activities contains approximately 170 individuals (USFWS 2020). BLM surveys have documented over 10,000 individuals (BLM 2006, as cited in USFWS 2008) and the USFWS (2020) estimates there may be approximately 8,000 individuals in the range-wide population. Therefore, this Amended HCP may impact approximately 2% of the known Siler pincushion cactus population. For these reasons, the Siler pincushion cactus is not included as a Covered Species of this Amended HCP.

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APPENDIX D

Reserve Habitat and Fire Management Plan

Red Cliffs Desert Reserve Habitat Management Plan

(Revised April 2019)

Background

The 1995 Washington County Habitat Conservation Plan (HCP) set aside 62,000 acres of Mojave desert tortoise (*Gopherus agassizii*; hereafter tortoise) critical and buffer habitat as the Red Cliffs Desert Reserve (RCDR) to assist the recovery of the tortoise in the Upper Virgin River Recovery Unit (Washington County 1995, as amended 2009). In response to large destructive wildfires that burned ~25% of the RCDR in 2005, the Habitat Conservation Technical Committee (TC) created a Habitat Management Plan (HMP) for the RCDR in 2009. In February 2018, the Washington County Habitat Conservation Advisory Committee (HCAC) asked the TC to evaluate the current RCDR fire management plans and provide updates for the HCP renewal process. During the June 2018 TC meeting, TC members met with fire experts from the Bureau of Land Management (BLM) and the Utah Division of Forestry, Fire & State Lands to assess the 2009 RCDR HMP. This revised HMP incorporates new and ongoing fire/habitat management priorities, strategies, and actions within the RCDR.

RCDR HMP

The proliferation of nonnative annual grasses and resulting wildfires has raised concerns about long-term management of the habitat and recovery of tortoises within the RCDR. In 2018, wildfire continues to be one of the greatest threats to tortoise habitat. The two primary goals of the RCDR HMP are: (1) protect remaining unburned tortoise habitat; and (2) restore burned tortoise habitat (see Sections 1.1–2.2 below). The TC has identified action items to achieve each of these goals. Table 1 identifies the priority and status of the TC-ranked seven highest priority RCDR HMP action items.

The intent of the HMP is to integrate HMP priorities and action items with those found in the Red Cliffs National Conservation Area (NCA) Record of Decision and Resource Management Plan (BLM 2016a), Southern Utah Support Area Fire Management Plan (BLM 2004), BLM St. George Field Office (SGFO) Programmatic Wildland Fire Emergency Stabilization and Rehabilitation Plan (BLM 2008), Southwest Utah Regional Wildfire Protection Plan (FCAG 2007), and other Federal, State, and local fire management plans.

Table 1: Seven Priority RCDR HMP Action Items

Priority	Action Item	Current Status
1	Treat roadsides (paved), maintain firebreaks along ROWs	Efforts are ongoing to treat non-native plants along select right-of-ways (see strategy 1-1-1). The BLM is working on getting Indaziflam/Esplanaide approved for ROW application. The BLM SGFO is working on new permitting stipulations regarding ROW maintenance and exotic nonnative plant control/effectiveness monitoring within existing ROWs. Continue to research (and plan to implement) outplanting or reseeding of warm season fire-resistant grasses (e.g., side oats grama [<i>Bouteloua curtipendula</i>], Purple threeawn [<i>Aristida purpurea</i>]) and other perennials along Cottonwood Road and ROWs. Writing grants, acquiring funds, acquiring herbicide, and treating exotic nonnative plants is an annual long-term BLM goal/effort.

Priority	Action Item	Current Status
2	Control nonnative species	<p>There are ongoing plans to manually remove invasive species, including silverleaf “Purple” nightshade (<i>Solanum elaeagnifolium</i>), Scotch thistle (<i>Onopordum acanthium</i>), Russian thistle (<i>Salsola</i> spp.), Sahara mustard, and other invasive species. The TC and RCDR stakeholders are planning to create two or more Esplanade herbicide study plots in different vegetation types within the RCDR. Research native specific species to compete with exotic nonnatives. The TC and RCDR stakeholders are planning to create two or more Esplanade herbicide study plots in different tortoise habitat types within the RCDR. The BLM SGFO plans to conduct an environmental assessment (EA) for the targeted use of herbicides to control invasive-nonnative plant species within the Red Cliffs NCA that follows best available science, and complies with management decisions in the Red Cliffs NCA RMP (BLM2016a) and BLM herbicide use EAs and programmatic environmental impact statements (EIS; BLM 2007; 2016b,c). Writing grants, acquiring funds, acquiring herbicide, and working with partner stakeholders to control nonnative plants, is an annual long-term goal/effort.</p>
3	Create islands of vegetation	<p>From 2016–2018, collaborative teams (by the BLM-UDWR-UNLV-TNC-HCP-USFWS) planted about 5500 plants comprised of six native species. Writing grants, acquiring funds, growing plants (e.g., BLM-NPS Song Dog Nursery agreement), and restoring burned habitat is an annual long-term goal/effort. Management stakeholders will continue to work collaboratively to identify priority restoration areas.</p>
4	Maintain communication between fire agencies and with the public	<p>The HCP Administration, BLM, UDWR and other partnering agencies will continue to coordinate public outreach. Continue to acquire/update geographic information system (GIS) fire perimeter-area and fire risk data/databases/maps, and distribute them to interagency-management stakeholders. Maps will be utilized for project prioritization.</p>
5	Monitor treated areas	<p>During 2017–2018, the BLM SGFO monitored the herbicide treatment area along Cottonwood Road, manual plant removal sites, and the location of exotic nonnative plant infestations targeted for future treatments. Monitoring treated areas, infestation sites, and study plots is an annual long-term goal/effort.</p>
6	Research/Monitor Methodology (reduce fuel)	<p>Continue to conduct literature reviews of new fuel reduction/fire management techniques. Coordinate with the U.S. Forest Service (USFS) for fuel monitoring and</p>

Priority	Action Item	Current Status
		reduction projects on USFS lands adjacent to the RCDR, where fires often originate.
7	Soil stabilization (e.g., gully plugs, straw mats, erosion fabrics, biocrust, inoculation, and/or native plant species).	Continue to pursue, including literature reviews of new research and effective techniques/species.

Goal 1: Protect unburned tortoise habitat

Objectives

1.1 Treat road edges to reduce the build-up of fuel sources and minimize the potential for human caused fires. Treatment may include mowing, grazing, herbicides, or other appropriate methods.

Strategy 1.1.1: Continue to identify and prioritize roadside areas suitable for treatment. Pursue the necessary city, county, or state partnerships for treating priority areas.

Action Item 1.1.1. (A): Continue treatment Cottonwood Road corridor.

Action Item 1.1.1. (B): Continue treatment of SR-18 corridor.

Action Item 1.1.1. (C): Continue treatment of I-15 corridor.

Action Item 1.1.1. (D): Continue treatment of Red Hills Parkway corridor.

Action Item 1.1.1. (E): Continue treatment of Tuacahn Drive corridor.

Action Item 1.1.1. (F): Continue treatment of Red Cliffs Recreation Area Road.

Action Item 1.1.1 (G): Continue treatment of other roads as identified.

Strategy 1.1.2: Research and monitor the effectiveness of different treatment methods on existing plant communities and tortoises.

Action Item 1.1.2 (A): Pursue research plots to assess the effectiveness of pre-emergent herbicides (e.g., Esplanade, Plateau) and other herbicide chemical/vegetation control methods.

Action Item 1.1.2 (B): Pursue roadside research plots to assess the effectiveness of focused grazing.

Action Item 1.1.2 (C): Pursue roadside test plots to assess the effectiveness of compaction, grading, or other mechanical methods.

1.2 Establish and/or maintain firebreaks in priority areas.

Strategy 1.2.1: Establish firebreaks through use of native fire-resistant plant species.

Action Item 1.2.1 (A): Pursue outplanting or seeding of warm season fire-resistant grasses (e.g., side oats grama and Purple threeawn) and other suitable perennials in priority areas.

Action Item 1.2.1 (B): Continue prioritizing roads and ROW's that can serve as firebreaks; establish research plots in priority areas.

Strategy 1.2.2: Maintain existing trails and roads to serve as strategic firebreaks. Require ROW holders to maintain ROWs/roads through stipulations.

Action Item 1.2.2. (A): Identify trails/roads where approved chemical methods can be applied.

Action Item 1.2.2. (B): BLM will work on effective ROW stipulations and ROW monitoring.

1.3 Improve the public's understanding of fire impacts on the RCDR.

Strategy 1.3.1: Increase public education at trailheads, along roads, ROW areas, and any other area of community interface.

Action Item 1.3.1. (A): Install informational signs along priority corridors to convey current fire danger. Priority corridors include Cottonwood Road, Turkey Farm Road, SR-18, and Snow Canyon Drive.

Action Item 1.3.1. (B): Maintain and improve fire education information for trailheads and kiosks. Identify whether current fire education messaging is sufficient at trailheads.

Action Item 1.3.1 (C): Produce and distribute fire awareness publications relative to the RCDR.

Strategy 1.3.2: Maintain open communication and work cooperatively with other RCDR partners to effectively manage tortoises and fire management issues in the RCDR.

Action Item 1.3.2. (A): Add a fire awareness component into RCDR tortoise awareness training.

Action Item 1.3.2 (B): Review the fire information maps on an annual basis; update fire information and maps as needed and distribute to the appropriate agencies.

Action Item 1.3.2 (C): Work with local media outlets to provide pre-fire season public service announcements or other appropriate public information.

Action Item 1.3.2 (D): Coordinate with the USFS to implement fuel monitoring/reduction projects, and strategies to reduce fires spreading from USFS lands onto the RCDR.

1.4 Control nonnative and invasive plant species in areas other than roads, ROWs, or trails.

Strategy 1.4.1: Reduce the role of nonnative plants in the fire cycle.

Action Item 1.4.1. (A): Inventory and map nonnative/invasive plant species present in the RCDR. Examples of species to target include Russian thistle, silverleaf "Purple" nightshade, and Sahara mustard. Use inventory maps to determine priority treatment areas for tortoise, including USGS cheatgrass mapping and TNC's Landscape Conservation Forecasting (LCF) mapping.

Action Item 1.4.1. (B): Develop and implement a plan for controlling nonnative/invasive species identified as fire hazards in the RCDR. Assess and use different control methods as appropriate.

Action Item 1.4.1. (C): Outplant or reseed control areas with native species that will out-compete nonnatives.

Goal 2: Restore burned habitat

Objectives:

2.1 Restore vegetation within burned areas.

Strategy 2.1.1: Assess and prioritize fire units for habitat restoration work.

Action Item 2.1.1. (A): Create a GIS/working map of the RCDR that includes land ownership/management boundaries, ROWs, restoration areas, recreation trails, roads, vegetation (including unburned islands), sensitive species, and soil types.

Strategy 2.1.2: Reestablish native plant species (especially ones that benefit tortoise).

Action Item 2.1.2. (A): Create restoration plots (i.e., islands of vegetation) within burned areas using native plant species.

Action Item 2.1.2. (B): Monitor restoration plots to determine the efficacy of outplanting or reseeding techniques and help refine methods.

Action Item 2.1.2. (C): Outplant or reseed priority restoration sites based on monitoring results, as determined by inventory maps created by USGS and TNC.

2.2 Monitor human impacts in burned areas.

Strategy 2.2.1: Continue monitoring recreation impacts in burned areas

Action Item 2.2.1. (A): Identify, repair and restore damaged trails, signs, fences, and other infrastructure.

Action Item 2.2.1. (B): Improve trail markings to prevent trail proliferation and off-trail use.

Action Item 2.2.1. (C): Increase or improve public education regarding fire impacts and/or restoration efforts at trailheads and along trails.

Action Item 2.2.1. (D): Stabilize soils in problem areas using gully plugs, straw mats, erosion fabrics, biocrusts, and/or native plant species.

Action Item 2.2.1. (E): Close trails as necessary to protect tortoises and habitat.

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APPENDIX E

Translocation Plan



State of Utah
DEPARTMENT OF NATURAL RESOURCES
Division of Wildlife Resources - Native Aquatic Species

**STATUS OF TRANSLOCATED TORTOISES
IN THE RED CLIFFS DESERT RESERVE,
SUMMARY REPORT, 1999-2018**

Publication Number 19-10
Utah Division of Wildlife Resources
1594 W. North Temple
Salt Lake City, Utah
Michal D. Fowlks, Director

TRANSLOCATION IN THE
RED CLIFFS DESERT RESERVE,
SUMMARY REPORT, 1999-2018

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Publication Number 19-10
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ACKNOWLEDGMENTS

We are grateful to the dedicated and hardworking field workers involved in this project including Melinda Bennion, Camille Burrus, Kody Callister, Christian Edwards, Brianna Johnson, Clayton Martinez, Justin Neighbor, Jason Pietrzak, Mark Ratchford, Skye Salganek, Martin Schijf, Sarah Siefken, Shawn Smith, Janice Stroud-Settle, Kevin Wheeler, Eric Woodhouse, and Joe Zant. Field workers from previous monitoring years (i.e., 2003, 2005, 2007, 2009, 2011, 2013, 2015, 2017) included: C. Aiello, J. Alderete, C. Ansari, B. Bartosz, M. Bennion, A. Bianco, J. Borden, M. Bosma, J. Brown, J. Bunkley, D. Butler, M. Cochrane, J. Day, C. Daystar, M. Doyle, T. Ellis, P. Emblidge, L. Getts, R. Gordon, S. Griffith, D. Harstad, B. Haslick, K. Hogg, M. Hutmacher, J. Jakubanis, S. Kim, J. Kohen, V. Kratman, C. LaMere, O. Macowski, J. Marr, K. Marshall, E. Martin, L. McIntosh, E. Meyer, A. Miller, P. Myers, W. Nevins, J. O’Hearn, W. Pence, M. Ratchford, A. Rehm, M. Reitz, C. Rognan, N. Rudolph, A. Saenger, H. Sanders, F. Shapiro, C. Smith, J. Stilley, K. Storm, C. Taylor, A. Valencia, B. Voelker, J. Wagner, E. Wildey. L. Wilson, C. Wooden, and E. Woodhouse. We would also like to thank J. Neighbor (Washington County), H. Whitcomb (USFWS) and L. Rose for additional field assistance. We thank L. Allison and R. Averill-Murray for draft review. The Utah Division of Wildlife Resources, Washington County Habitat Conservation Plan, and Endangered Species Mitigation Fund funded this project.

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EXECUTIVE SUMMARY

A healthy and viable desert tortoise population was established within the Red Cliffs Desert Reserve through the tortoise translocation program under the Washington County Habitat Conservation Plan. Translocated tortoises within Management Zone 4 have established a persistent population as long term trends (2003 to 2017) indicate a substantial increase in desert tortoise abundance and density. Zone 4 was selected as a translocation site under the Washington County Habitat Conservation Plan because it contained limited to no tortoises despite apparent high quality habitat. Tortoises displaced under the Washington County Habitat Conservation Plan were health screened and 485 tortoises were translocated into Zone 4 between 1999 and 2018. Long term density trends (1987 to 2017) are positive and increasing within Management Zone 4 indicating that translocated tortoises have successfully established a persistent and viable population. The number of adult tortoises translocated into Zone 4 since 1999 (n=317) are within the 95% confidence intervals of the pooled abundance estimate ($N=280$ tortoises; 95% CI: 157-498; CV: 29.13%) suggesting high survival and low mortality. In almost every monitoring year, we observed juvenile or immature tortoises, indicating that adult tortoises are reproducing and maintaining a sustaining population. A variety of sign was observed (i.e., deep burrows, tracks, and scat) throughout Zone 4 and most burrows observed were active. In addition, recaptured tortoises in Zone 4 had higher growth rates than resident tortoise in the Red Cliffs Desert Reserve (Zones 2, 3, and 5) indicating that the abundant shelters and forage areas are maintaining healthy populations. Although movements of translocated tortoises in Zone 4 were greater than resident tortoises elsewhere in the Red Cliffs Desert Reserve, translocated tortoises appear to have site fidelity within Zone 4 as a majority of the tortoises encountered are recaptured translocated tortoises. The average time since translocation for processed tortoises has increased annually since monitoring began in 2003. These results indicate that desert tortoise translocation in Zone 4 is successful in establishing and sustaining a healthy persistent population.

INTRODUCTION

Translocation may be an effective management tool for animals that have been displaced from natural habitat (e.g., incidental take areas) as well as to repopulate areas with low-density resident populations (Field et al. 2007; Nussear et al. 2000; Nussear et al. 2012). The Washington County Habitat Conservation Plan established Management Zone 4 of the Red Cliffs Desert Reserve (Reserve) as an area to translocate tortoises displaced from designated take areas (WCC 1995). The Utah Division of Wildlife Resources has been monitoring tortoises within the Reserve as an ongoing effort to track the effectiveness of the translocation program. From 2003 to 2018, the objectives of monitoring efforts were to: 1) determine the density and abundance of tortoises, 2) collect demographic data including population structure, sex ratio, growth, survival, reproduction and recruitment of the population, 3) determine areas where tortoises are established by identifying the spatial distribution of tortoises and their sign, 4) determine movements of translocated tortoises, and 5) understand the health status (e.g., URTD, shell disease) of tortoises within Zone 4.

To evaluate tortoise translocation in Management Zone 4 of the Reserve, we reviewed tortoise presence and absence transects conducted from 1987-1991, summarized translocation efforts from 1999 to 2018, presented a summary of monitoring results from line distance sampling from 2003 to 2017, and completed additional point transects in 2018 to examine population demographics (e.g., age, size, structure, sex ratios, survival, growth and mortality). We report on the overall status of translocated tortoises in Zone 4 of the Reserve and examined the effectiveness of the translocation program. Specifically, we evaluated the Zone 4 tortoise population by: 1) summarizing the status and demographics of the population including size, age, survival, persistence, movements, reproduction, and recruitment, and 2) compared tortoise population demographics in the Reserve (i.e., Management Zones 2, 3 and 5) to Management Zone 4 (e.g., size, survival, persistence, movements, etc.).

MATERIALS AND METHODS

Study Area – The Red Cliffs Desert Reserve is located in southwestern Utah, Washington County, within the Upper Virgin River Valley. Populations within the Reserve represent the northeastern extent of the desert tortoise's geographic distribution. Zone 4, one of five management zones within the Reserve is approximately 5,318 acres (21.52 km²) and is located east of Leeds (Figure 1). Land ownership within Zone 4 is primarily under the Bureau of Land Management. The primary management goal of Zone 4 was to serve as a translocation site for displaced tortoises from incidental take areas within Washington County (e.g., Hurricane, Ivins, St. George, Santa Clara, and Washington; WCC 1995). Zone 4 was selected as a translocation site under the Washington County Habitat Conservation Plan because it contained limited to no tortoises despite apparent high quality habitat. In addition, it is effectively isolated from the rest

of the Reserve with natural and human made barriers (i.e., Virgin River on the south, Quail Creek Reservoir and I-15 on the west), and thus posed a low risk of disease transmission to native tortoise populations elsewhere in the Reserve.

Desert tortoises occupy a mosaic of Navajo sandstone outcrops, rugged rocky canyons, creosote-bursage flats, and basalt-capped ridges interspersed with sandy valleys within the Reserve (Bury et al. 1994). In Zone 4, topography was particularly diverse and includes steep and rugged cliffs, mesas, rocky outcrops, talus slopes, sandstone formations, basalt outcrops along the Virgin River, and deep washes including Grapevine Wash which flows into the Virgin River. A combination of habitat types is utilized for winter and summer dens, egg laying, and foraging (Esque 1994). Overwintering tortoises are found in caves, deep fissures, rocky overhangs, and deep sandy burrows (Bury et al. 1994).

Vegetation within the Reserve is diverse and includes representative species from the Mojave and Great Basin desert scrub biomes (Turner 1982a, Turner 1982b). Major vegetation types consist of a transitional mix of creosote bush, blackbrush and sagebrush scrub along with desert psammophyte (USFWS 1994). Predominant vegetation within these groups includes creosote bush (*Larrea tridentata*), blackbrush (*Coleogyne ramosissima*), snakeweed (*Gutierrezia sarothrae*), ephedra (*Ephedra nevadensis*), sand sage (*Artemisia filifolia*), and white bursage (*Ambrosia dumosa*). The northwestern portions of Zone 4 were within the Quail Fire perimeter which ignited on June 23, 2012 and burned approximately 1,708 acres (370 acres of private, 1,338 acres of BLM public lands).

Low precipitation, humidity, and a wide annual temperature range characterize the Reserve. Average annual precipitation, from 1965 to 2017, was $209.22 \text{ mm} \pm 9.57$ (range = 80.77 - 401.57), with the majority of precipitation typically occurring from November to March (WRCC, 2017). Winter storms are typically widespread, with low intensity storms bringing moisture from the North Pacific. Summer thunderstorms, which bring moist tropical air northward from the Gulf of California, are usually intense, local, and of fairly short duration (Pope and Brough 1996).

Translocation –Primary management objectives for tortoise populations in Zone 4 is to promote survival of translocated tortoises and to minimize the spread of disease (USFWS 2013). Because desert tortoises are long-lived with low annual reproductive rates, a disease outbreak causing the death of adult tortoises would result in significant population declines, making it difficult for the population to recover (Homer 1998; USFWS 2013). To protect tortoise populations, health assessments and blood tests were conducted prior to translocating tortoises within Zone 4 to determine exposure to disease (Berry and Christopher 2001). Enzyme-linked immunosorbent assay (ELISA blood test) have been used to detect the presence of antibodies to *Mycoplasma agassizii* and *M. testudineum*, thought to be the cause of Upper Respiratory Tract

Disease in desert tortoises (Jacobson 1994). Because not all tortoises exposed to the disease will exhibit clinical signs, the ELISA blood tests add an important component to understanding the health of individual tortoises (Hudson et al. 2009). Due to the relationship between the physiological activity of the desert tortoise immune system and behavior, USFWS (2011b) recommended that ELISA tests be conducted during the tortoise activity period but no sooner than four weeks after the tortoise has left its hibernaculum, from April 15th to October 31st. The results of the blood test (i.e., ELISA titer levels), in addition to a general health assessment, determine the ultimate disposition of the tortoise including translocate (ELISA negative), retest (ELISA suspect), or on-site quarantine in the Temporary Care Facility (ELISA positive). Given that tortoise densities are relatively high within the Reserve compared to the rest of the Mojave, the focus is to minimize spread of disease for resident tortoise populations throughout the Reserve.

Displaced tortoises from incidental take areas within Washington County (WCC 1995) were translocated into the Babylon, East Reef, and Sand Cove areas within Zone 4. Prior to translocation, tortoises were measured, uniquely filed on the marginal scutes, and a unique tag number was epoxied on the fourth right costal scute of their shell. In addition, passive integrated transponder (PIT) tags (13 mm length, 3 mm diameter) were injected subcutaneously into the shoulder of tortoises with a carapace length \geq 140 mm. All tortoises (CL \geq 80 mm) were blood tested prior to translocation to determine their level of exposure to URTD. Blood samples were drawn by jugular venipuncture (Dr. Jacobson and Dr. Houston, St. George Regional Veterinary Hospital) and sent to the University of Florida in Gainesville for analysis. Tortoises that were ELISA negative (titer < 32) for URTD were translocated into Zone 4 in the spring (March 15 to May 30) or fall (August 20 to September 30) using a hard release strategy (e.g., no supplemental food or water) and placed near a natural shelter within or near a creosote-bursage plant community. To maintain the genetic integrity of the Upper Virgin Recovery Unit, only tortoises of Utah origin were translocated into Zone 4.

Line Transects, 1987-1991 – The strip-transect method was used to determine the distribution and relative density of desert tortoises within Washington County (Berry and Nicholson 1979). Live tortoises and number of tortoise sign (e.g., scat, burrows, shells, tracks) were recorded along a strip transect 10 yd wide by 1-1.5 miles long. Transects were generally in the shape of an equilateral triangle but modified in rugged topography. The relative age of tortoise scat was estimated from visual observation using a condition classification system. Class 1 included scat that was still wet (not from rain or dew) or freshly dried (<1 week); Class 2 scat was dried with glaze and dark brown (<1 month); Class 3 scat was dry with no glaze, light brown, signs of bleaching, and consisting of tightly packed material (1 to 6 months); Class 4 included scat that was dry, light brown to pale yellow in color, consisting of loose material (6

months to 1 year). The condition class of each burrow was determined using the following classification scheme: Class 1= currently active with tortoise or recent tortoise sign; Class 2= good condition, definitely tortoise but no evidence of recent use; Class 3= deteriorated condition, definitely tortoise. While recording data, the total number of tortoise sign was converted to total adjusted sign (TAS) by combining associated sign groups (e.g., scat at a burrow entrance or scat clusters) into a single adjusted sign. Using data from five study plots (Karl 1981), a relationship was calculated between the number of corrected sign and the relative densities in an area.

Line Distance Sampling, 2003-2017 – The distance sampling method was used to determine tortoise population density and abundance, population demographics, and spatial distribution of tortoises (McLuckie et al. 2018). The monitoring program consisted of two independent teams of observers, one surveying line transects and the other determining above ground activity of radioed tortoises. Line transects were located within the survey area by using a random number generator (Excel 2016) to select the initial starting point. Using the easting UTM random coordinate (NAD 83 Conus), transects were placed laterally, from north to south to the Reserve boundary, perpendicular to high concentrations of tortoises in the southern portions of the survey area. Following the initial survey years, portions of transects with greater than 45° slopes were excluded during sampling due to safety concerns (e.g., Sandstone Mt area, Little Purgatory).

During the first years of monitoring in Management Zone 4 (i.e., 2003 to 2009), transects were placed 100 m apart which allowed for more intensive survey effort and a distinct section of Zone 4 to be completed each year (Fridell et al. 1998). From 2013 to 2015, consecutive numbered transects were placed 200 m apart throughout the survey area, with each subsequent year surveying odd or even transects (McLuckie et al. 2018). In 2017, Washington County requested that Management Zone 4 be surveyed at a greater intensity, therefore all transects (i.e., odd and even) were completed. We did not include 2011 efforts in Reserve density calculations as those surveys were designed to identify the spread and intensity of URTD within the Reserve and located in areas of relatively high tortoise density.

Each 2 km transect was surveyed by a two person crew. Using a compass to check directional alignment, a 50 m surveyor tape was placed along the transect line. Crew members walked in a sinuous pattern on opposite sides of the surveyor tape, searching for tortoises on both sides of the transect line. Search efforts were concentrated within 10 m of the line, with one member of the team confirming that all tortoises along the line were detected. This procedure was repeated in 50 m increments until the entire transect was completed. Search time and observer speed varied with vegetation and topography. Snake sticks and signal mirrors were used to search under bushes and within deep shelters, particularly along the transect line. The

surveyed length of each transect was calculated as the straight-line distance between GPS coordinates at each corner of the square transect, excluding areas that could not be surveyed.

The proportion of tortoises above ground (g_o) during the monitoring period was estimated by simultaneously tracking a subset of radioed tortoises. Adult tortoises (CL \geq 180 mm) were fitted with radio transmitters (Telonics Model 125) affixed to the anterior of the carapace using quick-drying gel epoxy. Transmitters were attached below the highest point of the carapace to reduce interference in shelters. Antennas were attached to marginal scutes and masking tape was placed directly onto scute seams, to prevent epoxy from soaking into seams. Tortoises seen on the surface or in burrows with only the aid of mirrors were identified as above ground while tortoises deep in burrows and not visible were below ground (Anderson and Burnham 1996).

Radioed tortoises were located using a Telonics receiver (Model TR-2E) and directional antenna. Telemetered tortoises were monitored two to three times a week at a representative site located in the central portion of Zone 3 of the Reserve. Activity and UTM coordinates were noted for all radioed tortoises located. Associated vegetation, time found, wind, percent humidity, and ambient/surface temperatures were also recorded to develop a model of g_o .

For each tortoise encountered, exact perpendicular distance from the line was measured using a 30 m open reel fiberglass tape. Total distance along the transect line and UTM coordinates were also recorded. To determine the spatial distribution of tortoise sign, UTM coordinates of all tortoise shelters encountered were recorded in addition to shelter dimensions (i.e., depth, width, and height), presence of scat (in or adjacent to the burrow), and burrow condition. Depth was estimated by using a snake stick placed from the rear of the shelter to the burrow opening. Width and height were measured at the opening of the burrow. The condition of each burrow was determined using the following classification scheme devised by the USFWS (1992): Condition 1= currently active with tortoise or recent tortoise sign; Condition 2= good condition, definitely tortoise but no evidence of recent use; Condition 3= deteriorated condition, definitely tortoise; and Condition 4 = possibly used by tortoise.

We refined vegetation and topography types for the survey area using a system based on Brown (1994). Vegetation categories were based on the most visually prevalent species and included the following types: BURN= Burned by wildfire, BLMX= Blackbrush Mix, CREO= Creosote Bursage Mix, DESH= Desert Shrub Mix, GRMX=Grass Mix, and PJMX= Pinyon/Juniper Mix. Topography types included: CLIF= Cliffs, FLAT= Flats, MESA=Mesa, ROCK= Rocky Outcrop, SAND=Sand, SAST= Sandstone, TALU= Talus Slopes, WASH= Wash. The total line length was calculated and recorded in kilometers for each transect.

Field crews were intensively trained on distance sampling theory, field protocols and search patterns. Data were checked daily for quality and analyzed weekly to assess the detection histogram and improve search efforts. Field crews were regularly rotated between distance

sampling and radio telemetry to allow training in the overall survey method and to improve their tortoise search image.

Point Transects, 2018 – Point sampling was used to efficiently survey large areas, increase tortoise recapture rates for survival analysis, assess population demographics, and determine spatial distribution of tortoises within Management Zone 4 (Buckland et al. 2001). A 200 m by 200 m grid of points was overlaid onto the sampling area using ArcMap 10.2, and clusters, areas consisting of 4-6 points based on topography and access points, were identified (Figure 3). Using a random number generator (Excel 2016), we randomly selected survey clusters and completed all sampling points within each cluster. The sampling area included the entire Management Zone 4 area, with the exception of the rugged terrain in Little Purgatory and Sandstone Mt (21.20 km²).

The center of each 30 m point transect was located using a GPS unit and identified with red surveyor tape. Using a compass for directional alignment, the four cardinal points (e.g., north, south, east, west) of the outer edge of the 30 m point transect were identified. Each transect was surveyed by a team of one to four observers, with each observer walking in a sinuous pattern, searching for tortoises and their sign (burrows and tracks). For each tortoise encountered on a survey, perpendicular distance from the point center was estimated with a Garmin GPS (i.e., Rino650).

Tortoise Encounters, 1999-2018 – All tortoises, regardless if on a transect or opportunistic (e.g., observing a tortoise while walking to a transect, observing a tortoise while driving, etc.), were processed and recorded to inform our understanding of population demographics and distribution within Management Zone 4. Standard tortoise carapace measurements were taken including CL, post M3, and width at the M7 and M8 seam. Additional data recorded included sex (determined for tortoises with a CL ≥ 180 mm), time found, behavior, health observations, parasites (e.g., ticks, mites) observed, injuries, shell anomalies, and location (i.e., UTM coordinates). Shell wear was identified for each tortoise observed (Berry and Woodman 1984). If a tortoise could not be removed from a burrow, it was categorized as either reproductive (CL ≥ 180 mm) or nonreproductive (CL < 180 mm). All encountered tortoises were photographed and file marks, PIT tag number, and epoxy tags were recorded, if possible. A handheld radio frequency reader (RF reader; Mini-portable Reader Hs5900L-F, Biomark, Boise, Idaho) was used to identify the unique PIT tag code on relocated tortoises. Unmarked tortoises (CL > 100 mm), were given a unique number by filing marginal scutes. Tortoises were determined to be either marked or unmarked (e.g., translocated, recapture, original capture). Environmental variables recorded included temperature (ground and one meter above ground), wind speed, percent humidity, percent cloud cover, substrate, and dominant vegetation. We used sterile latex gloves while handling each tortoise and disinfected equipment with a diluted bleach

solution (1:10 dilution of 5.25% bleach) after use (Brown et al. 2003). Once processing was completed, tortoises were released at the point of detection.

For each shell remain found, CL, sex, UTM coordinates, signs of predator or scavenger, percent scutes and bones present, position of shell, estimated time since death, and perpendicular distance from the transect line were recorded. The CL of deteriorated or fragmented shell remains was estimated using regressions based on scute size (Berry and Woodman 1984). Time since death was estimated using deterioration rates of tortoise shell and skeletal remains (Berry and Woodman 1984). All processed shell remains were photographed.

Statistical Analyses – Processed tortoises were categorized into three class sizes based on carapace length (CL): juvenile (CL < 100 mm), immature (CL= 100-179), and reproductive adult (CL ≥ 180 mm). Nonreproductive tortoises includes all immatures and juveniles with CL < 180 mm. Descriptive statistics (means, standard errors and range) are presented for each size class observed as well as growth rates (Excel v. 6.0). Means are presented ± one standard error (SE). Sex ratios across all years of the study (2003 to 2017) were compared using Chi square with Yates correction using only translocated tortoises (Stangroom 2018). Total area sampled was determined using ERI ArcMap (v. 10.2.2).

Using simple geometry, the straight-line distance from the point of release to the point of recapture was measured for each translocated tortoise encountered (Excel v. 6.0). To address bias and measurement issues, tortoises with negative growth and those recaptured less than one year from their original capture date were eliminated from the analysis. Means are presented ± one standard error (SE). Density and abundance estimates for translocated tortoises include only reproductive tortoises detected on transects (CL ≥ 180 mm). Anderson et al. (2001) recommend excluding juveniles and immatures from analyses because they are often undetected along the transect line. Estimates that included immatures and juveniles would likely underestimate the true population density particularly if survey methods did not incorporate specific search protocols for small tortoises (e.g., use of trained dogs, g_o for nonreproductive animals, etc.; Thompson et al. 1998, Buckland et al. 2001).

A one way ANOVA was used to compare 1) growth rates by sex and age, and 2) total distance moved by sex and age in Zone 4 and across Management Zones (Zones 2, 3, and 5; Excel v. 6.0). A paired samples t-test was conducted to test each pair of means and determine the effect of age and sex on growth rates and total distance moved. After transforming the data, we performed a regression analysis on the natural log of total distance moved and time since translocated to determine their relationship.

We used Program DISTANCE 7.1 Release 1 (Thomas et al. 2010) to estimate density and abundance of tortoise populations within Zone 4 and reported estimates that could be applied across Zone 4 (i.e., 2009, 2013, 2015, 2017). Density was estimated using the following formula:

$\hat{D} = n/(2wL \cdot \hat{P}_a \cdot \hat{g}_0)$ where n is the number of tortoises observed, w is the width of the area searched on each side of the line transect, L is the total line length, \hat{P}_a is the probability of detecting a tortoise within the transect width w , and \hat{g}_0 is the proportion of tortoises that were detected above ground during the survey period. The variable \hat{D} is an estimate of the average density during the time of the survey and includes those tortoises above and below ground. Population abundance (N) is estimated by $\hat{N} = A \cdot \hat{D}$ where A is the total area sampled.

To account for tortoises hidden in burrows and not visible we used the correction factor, \hat{g}_0 . The proportion of tortoises above ground (\hat{g}_0) during the monitoring period was estimated by simultaneously tracking a subset of radioed tortoises. Adult tortoises (CL 180 mm) were fitted with radio transmitters (Telonics Model 125) affixed to the anterior of the carapace using quick-drying gel epoxy. Transmitters were attached below the highest point of the carapace to reduce interference in shelters. Antennas were attached to marginal scutes and masking tape was placed directly onto scute seams, to prevent epoxy from soaking into seams. Tortoises seen on the surface or in burrows with only the aide of mirrors were identified as above ground while tortoises deep in burrows and not visible were below ground (Anderson and Burnham 1996).

A weighted mean for \hat{g}_0 was computed from weekly averages by using the following formula: $\hat{g}_0 = \sum (\hat{g}_j) / \sum N_j$, where N_j equals the total number of tortoise observations and \hat{g}_j equals the number of locations where the tortoise was above ground and visible. To determine the mean and variance of \hat{g}_0 across all years of the study (i.e., 2003-2017), sampling variance for \hat{g}_0 was calculated annually using the following formula: $\text{var}(\hat{g}_0) = \sum N_j (\hat{g}_j - \hat{g}_0)^2 / [(\sum N_j)(n_T - 1)]$ where n_T equals the number of radioed tortoises. The delta method was used to determine the variance of \hat{g}_0 during the study. Standard error was calculated by taking the square root of the variance.

Four standard detection models were examined (uniform + cosine, uniform + simple polynomial, half-normal + cosine, half-normal + hermite polynomial) to analyze the data. The minimum Akaike Information Criterion (AIC) value was used to select the detection model that best fit the perpendicular distance data (Buckland et al. 2001). Outliers were truncated as they provide little information for estimating the detection function at $x=0$, are difficult to model, and may increase the sampling variance of the density estimate (Buckland et al. 2001). To determine the truncation point, w , we fit a preliminary model to the data and computed w based on $g(w) \approx 0.15$ (Buckland et al. 2001).

Encounter rates, density and abundance estimates, and 95% confidence intervals were calculated using program DISTANCE (Thomas et al. 2010). The precision of density and abundance estimates were computed by program DISTANCE as coefficients of variation (Thomas et al. 2010). The precision level of estimates (i.e., \hat{g}_0 , \hat{P}_a) will be refined as additional

years of monitoring data are collected. The linear trend of adult tortoise densities (1998 to 2017) was calculated from the log_e-transformed density estimates (Excel v. 6.0).

RESULTS

Translocation, 1999-2018 – A total of 485 tortoises were translocated to Management Zone 4 between April 1999 and 2018 (Figure 2). The majority of tortoises translocated into Zone 4 were adult size classes and more males were translocated than females (181♂:117♀; 11 Unknown; Figure 3). Carapace length of translocated tortoises processed prior to release ranged from 38 to 314 mm and included 49 Juveniles (mean CL = 60 ± 2.33 mm; range 38-96), 124 Immatures (mean CL = 124 ± 1.99 mm; range 100-179) and 309 Adults (mean CL = 234 ± 1.68 mm; range 180-314). Three tortoises were not included in the descriptive statistics due to insufficient release data (e.g., carapace length). Tortoises were translocated along Babylon Road and Sand Cove in the central and south central regions of Zone 4 (Figure 4).

Transects Completed, 1987-1991 – Twenty-five strip transects, a total length of 42.6 km (26.5 miles), were completed on July 29, 1987 and April 24-26, 1991 (Table 1). No tortoises were observed, however, sign was recorded on three transects including an inactive burrow and two old scats at the entrance, and one transect with a very old, bleached scat, estimated to be 1 year old (Figure 5). The total adjusted sign (TAS) was three and the area was considered to contain a limited tortoise presence as no live tortoises were found on surveys and no fresh sign was observed. The overall shelter site encounter rate was determined to be 0.05 burrows per km surveyed.

Transects Completed, 2003-2018 – Since 2003, line distance sampling transects were conducted over six monitoring periods in Management Zone 4; four of those were conducted to estimate density and abundance (Table 2). From 2003 to 2015, surveys were conducted entirely in June, after transects in the core of the Reserve (Zones 2, 3, and 5) were completed. In 2017, surveys were completed throughout the spring monitoring season, from April 7 to June 7, 2017. Table 2 summarizes the total effort (km) for each monitoring period including transects completed, and the number of tortoises encountered for each season.

A total of 132 point transects and two line transects were surveyed from April 6 to May 24, 2018 (Figure 6). To maximize tortoise encounters and area surveyed, on April 10 we converted exclusively to systematically placed point transects. Major vegetation communities within the survey area included creosote-bursage, blackbrush, desert shrub, grassland mix, riparian, and mixed juniper community. Topography was diverse and included steep and rugged cliffs, mesas, rocky outcrops, talus slopes, sandstone formations, flats, sandy dunes, basalt outcrops along the Virgin River, and deep washes including Grapevine Wash which flows into the Virgin River.

Tortoise Sign Observed, 2018 – Tortoise sign was confirmed on 70 transects and included live tortoises, tracks, shell remains, burrows, and scat (Figure 7 & 8). Over 64 scats and 55 shelters were observed on transects (Figure 9). The majority of shelters observed were deep burrows in soil or rock; 34 were > 80 cm in depth, 19 were of moderate depth (34-80 cm) and 2 were shallow pallets (<34 cm). Four fresh set of tracks were observed at the entrance of or near active burrows. Sign was concentrated in the southern and central areas of Zone 4.

Three shell remains were observed on or near transects. A freshly dead unmarked adult male tortoise (CL = 277 mm) was found upright and in full sun. Cause of death was undetermined and time since death was estimated to be less than one year. An adult marked female was observed smashed on Babylon road, with deep cracks in the plastron and carapace. This tortoise had been translocated on May 8, 2001, and time since death was estimated at spring 2018. Cause of death for a third heavily scattered and disarticulated shell was unknown and, due to the condition of scutes and bones, determined to have died more than four years ago.

Tortoise Burrows Observed, 2003-2018 – Since 2003, 350 sheltersites have been recorded throughout Management Zone 4 (Figure 10). Similar to what was observed in 2018, the majority of shelters recorded were classified as deep dens (51%), followed by burrows (34%) and pallets (15%). Most shelters were identified as active (57%) with either fresh scat or tortoises at the entrance. The remaining shelters were either not recently used (32%), deteriorated (9%), or a potential tortoise shelter (2%). Sheltersites were observed in a variety of substrate including rocky outcrops, sand dunes, desert pavement, and within mining sites. The majority of shelters were observed in the southwest, southcentral, central regions, or in clusters along the Virgin River. The overall shelter site encounter rate was determined to be 0.98 burrows per km surveyed.

Tortoises Encountered and Health Observations, 2018 – Eighteen live tortoises were encountered on transects from April 6 to May 24, 2018; an additional twenty-six tortoises were observed anecdotally including four recaptured within the 2018 monitoring period (Table 3). Four tortoises (CL > 180mm) could not be processed because they could not be removed from deep soil burrows. Size class of tortoises processed included three juveniles (CL=63 mm \pm 10.5; range=47-83), three immatures (CL=140 mm \pm 17.1; range=112-171 and thirty adults (CL=258 mm \pm 4.9; range=195-318). Processed tortoises were either an original capture (n=12), a translocated recapture (n=20) or other recapture (n=4).

Clinical signs of URTD (e.g., wheezing, swollen eyes, and wet, occluded or eroded nares with cloudy, thick exudate present) were found on 8.6% (n=3) of tortoises processed (Figure 9). Shell disease or shell fungus, covering the entire carapace in one adult male to a few scutes on all other tortoises, was observed on 12.5% (n=5) of processed tortoises. We observed sixteen tortoises with peeling scute laminae and three immature tortoises with premature depressions.

One adult female was observed with burn scars on the right side of the carapace and foreleg including extensive peeling, mottling, and discoloration of scute laminae, scarring on the right foreleg, with a disfigured foot. Eleven tortoises displayed costal (i.e., 4/5) and/or marginal anomalies (i.e., 10/11, 11/10, 11/12, 12/11, 12/12).

Sex Ratios – Sex could not be accurately determined for tortoises less than 180 mm, or tortoises that could not be extracted from deep burrows. Males were significantly larger than females (1998 to 2017; Males: mean CL= 261 ± 3.63 mm, range 202-314 mm, $n=634$; Females: mean CL= 233 ± 2.51 mm, range 184-270 mm, $n=640$). No significant difference in sex ratios was observed in 2018 ($15\delta:15\varphi$; 4 Unknown). In addition, the ratio of male to female translocated tortoises were similar to recaptures for all years (1999-2018; $64\delta:44\varphi$; $X^2=0.02$; $p=0.88$) with more males recaptured than females.

Growth Rates of Recaptured Tortoises – Twenty-eight processed tortoises were previously marked including four recaptures within the same monitoring year (i.e., 2018; Table 4). An epoxy tag was observed on one tortoise deep in a den and unable to be processed. Five recaptures were excluded from the growth analysis due to lack of growth data (i.e., CL) and multiple recaptures within the same capture period (e.g., 2018).

Mean carapace length of recaptured tortoises in 2018 was 260 ± 6.20 mm ($n=22$; range=217-318). The mean annual growth rate for male tortoises was 6.35 ± 1.38 mm/year ($n=10$; range=0.29-15.35) while growth rate for females was 2.75 ± 0.90 mm/year ($n=12$; range=0.07-9.39). The smallest growth recorded was of a female that grew only one mm in a 15 year period; conversely the largest growth was of a male tortoise that grew 91 mm in six years (Figure 11). In 2018, there was a significant difference between recaptured male and female growth rates (t -Test=2.25; $p = 0.036$) with males growing faster than females (Figure 12).

Carapace length and annual growth were calculated for all recaptures in Zone 4 by sex and age (Table 5). From 2000 to 2018, the mean annual growth rate for male tortoises was 5.84 ± 0.81 mm/year ($n=46$; range=0.00-26.89), the growth rate for females was 3.32 ± 0.59 mm/year ($n=38$; range=0.00-13.46), and the growth rate for juveniles was 10.71 ± 0.88 mm/year ($n=4$; range=8.10-11.90). When sex and age were analyzed across all years, growth rates in Zone 4 were significantly different for all groups (($F(2,85)=6.21$; $p = 0.003$)) with males growing faster than females (t -Test=2.25; $p = 0.018$) and nonreproductive tortoises growing faster than both males (t -Test=-4.08; $p = 0.001$) and females (t -Test=-3.97; $p = 0.0001$; Table 3).

Annual growth for reproductive tortoises in Zones 2, 3, and 5 showed a similar pattern with the mean annual growth rate highest for juveniles ($\bar{x} = 9.67 \pm 0.38$ mm/year; $n=88$; range=2.84-24.00), followed by male tortoises ($\bar{x} = 2.98 \pm 0.21$ mm/year; $n=201$; range=0-15.80), and females ($\bar{x} = 1.82 \pm 0.18$ mm/year; $n=229$; range=0-17.67; Table 5; Figure 12). Nonreproductive tortoises grew faster than both males (t -Test=15.30; $p < 0.001$) and females (t -

t -Test=18.58; $p < 0.001$), and growth rates were significantly different between males and females (t -Test=4.20; $p < 0.001$). Zone 4 tortoises grew significantly faster than tortoises in Zones 2, 3 and 5 by sex (Females: t -Test=-2.47; $p = 0.014$; Males: t -Test=3.43; $p = 0.001$) while growth of nonreproductive tortoises throughout the Reserve was not significantly different (t -Test=-0.57; $p = 0.56$).

Movement and site fidelity – In 2018, tortoises were recaptured an average of 11.13 ± 1.19 yrs since first marked ($n=24$; range 0.85-19.44). Tortoises moved an average of 130 ± 61 m/yr ($n=24$; range 4-1472) from their original capture location. Total distance moved averaged 613 ± 103 m ($n=24$; range 29-1815). The mean of total distance moved was greater for females (644 ± 168 m; $n=13$; range 57-1815) than males (576 ± 115 m; $n=11$; range 29-1150). Total distance moved, average distance moved and time since translocated were calculated for all recaptures in Zone 4 and across the Reserve (Zones 2, 3, and 5) by sex and age (Table 5).

When total distance moved and time since translocated were analyzed, there was no correlation detected for Zone 4 females and nonreproductive tortoises; in contrast, time since translocated explained 33% of the variation for male long distance movements (Total distance moved (y) = 0.42 (time) + 2.40 ; $R^2=0.33$; Figure 13) with total distance moved increasing as time since translocated increased. When Zone 4 tortoises were analyzed by age and sex, average distance moved (($F(2,97)=0.61$; $p = 0.54$)) and total distance moved (($F(2,97)=0.53$; $p = 0.59$)) were not significantly different. However, total distance moved of translocated tortoises ($\bar{x} = 672 \pm 0.21$ m; $n=106$; range=29-3831) was significantly more than unmarked tortoises in Zone 4 ($\bar{x} = 257 \pm 0.18$ m; $n=7$; range=9-891; t -Test=1.79; $p = 0.04$) and resident tortoises in Zones 2, 3 and 5 (t -Test=4.68; $p < .001$; Table 5; Figure 14).

Survivorship and Mortality – Over all monitoring years, annual survival was estimated at 0.90 (0.87 and 0.92) for adult tortoises ($SE=0.01$; $n=19$; 2000 to 2018). From 2003 to present, 27 dead tortoises were observed including 19 adults (12♂:5♀; 2 unknown) and eight nonreproductive tortoises. Human induced mortality (e.g., road kills, shot) was the largest source of mortality for tortoises in Management Zone 4, followed by disease and accidental (e.g., overturned; Table 6). Cause of death for 9 tortoises were unknown. Four tortoises were taken illegally from Zone 4 and, after confirming they had not been exposed to disease (e.g., URTD), returned to their original translocation site.

Detection Histogram and Probability Plots – To reduce the effects of extreme observations or ‘outliers’, data were truncated at 25 m. The best fit model selected was the uniform + cosine based on the minimum AIC value (491.05). The detection probability plot was not significantly different from the observed field data ($X^2 = 6.85$, $p = 0.81$, $df=11$; Figure 15). The effective strip width (ESW), the transect width where all animals are observed, was 15.94 m (95% CI: 13.35-19.03; CV: 8.92%) and, \hat{P}_a , the proportion of tortoises detected within transect

width w , was 0.64 (95% CI: 0.53-0.76; CV: 8.92%). The largest variance component in all years of the study was the spatial variation in the encounter rate.

Density and Abundance Estimates – From 1987 to 1991, because no live tortoises were observed on transects and sign observed was not recent, population density was assigned a zero (Figure 16). Density was estimated for four subsequent monitoring periods from 2003 to 2017 (Table 2). In 2017, the most recent estimate for Zone 4, density for adult tortoises was 13.43 tortoises per km² (95% CI: 7.54-23.92; CV: 29.13%; Table 4). The abundance of adult tortoises is 285 tortoises per area sampled (21.20 km²; 95% CI: 160-507; CV: 29.13%), which is consistent with the cumulative total of translocated adults since 1999, not accounting for survival, recruitment, mortality, and emigration (Figure 17). Since 1987, we observed an overall positive trend in tortoise densities ($y=2.10x$; $R^2=0.46$; Figure 16).

DISCUSSION

Translocation has been used as a management tool to mitigate impacts to wildlife populations from habitat loss (Guyot and Clobert 1997, Heise and Epperson 2005), however, previously translocation success, particularly for tortoise populations, has been limited (Hein 1997, Seigel and Dodd 2000). Recent studies, however, have shown that tortoises can be effectively translocated into Mojave Desert scrub habitat, such as in Zone 4 (Dickson et al. 2019, Drake et al. 2012, Field et al. 2007, Nussear et al. 2012). Major criteria used to determine the effectiveness of a translocation project included growth of released individuals, population growth, movement, reproduction, survival, and site fidelity (Bell and Herbert 2017, Miller et al. 2014, Nussear et al. 2000, Nussear et al. 2012, Rittenhouse et al. 2007, Seigel and Dodd 2000). Dispersing tortoises require large areas where individuals will remain as inhabitants (Nussear et al. 2012, Seigel and Dodd 2000). If translocated animals fail to remain on the release site, their dispersal movement patterns may increase mortality, particularly in areas with high road densities and traffic volume (Gibbs and Shriver 2002, Nussear et al. 2012). Hence, the long-term viability of a translocated tortoise population is largely determined by the number of tortoises that remain at the release site.

Translocated tortoises within Zone 4 have established a persistent and viable population as long term trends (2003 to 2017) indicate a substantial increase in desert tortoise abundance and density. Early transects (e.g., 1987 to 1991) indicated that Zone 4 did not contain a viable tortoise population, although it did appear to contain potentially suitable habitat. No live tortoises were encountered and little evidence was observed during early transects, with 0.05 burrows observed per km surveyed. By 2017, the overall shelter site encounter rate was 0.98 burrows per km with the majority of shelters identified as deep dens and active with either fresh scat or tortoises at the entrance. Shelters and live tortoises were often located in or adjacent to creosote

bursage habitat or mixed desert vegetational communities in the southwest and central regions, or clustered along the Virgin River. Recent density estimates in 2017 indicated that there were 13 adult tortoises per km² with 285 adult tortoises, an overall positive trend in tortoises since monitoring began in 1987. This is consistent with the total number of translocated tortoises (i.e., 300) placed in Zone 4 since 2003, not accounting for mortality, survival, and immigration of translocated immatures.

In 2018, the majority of tortoises appear to be healthy with no clinical signs of Upper Respiratory Tract Disease and limited evidence of shell disease. Tortoises with URTD clinical signs have been detected in Zone 4 as early as 2003 when two adult tortoises (1 ♂:1 ♀) were observed with minor to moderate clinical signs including wet nares, crusty discharge around eyes, and wheezing. Subsequent tortoises encountered during monitoring year 2005 and 2007 were healthy with no URTD clinical signs observed. However, on May 18, 2009, an adult male tortoise was observed with exudate present at both nares, wheezing, and droopy limbs, just west of Babylon Road. On June 17, 2009, a second adult male with similar URTD clinical signs was observed in the same general area. Both of these tortoises were ELISA negative when first translocated. Subsequent ELISA tests determined they were ELISA positive for URTD (Pers. Comm., Dr. John Roberts). During a field trip on September 11, 2009, three (2 ♂:1 ♀) of the five tortoises observed had clinical signs of URTD and all were located within a few meters of the initial 2009 disease observations. Tortoises observed in 2011 with URTD clinical signs were located in the vicinity of the initial disease outbreak in 2009 (within 41-824 m). URTD may have been introduced by a released captive. A highly visible deep winter shelter is located along Babylon Road, just a few meters west from the initial contact point. Alternatively, the disease may have been introduced through a result of poor ELISA test performance (e.g., false negative) thereby falsely identifying a sick tortoise as healthy (Pers. Comm., B. Rideout). Since 2009, when 25% of the tortoises encountered were observed with clinical signs of disease, a decrease in the overall percent of tortoises with clinical signs of disease has been observed. To reduce future spread of the disease, future translocation sites should be located away from the contact point, such as Sand Cove and along the Virgin River. In addition, we recommend continued monitoring of translocation populations to determine the extent and spread of the disease.

Growth is a critically important process for desert tortoises and is indicative of their ability to survive, reproductive fitness, and overall health (Bell and Herbert 2017, Brown et al. 2005). Similar to other studies, growth rates of Zone 4 juveniles were significantly higher than adults, and males had significantly higher growth rates than females (Fridell et al. 1995, Lambert et al. 1998, Medica et al. 2012). Interestingly, for all sex and age groups, Zone 4 tortoises had higher growth rates than tortoises in the rest of the Reserve (Zones 2, 3, and 5). Although Zone 4 has burned, those wildfires have been small and did not occur in areas of high relative tortoise

density. In addition, tortoises in Zone 4 have access to water throughout the year with the Virgin River located on the southern boundary and an ephemeral stream (i.e., Grapevine Wash) running from north to south in the center of Zone 4. Dense vegetational shrub communities are found on the edges of this stream which in turn provides tortoises with ephemeral vegetation in spring and early summer, depending on the snow pack on the Pine Valley Mountains. Medica et al. (2012) found that both winter rain and ephemeral vegetation predicated annual growth with years of greatest growth coinciding with high winter rainfall and plant production.

Aresco and Guyer (1999) found that Gopher Tortoises (*Gopherus polyphemus*) living in disturbed habitats had slower growth rates than those living in intact habitats. Catastrophic fires in the summer of 2005 burned approximately 25% of critical desert tortoise habitat within Management Zone 3, including areas with relatively high density tortoise populations. As a result, native tortoise populations have declined up to 50% in burned areas (McLuckie et al. 2007), due primarily to habitat degradation resulting from large wildfires and replacement of invasive weeds (e.g., red brome, cheatgrass, Russian thistle, etc.). Areas in the Reserve heavily infested with non-native exotics will repeatedly burn ultimately converting the vegetation from a native desert shrubland to an exotic invasive grassland.

In almost every monitoring year we have observed juvenile or immature tortoises, indicating that adult tortoises are reproducing. Although evidence of reproduction does not indicate genetic paternity (e.g., translocated or resident tortoises), based on the high number of translocated tortoises encountered, and the low relative densities of resident tortoises, genetic contribution from translocated tortoises is likely (Mulder et al. 2017). Further, recaptured translocated tortoises appear to have high site fidelity within Zone 4. In every year of monitoring, a majority of the tortoises encountered are translocated tortoises.

Translocated turtles can travel greater total distance, had greater net directed movement, and had larger home range size than resident turtles (Rittenhouse 2007). In addition, translocated tortoises can have more variable movement patterns the first year after release than resident tortoises, with long-distance movements decreasing over time as they became more familiar with available resources and establish home ranges (Nussear et al. 2000, Nussear et al. 2012). In our study, translocated tortoises had significantly larger movements when compared to resident tortoises across the Reserve. One adult male tortoise moved 4.2 km in a six year period (April 26, 2001 to June 12, 2007), 2.8 km more than any other recaptured translocated tortoise. Within its first year, another adult male moved 2.1 km in a two month period, 0.5 km more than any other tortoise within its first year. Although movements for translocated tortoises were higher than for resident tortoises, the rugged terrain (e.g., Sandstone Mt, Little Purgatory), as well as natural barriers (e.g., Virgin River, Quail Creek Reservoir), and limited fencing on the northern boundary, constrains the majority of tortoises from moving off of Zone 4.

Field et al. (2007) recommended that target densities for translocated populations can be as high as one standard deviation from the mean density of the nearest Recovery Unit. Using 2017 density estimates from the Reserve, in the Upper Virgin River Recovery Unit, we calculate the target density in Zone 4 to be 19.64 ± 2.67 tortoises per sq km ($SD=CV*D/100$ where $CV=13.60$). Given that the density in Zone 4 is currently below this target (2017: 13.43 tortoises per km²; CV: 29.13%), we recommend continuing the translocation program in Zone 4. To reduce spread of Upper Respiratory Tract Disease and increase survival of translocated tortoises, future sites in Zone 4 should be located away from high density tortoise areas and in appropriate habitat (e.g., creosote bursage vegetation community; Wendland 2010). In addition, we recommend continued monitoring of translocation populations to determine the extent and spread of disease.

The number of tortoises translocated annually has declined since 2004, with a few exceptions (Figure 2). We attribute the continued decline primarily to high density incidental take areas previously cleared (e.g., south of Snow Canyon State Park, Foremaster Ridge and properties adjacent to Industrial Park in St. George) and the increased effort to relocate tortoises to adjacent habitats within the Reserve. Most of the large tracts of undeveloped tortoise habitat adjacent to the Reserve (e.g., south of Snow Canyon State Park, east of SR-18, north of Snow Canyon Parkway, Hurricane area), have been cleared of tortoises.

Translocation within Zone 4 is successful based on growth of released individuals, evidence of reproduction, and an increasing trend in adult population size. Tortoises are well established as evidenced by their established shelters. Since monitoring began in 2003, there have been observations of juvenile and immature tortoises annually, indicating that adult tortoises are reproducing. We hope to continue to monitor tortoise populations to assess the population structure and spatial distribution of tortoises within Zone 4.

MANAGEMENT RECOMMENDATIONS:

Based on our results, we propose the following management recommendations:

1. Continue to monitor tortoise population density, demographics, and population trends across the Red Cliffs Desert Reserve.
2. Continue to monitor tortoise populations to assess density, survival, mortality, population structure and spatial distribution of tortoises in Zone 4. To maximize tortoise encounters, monitor tortoises throughout the spring, from April to June.
3. Given that the density in Zone 4 is currently below the recommended target density identified by the USFWS (Field 2007), we recommend continuing the translocation program in Zone 4.
4. To reduce spread of Upper Respiratory Tract Disease and increase overall success of translocation, future translocation sites in Zone 4 should be located away from high density tortoise areas and in appropriate habitat (e.g., creosote bursage vegetation community).
5. Identify management actions (e.g., signage, education, law enforcement presence) to reduce preventable mortality (e.g., roadkills, illegal collection) within Zone 4.
6. Identify and evaluate future potential translocation sites with low density tortoise populations in 2019-2020.

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Table 1. Desert tortoise sign observed on strip transects including date, transect number, survey agency, and total length of transect, 1987 to 1991, Red Cliffs Desert Reserve, Washington County, Utah. Total adjusted sign (TAS) is the total number of sign when associated sign groups are combined. Condition class of burrows include (2) good condition, definitely tortoise but no evidence of recent use; condition class of scat include (4) dry, light brown to pale yellow in color, consisting of loose material (6 months to 1 yr). Only transects that are located partially or entirely in Management Zone 4, RCDR, are included in the table.

Date	Transect #	Agency	Length (mile)	Tortoise Sign Observed				TAS
				Tortoise	Burrows	Scat	Condition	
7/29/87	180	UDWR	1.5	0	1	2	2	1
7/29/87	181	UDWR	1.5	0	1	2	2	1
7/29/87	182	UDWR	1.5	0	0	0		0
4/25/91	495	SWCA	1.0	0	0	0		0
4/25/91	496	SWCA	1.0	0	0	0		0
4/25/91	497	SWCA	1.0	0	0	0		0
4/25/91	498	SWCA	1.0	0	0	0		0
4/25/91	499	SWCA	1.0	0	0	0		0
4/25/91	500	SWCA	1.0	0	0	0		0
4/25/91	500A	SWCA	1.0	0	0	0		0
4/24/91	505	SWCA	1.0	0	0	0		0
4/24/91	506	SWCA	1.0	0	0	0		0
4/24/91	591	SWCA	1.0	0	0	0		0
4/26/91	592	SWCA	1.0	0	0	0		0
4/26/91	593	SWCA	1.0	0	0	0		0
4/26/91	594	SWCA	1.0	0	0	0		0
4/26/91	595	SWCA	1.0	0	0	0		0
4/26/91	596	SWCA	1.0	0	0	0		0
4/26/91	597	SWCA	1.0	0	0	0		0
4/26/91	598	SWCA	1.0	0	0	0		0
4/26/91	599	SWCA	1.0	0	0	0		0
4/26/91	600	SWCA	1.0	0	0	0		0
4/26/91	601	SWCA	1.0	0	0	0		0
4/26/91	602	SWCA	1.0	0	0	0		0
4/26/91	603	SWCA	1.0	0	0	1	4	1

Table 2. Summary of survey effort from 2003 to 2018 in Management Zone 4, Washington County, Utah. Main objectives for each survey period was to estimate density (Survey # 1, 3, 4, and 5), determine the extent and pattern of disease (Survey #2), and maximized recaptures for survival estimates (Survey #6). Status and sex of encountered tortoises includes translocated (T), recaptured (R), original (O), unknown (U) , male (M), female (F), adult Unknown (Ad U) and nonreproductive (N).

Survey #	Survey Year	Type	Transects Completed	Km Surveyed	Tortoises Observed		Status				Sex			
					Transects	Incidental	T	R	O	U	M	F	Ad U	N
1	2003	L	45	44.13	15	2	15	0	0	2	6	6	3	2
	2005	L	22	42.24	11	8	13	0	4	2	7	9	2	1
	2007	L	34	61.49	9	4	5	0	7	1	8	4	1	0
	2009	L	24	27.95	13	0	7	1	3	2	8	3	2	0
2	2011	L	14	42.34	18	0	14	0	3	1	9	5	1	3
3	2013	L	17	46.34	9	6	11	1	1	2	5	7	2	1
4	2015	L	16	41.79	6	5	7	0	2	2	5	3	2	1
5	2017	L	30	85.72	41	4	18	1	19	7	12	18	5	10
6	2018	P	132	n/a	18	22	21	4	13	2	15	15	4	6
Totals				392.00	140	51	111	7	52	21	70	70	24	24

Table 3. Tortoises encountered (n=44) including date found, transect, file number, epoxy number, status, carapace length, sex, Upper Respiratory Tract Disease (URTD) clinical signs, shell disease and original capture date of recaptured tortoises, 2018, Zone 4, Red Cliffs Desert Reserve, Washington County, Utah. Five tortoises could not be processed because they could not be removed from a deep soil burrow. Status of tortoises includes: O=original capture, R=recapture, X=recapture within the same monitoring period (e.g., year), and T=translocated recapture. Presence of URTD clinical signs and shell disease include N=no and Y=yes. Note that U=unknown and n/a=not applicable.

Date Found	Transect	File #	Epoxy #	Status	MCL	Sex	URTD	Shell Disease	Original Capture
4/06	12N	U	U	U	>180	U	U	U	n/a
4/10	28	4401	N	O	112	U	N	Y	n/a
4/10	45	4431	N	O	256	M	N	N	n/a
4/12	79	2723	649	T	295	M	N	N	05/08/12
4/12	53	4490	N	R	269	M	N	N	06/07/17
4/12	N	U	N	O	47	U	N	N	n/a
4/17	N	3003	N	R	235	F	N	N	06/12/07
4/17	4	4114	N	R	272	F	N	N	04/26/17
4/17	N	4439	N	O	228	F	U	N	n/a
4/17	N	4461	N	O	257	F	N	N	n/a
4/17	N	7078	609	T	291	M	N	N	08/27/10
4/23	N	3490	N	T	253	M	N	N	10/05/05
4/23	412	4410	N	O	171	U	N	N	n/a
4/25	440	3100	N	T	221	F	N	Y	09/29/06
4/25	459	3439	N	T	251	M	N	Y	08/20/04
4/27	N	42	N	T	287	M	N	N	10/10/00
4/27	N	2654	N	T	254	F	N	N	10/04/00
4/27	281	3220	N	T	222	F	N	N	08/20/04
4/27	N	3479	N	T	235	F	N	N	08/18/05
5/03	N	559	60	T	223	F	N	N	05/03/00
5/07	314	7454	725	T	217	F	N	N	10/06/16
5/07	278	N	N	O	60	U	U	U	n/a
5/11	74	4432	N	O	195	M	N	N	n/a
5/13	N	N	N	O	83	U	N	N	n/a
5/16	51	3532	N	T	253	F	N	N	5/6/07
5/16	50	4457	N	O	271	M	Y	N	n/a
5/16	N	N	N	O	>180	U	Y	U	n/a
5/16	51	U	U	T	>180	U	U	U	U
5/17	207	N	N	U	>180	U	U	U	n/a
5/18	N	530	N	T	318	M	N	N	09/28/04
5/24	111	7006	N	T	262	F	N	Y	09/29/07
7/12	N	7410	692	T	>180	M	N	N	05/08/14

7/20	N	4184	N	R	223	F	N	N	04/26/17
9/07	N	1428	N	T	268	F	N	N	09/03/03
9/07	N	2701	N	T	287	M	N	N	04/25/02
9/07	N	2736	N	T	292	M	N	N	09/03/03
9/07	N	4454	N	O	290	M	N	N	n/a
9/07	N	4457	N	X	270	M	Y	N	05/16/18
10/02	N	2730	299	T	275	F	Y	N	05/09/03
10/03	N	559	60	X	223	F	N	Y	05/03/00
10/03	N	3479	N	X	234	F	N	N	08/18/05
10/03	N	4077	N	O	138	U	N	N	n/a
10/05	N	621	125	T	279	M	N	N	04/28/99
10/08	N	42	N	X	285	M	N	N	10/10/00

Table 4. Recaptured tortoises encountered (n=24) including date found, file number, status, carapace length (CL), sex, original capture date, original CL (mm), annual growth (mm/yr), time since translocated (years), and distance moved (m/yr), 2018, Management Zone 4, Red Cliffs Desert Reserve, Washington County, Utah. Status of tortoises includes: R=recapture and T=translocated recapture. Tortoises with negative growth were removed from growth analysis.

Date Found	File #	Status	CL (mm)	Sex	Original Capture Date	Original CL (mm)	Annual Growth (mm/yr)	Time Since Trans (yrs)	Distance Moved (m/yr)
4/12	4490	R	269	M	6/7/17	268	1.18	0.85	35
4/12	2723	T	295	M	5/8/12	204	15.35	5.93	38
4/17	3003	R	235	F	6/12/07	182	4.89	10.85	63
4/17	4114	R	272	F	4/26/17	274	-2.05 ^B	0.98	125
4/17	7078	T	291	M	8/27/10	220	9.29	7.64	151
4/23	3490	T	253	M	10/5/05	176	6.14	12.55	74
4/25	3100	T	221	F	9/29/06	129	7.95	11.57	34
4/25	3439	T	251	M	8/20/04	138	8.26	13.68	66
4/27	3479	T	235	F	8/18/05	233	0.16	12.69	5
4/27	2654	T	254	F	10/4/00	250	0.23	17.56	4
4/27	3220	T	222	F	8/20/04	210	0.88	13.69	33
4/27	42	T	287	M	10/10/00	228	3.36	17.55	4
5/03	559	T	223	F	5/3/00	179	2.44	18.00	87
5/07	7454	T	217	F	10/6/16	212	3.15	1.59	376
5/16	3532	T	253	F	5/6/07	244	0.82	11.03	39
5/18	530	T	318	M	9/28/04	314	0.29	13.64	38
5/24	7006	T	262	F	9/29/07	162	9.39	10.65	23
7/12	7410	T	260 ^A	F	5/08/14	207	12.69 ^A	4.18	240
7/20	4184	R	223	F	4/26/17	222	0.81	1.23	1472
9/07	1428	T	268	F	9/3/03	267	0.07	15.01	24
9/07	2701	T	287	M	4/25/02	201	5.25	16.37	25
9/07	2736	T	292	M	9/3/03	163	8.59	15.01	31
10/02	2730	T	275	F	5/9/03	241	2.21	15.40	102
10/05	621	T	279	M	4/28/99	195	4.32	19.44	32

^ARecapture MCL and annual growth are estimates because observer did not have calipers.

^BThis measurement was excluded from analysis due to a nuchal deformity (e.g., gap between the nuchal and RM1) which may have caused a negative annual growth measurement.

Table 5. Descriptive statistics (mean, sample size, standard error, and range) of recaptured tortoises by age and sex including carapace length, annual growth, total distance moved, average distance moved and time since translocation, 2000 to 2018, Management Zone 4, Red Cliffs Desert Reserve, Washington County, Utah. Tortoises with negative growth values were not included in the analysis. Tortoises recaptured less than one year from original capture date were removed from the annual growth, average distance moved, and time since translocated analyses. No juveniles, immatures or subadults were recaptured in 2018.

Descriptive Statistics		Zone 4: 2000-2018			Zone 2, 3, 5: 1988 to 2018		
		♂	♀	Non-reproductive	♂	♀	Non-reproductive
Carapace Length (mm)	Mean	264	243	172	245	230	148
	Sample Size	46	38	4	201	229	88
	Standard Error	4.27	4.23	20.13	2	1	3
	Minimum Value	196	189	128	178	181	60
	Maximum Value	318	286	223	316	286	180
Annual Growth (mm/yr)	Mean	5.84	3.32	10.71	2.98	1.82	9.67
	Sample Size	46	38	4	201	229	88
	Standard Error	0.81	0.59	0.88	0.21	0.18	0.38
	Minimum Value	0	0	8.10	0	0	2.84
	Maximum Value	26.89	13.46	11.90	16	18	24
Total Distance Moved (m)	Mean	709	687	437	361	336	528
	Sample Size	52	42	6	173	214	53
	Standard Error	84	99	166	35	31	92
	Minimum Value	66	9	128	1	1	6
	Maximum Value	3832	2936	1164	4103	3463	2704
Average Dist Moved (m/yr)	Mean	147	109	106	115	80	123
	Sample Size	52	42	6	173	214	53
	Standard Error	26	24	49	20	8	23
	Minimum Value	5	1	17	1	1	1
	Maximum Value	1085	752	343	2996	807	856
Time Since Translocated (year)	Mean	8.08	9.98	5.20	6	6	6
	Sample Size	52	42	6	173	214	53
	Standard Error	0.72	0.74	1.14	0	0	1
	Minimum Value	1.15	1.59	2.47	1	1	1
	Maximum Value	19.44	18.00	8.91	24	26	18

Table 6. Suspected cause of death by year for desert tortoises in Management Zone 4, 2003 to 2018, Red Cliffs Desert Reserve, Washington County, Utah. Six tortoises with extreme clinical signs of disease (e.g., lethargic, sunken eyes, severely emaciated, damp/wet nares, exudate present, exheavily congested, and wheezing, rasping breath) were removed for necropsy from 2009 to 2010.

Year	Total	Status				Cause of Death				
		Male	Female	Unk Adult	Juvenile	Roadkill	Shot	Disease	Overturned	Unknown
2005	1				1					1
2008	3		1		2	2	1			
2009	9	5	1		3	3		2	1	3
2010	4	4						4		
2011	2	1			1	1				1
2014	3		1	1	1	1				1
2015	1			1						1
2016	1	1				1				
2017	1		1							1
2018	2	1	1			1				1
	27	12	5	2	8	9	1	6	1	9
% of Total						26%	3%	18%	3%	26%

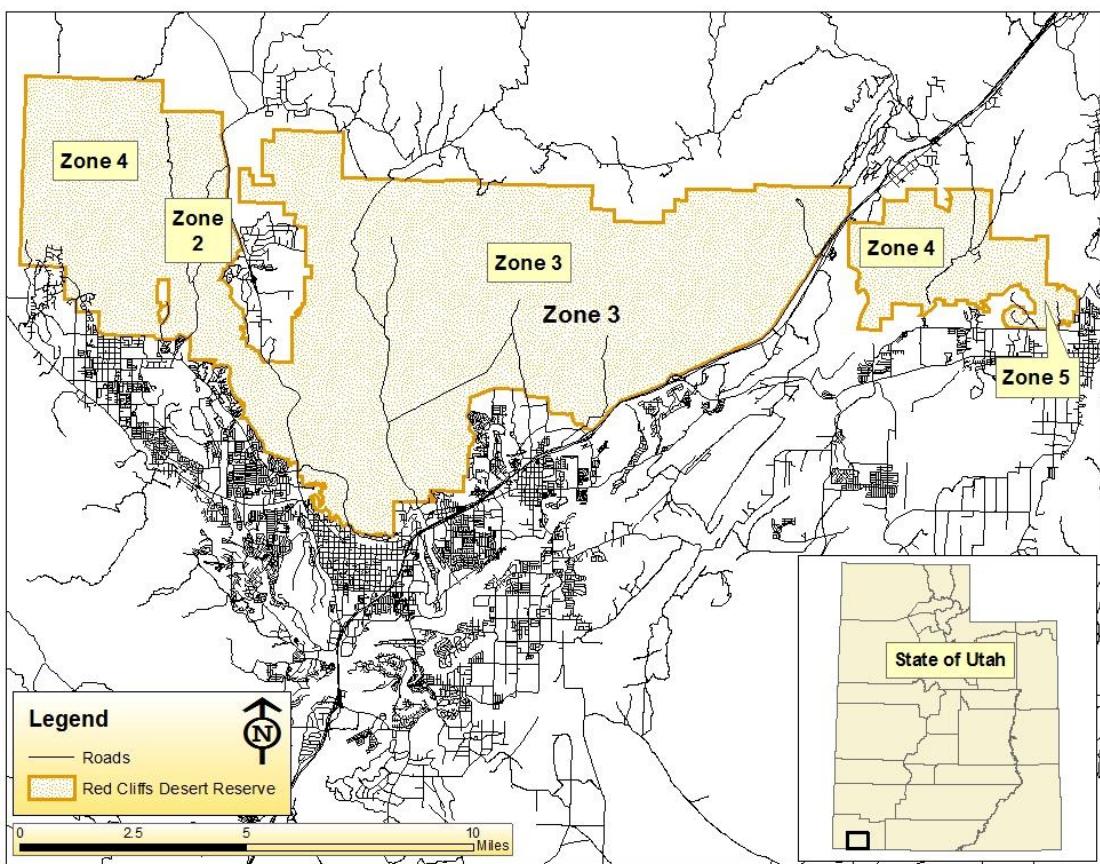


Figure 1. Location of HCP Management Zones 1 through 5 within the Red Cliffs Desert Reserve, Washington County.

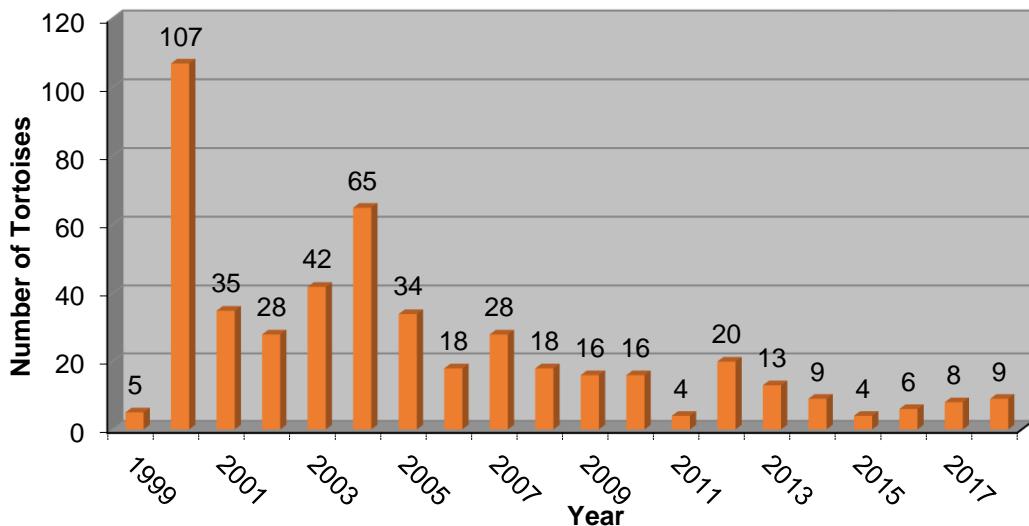


Figure 2. Total number of tortoises translocated annually to Zone 4 (n=485), 1999 to 2018, Management Zone 4, Red Cliffs Desert Reserve, Washington County, Utah.

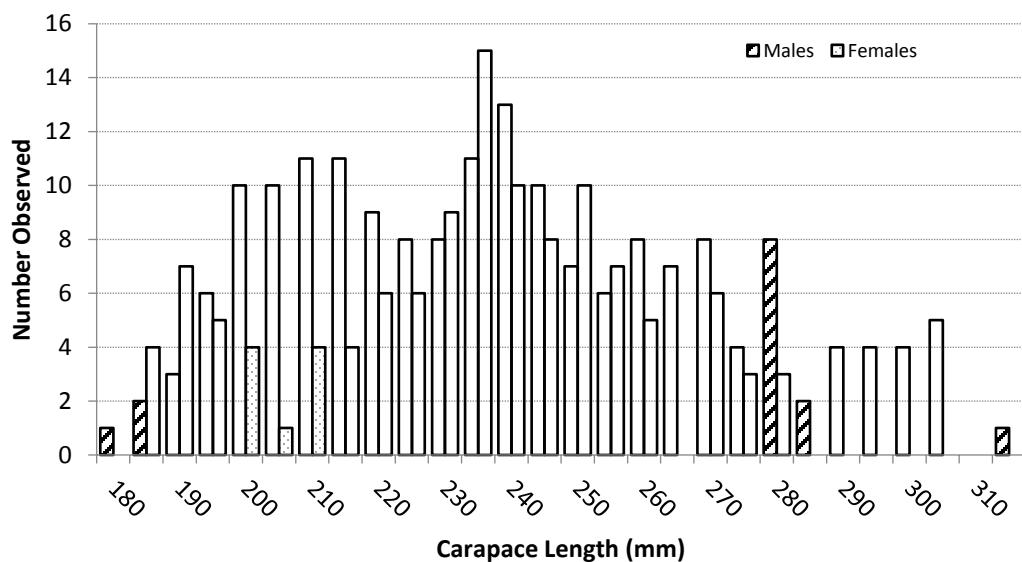


Figure 3. Length frequency histogram of reproductive translocated tortoises (CL \geq 180 mm), 1999 to 2018, Management Zone 4, Red Cliffs Desert Reserve, Washington County, Utah.

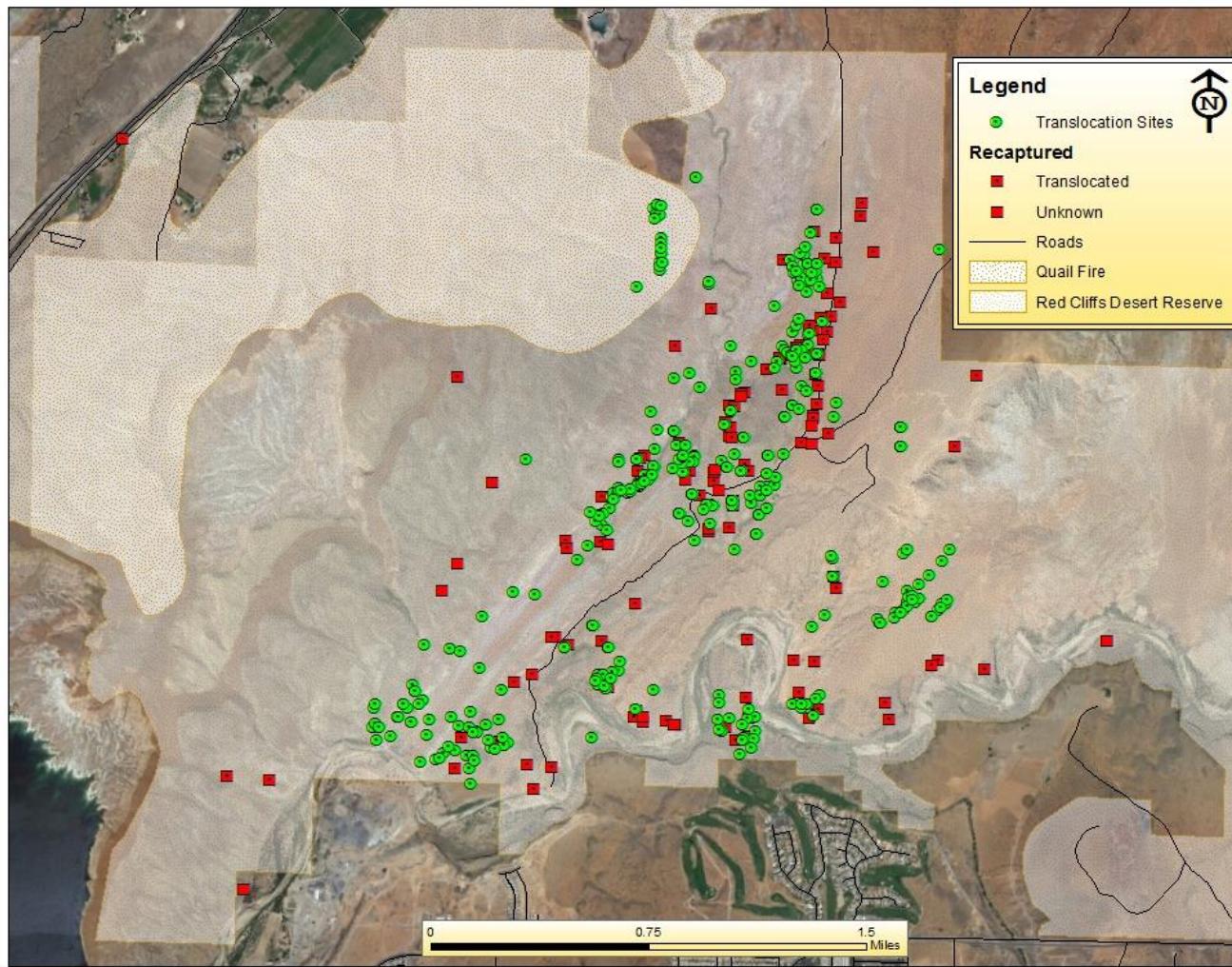


Figure 4. Locations of translocation sites and recaptured translocated tortoises, 1999 to 2018, Management Zone 4, Red Cliffs Desert Reserve, Washington County, Utah.

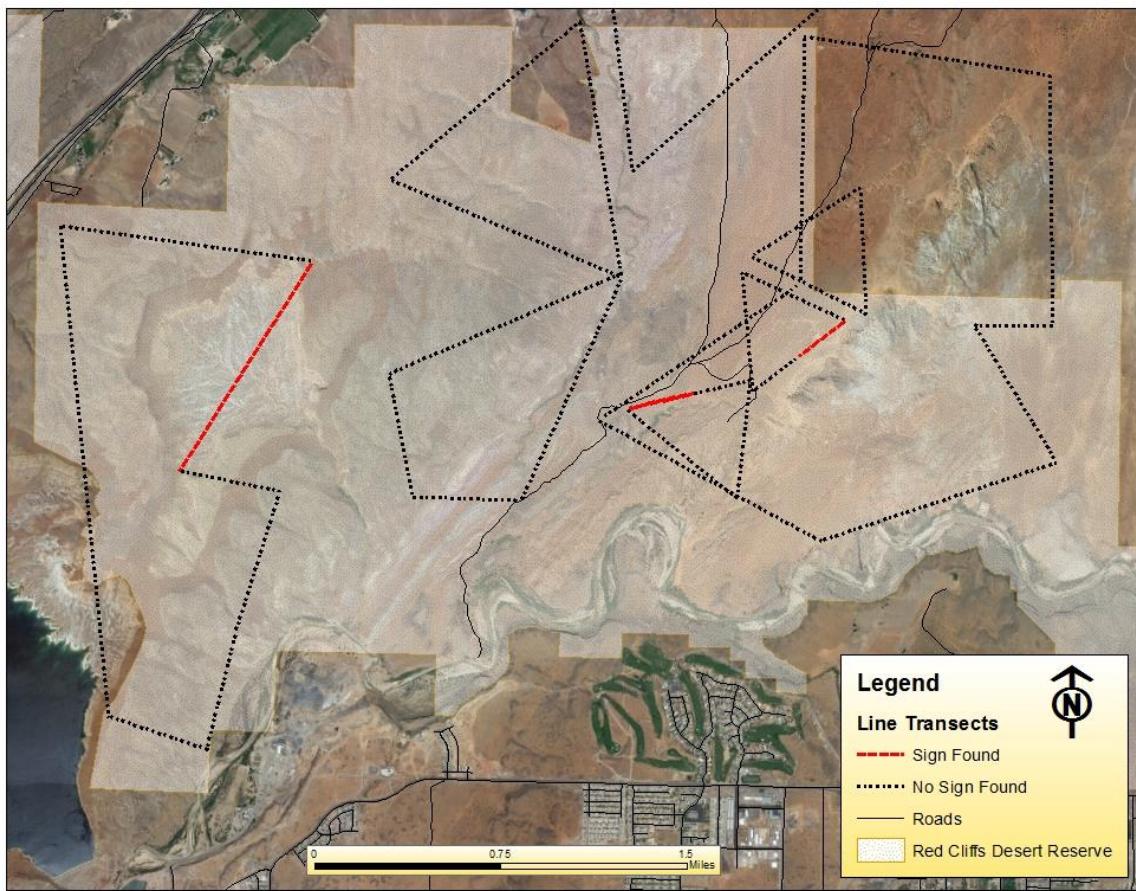


Figure 5. Location of strip-transects completed and sign found, 1987 to 1991, Red Cliffs Desert Reserve (RCDR), Washington County, Utah. Only transects that are located partially or entirely in Management Zone 4, RCDR, are identified.

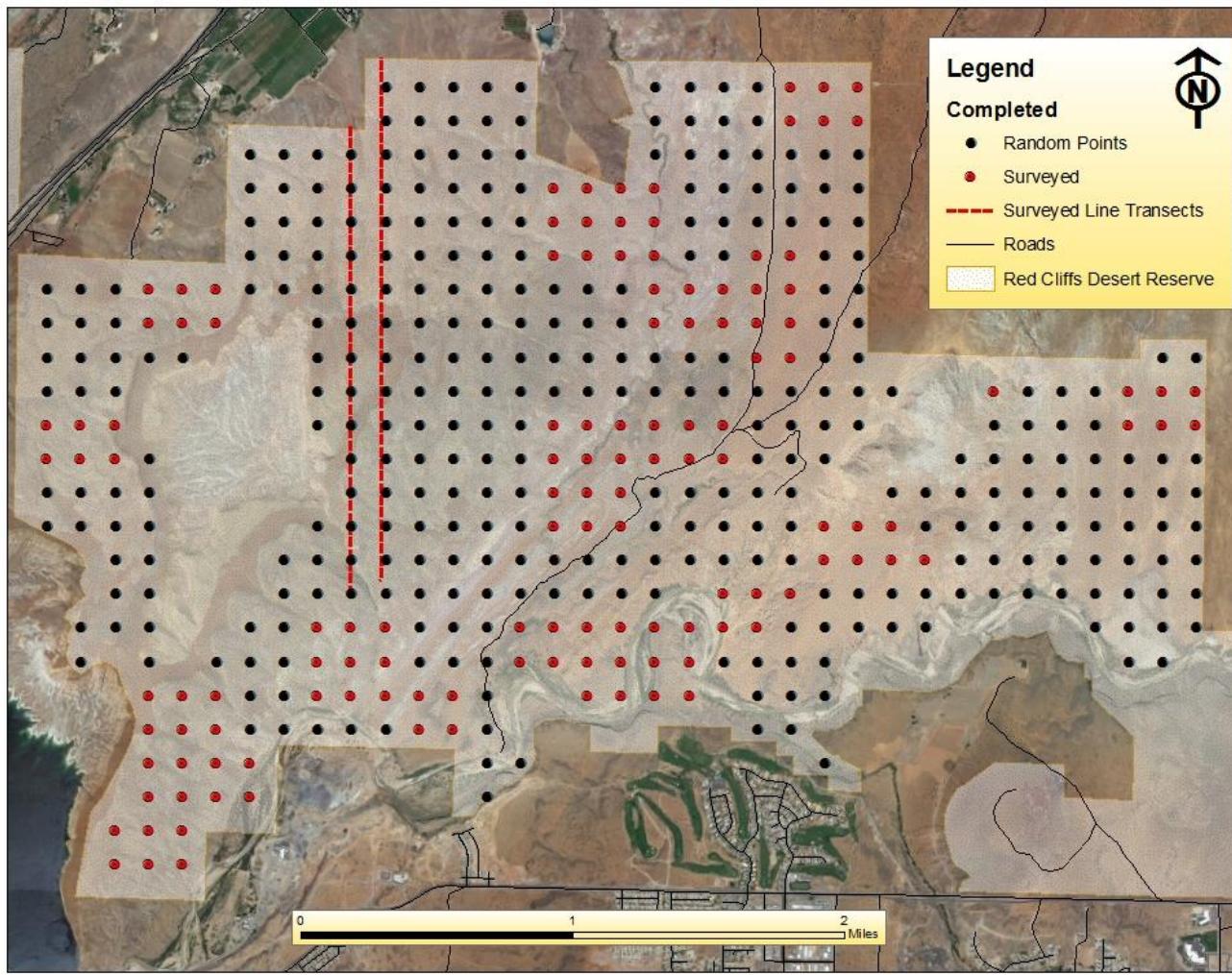


Figure 6. Point and line transects completed, April 6 to May 24, 2018, Management Zone 4, Red Cliffs Desert Reserve, Washington County, Utah.

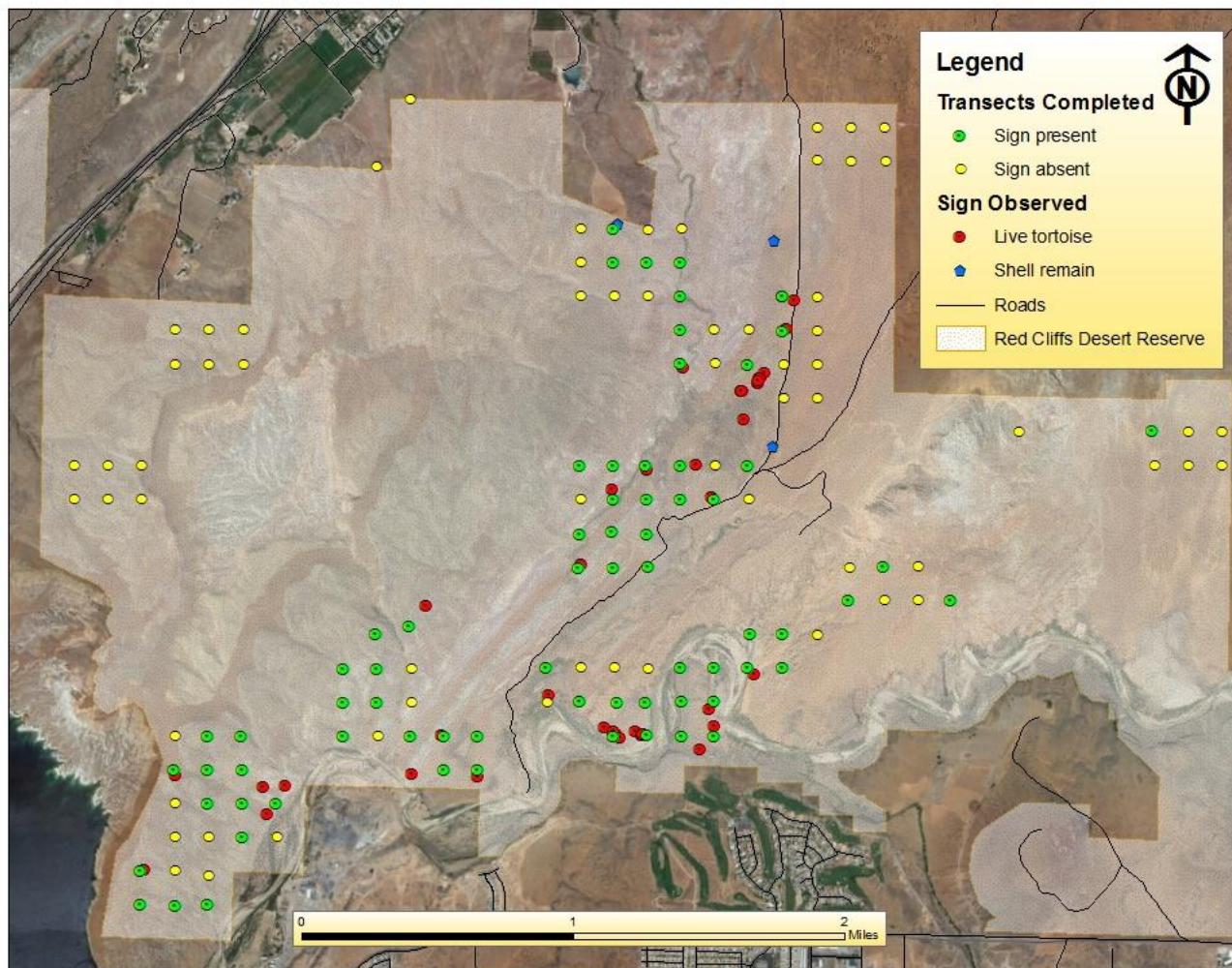


Figure 7. Tortoise sign observed on surveyed transects, April 6 to May 24, 2018, Management Zone 4, Red Cliffs Desert Reserve, Washington County, Utah.

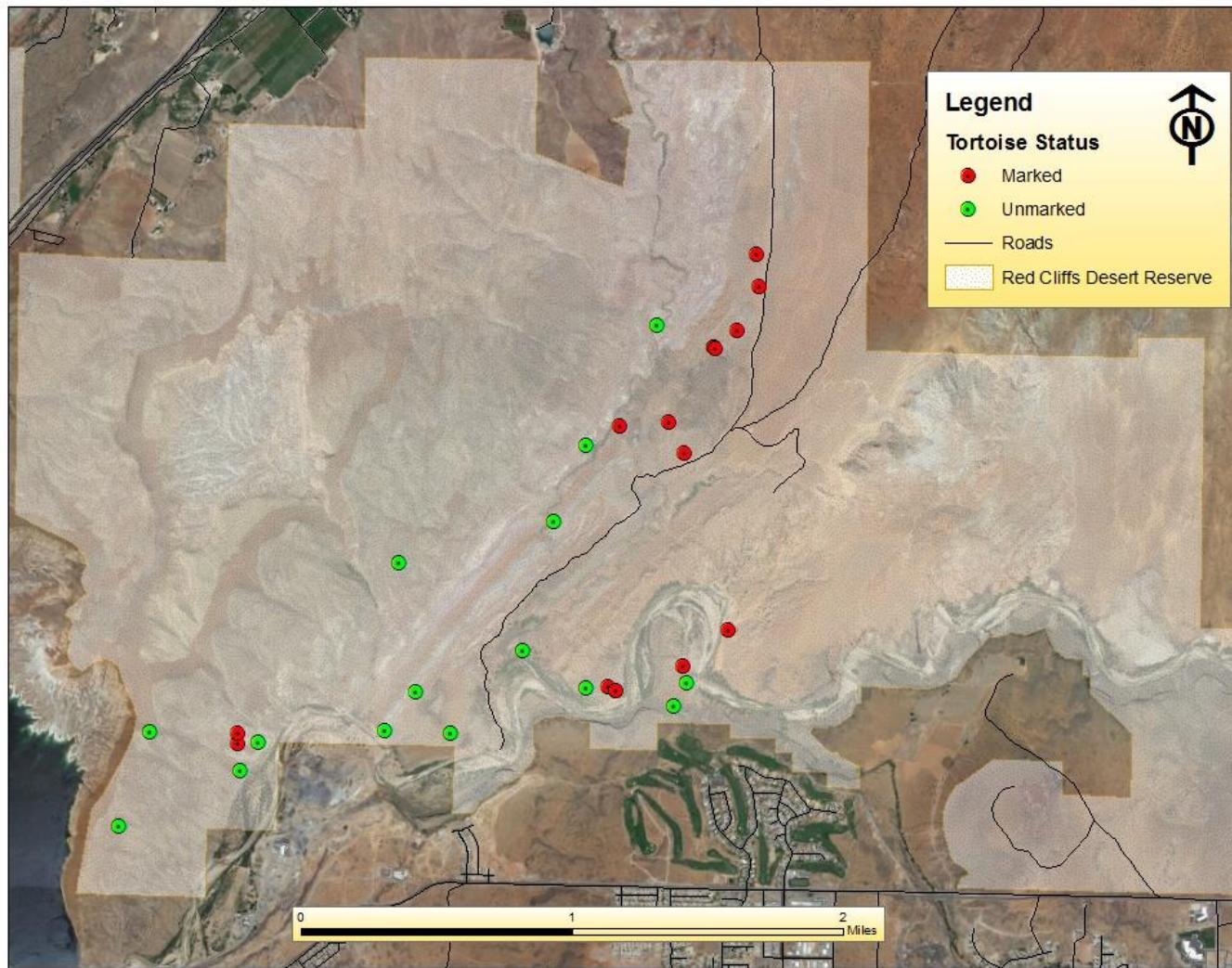


Figure 8. Locations of desert tortoises encountered during monitoring, April 6 to May 24, 2018, Management Zone 4, Red Cliffs Desert Reserve, Washington County, Utah.

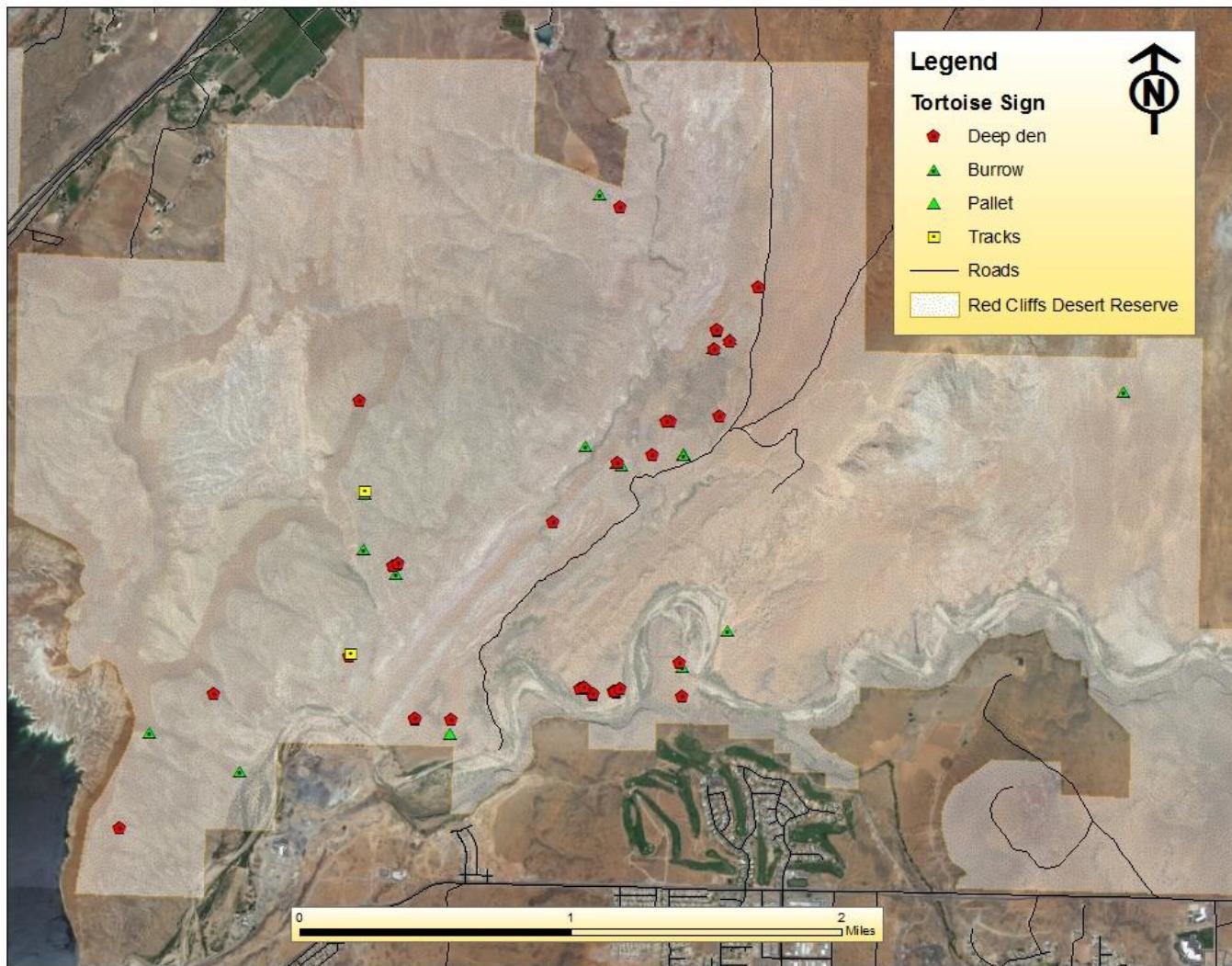


Figure 9. Locations of tortoise burrows observed during monitoring, April 6 to May 24, 2018, Management Zone 4, Red Cliffs Desert Reserve, Washington County, Utah.

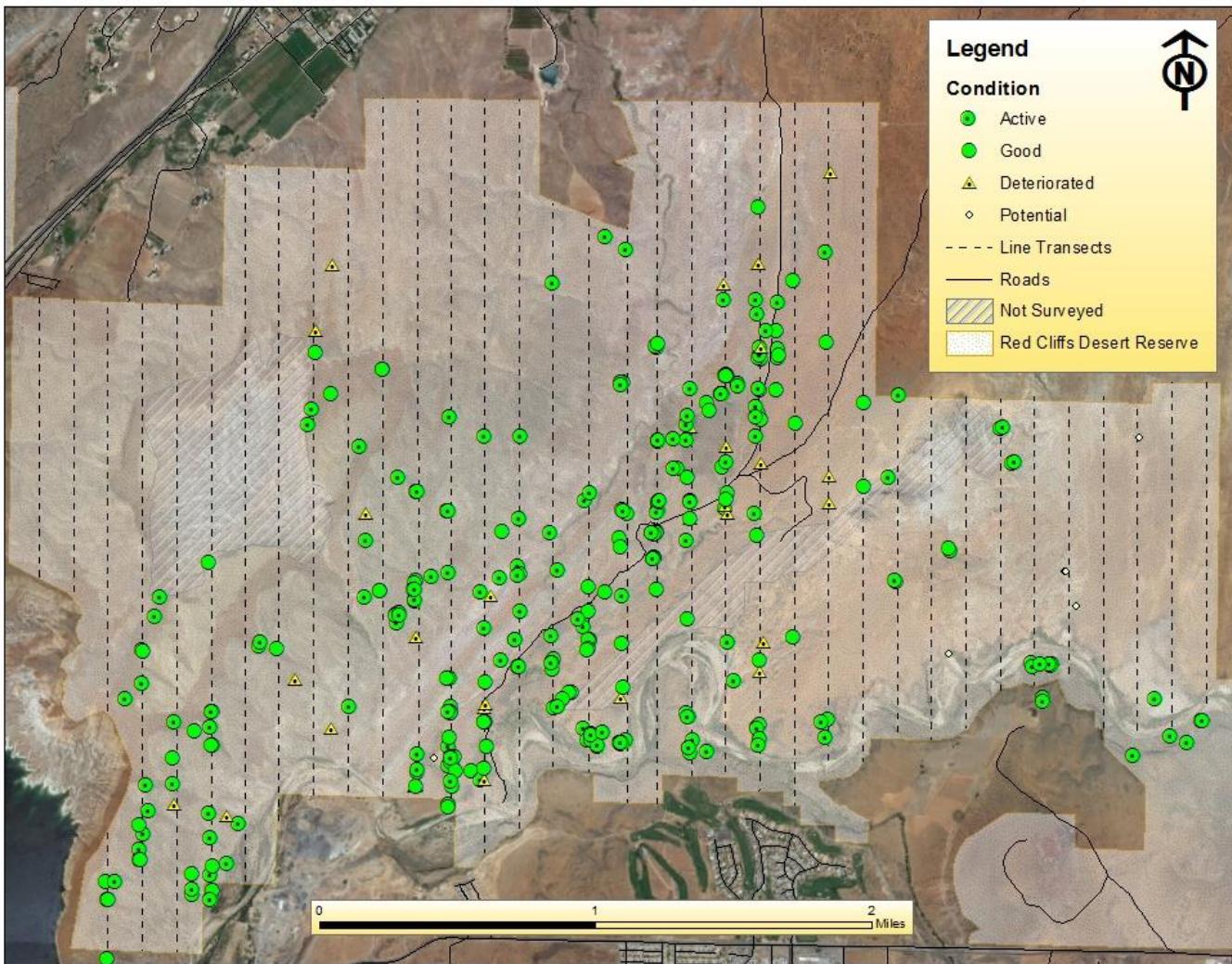


Figure 10. Tortoise burrows observed on surveyed transects, 2003 to 2018, Management Zone 4, Red Cliffs Desert Reserve, Washington County, Utah.

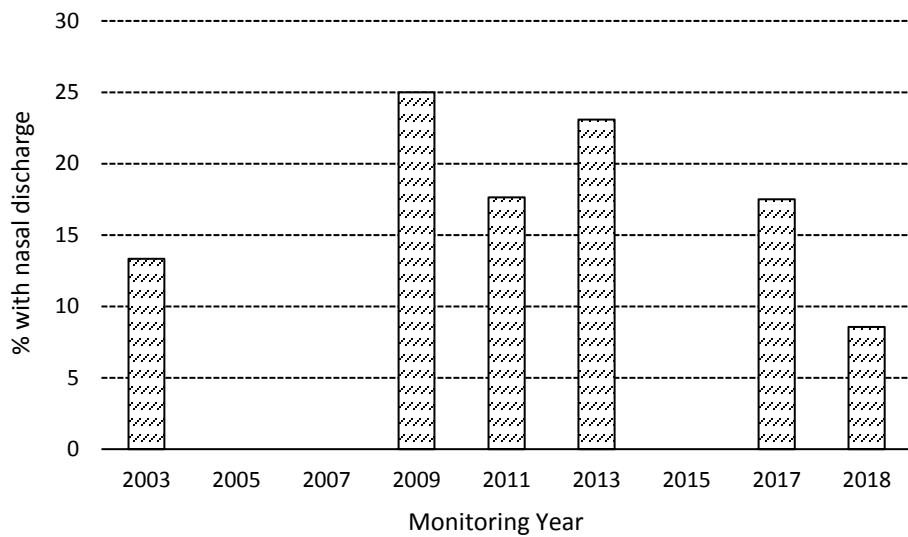


Figure 11. Percent of tortoises with clinical signs of URTD by monitoring year, 2003 to 2018, Management Zone 4, Red Cliffs Desert Reserve, Washington County, Utah. No tortoises with clinical signs or nasal discharge were observed in 2005, 2007, and 2015.

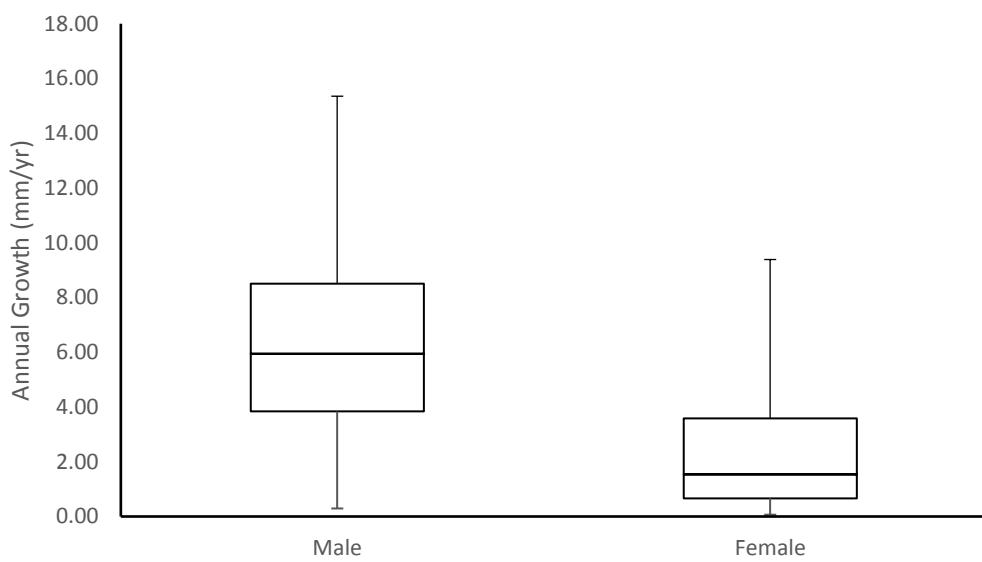


Figure 12. Median annual growth rate (mm/year) of reproductive recaptured desert tortoises, Management Zone 4, 2018, Red Cliffs Desert Reserve, Washington County, Utah. Horizontal lines represent the median, first and third quartile, while the center vertical line represents the range of values.

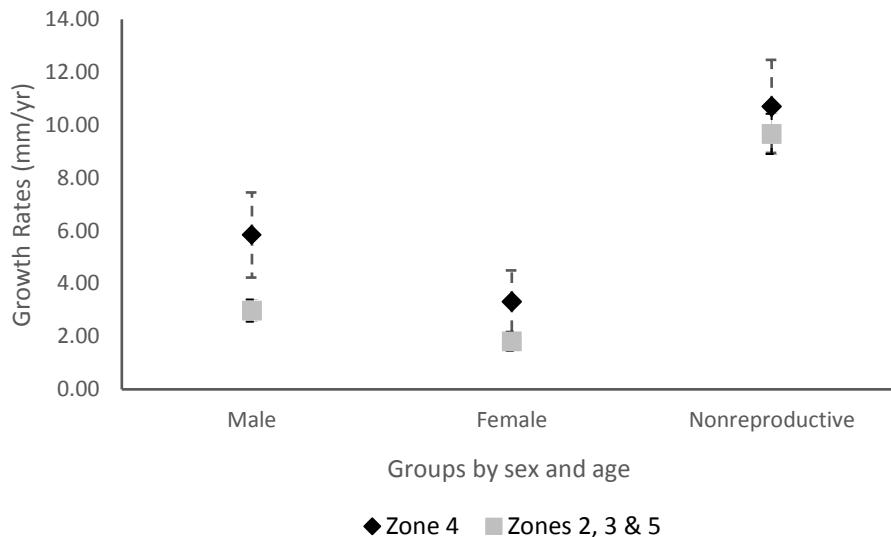


Figure 13. Annual growth rate (mm/year) of recaptured desert tortoises by sex and age, Red Cliffs Desert Reserve, Washington County, Utah. Vertical lines represent the 95% confidence interval. Data is grouped by Zone 4 and Reserve tortoises in Zones 2, 3, and 5. Non reproductive tortoises are all those with CL < 180 mm.

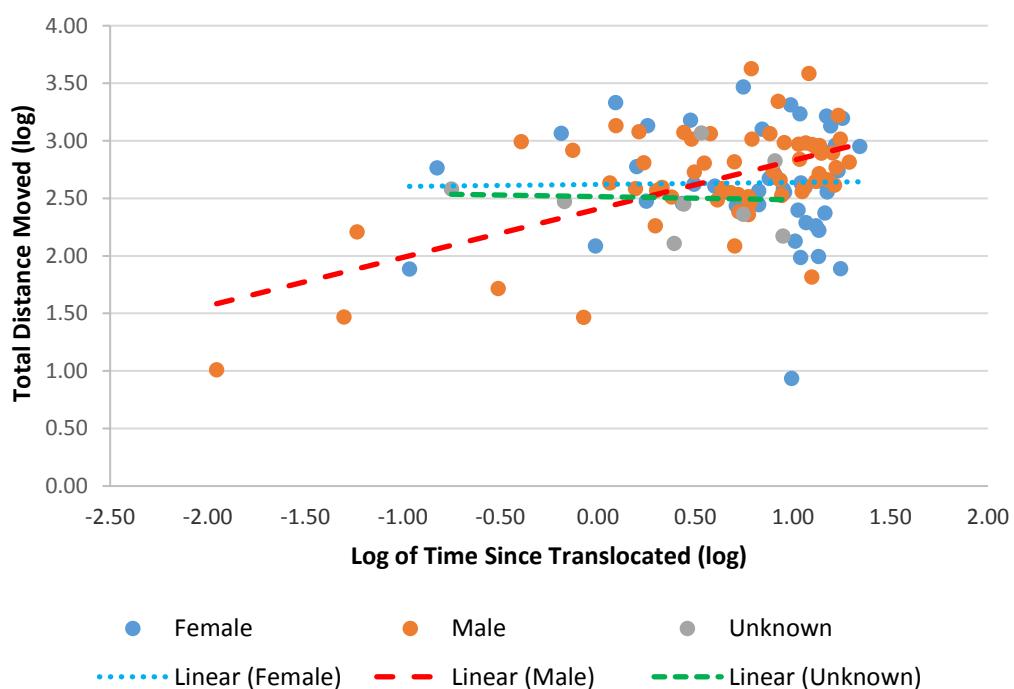


Figure 14. Regression analysis between log of total distance moved (m) and log of time since translocated (yr) of all recaptured tortoises in Zone 4, 2003 to 2018, Management Zone 4, Washington County, Utah.

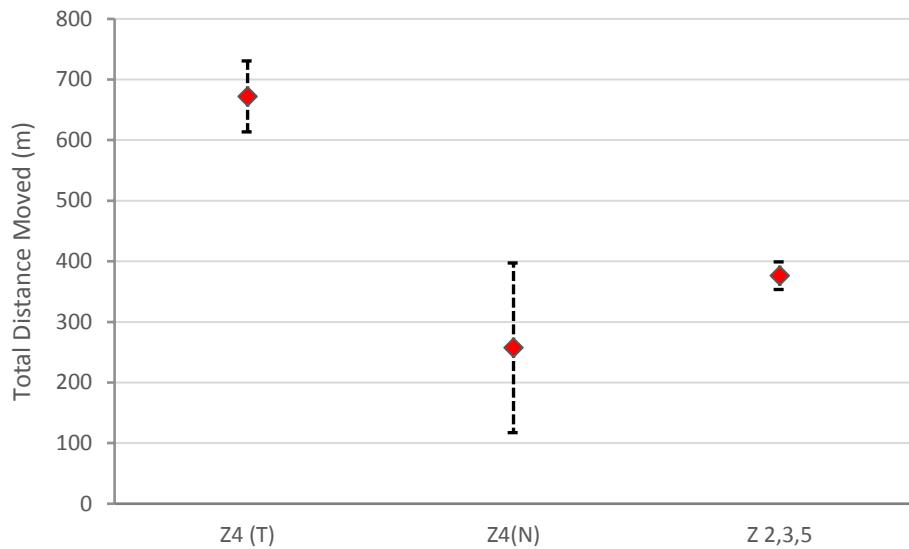


Figure 15. Comparison of total distance moved (m) for translocated and resident tortoises in Zone 4 and the Reserve (Zones 2, 3, 5), 1988 to 2018, Red Cliffs Desert Reserve, Washington County, Utah. Vertical lines represent the 95% confidence interval.

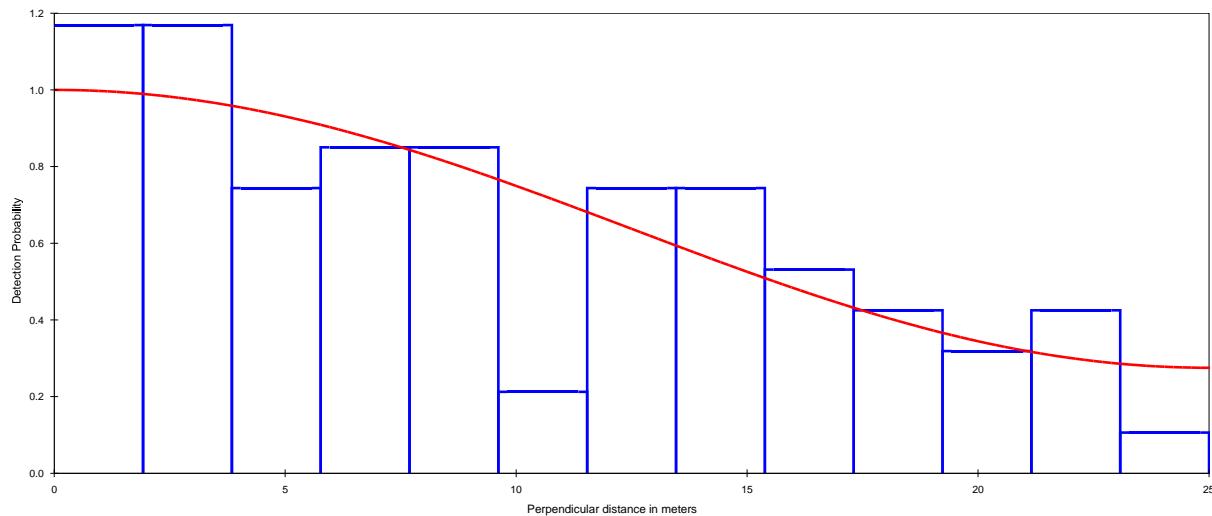


Figure 16. Detection histogram of perpendicular distances ($n=78$) and the detection probability plot (uniform + cosine model) for reproductive tortoises ($CL \geq 180$ mm) encountered within Management Zone 4, 2003 to 2017, Red Cliffs Desert Reserve, Washington County, Utah.

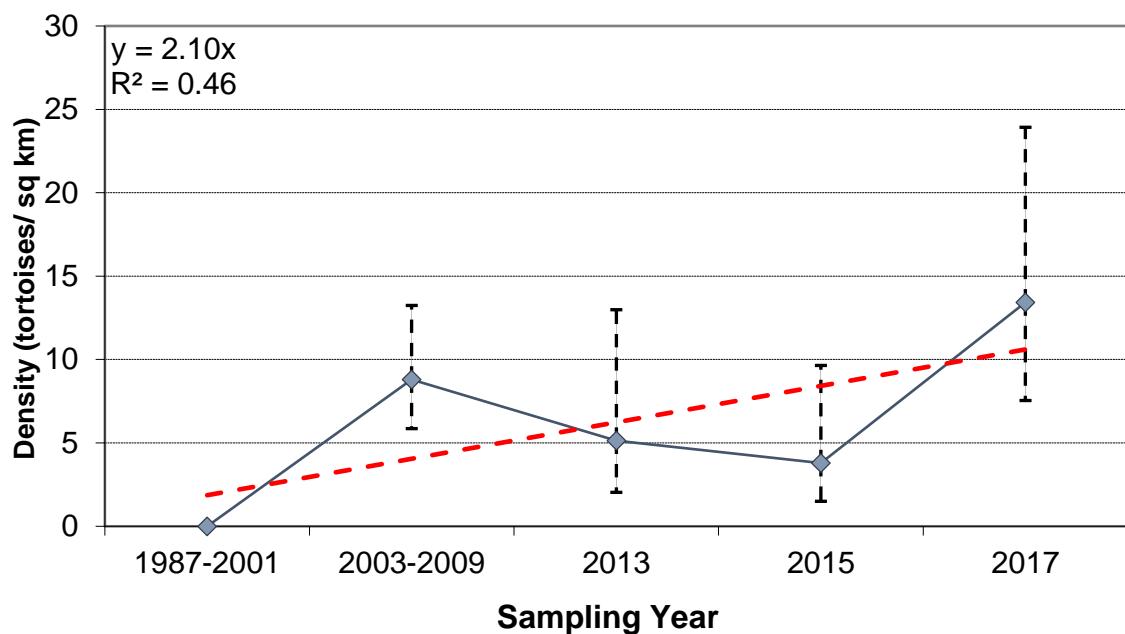


Figure 17. Density estimates of desert tortoise populations in Management Zone 3, 1987 to 2017, Red Cliffs Desert Reserve, Washington County, Utah. Vertical lines represent the 95% confidence interval. No tortoises were observed on transects from 1987 to 2001.

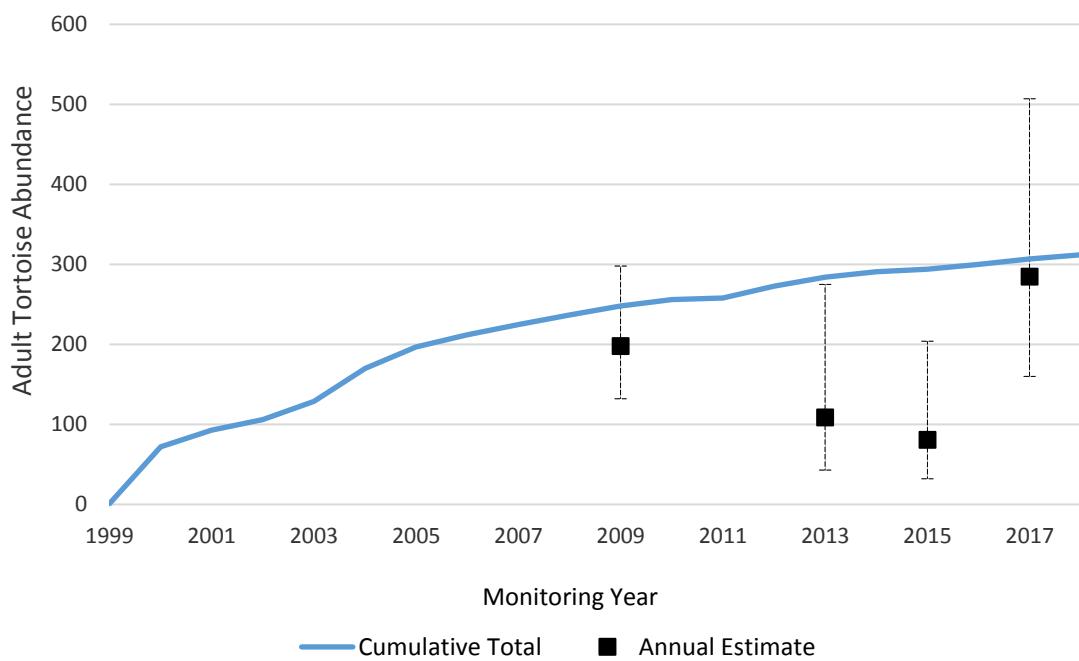


Figure 18. Cumulative annual totals of adult tortoises ($CL \geq 180$ mm) translocated into Management Zone 4 compared with abundance estimates on 2009, 2013, 2015, and 2017, Red Cliffs Desert Reserve, Washington County, Utah.

APPENDIX F
Form of Participation Agreement/Certificate of Inclusion



Washington County Habitat Conservation Plan

Participation Agreement and Certificate of Inclusion

Participant: _____

Agreement Date: _____

Application File No.: _____

This **WASHINGTON COUNTY HABITAT CONSERVATION PLAN PARTICIPATION AGREEMENT AND CERTIFICATE OF INCLUSION** (this “Agreement”) is entered into by the **PARTICIPANT** and **WASHINGTON COUNTY, UTAH** (the “County”), a subdivision of the State of Utah, on the Agreement Date.

INTRODUCTION

This Agreement is to be used when a proponent of activities covered by the Washington County Habitat Conservation Plan (the “Plan”) who is not directly regulated by the County or a municipality with an interlocal agreement with the County to implement the Plan desires to independently participate in the Plan. Through this Agreement, the non-federal proponent can avoid the need to obtain permission for the activity from the U.S. Fish and Wildlife Service (“Service”) in return for agreeing to follow the Plan and the terms and conditions of this Agreement.

BACKGROUND

The County is the permittee under federal Endangered Species Act incidental take permit number TE036719-[VERSION] issued by the Service on [DATE] (the “Permit”). The Permit authorizes “take” of Mojave desert tortoises (*Gopherus agassizii*) from the Upper Virgin River population of that species in exchange for implementation of the the Plan, as amended. The County administers the Plan, which includes, pursuant to 50 CFR 13.25(d-e) granting participation rights to applicants who are under the jurisdiction of or otherwise under contract to the permittee. Specifically, this Agreement satisfies the condition of 50 CFR 13.25(d) and 50 CFR 13.25(e)(2) that a person has executed a written instrument with the governmental entity, pursuant to the terms of the implementing agreement. In this case, the County has entered into an Implementation Agreement with, among others, the Service, specifically providing for the County’s issuance and entering into of Agreements and Certificates of Inclusion substantially in the form of this Agreement. Through participation in the Plan and execution of this Agreement, a participant receives authority for incidental “take” of the Mojave desert tortoise when it performs activities that are covered by the Plan and in accordance with any applicable provisions of the Plan. Incidental take means take that results from, but is not the purpose of, carrying out an otherwise lawful activity. Incidental take does not include purposeful actions to collect or capture members of the

species; such actions requiring a separate permit or authorization from the Service. Participant represents that Participant owns or controls the tract or tracts of land (the “Property”) that is located within Washington County, Utah, and described on Exhibit A to this Agreement. Participant further represents and warrants that Participant is duly authorized to execute this Agreement and be bound by the terms hereof.

Agreement

1. Grant of Participation Rights and Obligations of Participant.

The County hereby grants to the Participant the right to participate in the Plan with respect to the Participant’s proposed activities on the Property. Exhibit B to this Agreement describes the Participant’s proposed activities to be covered under this Agreement. The Participant represents and warrants that the activities proposed to be covered under this Agreement will be carried out in full compliance with all applicable federal, state, and, local laws and regulations. This Agreement covers only those activities described on Exhibit B. The Participant shall consult with the County before deviating in any material respect from the described activities. This Agreement is entered into subject to all terms and conditions of the Permit, the Plan, and applicable law and regulations, and the Participant assumes and agrees to be bound by all of such terms and conditions, including without limitation those, if any, described on Exhibit C to this Agreement.

2. Compliance with Development Protocols.

Participant shall comply with all applicable provisions of the Development Protocols (attached as Appendix A to the Plan) in the conduct of the activities described in Exhibit B.

3. Right to Inspect.

The County shall have the right from time to time in its discretion to inspect the Property, after reasonable notice to the Participant, in order to ensure compliance with the terms of this Agreement.

4. Breach by Participant.

The County shall provide Participant written notice specifying any breach of the terms of this Agreement, and Participant will have seven (7) days thereafter, or such other length of time the County agrees in writing, to cure said breach. The County, at its sole discretion and for good cause, including without limitation Participant’s failure to cure any breach within the applicable timeframe, may terminate this Agreement. Notification of breach and termination of participation rights shall be made by the County to the Participant in writing at the address provided herein.

5. Participant’s Sole Recourse.

In the event that this Agreement is (i) ineffective or deficient with respect to the Property or the Participant’s proposed activities described in Exhibit B for any reason, or (ii) terminated in accordance with the terms and provisions of this Agreement, Participant’s sole resource against the County shall be to recover from the County an amount not to exceed the total sum of any impact fees paid by Participant to the County, as described in Exhibit C.

6. Covenants Run with the Land; Recordation.

Participant agrees that the covenants provided herein are intended to be binding upon any heirs, successors, and assigns in interest to the Property. Upon any transfer of any ownership interests to all or part of the Property, this Agreement shall not terminate as to the Property, but rather shall continue in full force and effect and shall be fully binding upon any heirs, successors, and assigns in interest to the Property, or any portion thereof.

Upon execution of this Agreement by the County and Participant, this Agreement shall be recorded by the Participant in the Official Public Records of Washington County, Utah. The Participant shall promptly provide a copy of the recorded Agreement to the County.

7. Venue and Choice of Law.

The obligations and undertakings of the County and the Participant under this Agreement shall be performable in Washington County, Utah, and this Agreement shall be governed by and construed in accordance with the laws of the United States and the State of Utah.

8. Entirety of Agreement and Modification.

This instrument constitutes the entire agreement between the County and the Participant related to the rights herein granted and the obligations herein assumed. Any prior agreements, promises, negotiations, or representations not expressly set forth in this Agreement are of no force or effect. Any oral representations or modifications concerning this Agreement shall be of no force or effect, excepting a subsequent modification in writing signed by the party to be charged and expressly approved by an authorized representative of such party.

9. Non-Assignment.

Participant shall not sell, transfer, or assign all or any part of this Agreement to a party other than a successive owner of all or a portion of the Property without prior written consent of the County.

10. Successors and Assigns.

This Agreement shall be binding upon and inure to the benefit of the successors and assigns of the respective parties hereto, as and where authorized pursuant to this Agreement.

11. Notice.

All notices under this Agreement shall be in writing and shall be deemed to have been properly given, delivered, and received (i) as of the date of delivery if personally delivered, or (ii) as of the date of deposit in the mail system if sent by United States certified mail, return receipt requested, postage prepaid. For purposes of notices, the addresses of the parties are as follows:

PARTICIPANT:

[Name]

[Attention]

[Address 1]

[Address 2]

[City, State ZIP Code]

Attention: Habitat Conservation Plan Application File No. [xxxxxxxx]

Phone: [xxx-xxx-xxxx]

COUNTY:

Washington County Habitat Conservation Plan

c/o HCP Administrator

10 N 100 E

St. George, UT 84770

Attention: Habitat Conservation Plan Application File No. [xxxxxxxx]

Phone: (435) 634-5759

or to such other address as hereafter shall be designated in writing by the applicable party.

12. Term of Participation Agreement.

This Agreement shall terminate upon the expiration or termination of the Permit.

13. Headings.

The headings at the beginning of the various provisions of this Agreement have been included only in order to make it easier to locate the subject covered by each provision and are not to be used in construing this Agreement.

14. Number and Gender Defined.

As used in this Agreement, whenever the context so indicates, the masculine, feminine, or neuter gender and the singular or plural number shall each be deemed to include the others.

SIGNATURES

EXECUTED AS OF THE TO BE EFFECTIVE AS OF THE AGREEMENT DATE.

PARTICIPANT:

By: _____

Print Name: _____

Title: _____

Date: _____

NOTARY ACKNOWLEDGEMENT

State of Utah

County of Washington

On this _____ day of _____, in the year _____, before me,

_____, a notary public, personally appeared,

_____, proved on the basis of satisfactory evidence to be the

person(s) whose name is subscribed to this instrument, and acknowledged he executed the same.

Witness my hand and official seal.

COUNTY:

By: _____

Print Name: _____

Title: _____

Date: _____

NOTARY ACKNOWLEDGEMENT

State of Utah

County of Washington

On this _____ day of _____, in the year _____, before me,

_____, a notary public, personally appeared,

_____, proved on the basis of satisfactory evidence to be the

person(s) whose name is subscribed to this instrument, and acknowledged he executed the same.

Witness my hand and official seal.

EXHIBIT LIST

Exhibit A: Description of Participant's Property

Exhibit B: Participant's Proposed Covered Activities

Exhibit C: Special Terms and Conditions

EXHIBIT A

TO PARTICIPATION AGREEMENT

Description of Participant's Property

[Insert appropriate legal description of the Property where participant activities subject to the Agreement would occur. Identify the total acres of the Property. Insert a description of the Property location and a map showing the Property boundary. Attach any available spatial data representing the Property boundary.]

EXHIBIT B

TO PARTICIPATION AGREEMENT

Participant's Proposed Covered Activities

[Summarize the scope and nature of the proposed activities and uses of the Property.]

Exhibit C

To Participation Agreement

Special Terms and Conditions

Participant's Property is inside the Reserve. The following special terms and conditions apply:

- No special terms or conditions apply.
- xxxxxxx
- xxxxxxx
- xxxxxxx

Participant's Property is outside the Reserve. The following special terms and conditions apply:

- No special terms or conditions apply.
- xxxxxxx
- xxxxxxx
- xxxxxxx

APPENDIX G

Determining Fully Offset for the Northern Corridor

Determining Fully Offset for the Northern Corridor

The Northern Corridor is not a Covered Activity of the Amended HCP. Therefore, the County contends that the fully offset and maximum extent practicable standards established in the issuance criteria for an ITP do not apply to Washington County's application to renew its ITP (see attached letter detailing this legal clarification). Instead, the issuance criteria evaluation should be based on the conservation program of the Amended HCP, independent of BLM's decision to issue a Right of Way (ROW) for the Northern Corridor and in light of conservation achievements accomplished to date under the 1995 HCP and ITP.

The Amended HCP identifies BLM's issuance of the Right of Way for the Northern Corridor as a trigger for a "Changed Circumstance," and the following analysis shows how the County's response would support the fully offset standard and could be relied upon by Utah Department of Transportation (UDOT) and the Bureau of Land Management (BLM) to demonstrate that their impacts to the baseline conservation program of the 1995 and the Amended HCP will be fully offset. The HCP Handbook describes fully offset as "the biological value that will be lost from covered activities will be fully replaced through implementation of conservation measures with equivalent biological value. Fully offset also means the mitigation is commensurate (equal) with the impacts of taking (HCP Handbook 9-28)." In this case, the biological values include: number of animals affected, size, intactness, connectivity and condition of habitats affected.

To determine the impacts of the taking, applied here for the effects of the Northern Corridor, the HCP Handbook suggests using the number of individuals taken or habitat lost (HCP Handbook 9.5). For this analysis the County considered direct and indirect impacts to both individual tortoises and acres of habitat, as described for the Northern Corridor preferred alternative in the Draft Environmental Impact Statement (EIS) and related actions (BLM and U.S. Fish and Wildlife Service [USFWS] 2020). This fully offset analysis also includes consideration of tortoise habitat connectivity, since the Northern Corridor fragments an important part of the Reserve. The County used the same criteria for assessing impacts of the ROW to evaluate benefits of the proposed offsetting actions. These beneficial actions include: 1) the establishment of a new Reserve (Zone 6) containing 6.813 acres that would support the Biological Goals and Objectives of the Amended HCP, 2) avoidance of development impacts on 3,341 acres of non-federal lands otherwise permissible under the baseline conservation program, 3) beneficial land management actions on 6,813 acres of the proposed Zone 6 intended to improve and conserve existing tortoise habitat, 4) the construction of tortoise passages across Cottonwood Road to reduce fragmentation from a pre-existing road, thereby restoring intrinsic biological values like connectivity between east and west portions of Zone 3.

Tortoise estimates in the Reserve were calculated with the kernel density tool in ArcPro Geographic Information System (GIS), using UDWR transect monitoring data between 2007 to 2017. Zone 6 tortoise estimates were calculated from UDWR / County surveys in 2017. While these datasets represent the best available data for these respective locations, some of the lands were not surveyed due to steep terrain or land use-restrictions, and therefore may over or underestimate actual tortoise abundance. Furthermore, it is possible that tortoise populations have changed as a result of recent events like the 2020 wildfires. For assessing acres impacted, we relied on information as reported in the Draft EIS.

The results of our comparative analysis (Figure 1) demonstrate that the beneficial actions of establishing Zone 6 and inclusion of tortoise passages on Cottonwood Road are likely to exceed the detrimental impacts that effect desert tortoises from the proposed Northern Corridor ROW for all values analyzed. The direct impacts of loss of habitat in the ROW would be replaced through the addition of Zone 6 acreage. These lands would be replaced at approximately 12:1 (Figure 2), twice the maximum 6:1 mitigation prescribed by the Washington County Habitat Conservation Plan Utility Development Protocols and the Desert Tortoise Management Oversight Group (MOG) guidelines (Desert Tortoise Compensation Team 1991). Similarly, the number of adult tortoises relocated from the ROW (40) is offset at approximately 8:1 by tortoises (304) that would be conserved and managed from future

development impacts by the County's avoidance of take on those lands. While the understanding of the efficacy of tortoise passages is admittedly limited, the 10,463-acre western fragment of Zone 3 that would be restored through passage across Cottonwood Road is nearly eight times larger than the 1,330-acre southern fragment of Zone 3 caused by the Northern Corridor (Figures 3 and 4).

In 2020, USFWS conducted a biological analysis of all the tortoise populations in the Upper Virgin River Recovery Unit. Results of this study indicate that the Green Valley analytical unit which includes proposed Zone 6, is the most resilient of all the units analyzed. However, due to lower estimated abundance (which may be a result of inadequate surveys), its conservation value was estimated at 7% of the total, with East and West Cottonwood units estimated at 16% and 26% respectively (average of 20.7% for span of Northern Corridor). Using these reported conservation values, permanent loss to connectivity and impairment to intactness from the Northern Corridor should be replaced at a 3:1 ratio in the Green Valley analytical unit to fully offset those values. By this measure, the County's response to the Northern Corridor Changed Circumstance is approximately 12 times more than expected for habitat lost and 3 times more than expected for connectivity and intactness impacts to demonstrate fully offset of the conservation value.

The Amended HCP describes significant other conservation actions the County and HCP Partners have completed beyond the scope of the 1995 HCP. These beneficial actions, estimated at over 7,700 acres in conservation value, improve upon the conservation program beyond that which was contemplated in the 1995 HCP and could also be considered as offsetting actions for the Northern Corridor. A summary of those conservation benefits are described in 6.4.2 of the Amended HCP and copied below.

6.4.2 Conservation Benefits Not Previously Considered

This Amended HCP identifies conservation benefits achieved during the Original ITP Term that were not previously considered by the USFWS. These unanticipated conservation benefits are part of the baseline condition and together with the additional conservation benefits anticipated from the expanded commitments in this Amended HCP, ensure that the impacts of the authorized incidental take remain fully offset through the Renewed/Amended ITP Term. The additional conservation benefits generated through 2019, but not previously considered by the USFWS in the evaluation of ITP issuance criteria, include:

- **Expansion of the Reserve**—The County and the HCP Partners acted on several opportunities to expand the size of the Reserve that were not otherwise associated with an offset for allowed activities in the Reserve or a minor boundary adjustment. These opportunistic acquisitions added approximately 1,240 acres to the Reserve, for a net increase in Reserve size of approximately 987 acres (see **Chapter 6.3.1.1.1**).
- **Repopulation of Reserve Zone 4**—The translocation program of the 1995 HCP was experimental with a 5-year implementation commitment. Ultimate success of the translocation efforts was neither assured nor required. The MDT entered into the translocation program were considered fully taken for the purposes of the 1995 HCP. However, the translocation program proved to be a success and resulted in the repopulation of Reserve Zone 4, which was not known to be occupied by MDT at the time of the 1995 HCP was approved (see **Chapter 6.3.2.4**). While Reserve Zone 4 was part of the original Reserve boundary established in the 1995 HCP, the extended and ultimately successful translocation program has repopulated 3,753 acres of previously unoccupied MDT Habitat with a “persistent and viable population” (McLuckie et al. 2019).
- **Expanded Funding for Conservation Actions**—The County’s commitments to the 1995 HCP were measured in terms of the funding spent on various types of conservation actions, with those financial commitments capped at specified levels. The County spent

170% of its specified financial commitment towards implementation of the 1995 HCP, exceeding the activity-specific caps for most categories of actions. This expanded financial contribution supported on-the-ground actions by the County itself and its HCP Partners, particularly UDNR, related to education and outreach, law enforcement, adaptive management, and monitoring (see **Chapter 6.2.1**). The USFWS previously determined that these extra conservation actions, which were beyond the required commitments of the 1995 HCP, were more than sufficient to support all of the incidental take authorization under the 1995 HCP and resulted in an excess of 3,017 acres of anticipated take to be credited (see **Table 14**).

Temporal Benefit of Conservation Actions Ahead of Takings— As of 2019, only 26% of the incidental take authorization has been used. While the Reserve is not yet fully acquired, the County and the HCP Partners have nonetheless established, used, managed, and monitored the Reserve for the duration of the Original ITP Term regardless of acquisition status. Therefore, the MDT has been receiving the full benefit of the conservation program for the Original ITP Term plus the period of extension while the ITP renewal was being processed. The realization of these conservation benefits in advance of the completion of the authorized take creates a temporal conservation benefit for the MDT. In essence, the MDT has been receiving the full benefit of the 1995 HCP for 25 years but has only experienced 26% of the authorized take.

In summary, the efforts of the County and the HCP Partners have generated the equivalent of 7,757 acres of conservation credit value for the MDT in excess of that contemplated by the 1995 HCP and ensured that the MDT has had the benefit of 1995 HCP conservation program well in advance of nearly three-quarters of the authorized takings. The magnitude of the temporal conservation benefits, considering only the continuation of the 1995 HCP conservation program during the period of ITP renewal (i.e., 2016 through 2020), is difficult to quantify. However, this temporal conservation benefit may be roughly approximated by the number of “tortoise years” gained by each MDT in the Permit Area outside the Reserve that was not taken during the Original ITP Term and the period of ITP renewal and each MDT that benefited from Reserve management by the County that is above and beyond the commitments of the 1995 HCP.

Citations

Desert Tortoise Compensation Team (MOG). 1991. *Compensation for the Desert Tortoise*. Prepared for Desert Tortoise Management Oversight Group. Available at:
<https://tortoise.org/conservation/hastey1991.pdf>. Accessed April 15, 2020.

U.S. Bureau of Land Management (BLM) and U.S. Fish and Wildlife Service (USFWS). 2020c. Northern Corridor – Highway Right-of-Way, Issuance of an Incidental Take Permit Draft Environmental Impact Statement and Draft Resource Management Plan Amendments. Salt Lake City, UT: U.S. Department of the Interior, Bureau of Land Management, Utah State Office.

Figure 1. Summary of analysis demonstrating fully offset of the Northern Corridor.

Direct Effects to Tortoise Habitat		
Description	Northern Corridor Impacts	Zone 6 Offset (non-federal lands)
Length of ROW corridor / Zone 6 non-federal lands boundary	6.9 km (4.3 miles)	N/A
Width of ROW corridor	500 feet*	N/A
Direct Impacts - Habitat Acres disturbed by ROW / protected in Zone 6	-275 acres	+ 3,341 acres
Net Improvement 3,066 acres		
Fragmentation Effects		
Fragmentation		
Acres south of the ROW to boundary / acres west of Cottonwood Road to SR-18	-1,335 acres	+ 10,463 acres (+ 7,499 suitable)
Permeability before ROW construction	100%	0%
Estimated permeability after ROW construction / installation of tortoise passages **	Medium**	Low
Acreage equivalent affected by change in permeability	-668 acres	+ 2,616 (+ 1,875 suitable)
Net Improvement 1,207 acres		
Other Indirect Effects to Tortoise Habitat		
Indirect Impacts - Habitat		
Southern fragments & 508-meter buffer from ROW corridor / 508-meter buffer from Zone 6 non-federal lands (i.e., adjacent federal lands)	-2,335 acres	+2,270 acres total (+ 411 acres outside Zone 6)
Indirect benefits from conservation uplift activities on all of Zone 6	N/A	+ 6,813 acres
Indirect impacts Total	-2,335 acres	+ 7,224 acres
Net Improvement 4,889 acres		
Direct & Indirect Effects to Tortoises		
Direct Effects - Tortoises		
Tortoises short-distance relocated from ROW / tortoises protected in Zone 6 non-federal lands	- 40 tortoises	+ 304 tortoises
Indirect Effects – Tortoises		
Tortoises on BLM lands in Zone 6	N/A	+ 316 tortoises
Disturbance: Tortoises in 508-meter buffer area	-234 tortoises	+ 37 tortoises
Fragmentation: Tortoises south of ROW / west of Cottonwood Road	-206 tortoises	+ 860 tortoises
Total indirect effects – tortoises	-328 tortoises	+ 1,213 tortoises
Total number of tortoises affected by ROW & Zone 6 (all direct and indirect effects)	-368 tortoises	+ 1,517 tortoises
Net Improvement for 1,149 tortoises		

Acreage and tortoise abundance estimates based on 2020 draft EIS, 2020 draft biological assessment, 2020 draft USFWS biological report, UDWR kernel density data (2007-2017), and Washington County/UDWR 2017 survey report.

* Actual ROW may be 300 feet instead of 500 feet, directly impacting 165 acres and 23 tortoises (approximately 40% reduction to impacts).

** Precise permeability is unknown. For this exercise we estimated “high” = 75%, “medium” = 50% and “low” = 25% permeability.

Figure 2. Summary of Zone 6 benefits to Mojave desert tortoise and habitat.

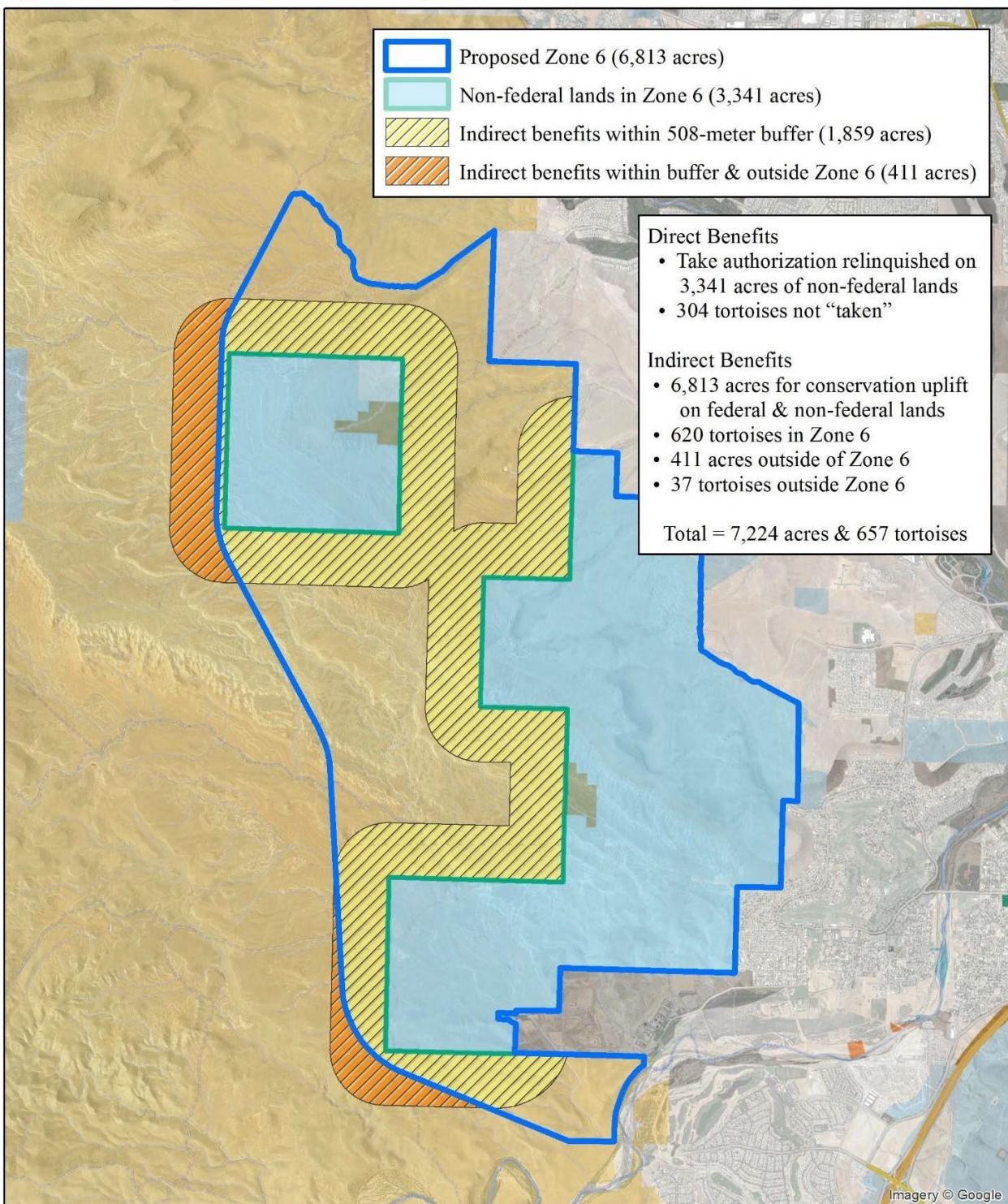


Figure 3. Direct, indirect and fragmentation impacts of the proposed Northern Corridor.

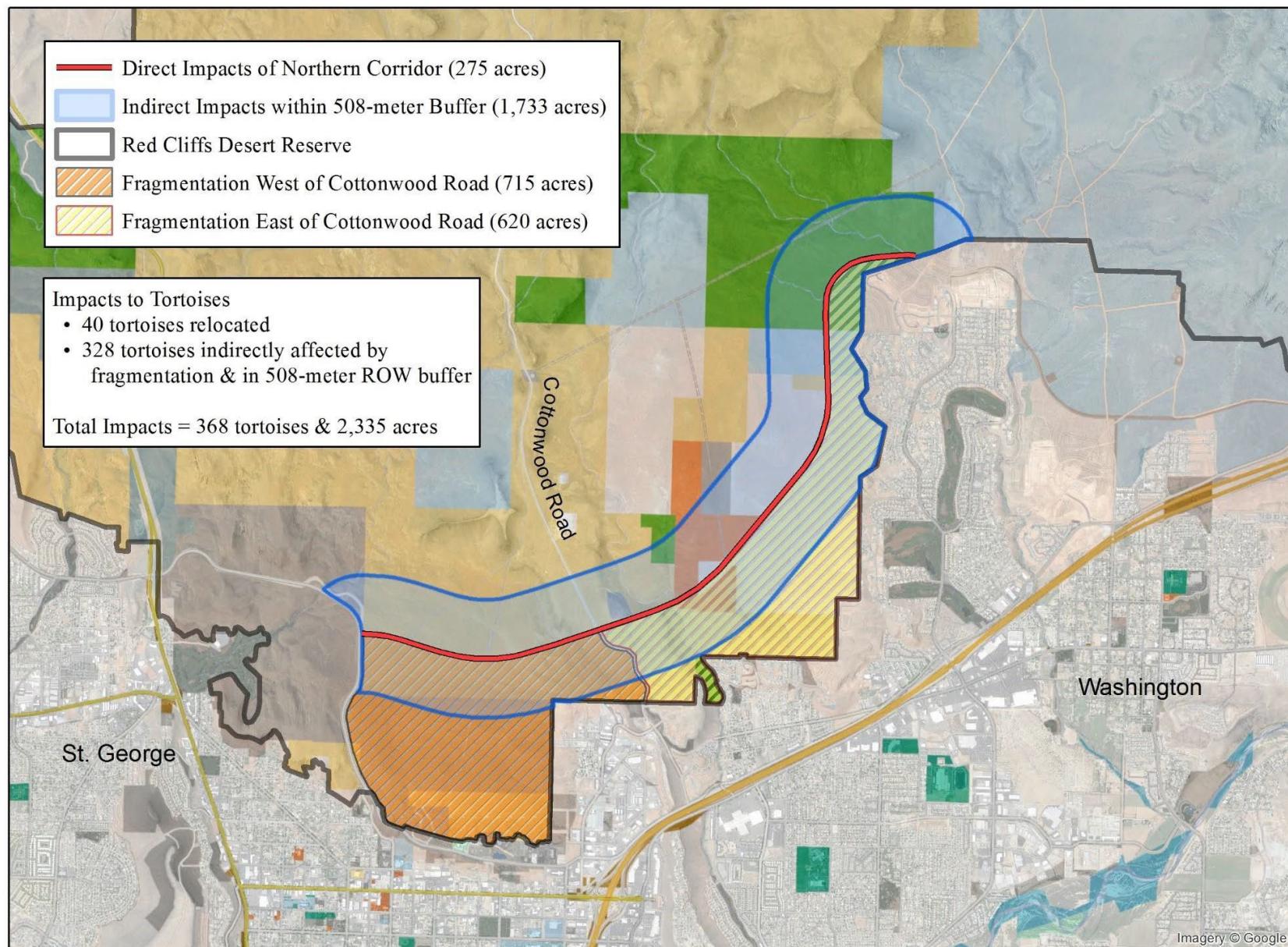
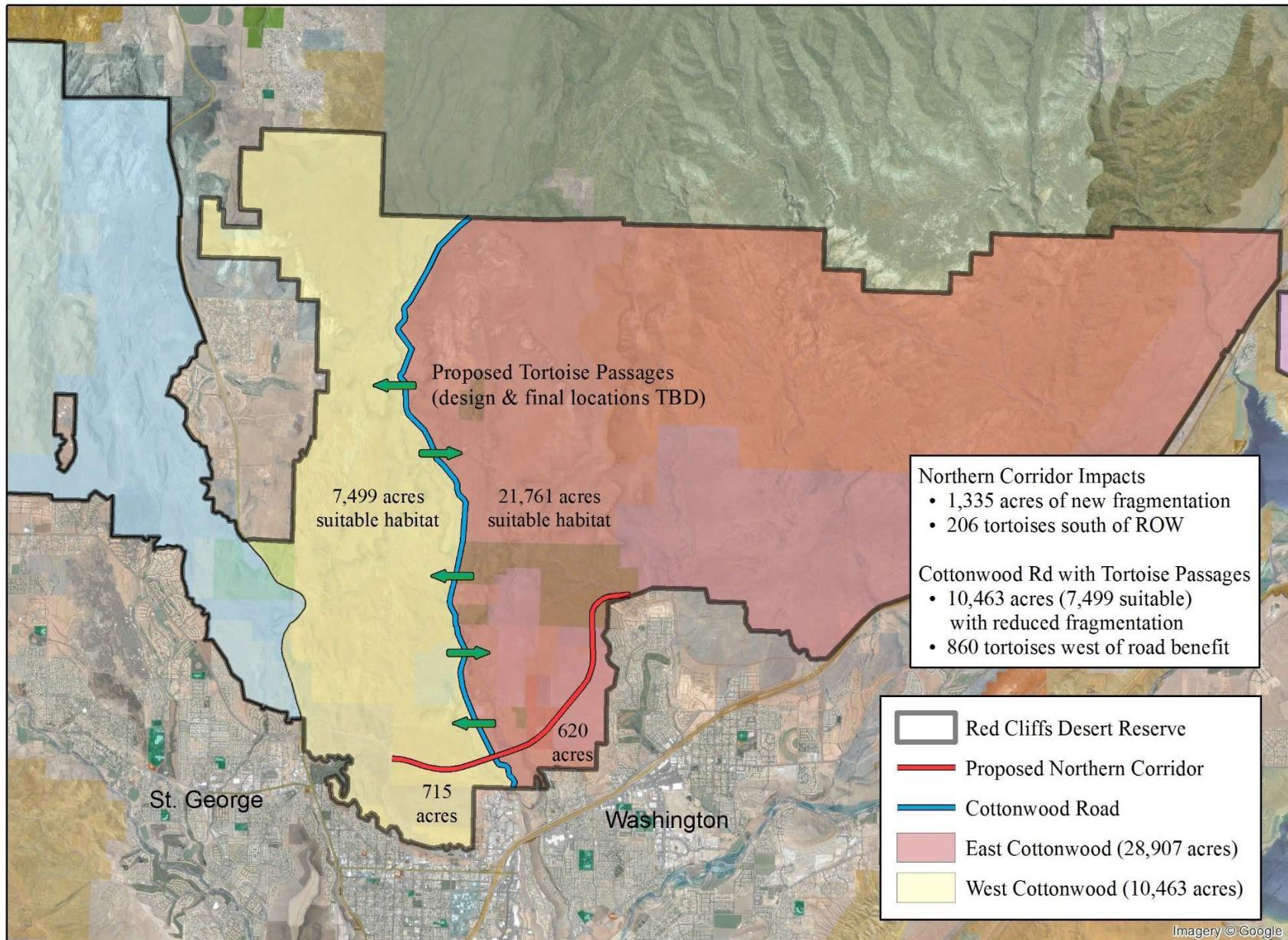


Figure 4. Off-setting fragmentation impacts with installation of tortoise passages on Cottonwood Road.



SMITH ROBERTSON, LLP



ALAN M. GLEN

Partner

Direct Line 512.225.5801 • Fax 512.225.5821
Email aglen@smith-robertson.com

September 10, 2020

Bureau of Land Management
Attn: Northern Corridor
345 East Riverside Drive
St. George, UT 84790
Submitted via email to: BLM_UT_NorthernCorridor@blm.gov

U.S. Fish and Wildlife Service
Attn: Yvette Converse, Field Supervisor
Utah Ecological Services Field Office
2369 W. Orton Circle
West Valley City, UT 84119

RE: Regarding the June 2020 "Northern Corridor – Highway Right-of-Way, Issuance of an Incidental Take Permit Draft Environmental Impact Statement and Draft Resource Management Plan Amendments"

Dear Federal Action Agencies:

I represent Washington County in connection with the referenced matters. I am writing this letter for your consideration and primarily to preserve potential claims in the event third-parties initiate litigation pertaining to the Service's approval of the Amended Habitat Conservation Plan and the Renewed Incidental Take Permit (ITP). It is a reasonable assumption that any such litigation would focus on the sufficiency of the Service's evaluations under the National Environmental Policy Act (NEPA) and sections 7 and 10 of the Endangered Species Act (ESA). There exist, however, strong but untested arguments that neither NEPA nor section 7 are legally applicable to issuance of an ITP.

The Service "action" which potentially triggers NEPA and ESA section 7 review is issuance of the ITP. However, the hallmark of NEPA and section 7 is that those procedures are triggered only where a federal agency is considering a discretionary action and the reasonable range of alternative actions that may be available to such agency. While we are not aware of a court having addressed this precise question, our review of the caselaw and the ESA and applicable regulations and guidance leads us to the conclusion that the Service's "action" of issuing a renewed ITP is in critical respects not discretionary. Therefore, while third parties may challenge how the Service approached review under NEPA and section 7, we wish to preserve the argument that in any event neither law was applicable to the Service's review of our application for a renewed ITP, and thus any third-party claims about failings in those processes are moot. The heart of this question is, of course, whether a court should conclude that Service consideration of application for a renewed ITP is a discretionary action subject to NEPA and ESA section 7. After careful review and consideration, we believe that it is doubtful that in this context the Service holds sufficient discretion to require and support the NEPA and section 7 processes. While we

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SMITH ROBERTSON, LLP

would be willing to expand upon our analysis, we are at this point seeking only to preserve a point in the event of litigation. We are, of course, far more interested in completing the processes to the mutual satisfaction of all concerned.

Thank you for your consideration of this correspondence. Please place it in the administrative record concerning any action the Service ultimately takes in connection with the HCP.

Very truly yours,

A handwritten signature in blue ink, appearing to read "ALAN M. GLEN". It is written in a cursive style with a horizontal line through the middle of the signature.

Alan M. GLen

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