U.S. Department of the Interior
Bureau of Land Management
Fish & Wildlife Service

Final Supplemental Environmental Impact Statement to Reconsider a Highway Right-of-Way Application and Associated Amendment of an Incidental Take Permit, Washington County, Utah

November 2024

Cover photograph: Red Cliffs National Conservation Area
Photograph courtesy of BLM staff

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Final Supplemental Environmental Impact Statement to Reconsider a Highway Right-of-Way Application and Associated Amendment of an Incidental Take Permit, Washington County, Utah

Prepared by:

U.S. Department of the Interior
Bureau of Land Management
Fish & Wildlife Service

In Cooperation with:

City of Hurricane
City of Ivins
City of St. George
Dixie Metropolitan Planning Organization
Paiute Indian Tribe of Utah
Santa Clara City
Shivwits Band of Paiutes
State of Utah – Public Lands Policy Coordinating Office
Utah Department of Environmental Quality
Utah Trust Lands Administration
Washington City

November 2024

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Final Supplemental Environmental Impact Statement to Reconsider a Highway Right-of-Way Application and Associated Amendment of an Incidental Take Permit, Washington County, Utah

Lead Agencies:	U.S. Department of the Interior, Bureau of Land Management (BLM), and U.S. Fish & Wildlife Service (FWS).
Cooperating Agencies:	City of Hurricane, City of Ivins, City of St. George, Dixie Metropolitan Planning Organization, Paiute Indian Tribe of Utah, Santa Clara City, Shivwits Band of Paiutes, State of Utah – Public Lands Policy Coordinating Office, Utah Department of Environmental Quality, Utah Trust Lands Administration, and Washington City.
Proposed Action:	In 2018, the Utah Department of Transportation (UDOT) submitted an application for a Federal Land Policy and Management Act (FLPMA) Title V right-of-way grant (ROW) to construct a multi-lane, divided highway (referred to as the Northern Corridor) north of the City of St. George, Utah, on BLM-managed and non-Federal lands within the Red Cliffs National Conservation Area (NCA) and the overlapping Red Cliffs Desert Reserve (Reserve), with the stated objective of reducing congestion, increasing capacity, and improving east-west mobility on arterial and interstate roadways in Washington County, Utah.
Abstract:	The BLM and FWS have prepared this Final Supplemental Environmental Impact Statement (Final SEIS) to reconsider the environmental effects of issuing a highway ROW grant to UDOT for the Northern Corridor and an associated amendment of an Incidental Take Permit (ITP) for Mojave desert tortoise to Washington County. In response to a November 2023 court remand, the Northern Corridor ROW and ITP, which were analyzed in the November 2020 *Final Environmental Impact Statement to Consider a Highway Right-of-Way, Amended Habitat Conservation Plan and Issuance of an Incidental Take Permit for the Mojave Desert Tortoise, and Proposed Resource Management Plan Amendments, Washington County, UT* (Final EIS), and authorized in separate Records of Decision (ROD) in January 2021 by the BLM and FWS, are being further evaluated. This SEIS analyzes five alternative routes for the Northern Corridor that were previously considered in the Final EIS (UDOT ROW Alignment, T-Bone Mesa Alignment, Southern Alignment, Red Hills Parkway Expressway, and St. George Boulevard/100 South One-way Couplet) and an alternative that would terminate UDOT's ROW grant for the Northern Corridor within the NCA. This SEIS supplements the information in the Final EIS regarding (1) the trend of increasing frequency and extent of wildfires in the Mojave Desert; (2) the rise of noxious weeds and invasive species in post-burn areas; and (3) the impacts increased fire and noxious weeds and invasive species have on the Mojave desert tortoise. The analysis also includes resources that warrant reconsideration based on new information or changed conditions beyond what was presented in the Final EIS.
Further Information:	Contact Dawna Ferris-Rowley, BLM Project Manager at 435-688-3200.

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United States Department of the Interior

BUREAU OF LAND MANAGEMENT
Utah State Office
440 West 200 South, Suite 500
Salt Lake City, UT 84101-1434

In Reply Refer To:
2800 (UTC0300)
UTU-93620

Dear Reader:

Enclosed for your review is the Final Supplemental Environmental Impact Statement (Final SEIS) that further considers the effects of granting a right-of-way (ROW) to the Utah Department of Transportation (UDOT) for the Northern Corridor (a proposed highway), as well as a potential amendment to the Incidental Take Permit (ITP) issued to Washington County, Utah, under Section 10(a)(1)(B) of the Endangered Species Act of 1973.

This Final SEIS was prepared by the U.S. Department of the Interior, Bureau of Land Management (BLM) and U.S. Fish and Wildlife Service (FWS), as co-lead agencies. It follows a Settlement Agreement that was the result of a lawsuit in response to the 2021 Records of Decision related to the Final Environmental Impact Statement to Consider a Highway Right-of-Way, Amended Habitat Conservation Plan and Issuance of an Incidental Take Permit for the Mojave Desert Tortoise, and Proposed Resource Management Plan Amendments, Washington County, UT (FEIS).

In 2018, UDOT applied for a ROW grant for the Northern Corridor project north of the City of St. George, Utah, on BLM-managed and non-Federal lands within the Red Cliffs National Conservation Area (NCA) and Red Cliffs Desert Reserve (Reserve). The Red Cliffs NCA was established through the passage of the Omnibus Public Land Management Act of 2009 (16 U.S.C. § 460www). Prior to the NCA's designation, the Reserve was established for the protection of the Mojave desert tortoise as part of the 1995 Washington County Habitat Conservation Plan (HCP). In 2015, pursuant to Section 10(a)(1)(B) of the ESA, Washington County applied to renew and amend the HCP and associated ITP. The restated and amended HCP described the Northern Corridor highway as a potential changed circumstance that would be offset with the addition of a new sixth zone to the Reserve (Zone 6) as the primary conservation strategy. To consider the application and the proposed Zone 6, the BLM needed to also consider amending the St. George Field Office and Red Cliffs NCA Resource Management Plans (RMPs).

On June 3, 2021, seven conservation organizations (collectively, Plaintiffs) filed an initial complaint in the United States District Court for the District of Columbia, Case No. 1:21-cv-01506. Among other claims, Plaintiffs alleged the BLM's ROW decision violated both NEPA and the National Historic Preservation Act (NHPA). The Plaintiffs stated, in part, the FEIS did not fully address the changed circumstances of wildfire in the region and the impacts it may have on the survival of the threatened Mojave desert tortoise and its critical habitat. The Plaintiffs also alleged that the BLM failed to comply with the consultation requirements under Section 106 of the NHPA.

In accordance with the Settlement Agreement, the analysis contained in this Final SEIS supplements the information in the Final EIS regarding (1) the trend of increasing frequency and extent of wildfires in the Mojave Desert; (2) the rise of noxious weeds and invasive species in post-burn areas; and (3) the impacts increased fire and noxious weeds and invasive species have on the Mojave desert

tortoise. The analysis also includes those resources that warrant reconsideration based on new information or changed conditions beyond what was presented in the Final EIS, in order to better inform the BLM's review of granting UDOT's ROW.

Chapter 2 of the Final SEIS considers six alternatives, five of which include a specific ROW alignment and a sixth that terminates the ROW. All of the alternatives identify the corresponding action required of the FWS regarding the Washington County ITP. The six alternatives analyzed in detail in the Final SEIS are similar to those included in the FEIS published in November 2020. No new highway alignments that meet UDOT's stated purpose and need for the Northern Corridor highway were identified by the public during the scoping period for the SEIS or during the public comment period on the Draft SEIS.

The analysis of the alternatives presented in the Final SEIS was informed by public input gathered from a 60-day comment period on the Draft SEIS, offered between May 10th, 2024, to July 9th, 2024. Substantive public comments and ongoing agency coordination led to several changes in Chapter 3 from the Draft SEIS to the Final SEIS. Additional data became available after publication of the Draft SEIS that is incorporated into the analysis in the Final SEIS, including vegetation Assessment, Inventory, and Monitoring data for the three ROW alternatives in the NCA, corrected boundaries for two Land and Water Conservation Fund-acquired parcels, updated traffic modeling results for each ROW alternative, and the identification of additional environmental justice concerns, primarily for the ROW alternatives that would reconfigure existing roadways. The BLM and FWS responded to substantive comments and made appropriate revisions in the Final SEIS or explained why a comment did not warrant a change, as documented in Appendix F of the Final SEIS.

The BLM, in coordination with the FWS, has identified the Red Hills Parkway Expressway as the BLM's preferred alternative as it addresses the east-west transportation needs of the greater St. George area, while protecting the resource values of the NCA. Based on this selection, Reserve Zone 6 would be removed from the Red Cliffs Desert Reserve. The FWS's preferred alternative is to amend Washington County's ITP to authorize incidental take of the Mojave desert tortoise associated with the implementation of covered activities that could occur on 3,341 acres of non-Federal lands in the previous Reserve Zone 6. Identification of these alternatives does not represent final agency decisions and Records of Decision will be issued no sooner than 30 days after publication of the Final SEIS Notice of Availability in the *Federal Register.*

We appreciate the information and suggestions you contributed to this SEIS process. The Final EIS may be accessed on the project website at https://eplanning.blm.gov/eplanningui/admin/project/2026562/510. For additional information regarding this document, please contact Dawna Ferris-Rowley, Project Manager at BLM UT Northern Corridor @blm.gov or by phone at 435-688-3200.

Sincerely,

GREGORY SHEEHAN
Digitally signed by GREGORY SHEEHAN
Date: 2024.09.27 07:34:45 -06'00'

Gregory Sheehan
State Director
BLM Utah

GEORGE WEEKLEY
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George Weekley
Field Office Supervisor
FWS Utah Ecological Services Field Office

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ACRONYMS AND ABBREVIATIONS

ACEC	Area of Critical Environmental Concern
ACHP	Advisory Council on Historic Preservation
ACS	American Community Survey
AIM	Assessment, Inventory, and Monitoring
BLM	Bureau of Land Management
CEQ	Council on Environmental Quality
CFR	Code of Federal Regulations
CI	Confidence Interval
DMPO	Dixie Metropolitan Planning Organization
EIS	Environmental Impact Statement
EJ	Environmental Justice
EO	Executive Order
ESA	Endangered Species Act of 1973
FLPMA	Federal Land Policy and Management Act
FR	Federal Register
FWS	United States Fish and Wildlife Service
GIS	Geographic Information System
HCP	Habitat Conservation Plan
I-15	Interstate-15
ITP	Incidental Take Permit
LWCF	Land and Water Conservation Fund
MGA	Meaningfully Greater Analysis
MOA	Memorandum of Agreement
NCA	National Conservation Area
NEPA	National Environmental Policy Act of 1969
NHPA	National Historic Preservation Act
NOA	Notice of Availability
NOI	Notice of Intent
NRHP	National Register of Historic Places
OHV	Off-highway Vehicle
OPLMA	Omnibus Public Lands Management Act of 2009
PA	Programmatic Agreement
PLPCO	Public Lands Policy Coordinating Office
POD	Plan of Development
Reserve	Red Cliffs Desert Reserve
RMP	Resource Management Plan

ROD	Record of Decision
ROW	Right-of-way
SEIS	Supplemental Environmental Impact Statement
SHPO	State Historic Preservation Officer
SR	State Route
TLA	Trust Lands Administration
U.S.C.	United States Code
UDNR	Utah Department of Natural Resources
UDOT	Utah Department of Transportation
UDWR	Utah Division of Wildlife Resources
UVRRU	Upper Virgin River Recovery Unit
VRM	Visual Resource Management

EXECUTIVE SUMMARY

Introduction

This Final Supplemental Environmental Impact Statement (SEIS) was prepared by the U.S. Department of the Interior's Bureau of Land Management (BLM) and U.S. Fish and Wildlife Service (FWS), as co-lead agencies, in compliance with the National Environmental Policy Act of 1969, as amended (NEPA). The SEIS further considers the effects of granting a right-of-way (ROW) to the Utah Department of Transportation (UDOT) for the Northern Corridor (a proposed highway), as well as a potential amendment to the Incidental Take Permit (ITP) issued to Washington County, Utah, under Section 10(a)(1)(B) of the Endangered Species Act of 1973 (ESA; 16 U.S.C. 1533(c)(1)). The SEIS follows a Settlement Agreement that was the result of a lawsuit filed by seven environmental and wildlife conservation organizations in response to the 2021 Records of Decision (RODs; BLM 2021, FWS 2021a) related to the *Final Environmental Impact Statement to Consider a Highway Right-of-Way, Amended Habitat Conservation Plan and Issuance of an Incidental Take Permit for the Mojave Desert Tortoise, and Proposed Resource Management Plan Amendments, Washington County, UT* (Final Environmental Impact Statement [EIS]; BLM 2020a). On November 16, 2023, the United States District Court for the District of Columbia granted the United States' request for voluntary remand of the 2021 RODs to the BLM and FWS for reconsideration.

In accordance with the Settlement Agreement and the remand order, the analysis contained in this SEIS supplements the information in the Final EIS regarding:

1) The trend of increasing frequency and extent of wildfires in the Mojave Desert.
2) The rise of noxious weeds and invasive species in post-burn areas.
3) The impacts increased fire and noxious weeds and invasive species have on the Mojave desert tortoise.

The analysis also includes those resources that warrant reconsideration, based on new information or changed conditions beyond what was presented in the Final EIS, to better inform the BLM's review of granting UDOT's ROW. Title 40 of the Code of Federal Regulations (CFR) Section 1502.9(d)(1) states that a SEIS shall be prepared if: (i) the agency makes substantial changes to the proposed action that are relevant to environmental concerns; or (ii) there are significant new circumstances or information relevant to concerns and bearing on the proposed action or its impacts.[1] The BLM will also complete the consultation requirements under the ESA and the National Historic Preservation Act (NHPA). The supplemental analysis tiers to and incorporates by reference all other information and analyses that were addressed in the Final EIS.

Purpose and Need

The BLM's purpose for action is to reconsider the 2018 UDOT ROW application to determine whether the BLM will affirm, affirm with modifications, or terminate the ROW grant. The FWS's purpose for action is to consider whether to amend Washington County's ITP so that it reflects the BLM's reconsideration of UDOT's ROW application and grant.

[1] Because this project was initiated prior to the effective date of the new NEPA regulations, the BLM and FWS rely on the language found in the 40 CFR 1500 regulations as of September 14, 2020.

This supplemental document is needed to further analyze the potential impacts of the construction and use of the Northern Corridor highway, increased wildfires, the proliferation of noxious weeds and exotic invasive grasses, and their cumulative effects on the Mojave desert tortoise.

Decisions to be Made

After evaluation of public comments and completion of the supplemental analysis, there are two Federal decisions to be made:

1) With respect to UDOT's ROW grant, the BLM Authorized Officer will decide whether to affirm, affirm with modifications, or terminate.
2) If changes are made to the ROW grant, the FWS Authorized Officer will determine whether any change is consistent with the Northern Corridor changed circumstances commitments identified in the Washington County Amended Habitat Conservation Plan (HCP) and whether an amendment to the 2021 ITP is warranted.

The BLM will not consider amendments to the Red Cliffs National Conservation Area Resource Management Plan (RMP, approved 2016, amended 2021) or the St. George Field Office RMP (approved 1999, amended 2016 and 2021) in this SEIS. As Washington County has not made any changes to its Amended HCP, the FWS will not consider any changes to the Amended HCP in this SEIS. If the BLM's 2024 decision on the UDOT ROW application differs from the 2021 ROW decision, the BLM will undertake additional land use planning to reflect the 2024 decision. Until that additional planning is completed, the BLM will not consider or reconsider a similar ROW application within the Red Cliffs National Conservation Area (NCA).

Alternatives

Five alternative routes for the Northern Corridor highway that were previously considered in detail are carried forward in this SEIS and are described in more detail below. An additional alternative that would terminate UDOT's ROW grant in the NCA is also included in this SEIS. This alternative would have a similar analysis of effects as the "no action" alternative in the 2020 Final EIS, except for the additional actions that have been taken by Washington County in support of the changed circumstance under the HCP since the establishment of Zone 6 of the Red Cliffs Desert Reserve (Reserve) in 2021.

- **UDOT ROW Alignment (Affirm Current ROW Grant):** The UDOT ROW Alignment was the Proposed Action in the Final EIS; the BLM approved the ROW for this alternative in the 2021 ROD. The BLM would affirm UDOT's ROW grant across public lands in the NCA for the Northern Corridor. This alternative functions as the "no change" alternative in the SEIS because the ROW grant for the Northern Corridor was issued to UDOT in January 2021 and was not vacated by the District Court when it remanded the BLM and FWS decisions. This alternative would have a similar analysis of effects as the "UDOT Application Alignment for the Northern Corridor" described in the Final EIS, although the alternative is not the same as in the Final EIS because some conservation commitments identified in Section 2.2 have already been completed or are currently occurring. This alternative would connect Green Spring Drive on the east to Red Hills Parkway on the west just north of the Pioneer Hills trailhead parking area. The Northern Corridor would be approximately 4.5 miles long, approximately 1.9 miles of which would be across BLM-managed lands in the NCA. Under this alternative, the FWS would affirm Washington County's ITP for the take of Mojave desert tortoise, and the Northern Corridor changed circumstance would remain triggered; Zone 6 would remain part of the Reserve.
- **T-Bone Mesa Alignment:** The BLM would affirm the ROW grant to UDOT across public lands in the NCA but show the T-Bone Mesa Alignment as the approved highway corridor. This alignment would connect Green Spring Drive on the east to Red Hills Parkway on the west just north of the Pioneer Hills trailhead parking area. Under this alternative, the Northern Corridor

would skirt the southern edge of T-Bone Mesa, a prominent mesa just west of Cottonwood Springs Road near the T-Bone Trail parking area. The Northern Corridor would be approximately 4.2 miles long, 2.2 miles of which would be across public lands in the NCA. Under this alternative, the FWS would affirm Washington County's ITP for the take of Mojave desert tortoise, and the Northern Corridor changed circumstance would remain triggered; Zone 6 would remain part of the Reserve.

- **Southern Alignment:** The BLM would affirm the ROW grant to UDOT across public lands in the NCA but show the Southern Alignment as the approved highway corridor. Under this alternative, the Northern Corridor would be near the southern border of the NCA, connecting Green Spring Drive on the east to Red Hills Parkway on the west just south of, and slightly encroaching onto, the Pioneer Hills trailhead parking area. The Northern Corridor would be approximately 5.5 miles long, approximately 1.5 miles of which would be across public lands in the NCA. Under this alternative, the FWS would affirm Washington County's ITP for the take of Mojave desert tortoise, and the Northern Corridor changed circumstance would remain triggered; Zone 6 would remain part of the Reserve.
- **Red Hills Parkway Expressway:** This alternative would convert Red Hills Parkway into a grade-separated expressway between Interstate 15 and Bluff Street. Under this alternative, UDOT would no longer hold the ROW grant for the Northern Corridor across the NCA. If the planned improvements exceed the boundaries of the existing ROW, the BLM may need to grant necessary ROW amendments to the City of St. George's existing ROW for the Red Hills Parkway, subject to all other applicable approvals, laws, and regulations. If this were the case, the City of St. George, or assignee, would need to submit an application to amend its existing ROW.

  The FWS would need to amend Washington County's ITP under this alternative because the Northern Corridor changed circumstance would not occur. This would eliminate certain special protections for Mojave desert tortoises and their habitat on 3,341 acres[2] of non-Federal lands in Zone 6 of the Reserve. Zone 6 was added to the Reserve in 2021 as mitigation in response to the Northern Corridor changed circumstance to offset the construction of a highway within Zone 3 of the Reserve. Under this alternative, Zone 6 would be eliminated as a zone of the Reserve.
- **St. George Boulevard/100 South One-way Couplet:** The St. George Boulevard/100 South One-way Couplet alternative (One-way Couplet) proposes changes to St. George Boulevard and 100 South instead of construction of a new highway across the NCA. Under this alternative, UDOT would no longer hold the ROW grant for the Northern Corridor. This alternative would have to be implemented by the City of St. George because it does not cross any BLM-managed lands. The FWS would need to amend Washington County's ITP under this alternative because the Northern Corridor changed circumstance would not occur, thus eliminating Zone 6 from the Reserve.

[2] A mapping error reported this number as 3,383 acres in the Draft SEIS. This, and other acreages reported in the Final SEIS, have been corrected to ensure consistency and accuracy.

- **Terminate UDOT's ROW:** Under this alternative, UDOT would no longer hold the ROW grant for the Northern Corridor and a highway would not be constructed across the NCA. The FWS would amend Washington County's ITP because the Northern Corridor changed circumstance is not triggered, thus eliminating Zone 6 from the Reserve.

Zone 6 is currently functioning as part of the Reserve, and Washington County's commitments and actions taken to date have resulted in conservation benefits in the Reserve. If the BLM affirms UDOT's ROW Alignment for the Northern Corridor, Zone 6 would be retained as part of the Reserve, the Northern Corridor changed circumstance would continue to be triggered, and Washington County would continue to implement the Amended HCP under the changed circumstance. Similarly, if the BLM affirms UDOT's ROW with modifications to show the T-Bone Mesa Alignment or Southern Alignment as the highway corridor, the FWS would not amend Washington County's ITP, as the Northern Corridor changed circumstance would still apply. Zone 6 would be retained as part of the Reserve. If the BLM terminates UDOT's ROW grant or selects an alternative outside of the NCA, then the FWS would amend Washington County's ITP because the Northern Corridor changed circumstance would no longer be triggered. The non-Federal lands in Zone 6 would no longer be managed for the protection of Federally-listed native plants and the Mojave desert tortoise and would be available for development. Other County-committed conservation measures would also be foregone.

Scoping and Issues

The BLM and FWS conducted a scoping process for the Draft SEIS from November 16, 2023, to December 28, 2023, to obtain information from the public regarding the scope of the analysis, potential alternatives, and the identification of relevant information and studies to help determine which additional impacts and resources should be more thoroughly assessed. The scoping process and its results appear in the Scoping Report posted on the BLM's ePlanning website (https://eplanning.blm.gov/eplanning-ui/project/2026562/570).

The key issues that are addressed in this SEIS include those identified in the Notice of Intent (88 Federal Register [FR] 220, November 16, 2023) or during internal agency and public scoping, and for which there is new information or guidance since publication of the Final EIS. They are as follows:

- **Vegetative Communities:** The impacts of the alternatives on the potential spread of noxious weeds and invasive species within the Reserve/NCA are of particular concern, as these species can readily regrow and invade native ecosystems following fire and other disturbances.
- **Special Status Plants:** Three Federally-listed endangered plant species and three BLM sensitive plant species are known to occur in the Reserve/NCA and could be impacted directly by the alternatives or indirectly through increased spread of noxious weeds, invasive species, and wildfires.
- **Fire and Fuels Management:** Wildfire regimes are changing dramatically across North American deserts with the spread of invasive grasses and the increase in fine fuels in the spaces between native shrubs due to the presence of invasive annual grasses, resulting in larger and more frequent fires. A total of 12,437 acres were burned in the Reserve/NCA in 2020 from five fires; 2,583 acres of that total were previously unburned.
- **Special Status Wildlife:** The impacts of the alternatives on the threatened Mojave desert tortoise or its habitat is of concern because of habitat destruction and fragmentation from development, increased wildfire frequency, and the proliferation of noxious weeds and invasive species.
- **ESA Section 6 Land Acquisition Grants:** Using ESA Section 6 grants, three parcels totaling 120 acres have been purchased by the Utah Department of Wildlife Resources (UDWR) within the NCA since publication of the Final EIS.

- **Land and Water Conservation Fund (LWCF) Lands:** Using LWCF funding, three parcels totaling 87.3 acres have been purchased within the Reserve/NCA since publication of the Final EIS.
- **National Conservation Area:** A determination of compatibility with the Congressionally defined purposes of the Red Cliffs NCA will be made on the selected alternative in the ROD, based on the analyses in the Final EIS and SEIS.
- **Cultural Resources and Native American Concerns:** The Federal actions of the BLM and FWS are undertakings, as defined by Federal regulations (36 CFR 800.16(y)) that implement the Section 106 process of the NHPA. To resolve adverse effects to historic properties (i.e., cultural resources eligible for or listed to the National Register of Historic Places) through the Section 106 process, the BLM is continuing to consult with the Utah State Historic Preservation Officer (SHPO) and consulting parties, including culturally affiliated Tribes, other State and Federal agencies, representatives of local governments, and other individuals and organizations with a demonstrated interest in this undertaking. The consultations have supported the development of a Programmatic Agreement (PA) to avoid, minimize, or mitigate adverse effects on historic properties that could result from the BLM's Federal actions. The PA will be signed prior to issuance of the Record of Decision (ROD).
- **Environmental Justice (EJ) and Socioeconomics:** The issuance or termination of the UDOT ROW could result in disproportionate or adverse impacts to minority, low-income, and Tribal populations. Because of the growth in and around the greater St. George metropolitan area since 2020, updates to EJ communities and demographics, as well as traffic volumes and patterns, are presented in the SEIS.

Response to Public Comments on the Draft SEIS

The BLM and FWS published the *Notice of Availability (NOA) of the Draft SEIS to Reconsider a Highway Right-of-Way Application and Associated Amendment of an Incidental Take Permit, Washington County* on May 10, 2024 (89 FR 40504). The publication of the NOA signaled the start of a 45-day public comment period, originally scheduled to end on June 24, 2024. An updated traffic analysis for the Northern Corridor was released by the Dixie Metropolitan Planning Organization on June 20, 2024. A report of the findings of the BLM's updated vegetation assessment, inventory, and monitoring (AIM) for the three Northern Corridor alignments in the NCA was also released on June 20, 2024. Both reports were made available on the BLM's ePlanning site on June 21, 2024. The public comment period was extended until July 9, 2024, to provide the public with additional time to review the traffic analysis and the AIM report, as well as the Draft SEIS. The extension resulted in a 60-day public comment period.

During the public comment period, the BLM and FWS hosted one public meeting to provide an overview of the Draft SEIS and answer questions from the public. The meeting was held on June 4, 2024, starting at 5:00 p.m. at the Dixie Convention Center in St. George, Utah.

The BLM and FWS received 4,255 comment submissions from the public during the 60-day public comment period. Of the 4,255 submissions, 901 were unique comments and 3,354 were part of organized letter writing campaigns. Substantive comments were responded to and are included in Appendix F of the Final SEIS.

Primary Impacts in the SEIS

Construction of the Northern Corridor highway within the UDOT ROW, T-Bone Mesa, or Southern alignments would result in ground disturbance and seed dispersal that could facilitate the spread of noxious weeds and invasive plants. Vehicular travel on roads can also introduce and spread these undesirable plants. The prevalence of invasive grasses increases the threat of wildfires. Construction of the Northern Corridor on any one of these three alignments has the potential to further introduce ignition

sources during construction and through daily vehicle usage. This could increase fire probability and fire frequency near the highway, which would again lead to the proliferation of noxious weeds and invasive species.

Modifications to the Red Hills Parkway to make it function as an expressway would result in substantially fewer impacts on native vegetation or the spread of noxious weeds and invasive species when compared to the construction of a new highway within the UDOT ROW, T-Bone Mesa, or Southern alignments. There would be no new impacts on noxious weeds or invasive species if the One-Way Couplet were selected or from the termination of UDOT's ROW grant.

Construction of the Northern Corridor on the UDOT ROW, T-Bone Mesa, or Southern alignments would create a permanent fuel break. Weed treatments and road maintenance activities could reduce fuel loads in the short term. These actions may not offset the increase in fire probability and fire frequency that would occur from constructing a new highway in the Reserve/NCA.

Selecting the Red Hills Parkway Expressway, One-way Couplet, or the alternative to Terminate UDOT's ROW grant would remove current protections on non-Federal lands within the Zone 6 boundaries because the Northern Corridor changed circumstance would not be triggered. This would eliminate Zone 6 from the Reserve and development of non-Federal lands in Zone 6 could occur. Development is expected to include the construction of new roads, increasing the risk of wildfires and the proliferation of weeds and invasive species on both non-Federal and adjacent Federal lands. Continued degradation of soils and habitat loss from unmanaged motorized and non-motorized recreational activities on non-Federal lands in Zone 6 may also occur, which could increase the risk of wildfire.

Construction of the Northern Corridor within the UDOT ROW, T-Bone Mesa, or Southern alignments would not impact any Federally-listed plant species. The Virgin thistle, a BLM sensitive species, could be impacted by construction within any of these three alignments or along the Red Hills Parkway Expressway. Endangered plants and occupied desert tortoise habitat would be impacted on non-Federal lands in Zone 6 since these lands would be subject to development if the Red Hills Parkway Expressway, One-Way Couplet, or the alternative to Terminate UDOT's ROW grant is selected, thus eliminating Zone 6 from the Reserve.

Construction and operation of the Northern Corridor within the UDOT ROW, T-Bone Mesa, or Southern alignments would result in the permanent loss and adverse modification of designated critical tortoise habitat, the displacement and short-distance translocation of tortoises, disruptions to tortoise home range and landscape movement patterns, and the destruction of burrows within the NCA. Indirect effects include increasing the threat of wildfire and facilitating the spread of noxious weeds and invasive species, further degrading habitat quality, especially if wildfires occur in previously unburned areas. Additionally, Mojave desert tortoise could be affected by disturbance from noise and vibrations associated with construction and use of the highway, increased human presence in their habitat, and changes in predator abundance and distribution.

No Mojave desert tortoise habitat in the NCA would be directly lost by selecting the Red Hills Parkway Expressway, One-way Couplet, or the alternative to Terminate UDOT's ROW grant. Selecting any of these alternatives would not trigger the Northern Corridor changed circumstance, thus eliminating Zone 6 from the Reserve and making the non-Federal lands in Zone 6 available for development. Although the nature and full extent of that development is not currently known, it would impact the Mojave desert tortoise and its habitat. The HCP analysis area included the 3,341 acres of non-Federal lands in Zone 6 and accounted for the potential take (i.e., loss to development) of this acreage. For a complete analysis, refer to Section 3.5.2.1 of the Final EIS.

The T-Bone Mesa Alignment would directly encroach on parcels acquired using ESA Section 6 funding. The three proposed highway alignments located entirely within the NCA are within 1 kilometer of these parcels, and there could be indirect impacts to Mojave desert tortoise and other wildlife habitats. Two

alternatives within the NCA would impact LWCF lands acquired since 2021, with the Southern Alignment potentially having a greater impact and the T-Bone Mesa Alignment having a lesser impact. The UDOT ROW alignment would have no impact on LWCF lands acquired since 2021.

Construction of a highway in the UDOT ROW Alignment may result in adverse effects to as many as eight historic properties (sites eligible to or listed on the National Register of Historic Places (NRHP)), the T-Bone Mesa Alignment six historic properties, the Southern Alignment five historic properties, and the Red Hills Parkway Expressway two historic properties. There are 63 historic structures that are eligible for listing to the NRHP located along the two streets comprising the One-way Couplet; however, it is unlikely that there would be adverse effects to any of these structures from converting the streets into a one-way couplet. The number of historic properties that may be impacted under any of the alternatives could change after final engineering and design is completed. The BLM, in consultation with the Utah State Historic Preservation Officer and Consulting Parties, has developed and will implement a PA in accordance with CFR 800.14 (b) that will include the terms and conditions agreed upon to resolve the potential adverse effects of the undertaking.

Construction of the Northern Corridor on the UDOT ROW Alignment or T-Bone Mesa Alignment would help to relieve congestion on existing roadways in the St. George area compared to the Terminate UDOT's ROW grant. Less improvement in operations at key intersections would be realized from the Southern Alignment, as its results are similar to the Terminate UDOT's ROW grant. Traffic patterns under the Red Hills Parkway Expressway or the One-way Couplet alternatives would improve compared to the Terminate UDOT's ROW grant. Selection of the Red Hills Parkway Expressway or the One-way Couplet alternatives could impact EJ communities in multiple disproportionate and adverse ways.

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1 PURPOSE AND NEED FOR ACTION

1.1 Introduction

This Supplemental Environmental Impact Statement (SEIS) was prepared by the U.S. Department of the Interior's Bureau of Land Management (BLM) and U.S. Fish and Wildlife Service (FWS), as co-lead agencies, in compliance with the National Environmental Policy Act of 1969, as amended (NEPA). The SEIS further considers the effects of granting a right-of-way (ROW) to the Utah Department of Transportation (UDOT) for the Northern Corridor (a proposed highway), as well as a potential amendment to the Incidental Take Permit (ITP)[3] issued to Washington County, Utah, under Section 10(a)(1)(B) of the Endangered Species Act of 1973 (ESA; 16 United States Code [U.S.C.] 1533(c)(1)). The SEIS follows a Settlement Agreement that was the result of a lawsuit filed by seven environmental and wildlife conservation organizations in response to the 2021 Records of Decision (RODs; BLM 2021, FWS 2021a) related to the *Final Environmental Impact Statement to Consider a Highway Right-of-Way, Amended Habitat Conservation Plan and Issuance of an Incidental Take Permit for the Mojave Desert Tortoise, and Proposed Resource Management Plan Amendments, Washington County, UT* (Final Environmental Impact Statement [EIS]; BLM 2020a). On November 16, 2023, the United States District Court for the District of Columbia granted the United States' request for voluntary remand of the 2021 RODs to the FWS and BLM for reconsideration.

In accordance with the Settlement Agreement and the remand order, the analysis contained in this SEIS supplements the information in the Final EIS regarding:

1) The trend of increasing frequency and extent of wildfires in the Mojave Desert.
2) The rise of noxious weeds and invasive species in post-burn areas.
3) The impacts increased fire and noxious weeds and invasive species have on the Mojave desert tortoise.

The analysis also includes those resources that warrant reconsideration based on new information or changed conditions beyond what was presented in the Final EIS to better inform the agencies' review of granting UDOT's ROW. Title 40 of the Code of Federal Regulations (CFR) Section 1502.9(d)(1) states that a SEIS shall be prepared if: (i) the agency makes substantial changes in the proposed action that are relevant to environmental concerns; or (ii) there are significant new circumstances or information relevant to concerns and bearing on the proposed action or its effects.[4] The BLM will also complete the consultation requirements under the NHPA. The supplemental analysis tiers to and incorporates by reference all other information and analyses that were addressed in the Final EIS.[5]

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[3] The Endangered Species Act (ESA) requires that an ITP be obtained for any "take" of an endangered or threatened species incidental to an otherwise lawful activity, such as development. Take is defined under the ESA as "to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct."

[4] See Footnote 1.

[5] *Final Environmental Impact Statement to Consider a Highway Right-of-Way, Amended Habitat Conservation Plan and Issuance of an Incidental Take Permit for the Mojave Desert Tortoise, and Proposed Resource Management Plan Amendments, Washington County, UT* (BLM 2020a). Available at: https://eplanning.blm.gov/eplanning-ui/project/2026562/570.

On July 16, 2020, the Council on Environmental Quality (CEQ) published a final rule in the Federal Register (FR) to update its regulations for Federal agencies to implement NEPA (85 FR 43304). The updated regulations took effect September 14, 2020. The purpose of this update was to facilitate more efficient, effective, and timely NEPA reviews by Federal agencies in connection with proposals for agency action; improve interagency coordination in the environmental review process; promote earlier public involvement; increase transparency; and enhance the participation of States, Tribes, and localities. This rule was amended on April 20, 2022, with an effective date of May 20, 2022 (87 FR 23453), to clarify, among other things, that agencies have discretion to consider a variety of factors when assessing an application for an authorization, removing the requirement that an agency base the purpose and need on the goals of an applicant and the agency's statutory authority. A rule with additional implementing regulations was released by the CEQ on May 1, 2024, with an effective date of July 1, 2024 (89 FR 35442). The latest rule revisions were provided for an effective environmental review process and to ensure full and fair public engagement; enhance efficiency and regulatory certainty; and promote sound Federal agency decision making that is grounded in science, including consideration of relevant environmental, climate change, and environmental justice (EJ) effects. This Final SEIS tiers to and supplements the prior 2020 Final EIS, which was underway prior to the effective date of the new regulations. Therefore, the BLM and FWS will continue to apply the CEQ's NEPA regulations for the Final SEIS under the prior regulations (i.e., 40 CFR parts 1500-1508, as amended April 20, 2022; 87 FR 23453). These regulations were in place when the NEPA process was initiated for the 2020 Final EIS through publication of the Notice of Intent (NOI) on December 5, 2019, which is specifically allowed for in 40 CFR 1506.13.

1.2 Background

On April 2, 1990, the FWS determined the Mojave population of the desert tortoise (*Gopherus agassizii*) to be threatened, pursuant to the ESA (55 FR 12178). The Mojave population covered by this rule included all tortoises north and west of the Colorado River in California, southern Nevada, southwestern Utah, and northwestern Arizona. Reasons for the listing included loss of habitat from construction projects (i.e., roads, housing, energy developments, and conversion of native habitat to agriculture). Livestock grazing and vehicle use off existing roads were also noted to have degraded additional habitat. Also cited as threatening the Mojave desert tortoise's continued existence were illegal collection, upper respiratory tract disease, and predation on juvenile tortoises by common ravens (*Corvus corax*; hereafter raven). Critical habitat for the entire Mojave population of desert tortoise was designated on February 8, 1994 (59 FR 5820). A Mojave desert tortoise recovery plan was published in June 1994 (FWS 1994a). This plan included identification of six recovery units (Upper Virgin River, Northeastern Mojave, Eastern Mojave, Eastern Colorado, Northern Colorado, and Western Mojave), recommendations for a system of Desert Wildlife Management Areas within the recovery units, and development and implementation of specific recovery actions.

In response to growth and development in Washington County in the late 1980s and early 1990s, the Washington County Commission applied to the FWS for an ITP for Mojave desert tortoise in the Upper Virgin River Recovery Unit (UVRRU), which encompasses all Mojave desert tortoise habitat in Washington County, Utah, east of the Beaver Dam Mountains. As part of the permit application, Washington County, with the assistance of a steering committee (which included Federal, State, and local government entities, as well as environmental groups and land use groups), prepared a Habitat Conservation Plan (HCP) in 1995 that provided for the conservation of the UVRRU tortoise population (Washington County Habitat Conservation Plan Steering Committee and SWCA Environmental Consultants 1995). The 1995 HCP was prepared with the goal of reducing the potential for conflicts between otherwise lawful land use activities and species protected by the ESA, most notably the Mojave desert tortoise.

The central conservation measure of the 1995 HCP was the proposed creation of a 61,022-acre Red Cliffs Desert Reserve (Reserve).[6] The Reserve design was consistent with the criteria for the Upper Virgin River Desert Wildlife Management Area envisioned by the Mojave desert tortoise recovery plan (FWS 1994a) and set aside critical and buffer habitat to assist the recovery of the tortoise in the UVRRU. In 1996, the FWS issued an ITP to Washington County, pursuant to Section 10(a)(1)(B) of the ESA, for the take of Mojave desert tortoise incidental to covered activities in the County's permit area and the Reserve was established. Issuance of the ITP allowed Washington County to proceed with covered activities while complying with the ESA. It also provided regulatory assurances to Washington County that the FWS would not impose additional Mojave desert tortoise conservation measures throughout the duration of the permit if the County was properly implementing the 1995 HCP and the existence of any listed species was not jeopardized.

Creating the Reserve involved actions by Washington County, the BLM and other HCP partners, to define the Reserve boundary, consolidate approximately 18,609 acres of private or State lands within the Reserve boundary into Federal or State ownership, and establish certain land use restrictions to protect the Mojave desert tortoise on the multi-jurisdictional lands within the Reserve. Other conservation measures of the 1995 HCP included removing domestic livestock grazing from the BLM and State-managed lands, restricting motorized vehicle travel to specific designated roadways, and developing a education outreach program to increase public awareness of the need to protect the Mojave desert tortoise and its habitat. The Reserve was divided into five zones to facilitate management (Zones 1 through 5). As a result of the ITP and compliance with the HCP, development has been able to occur in tortoise habitat on non-Federal lands in Washington County outside the Reserve while remaining compliant with the ESA.

The Red Cliffs National Conservation Area (NCA) was designated by Congress on March 30, 2009, through the Omnibus Public Land Management Act (OPLMA) of 2009 (16 U.S.C. 460www). The OPLMA designated the approximately 44,725 acres of BLM-managed public land in the Reserve as the NCA and defined its purposes as follows (16 U.S.C. 460www(a), Title I, Subtitle O, Section 1974(a)):

> ***SEC. 1974. RED CLIFFS NATIONAL CONSERVATION AREA.***
>
> (a) *PURPOSES.—The purposes of this section are—*
>
> (1) *to conserve, protect, and enhance for the benefit and enjoyment of present and future generations the ecological, scenic, wildlife, recreational, cultural, historical, natural, educational, and scientific resources of the National Conservation Area; and*
>
> (2) *to protect each species that is—*
>
> (A) *located in the National Conservation Area; and*
>
> (B) *listed as a threatened or endangered species on the list of threatened species or the list of endangered species published under section 4(c)(1) of the Endangered Species Act of 1973 (16 U.S.C. 1533(c)(1)).*

[6] Land ownership within the Reserve in 1995 consisted of 38,034 acres of BLM-managed lands, 4,379 acres of State park lands, 10,938 acres of State lands owned by the Trust Lands Administration, and 7,671 acres of private or local government lands. Subsequent boundary changes resulted in an increase in size of the Reserve to 62,009 acres.

The OPLMA further stated (16 U.S.C. 460www(e)), Title I, Subtitle O, at Section 1974(e)):

> (e) *MANAGEMENT.—*
>
> (1) *IN GENERAL.—The Secretary [of the Interior] shall manage the National Conservation Area—*
> (A) *in a manner that conserves, protects, and enhances the resources of the National Conservation Area; and*
> (B) *in accordance with—*
> (i) *the Federal Land Policy and Management Act of 1976 (FLPMA) (43 U.S.C. 1701 et seq.);*
> (ii) *this section [of the OPLMA]; and*
> (iii) *any other applicable law (including regulations).*
>
> (2) *USES.—The Secretary shall only allow uses of the National Conservation Area that the Secretary determines would further a purpose described in subsection (a).*
>
> (3) *MOTORIZED VEHICLES.—Except in cases in which motorized vehicles are needed for administrative purposes, or to respond to an emergency, the use of motorized vehicles in the National Conservation Area shall be permitted only on roads designated by the management plan for the use of motorized vehicles.*

The OPLMA at Section 1977(b) directs the Secretary to develop a comprehensive travel management plan for the land managed by the BLM in Washington County. Section 1977(b)(2)(A) states that the Secretary shall, in consultation with appropriate Federal agencies and State, Tribal, and local governmental entities (including the County and St. George City, Utah), and the public, identify one or more alternatives for a northern transportation route in the County. The BLM began the travel management plan, on a separate but parallel track, to the NCA land use planning effort. Completion of the travel management planning process was halted in 2018, so that the agency could focus on processing UDOT's ROW application which required the preparation of an EIS and amendments to two BLM RMPs.

In 2016, as part of developing the Red Cliffs NCA Resource Management Plan (RMP; BLM 2016), the BLM considered an alternative that included a Northern Corridor in the NCA. However, at that time, the BLM did not have a specific ROW application to consider as part of that planning process. Instead, the BLM relied on several conceptual alignments from the Dixie Metropolitan Planning Organization (DMPO) that were based on Washington County's recommendations. In December 2016, the BLM issued a Record of Decision (ROD) and Approved RMP for the Red Cliffs NCA (BLM 2016). While the BLM eventually selected a different alternative that did not include a corridor, the selected alternative did create an avoidance area that could accommodate a Northern Corridor alignment in the NCA. The BLM defines an avoidance area as an area identified through resource management planning where granting ROWs is to be avoided but that may be available for ROW location if specific conditions are met.

The RMP includes management goals, objectives, and actions that are consistent with the Congressionally-defined purposes of conservation, protection, and enhancement of public land values in the NCA. One of the goals under Section 6.33, "Lands and Realty" of the RMP was that "Land use authorizations further the purposes of conservation, protection, and enhancement of resource values in the NCA." This section specifically addressed linear ROWs in the NCA as follows:

LAR-13: Designate ROW Avoidance and Exclusion areas and retain an existing ROW corridor as follows:

Exclusion areas: (areas that are not available for location of ROWs under any conditions, including all designated wilderness within the NCA): 38,472 acres.

Avoidance areas: 6,367 acres.

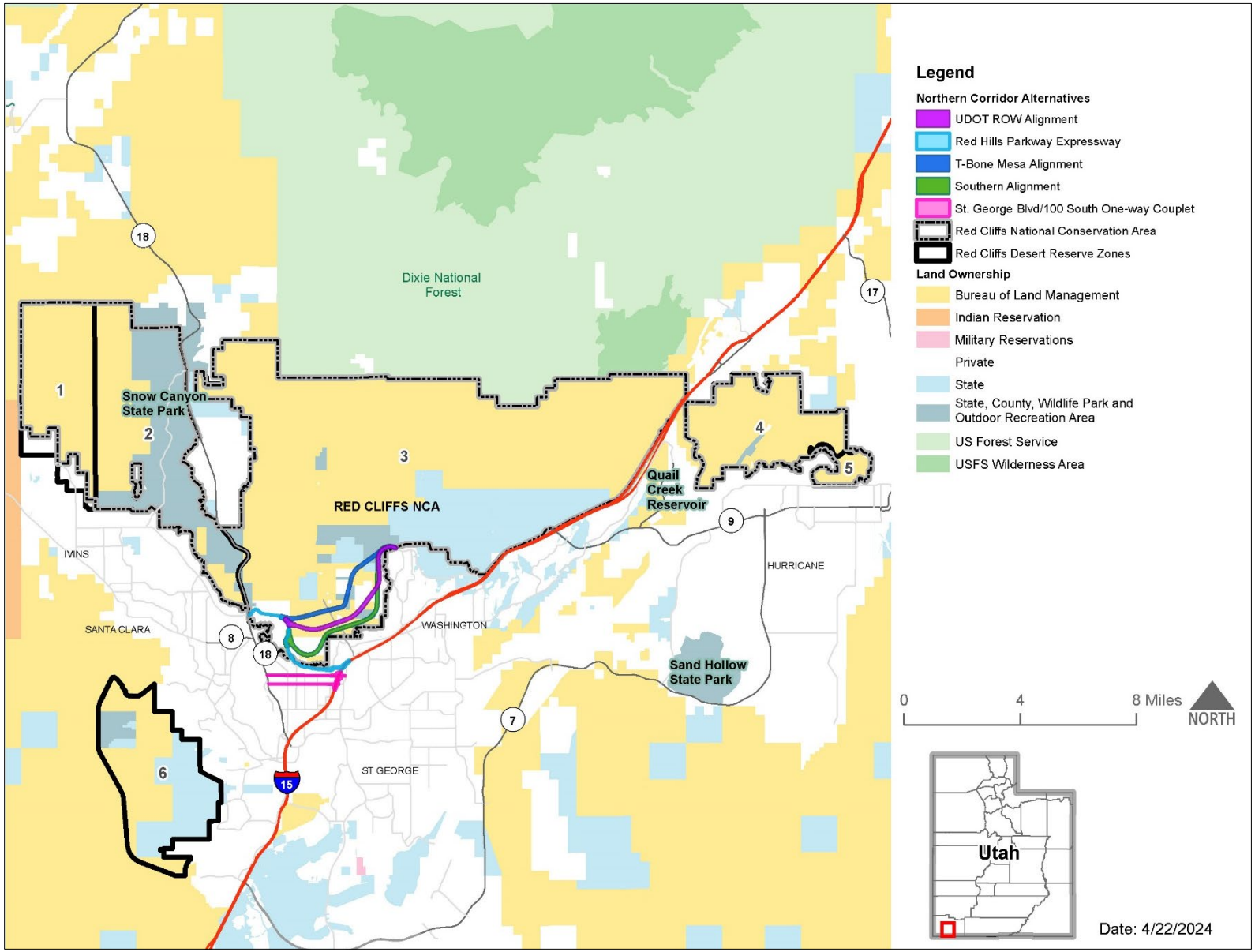
While considering a new proposed ROW application the BLM will:

- *a) consider options for routing or siting the ROW outside of the NCA;*
- *b) ensure consistency of the ROW with the established purpose of the NCA, as identified in OPLMA;*
- *c) ensure that new ROWs share, parallel, or adjoin existing ROWs;*
- *d) apply special stipulations and mitigation measures within avoidance areas consistent with VRM objectives and the purpose of the NCA;*
- *e) authorize new ROWs only when the project specific NEPA analysis indicates that the construction and operation of the facility would not result in the take of Federally-listed species; the adverse modification of designated critical habitats; or adverse effects to National Register of Historic Places listed or eligible properties, and the following criteria are met:*
  - *1) construction could be accomplished through methods that minimize new surface disturbances and resource impacts;*
  - *2) new ROW access roads would not be required for construction, operation, and maintenance;*
  - *3) existing ROW access roads would not be permanently widened or upgraded for construction, operation, and maintenance; temporary enlargements or modifications to existing access routes needed during construction would be rehabilitated immediately after construction is completed; and*
  - *4) construction, operations, and maintenance would not require off-road travel by motorized vehicles.*

Designated ROW Corridor: 20 acres.

On September 18, 2018, UDOT applied for a ROW grant to construct a multi-lane, divided highway (referred to as the Northern Corridor) north of the City of St. George, Utah, on BLM-managed and non-Federal lands within the NCA and the overlapping Reserve (Figure 1). The stated purposes of the highway were reducing congestion, increasing capacity, and improving east-west mobility on arterial and interstate roadways between State Route (SR) 18 and Interstate 15 (I-15) at milepost 13. The need for the highway was driven by the current and forecasted population growth within Washington County, which was anticipated to continue to increase demand on the transportation network. Based on traffic projections from the 2019 DMPO regional travel demand model (DMPO 2019), UDOT stated the existing transportation network between SR 18 and I-15 was not considered adequate to meet future travel demand in the northeastern and northwestern areas of St. George. The ROW application from UDOT sought a ROW through the NCA that was larger than the identified ROW avoidance area could accommodate and, thus, could not be granted without amending the Red Cliffs NCA RMP. Amendments to the St. George Field Office RMP were also considered to enhance Mojave desert tortoise conservation on BLM-managed lands outside the NCA to comply with Washington County's amended HCP.

Figure 1. Project Area



Prior to the ITP's expiration in 2016, Washington County applied to the FWS to renew its ITP, as described in its proposed HCP for Washington County, Utah, Restated and Amended October 2020 (hereafter Amended HCP; Washington County 2020). If a ROW crossing the NCA/Reserve were granted for the Northern Corridor, the Amended HCP included a Northern Corridor changed circumstance that addressed effects of the highway on the HCP conservation program. The FWS defines 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 [FWS] and that can be planned for" (50 CFR 17.3). Selecting a ROW alignment that crosses the Reserve would be considered a changed circumstance, in accordance with Section 9.1 of the Amended HCP, that may affect the Mojave desert tortoise. If triggered, a significant part of the changed circumstance was to expand the Reserve by approximately 6,813 acres with the addition of a new sixth zone (Zone 6; see Figure 1). Creation of Zone 6 was contingent on the BLM issuing a ROW grant crossing the NCA/Reserve's Zone 3 and was the primary conservation strategy to offset granting the Northern Corridor ROW in the Reserve.

To consider UDOT's ROW application and Washington County's ITP application, the BLM and FWS prepared a Final EIS that analyzed the environmental impacts associated with several alternative Northern Corridor highway corridors (i.e., northern transportation routes) and proposed amendments to the Red Cliffs NCA and the St. George Field Office RMPs. The BLM consulted with the FWS to meet the requirements identified in Section 7 of the ESA for both the ROW application and the amendments to the RMPs. On January 12, 2021, the FWS issued a Biological Opinion to the BLM that determined the ROW and approved amendments to the RMPs were not likely to jeopardize the continued existence of the Mojave desert tortoise, and that they were not likely to destroy or adversely modify designated critical habitat for the species.

The FWS also issued an intra-agency Biological Opinion on January 12, 2021 that determined the ITP was not likely to jeopardize the continued existence of the Mojave desert tortoise, Holmgren milkvetch (*Astragalus holmgreniorum*), Shivwits milkvetch (*Astragalus ampullarioides*), dwarf bear-poppy (*Arctomecon humilis*), or Siler pincushion cactus (*Pediocactus sileri*), or result in the adverse modification of critical habitat for any of the above listed species. Further, the FWS determined that the amended HCP's conservation program fully offset the effects to Mojave desert tortoise from covered activities, including the effects from the Northern Corridor changed circumstance. On January 13, 2021, the FWS Regional Director for Interior Regions 5 and 7 signed a ROD and issued an ITP to Washington County for the Mojave desert tortoise under Section 10(a)(1)(B) of the ESA, which included the changed circumstance of the Northern Corridor ROW and associated mitigation (i.e., creation of Zone 6 of the Reserve and associated actions; see Section 2.2).

On January 13, 2021, after the Final EIS was completed, the Secretary of the Interior signed a ROD that approved UDOT's Northern Corridor ROW application and the amendments to the RMPs. The decision approving the ROW was effective immediately, and the BLM signed and issued a FLPMA Title V ROW grant to UDOT that approved the issuance of a 1.9-mile ROW for the approximately 4.5-mile long Northern Corridor that crosses the NCA. The Red Cliffs NCA RMP Amendment allowed a one-time exception for a transportation ROW within the NCA, and the St. George Field Office RMP amendment modified management on a portion of the 6,813-acre mitigation area (Zone 6) that was added to the Reserve to offset the ROW impacts. Tables 2.3-1 and 2.5-1 of the Final EIS (BLM 2020a) describe in more detail the approved amendments that were made to the Red Cliffs NCA RMP and the St. George Field Office RMP, respectively, in granting the ROW to UDOT.

In response to these decisions, seven organizations (i.e., Conserve Southwest Utah, Conservation Lands Foundation, Center for Biological Diversity, Defenders of Wildlife, Southern Utah Wilderness Alliance, Wilderness Society, and WildEarth Guardians; collectively, Plaintiffs) filed an initial complaint in the United States District Court for the District of Columbia against the Department of the Interior on June 3, 2021. Among other claims, the Plaintiffs alleged the BLM's ROW decision violated NEPA, the NHPA,

OPLMA, and the Land and Water Conservation Fund (LWCF) Act. The Plaintiffs stated the Final EIS did not fully address the changed conditions of wildfire in the region and the impacts it may have on the Mojave desert tortoise, tortoise habitat, and the spread of invasive annual grasses. On July 27, 2021, Plaintiffs amended their complaint to include the FWS and additional claims related to NEPA and the ESA. In August 2023, the United States and Plaintiffs entered into a Settlement Agreement that requires the BLM and FWS to complete a supplemental EIS and NHPA consultation (as necessary) and issue a new ROW decision, updated Biological Opinion, incidental take statement, and ITP by November 2024. On November 16, 2023, the United States District Court Order, supported by a Memorandum Opinion, granted the request for voluntary remand of the 2021 decisions to the BLM and FWS for reconsideration. On March 8, 2024, per the conditions of the Settlement Agreement, the FWS rescinded its Biological Opinion for the ROW and issued an amended Biological Opinion for the St. George Field Office and Red Cliffs NCA RMP amendments. Section 7 consultation will be completed, as appropriate, for any ROW decision.

1.3 Purpose and Need

The BLM's purpose for action is to reconsider the 2018 UDOT ROW application to determine whether the BLM will affirm, affirm with modifications, or terminate the ROW grant. The FWS's purpose for action is to consider whether to amend Washington County's ITP so that it reflects the BLM's reconsideration of UDOT's ROW application and grant.

This supplemental document is needed to further analyze the potential impacts of the construction and use of the Northern Corridor highway in the context of the following:

- The trend in the increasing frequency and extent of wildfires in the Mojave Desert.
- The rise of non-native/exotic and invasive vegetation in post-burn areas.
- The impacts increased fire and new non-native/exotic and invasive vegetation have on Mojave desert tortoise.

1.4 Decisions to be Made

After evaluation of public comments and completion of the supplemental analysis, there are two Federal decisions to be made:

1) With respect to UDOT's ROW grant, the BLM Authorized Officer will decide whether to affirm, affirm with modifications, or terminate.
2) If changes are made to the ROW, the FWS Authorized Officer will determine whether any change is consistent with the Northern Corridor changed circumstances commitments identified in the Washington County Amended HCP and whether an amendment to the 2021 ITP is warranted.

The BLM will not consider amendments to the Red Cliffs NCA RMP or the St. George Field Office RMP in this SEIS. As Washington County has not made any changes to its Amended HCP, the FWS will not consider any changes to the Amended HCP in this SEIS. If the BLM's 2024 decision on the ROW application differs from the 2021 ROW decision, the BLM will undertake additional land use planning to reflect the 2024 decision. Until that additional planning is complete, the BLM will not consider or reconsider a similar ROW application within the NCA.

1.5 Land Use Plan Conformance

The Red Cliffs NCA RMP (2016, as amended 2021) and the St. George Field Office RMP (1999, as amended 2016, 2021) provide management direction for the public lands administered by the BLM that may be crossed by the alternatives considered in this SEIS. The 2020 Final EIS evaluated if the ROW

application was in conformance with the Red Cliffs NCA RMP and determined that an amendment to that plan was needed to accommodate the proposed ROW.

The 2021 Red Cliffs NCA RMP amendment allowed for a one-time exception to LAR-13, Criteria E, for the issuance of a Title V ROW for the Northern Corridor within the existing ROW Avoidance Area. It also amended Visual Resource Management (VRM) decision VRM-07 to manage the Northern Corridor ROW as BLM VRM Class IV and the Recreation Management decision REC-05 to manage the 600-foot-wide area around the selected route for the Northern Corridor as part of the Rural Recreation Management Zone. Applications for future ROWs would continue to have to comply with all the special considerations for the siting of ROWs in the avoidance area in the NCA.

The St. George Field Office RMP Amendment aligned the management of 3,471 acres of BLM-managed lands in Zone 6 with the management described in the Amended Washington County HCP for the Reserve. The amendment also included a commitment by the BLM to acquire and manage the State lands and to acquire the private lands from willing sellers in Zone 6.

1.6 Relationship to Statutes, Regulations, and Other Plans

All alternatives analyzed in detail must be consistent with Federal laws and applicable agency policies, including the FLPMA, OPLMA, NHPA, and ESA, as described below. The BLM and FWS also recognize the importance of State, Tribal, and local plans. The agencies conducted a detailed review of relevant State and County plans to evaluate the consistency of these plans with the alternatives provided in the Final EIS. The results of this review and coordination with local governments related to this subject can be found in Appendix H of the Final EIS, and updates are incorporated into applicable sections of the SEIS, as appropriate. Additional information is provided below.

1.6.1 Statutes and Regulations

Federal Land Policy and Management Act of 1976, as amended (43 U.S.C. 1701 et seq.). The BLM responded to UDOT's application for a ROW grant under Title V of the FLPMA. On January 13, 2021, the Secretary of the Interior signed a ROD that allowed for the immediate issuance of a FLPMA Title V ROW grant to UDOT for the Northern Corridor highway. The decision in the SEIS is whether to affirm, affirm with modifications, or terminate the FLPMA Title V ROW grant. The FLPMA, Section 302(a) states that "public lands are to be managed under the principles of multiple use and sustained yield except where that tract of such public land has been dedicated to specific uses according to any other provision of law that it will be managed in accordance with such law." The designation of the Red Cliffs NCA through the Omnibus Public Land Management Act of 2009 has dedicated the public lands of the NCA to be managed for resource conservation, protection, and enhancement.

The Omnibus Public Land Management Act of 2009 (P.L. 111-11). As stated in Section 1.2, the designating statutory authority for the Red Cliffs NCA is the OPLMA of 2009 (Public Law 111-11 at Title I, Subtitle O, Section 1974(a)), codified at 16 U.S.C. 460www. Section 1974 directs the Secretary of the Interior to manage the NCA in a manner that conserves, protects, and enhances its resources, and to only allow uses that would further its designation purposes. The OPLMA, Title 1, Subtitle O, Section 1977(b)(2) also directs the Secretary to develop a comprehensive travel management plan for the land managed by the BLM in Washington County and, in accordance with the FLPMA, "in developing the travel management plan, the Secretary shall—(A) in consultation with appropriate Federal agencies, State, Tribal, and local governmental entities (including Washington County and St. George City, Utah), and the public, identify one or more alternatives for a northern transportation route in the County."

Land and Water Conservation Fund Act of 1965 (54 U.S.C. 200301 et seq.). The LWCF Act established a funding source to assist Federal agencies and States in acquiring certain lands for certain recreation and other conservation purposes. The LWCF Act has a Federal agency component (54 U.S.C. 200306) and a State and local government component (54 U.S.C. 200305), which have different uses and requirements. For Federal land management agencies such as the BLM and FWS, the LWCF may be used

to purchase lands to meet certain resource management objectives. Lands acquired for Federal purposes are administered by the respective Federal land management agency and subject to other laws. Since the establishment of the Reserve, and in accordance with the 1995 HCP Implementation Agreement, the BLM has acquired private property parcels within the Reserve. Most of these acquisitions have been made with funds originating from the LWCF Act.

National Historic Preservation Act Section 106 Consultation (54 U.S.C. 100101 et seq.). The issuance of a ROW by the BLM is a Federal undertaking, which triggers Section 106 of the NHPA. Section 106, through its implementing regulations (36 CFR 800), defines Federal undertakings as any project, activity, or program funded in whole or in part under the direct or indirect jurisdiction of a Federal agency, including those carried out by or on behalf of a Federal agency, those carried out with Federal financial assistance, and those requiring a Federal permit, license, or approval. The regulations require Federal agencies to consider the effects of their undertakings that have the potential to impact historic properties, including any district, site, building, structure, or object that is listed on or eligible for listing on the National Register of Historic Places (NRHP) and provide the State Historic Preservation Officer (SHPO), affected Tribes, and other consulting parties an opportunity to comment. The BLM and FWS notified the public that they would coordinate their public involvement obligations under the NHPA through this NEPA process, as provided for in 36 CFR 800.2(d)(3) through the NOI to prepare a SEIS (88 FR 78781-78783). As stated in 36 CFR 800.8(c)(4), when there will be adverse effects to historic properties, the agency must make binding commitments to avoid, minimize, or mitigate those effects in the ROD (see Section 4.2.2 for additional detail).

Endangered Species Act of 1973 (16 U.S.C. 1533(c)(1)). Section 7(a)(2) of the ESA requires that each Federal agency ensure that any action it authorizes, funds, or carries out is not likely to jeopardize the continued existence of a listed species or result in the destruction or adverse modification of designated critical habitat. Reasonable and prudent measures are taken, as needed, to minimize any "take" of listed species or their critical habitat. If an agency determines a proposed action may affect listed species or designated critical habitat, consultation between that agency and the FWS is required under Section 7 of the ESA. The ROW alternatives within the NCA cross designated critical habitat for the Mojave desert tortoise. The BLM developed a Biological Assessment to document the expected impacts to the species and its designated critical habitat, and completed formal consultation with the FWS, as part of the Final EIS process. The FWS also completed a formal intra-agency Section 7 consultation regarding the potential effects of issuing an ESA, Section 10(a)(1)(B) ITP to Washington County. The FWS, as co-lead for the SEIS, has again been working with the BLM to identify the potential impacts of the actions on threatened and endangered species and designated critical habitats in the SEIS. If an amendment to the ITP is warranted, the FWS will review the intra-agency Section 7 consultation to determine if revision is necessary.

1.6.2 Other Plans

Revised Recovery Plan for the Mojave Population of the Desert Tortoise (*Gopherus agassizii*). On April 2, 1990, the FWS listed the entire Mojave population (all tortoises north and west of the Colorado River in Arizona, Utah, Nevada, and California) as threatened, and a recovery plan was published in June 1994 (FWS 1994a). Recovery plans delineate reasonable actions that are believed to be required to recover and protect listed species. The recovery plan described a strategy for recovering the Mojave population of the desert tortoise, which included the identification of six recovery units, recommendations for a system of Desert Wildlife Management Areas within the recovery units, and development and implementation of specific recovery actions, especially within Desert Wildlife Management Areas. Establishment of recovery units and Desert Wildlife Management Areas was intended, in part, to facilitate an ecosystem approach to land management and desert tortoise recovery, as stipulated by Section 2(b) of the ESA (FWS 1994a). Following a multi-year collaboration with scientists, managers, and stakeholders, the FWS published the Revised Recovery Plan for the Mojave Population of the Desert Tortoise in May 2011 (FWS 2011).

City of St. George General Plan. Since the Final EIS was completed in 2020, the St. George City Council has adopted a new Downtown Area Plan. Many updates have been made to the St. George area, and specifically the downtown area, to improve livability of the downtown neighborhood since the General Plan was adopted in 2002, including a new library, children's museum, elementary school (Legacy Elementary), and City Hall. A new General Plan is also being developed but has not yet been adopted, as of the publication of this Final SEIS. The St. George Boulevard/100 South One-way Couplet alternative would not be consistent with the objectives of the Downtown Area Plan and the Draft General Plan. These are described in detail in Appendix H of the Final EIS and include objectives by the City to re-install on-street parking throughout the downtown area, promote a pedestrian-friendly downtown atmosphere, and develop a landscaped median in the core section of St. George Boulevard. These objectives would be difficult to accommodate if the One-way Couplet Alternative were implemented.

1.7 Public Involvement

Public participation opportunities that occurred prior to this SEIS are detailed in the Final EIS in Section 4.1 (page 4-1). Additional opportunities for the public to provide input were provided throughout the SEIS process. The formal scoping process for the SEIS began on November 16, 2023, with the publication of the NOI in the *Federal Register* (FR)informing the public of the BLM's and FWS's intent to prepare an SEIS to further consider the effects of granting a ROW to UDOT for the Northern Corridor, as well as a potential amendment to the ITP issued to Washington County, Utah, under Section 10(a)(1)(B) of the ESA (FR Vol. 88, No. 220, Thursday, November 16, 2023).[7] The initial notice had an incorrect end date for the scoping period of December 18, 2023. A subsequent notice was published that stated the correct end date of the scoping period was December 21, 2023 (FR Vol. 88, No. 240, Friday, December 15, 2023). Comments were accepted until December 28, 2023, due to requests by the public and elected officials for additional time to submit scoping comments.

During the public scoping period, an open house-style meeting was held at the Dixie Center in St. George on December 6, 2023. A total of 8,993 submissions were received from the public during the scoping period. Comments were reviewed and organized into categories to inform the analysis in the Draft SEIS. Scoping and public involvement activities are described in detail in the Scoping Report posted on the BLM's ePlanning website and are summarized in Section 4.1. Comments received during the scoping period were used to refine the issues addressed in the Draft SEIS. Because the SEIS focuses on topics identified in the NOI and any new conditions or information, some comments contained information beyond the scope of the decisions to be made.

A Notice of Availability (NOA) of the Draft SEIS for public review was published on May 10, 2024, as detailed in Section 4.1. The publication of the NOA signaled the start of a 45-day public comment period, originally scheduled to end on June 24, 2024. During the public comment period, the BLM and FWS hosted an open house-style meeting to provide an overview of the Draft SEIS and answer questions from the public. The meeting was held June 4, 2024, at 5:00 p.m. at the Dixie Convention Center in St. George. An updated traffic analysis for the Northern Corridor was released by the DMPO on June 20, 2024. A report of the field results of the updated vegetation monitoring for the three Northern Corridor routes in the NCA was also released on June 20, 2024. Because the public meeting was held before the updated traffic analysis and vegetation monitoring information was released, that information was not available at the public meeting. Both reports were made available on the BLM's ePlanning site on June 21, 2024, and the public comment period was extended to July 9, 2024, to allow for a total 60-day public comment period. Substantive comments received on the Draft SEIS were addressed in preparation of the SEIS.

[7] The NOI is available on BLM's ePlanning website at https://eplanning.blm.gov/eplanning-ui/project/2026562/570.

The BLM is using the NEPA public participation process to satisfy the public involvement requirements under Section 106 of the NHPA (54 U.S.C. 306108) and pursuant to 36 CFR 800.2(d)(3). The information about cultural resources within the Area of Potential Effects for this undertaking will assist the BLM in identifying and evaluating effects and/or impacts to such resources in the context of both NEPA and Section 106 of the NHPA. Further discussion of NHPA Section 106 consultation actions taken by both the BLM and FWS is provided in Sections 3.9 and 4.2.

1.8 Issues Considered for Detailed Analysis

This SEIS supplements the Final EIS and addresses the specific issues associated with supplemental information, as identified in the NOI. Key issues that are the focus of this SEIS analysis, including those identified in the NOI or during internal agency and public scoping, and for which there is new information or guidance since publication of the Final EIS, are:

- Vegetative Communities, including Noxious Weeds and Invasive Species.
- Special Status Plants.
- Fire and Fuels Management.
- Special Status Wildlife, specifically incorporating updated Mojave desert tortoise information.
- ESA Section 6 Land Acquisition Grants.
- Land and Water Conservation Fund Lands.
- National Conservation Area, specifically addressing the compatibility of the project with the conservation, protection, and enhancement of the resources of the Red Cliffs NCA.
- Cultural Resources and Native American Concerns, specifically addressing NHPA Section 106 compliance.
- Environmental Justice.
- Socioeconomics.

A detailed transportation and traffic analysis was prepared for the Final EIS by Horrocks Engineers under contract to the DMPO to help inform the development of alternatives. The analysis was also used to distinguish among the alternatives related to average intersection delay and travel time at key points and routes in the City of St. George. The traffic and transportation effects were based on future 2050 travel demand forecasts that were developed using the DMPO's regional travel demand model that included an analysis of the transportation system within the City of St. George, Washington City, City of Santa Clara, and the City of Ivins metropolitan areas. The traffic and transportation analysis methodology, study, intersections and roadways, and results are detailed in the *Northern Corridor Highway Alternatives Development Report* (Jacobs 2020a and included as Appendix J in the Final EIS) and the Preliminary Northern Corridor Traffic Analysis Memorandum (Horrocks Engineers 2020 and included as Appendix L in the Final EIS). The growth in and around the greater St. George metropolitan area, since the Final EIS was published, warranted an update to the traffic analysis. The DMPO commissioned Horrocks Engineers to update the traffic analysis in 2024. While this analysis was not available at the time of publication of the Draft SEIS in May of 2024, it is included in Appendix D in the Final SEIS (Horrocks Engineers 2024a). The Draft SEIS provided qualitative information and analysis regarding traffic data.

Issues Not Analyzed in Detail

Issues satisfactorily addressed in the Final EIS, or that have not substantially changed, or for which there is no new information that has bearing on the proposed action or its effects, are not analyzed in detail in this SEIS. Rather, the supplemental analysis tiers to and incorporates by reference the information and analyses contained in the Final EIS. The issues that were considered in this analysis, but not analyzed in detail, are listed below; more detail on the rationale for dismissal from detailed analysis, and where additional information for each resource can be found in the Final EIS, is provided in Appendix A. These issues include:

- General Wildlife.
- Geology, Mineral Resources, and Soils.
- Paleontology.
- Prime and Unique Farmland.
- Wetlands, Floodplains, and Waters of the United States.
- Water Resources.
- Air Quality, including Greenhouse Gases.
- Visual Resources.
- Recreation and Visitor Services.
- BLM Transportation and Travel Management.
- Areas of Critical Environmental Concern.
- BLM Lands and Realty.
- Livestock Grazing.
- Noise.
- Hazardous Materials and Solid Waste.
- Human Health and Safety.

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2 ALTERNATIVES

2.1 Introduction

The 2020 Final EIS describes five alternatives (UDOT ROW Alignment, T-Bone Mesa Alignment, Southern Alignment, Red Hills Parkway Expressway, and St. George Boulevard/100 South One-way Couplet)[8] that were considered in detail for the Northern Corridor and a No Action alternative. These alternatives, as well as others that were not considered in detail, are described in the *Northern Corridor Highway Alternatives Development Technical Report* (Jacobs 2020a). The five alternative routes for the Northern Corridor highway that were previously considered in detail are carried forward in this SEIS, as is an alternative that would terminate UDOT's ROW grant in the NCA, which is the equivalent of the "no action" alternative included in the 2020 Final EIS. When developing the alternatives for the SEIS, the BLM and FWS considered issues and alternatives raised during public scoping, input from consultation and coordination with Cooperating Agencies, and any new data and issues raised by agency resource specialists since publication of the Final EIS.

The five alternatives were developed through collaborative discussions with traffic engineers, environmental resource leads, agency stakeholders, project proponents, and the public. Three alternative alignments (UDOT ROW Alignment, T-Bone Mesa Alignment, and Southern Alignment) would result in a new highway being constructed within the NCA. The three alternatives within the NCA would create a multi-lane, divided highway with the following common features, as described in the UDOT Plan of Development (UDOT 2020):

- Up to a 500-foot-wide ROW. The total width of the ROW would vary between 300 and 500 feet because of differences in the cut and fill slopes and construction requirements along the length of the proposed highway. These variations would be based on geotechnical analysis, terrain type (e.g., rock or dirt), and further design to minimize impacts. The 500-foot study corridor width was selected to accommodate those areas requiring cut and fill slopes that would extend beyond the standard 300-foot typical section, which was based on the conceptual engineering design using readily available topographical and design-related information.
- A four-lane highway with two 12-foot-wide travel lanes in each direction, 8-foot shoulders, and a 20-foot center median.
- A combination of curb and gutter, drainage swales, and ditches.
- A 10- to 14-foot-wide multi-use, paved trail accommodating bicyclists and pedestrians on both sides of the proposed highway.
- Associated signage and fencing.
- Posted speed limit of 50 miles per hour.
- A new intersection for connection to Red Hills Parkway, consisting initially of an at-grade intersection with traffic signals and lighting. The intersection would later be converted to a grade-separated interchange with bridges, ramps, and lighting similar to a freeway interchange. Based on traffic levels and available funding, the conversion to the interchange would occur by 2050.
- A new at-grade intersection with traffic signals at Cottonwood Springs Road (also known as Old Dump Road or Turkey Farm Road); this connection would fit within the 500-foot ROW.
- A connection to the Washington Parkway at Green Spring Drive.

[8] The alternatives described in the Final EIS and carried forward here are based on preliminary engineering plans that may change. On February 2, 2024, UDOT provided the BLM with the Geographic Information System (GIS) shapefiles of its 30% design plan for the complete build out of the UDOT ROW Alignment. These plans were not available when the Final EIS was published and may be subject to further changes.

- Under-road passages (e.g., culverts) to provide connectivity underneath the roadway for Mojave desert tortoise and for recreational trails.
- Communications infrastructure (e.g., roadway cameras and associated fiber) and power supply for roadway cameras, lighting, and traffic signals may be required within the ROW. The requirements for these appurtenances would be determined during roadway design. If required, power supply and fiber would be buried within the ROW.

Under these alternatives, the highway may be constructed in two phases. Although specific details of the phased construction would be determined by UDOT during the final design of the highway, the first construction phase would result in one lane in each direction, likely with a center median. The second phase would provide an extra lane in each direction and conversion of the intersection with Red Hills Parkway to an interchange later.

The Red Hills Parkway is an existing multi-lane highway that crosses approximately 1,119 feet of public lands in the NCA. The BLM may need to grant necessary ROW amendments to the City of St. George's existing ROW for the Red Hills Parkway to accommodate the planned improvements to convert it to an expressway. The St. George Boulevard/100 South One-way Couplet is entirely outside the NCA and consists of existing roadways that are under the purview of the City of St. George. Under the Terminate UDOT's ROW alternative, the BLM would terminate the ROW grant issued to UDOT for the Northern Corridor across public lands in the NCA.

2.2 Zone 6 and Other Conservation Actions Associated with the Northern Corridor Changed Circumstance in the Amended Washington County HCP

FWS 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 (FWS) 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)." 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 (63 FR 8859). The approval of the Northern Corridor across the Reserve was included as a changed circumstance in Washington County's Amended HCP (Washington County 2020). Zone 6 of the Reserve was established as mitigation in response to the Northern Corridor changed circumstance to offset the construction of a highway within Zone 3 of the Reserve.

Zone 6 is currently functioning as part of the Reserve and the County's commitments and actions taken to date have resulted in conservation benefits in Zone 6. Zone 6 (see Figures 1 and 2) represents a contiguous block of Mojave desert tortoise habitat, separate from the other five zones of the Reserve. Management of this zone currently protects tortoises and suitable habitat on 3,341 acres of non-Federal lands that would have otherwise been subject to take under Washington County's ITP (for more information, see Section 2.4.2.6 of the Final EIS and Section 5.2.4 of the 2020 Biological Opinion issued by the FWS for the ROW and amendments to the RMPs). As part of the establishment of Zone 6, the BLM has an objective of acquiring non-Federal lands in Zone 6 that would be facilitated by Washington County and supported by the FWS, Utah Division of Wildlife Resources (UDWR), and the Utah Trust Lands Administration (TLA). Approximately 6,760 acres of the total 6,813 acres of Zone 6 are considered occupied Mojave desert tortoise habitat. Adding Zone 6 to the Reserve represented a nearly 11% increase in the area covered by the Reserve to offset the less than 1% of critical Mojave desert tortoise habitat that would be lost (direct effects), and the approximately 3.3% of habitat that would be fragmented (indirect effects), by the UDOT ROW.

Approximately one-third (2,345 acres) of the public lands in Zone 6 are within the Red Bluff Area of Critical Environmental Concern (ACEC; Figure 2). The BLM manages this ACEC to provide specific protections for the dwarf bear-poppy, an endangered native plant that only grows in Washington County, in highly erodible saline soils. These special protections include limiting motorized and non-motorized recreation uses to designated roads and trails, physical barriers to prevent off-trail use, and managing the public lands as an avoidance area to new ROWs.

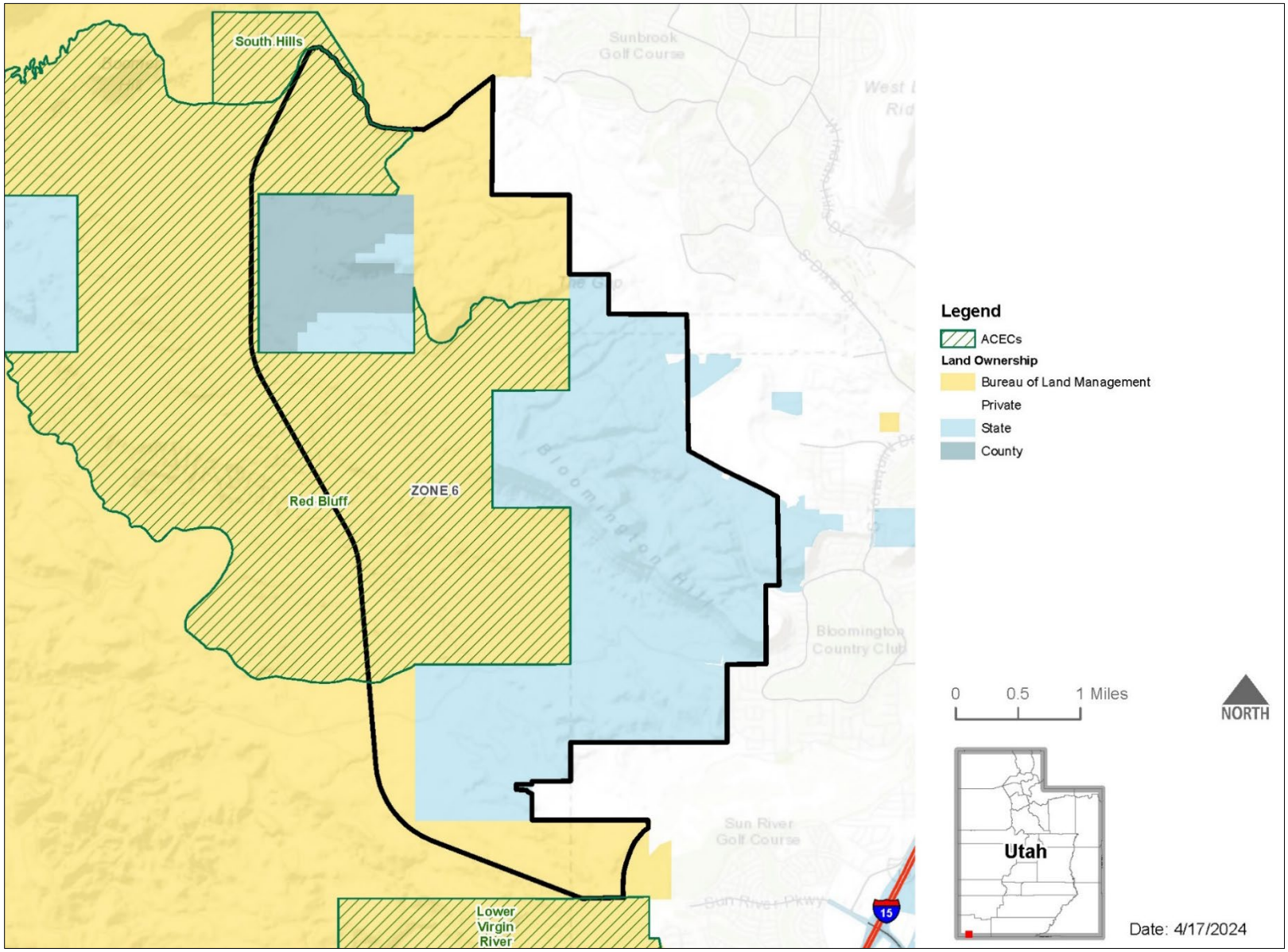
Additional HCP partner conservation obligations related to the establishment and management of Zone 6 are described in detail in the Amended HCP (Washington County 2020). Washington County increased its commitment to minimize and mitigate the impact of Mojave desert tortoise take to include many other actions, many of which are already underway or complete, including:

- Protecting additional high-density tortoise habitat in Zone 6.
- Providing $150,000 for Mojave desert tortoise passage structures (e.g., culverts) in Cottonwood Springs Road in Zone 3.
- Purchasing 450 acres of non-Federal land in Zone 6 (completed).
- Providing funding to support post-fire restoration in the Reserve, as described in the Amended HCP.
- Funding for Reserve administration.
- Fencing installations to prevent motorized access and enhance protections for listed plant species within Zone 6.
- Additional funding for law enforcement within the Reserve.
- Community education and outreach.
- Grazing permit acquisition and retirement (completed).
- Additional funding to support the application of development protocols.
- Reduction of existing designated recreation access routes.
- Funding for recreation management activities.
- Habitat and fire management.
- Monitoring and adaptive management planning.

If, following completion of the SEIS, the BLM affirms UDOT's ROW grant for the Northern Corridor, Zone 6 would be retained, the Northern Corridor changed circumstance would continue to be triggered (as described in the 2021 ITP), and Washington County would continue to implement the Amended HCP under the changed circumstance, including the commitments listed above. If the BLM selects the T-Bone Mesa or Southern Alignment, the FWS would not amend the ITP, as the Northern Corridor changed circumstance still applies. If the BLM terminates UDOT's ROW grant or selects an alternative outside of the NCA, then the FWS would amend the ITP because the Northern Corridor changed circumstance would no longer be triggered, thus eliminating Zone 6 as mitigation for UDOT's ROW grant and the conservation obligations stated above.

The Final EIS analyzed the effects of issuing the ITP both with and without the changed circumstance triggered. This analysis accounted for the potential take of Mojave desert tortoise on the 3,341 acres of non-Federal lands in Zone 6 should the Northern Corridor changed circumstance not be triggered (i.e., selection of a ROW alternative not crossing the NCA or the Terminate UDOT's ROW). As the agencies have previously analyzed take of desert tortoise from covered activities on non-Federal lands in Zone 6 in the Final EIS, similar effects are anticipated and that analysis has been supplemented with updated information throughout the SEIS, as appropriate. For a complete analysis, refer to Section 3.5.2.1 of the Final EIS.

Figure 2. Zone 6 of the Reserve



2.3 Alternatives for Analysis

The five alternative routes for the Northern Corridor highway that were previously considered in the Final EIS are carried forward in this SEIS, as is an alternative that would terminate UDOT's ROW for the Northern Corridor highway within the NCA. Updated preliminary cost estimate ranges were developed in June 2024 for each of the five Northern Corridor alternatives (Horrocks Engineers 2024b). These were based on conceptual engineering designs, but do not include refined design considerations such as site-specific ROW and constructability costs. Nevertheless, they are useful for general comparison purposes among the alternatives. Additional engineering design, planning, and approvals would be necessary for any of the alternatives. The BLM has identified Red Hills Parkway Expressway as the agency's preferred alternative.

2.3.1 UDOT ROW Alignment (Affirm Current ROW Grant)

The UDOT ROW Alignment was the Proposed Action in the Final EIS, and the BLM granted the ROW for this alternative in the 2021 ROD. Under this alternative, the BLM would affirm UDOT's ROW grant across public lands in the NCA for the Northern Corridor (Figure 3). This alternative functions as the "no change" alternative because the ROW grant for the Northern Corridor was issued to UDOT in January 2021 and was not vacated by the District Court when it remanded the BLM and FWS decisions. This alternative would have a similar analysis of effects as the "UDOT Application Alignment for the Northern Corridor" described in the Final EIS, although it is acknowledged that some of the conservation commitments identified in Section 2.2 have already been completed or are currently occurring; thus, the alternative is not exactly the same as in the Final EIS. The current term "UDOT ROW Alignment" will be used in this SEIS when referring to the analysis for this alternative in either the Final EIS or this SEIS.

The UDOT ROW Alignment would connect Green Spring Drive on the east to Red Hills Parkway on the west just north of the Pioneer Hills trailhead parking area. The Northern Corridor would be approximately 4.5 miles long, approximately 1.9 miles of which would be across BLM-managed lands. Under this alternative, the FWS would affirm Washington County's ITP for the take of Mojave desert tortoise. The changed circumstance related to construction of the Northern Corridor across the Reserve described in the Amended HCP remains triggered, and Zone 6 would remain as part of the Reserve. The estimated cost of construction of the UDOT ROW Alignment is between $183 million and $274 million dollars (Horrocks Engineers 2024b).

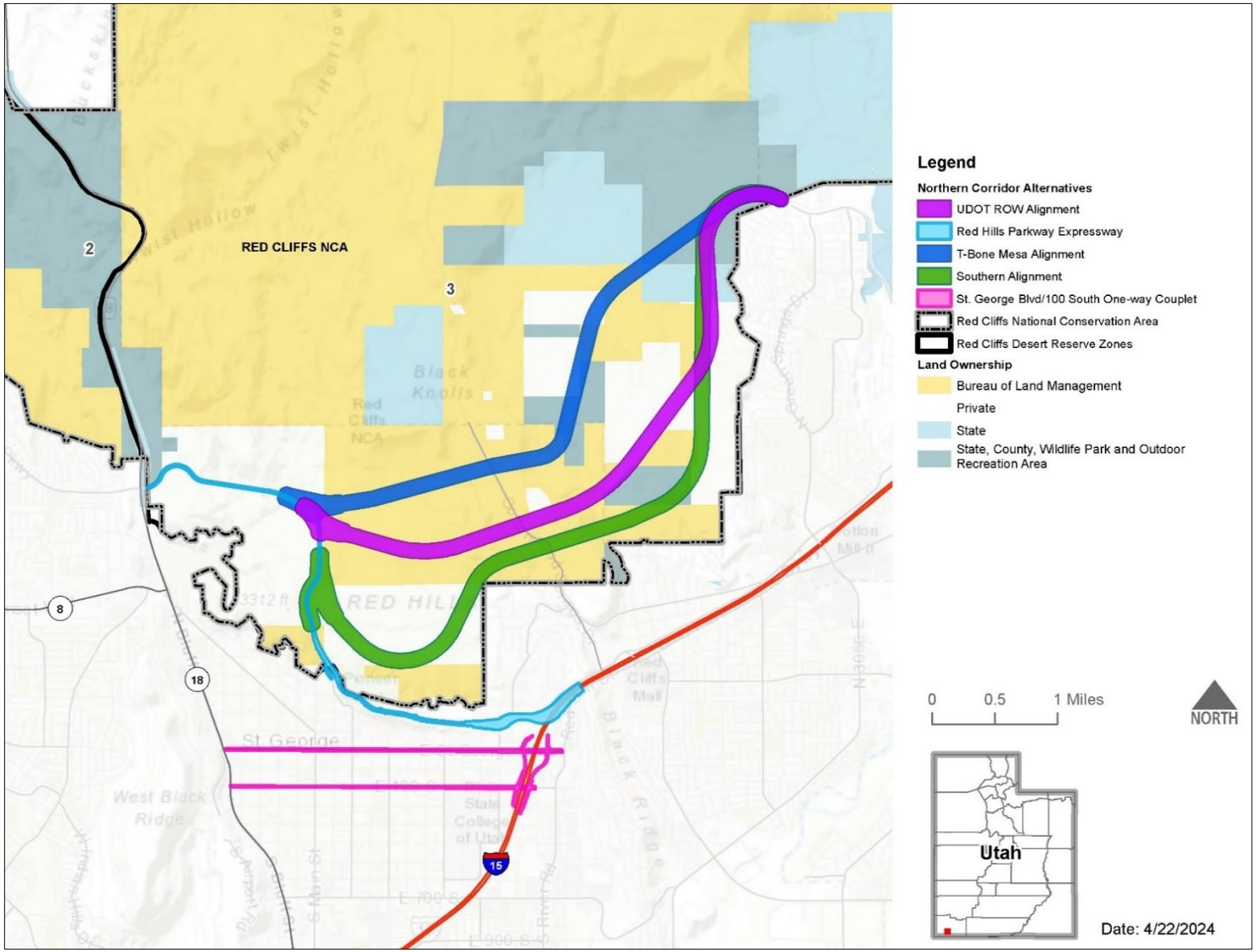
2.3.2 T-Bone Mesa Alignment

The BLM would affirm the ROW grant to UDOT across public lands in the NCA but show the T-Bone Mesa Alignment as the approved highway corridor. This alignment would connect Green Spring Drive on the east to Red Hills Parkway on the west just north of the Pioneer Hills trailhead parking area. Under this alternative, the Northern Corridor would skirt the southern edge of T-Bone Mesa. The Northern Corridor would be approximately 4.2 miles long, 2.2 miles of which would be across public lands in the NCA (Figure 3). Under this alternative, the FWS would affirm Washington County's ITP for the take of Mojave desert tortoise. The changed circumstance related to construction of the Northern Corridor across the Reserve described in the Amended HCP remains triggered, and Zone 6 would remain part of the Reserve. The estimated cost of construction of the T-Bone Mesa Alignment is between $171 million and $257 million (Horrocks Engineers 2024b).

2.3.3 Southern Alignment

The BLM would affirm the ROW grant to UDOT across public lands in the NCA but show the Southern Alignment as the approved highway corridor (Figure 3). Under this alternative, the Northern Corridor would be near the southern border of the NCA, connecting Green Spring Drive on the east to Red Hills Parkway on the west just south of, and slightly encroaching onto, the Pioneer Hills trailhead parking area. The Northern Corridor would be approximately 5.5 miles long, approximately 1.5 miles of which would be across public lands in the NCA.

Figure 3. Proposed Northern Corridor Alternatives



Under this alternative, the FWS would affirm Washington County's ITP for the take of Mojave desert tortoise. The changed circumstance related to construction of the Northern Corridor across the Reserve described in the Amended HCP remains triggered, and Zone 6 would remain as part of the Reserve. The estimated cost of construction of the Southern Alignment is between $175 million and $263 million (Horrocks Engineers 2024b).

2.3.4 Red Hills Parkway Expressway

The Red Hills Parkway Expressway alternative proposes modifying the existing Red Hills Parkway so that it would function as an expressway (Figure 3). An expressway is defined as a highway designed for higher speeds, with controlled entrances and exits, a dividing strip between the traffic in opposite directions, and two or more lanes in each direction. Under this alternative, UDOT would no longer hold the ROW grant for the Northern Corridor across the NCA. If the planned improvements exceed the boundaries of the existing ROW, the BLM may need to grant necessary ROW amendments to the City of St. George's existing ROW for the Red Hills Parkway, subject to all other applicable approvals, laws, and regulations. In this case, the City of St. George, or assignee, would need to submit an application to amend the existing ROW.

This alternative would convert Red Hills Parkway into a grade-separated expressway between I-15 and Bluff Street. Improvements would include new east-to-north and south-to-west connections to I-15 to connect Red Hills Parkway directly to I-15, including an additional lane in each direction extending most of the length between 200 East and 900 East. The alternative would also convert the existing at-grade signalized intersections at 200 East (Skyline Drive) and 1000 East to grade-separated interchanges with necessary modifications to the mainline roadway to accommodate the new interchanges. New flyover ramps would be constructed to connect Red Hills Parkway to I-15. The intersections at 900 East and Industrial Road would be closed or converted to right-in-right-out movements only because of their proximity to the 1000 East interchange and I-15 flyover ramps. The intersection at Highland Drive would be closed. Existing driveways to public and private properties along the existing roadway would either be closed or converted to right-in-right-out movements only; all left turns in and out would be prohibited.

Additional widening of Red Hills Parkway at various locations between 200 East and 900 East would be required to add exclusive turning lanes for access to individual properties or public use areas where feasible. Fencing with tortoise mesh exists along Red Hills Parkway wherever it crosses tortoise habitat, and widening the road to accommodate turning lanes may require moving the existing tortoise fencing. The existing pedestrian trail along Red Hills Parkway would be relocated in various locations between 200 East and 900 East to accommodate improvements, including lengthening of the existing pedestrian tunnel under Red Hills Parkway in the Pioneer Park area. The estimated cost of construction of the Red Hills Parkway Expressway alternative is between $174 million and $261 million (Horrocks Engineers 2024b).

The FWS would need to amend the ITP under this alternative because the Northern Corridor changed circumstance would no longer be triggered, thus eliminating Zone 6 as mitigation for the Northern Corridor highway. Instead, the FWS would authorize incidental take of the Mojave desert tortoise associated with the implementation of covered activities occurring on 3,341 acres of non-Federal lands in Zone 6. The additional HCP partner conservation obligations related to the establishment and management of Zone 6 described in Section 2.2 and in detail in the Amended HCP (Washington County 2020), some of which have already occurred, would end.

2.3.5 St. George Boulevard/100 South One-way Couplet

The One-way Couplet alternative proposes changes to existing St. George Boulevard and 100 South in the City of St. George (Figure 3). Under this alternative, UDOT would no longer hold the ROW grant for the Northern Corridor across the NCA. While this alternative meets the purpose and need of the project, it would have to be implemented by the City of St. George because it does not cross any BLM-managed lands.

This alternative would include modifications to St. George Boulevard and 100 South to respond to future transportation demands in the greater St. George metropolitan area. The two roadways would be converted into a one-way couplet system between I-15 and Bluff Street, wherein St. George Boulevard would only accommodate westbound traffic and 100 South would only accommodate eastbound traffic. St. George Boulevard would be converted from its existing two lanes in each direction (with a raised center median and turn pockets) to three westbound lanes. Modifications to the cross streets between I-15 and Bluff Street would disallow eastbound left and right turns from the cross streets. Similarly, 100 South would be converted from its existing one lane in each direction (with a center-turn lane), to three eastbound lanes. Modifications to the intersections at cross streets between I-15 and Bluff Street would disallow westbound left and right turns from the cross streets. Other minor reconstructions to storm drain and utility systems may be required to safely convert these streets to one-way operations.

On St. George Boulevard, the raised and landscaped medians and irrigation systems would be removed, and the median lighting would be replaced or relocated to the sides of the road. In addition, the Diverging Diamond Interchange at I-15/St. George Boulevard would be reconfigured to a more conventional diamond intersection configuration. On 100 South, the center two-way left-turn median and shoulders would be reconfigured. In addition, the existing interchange with I-15 at St. George Boulevard would be reconfigured and combined with a new interchange at 100 South to provide a split interchange system between these two roadways connected by one-way ramps. Southbound interstate traffic would exit at St. George Boulevard and enter from 100 South. Similarly, northbound interstate traffic would exit at 100 South and enter from St. George Boulevard. The estimated cost of construction of the One-way Couplet alternative is between $43 million and $64 million (Horrocks Engineers 2024b).

The FWS would need to amend the ITP under this alternative because the Northern Corridor changed circumstance would not be triggered, thus eliminating Zone 6 from the Reserve. Instead, the FWS would authorize incidental take of the Mojave desert tortoise associated with the implementation of covered activities occurring on non-Federal lands in Zone 6. The additional HCP partner conservation obligations related to the establishment and management of Zone 6 described in Section 2.2 and in detail in the Amended HCP (Washington County 2020) would cease. Management of Federal lands within Zone 6 would remain unchanged until a future land use planning process amends or revises the St. George Field Office RMP.

2.3.6 Terminate UDOT's ROW

Under this alternative, UDOT's ROW grant for the Northern Corridor across the NCA would be terminated. This alternative would have a similar analysis of effects as the "no action" alternative in the 2020 Final EIS, with the exception of the additional actions that have been taken by Washington County since the establishment of Zone 6 in 2021. The FWS would amend Washington County's ITP because the Northern Corridor changed circumstance would not be triggered, thus eliminating Zone 6 from the Reserve. Instead, the FWS would authorize incidental take of the Mojave desert tortoise associated with the implementation of covered activities occurring on non-Federal lands in Zone 6. The additional HCP partner conservation obligations related to the establishment and management of Zone 6 described in Section 2.2 and in detail in the Amended HCP (Washington County 2020), some of which have already occurred, would end. Management prescriptions and objectives for BLM-managed lands within Zone 6 would remain unchanged unless the RMP is amended in the future.

3 AFFECTED ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES

3.1 Introduction

This chapter describes the affected environment and environmental consequences associated with the resource issues identified in Section 1.8. The affected environment sections describe and update the existing conditions, focusing on those that have changed since the Final EIS was published. For all resources, the impacts of the past and present actions contribute to the current condition and are captured through the affected environment description for that resource. For most resources, the affected environment is the same as described in the Final EIS. Any differences between the Final EIS and this supplemental analysis are noted in Sections 3.2 to 3.11.

The environmental consequences analyze the effects of the alternatives and address specific, relevant concerns identified by the NOI or issues raised during scoping. The BLM and FWS reviewed available information to identify significant new circumstances or information relevant to environmental concerns and the alternatives analyzed (40 CFR Section 1502.9(d)(1)(II)). The analysis is organized by first presenting a summary of the effects identified in the Final EIS; then presenting any new data, direction, guidance, and analysis; and finally stating whether any of that changes the environmental consequences described in the Final EIS.

3.2 Vegetative Communities, Including Noxious Weeds and Invasive Species

The analysis area for the evaluation of impacts on vegetative communities in the Final EIS was defined as all Mojave desert tortoise suitable habitat and potential habitat within Washington County (including the UVRRU but excluding the Northeastern Mojave Recovery Unit along the western border of Washington County). This analysis area includes the Reserve (including Zone 6). The impacts of the alternatives to the dominant vegetative communities within the analysis area remain largely as described in Section 3.2.2 of the Final EIS. However, impacts of the alternatives on the potential spread of noxious weeds and invasive species within the Reserve and NCA are of particular concern, as these species can readily regrow and invade native ecosystems following fire and other disturbances. Therefore, the supplemental analysis in this section focuses primarily on noxious weeds and invasive species.[9]

3.2.1 2020 Final EIS Summary

Section 3.2 of the Final EIS (pages 3-6 to 3-19) discusses vegetative communities within the Reserve. According to the Final EIS, desert scrub predominates the vegetation types in the Reserve, accounting for 68% of the vegetation in Zones 1 through 5 of the analysis area in the Reserve and 88% in Zone 6. This group ranges from a sparse, mostly barren ground surface to a moderately dense layer (1 to 50% cover) of evergreen or drought-deciduous, broad-leaved shrubs and/or succulent species adapted to an environment with little water availability. Dominant shrubs may include creosote bush (*Larrea tridentata*), white bursage (*Ambrosia dumosa*), saltbush (*Altriplex canescens*), big sagebrush (*Artemisia tridentata*), yuccas (*Yucca* sp.), blackbrush (*Coleogyne ramosissima*), or rabbitbrush (*Ericameria* sp. or *Chrysothamnus* sp.). Invasive grasses, such as cheatgrass (*Bromus tectorum*) and red brome (*B. rubens*), and noxious weeds, such as African mustard (*Strigosella africana*), have been identified as a dominant understory throughout this community group in the analysis area (Miller 2018).

[9] A noxious weed is defined as a plant species designated by Federal or State law or by county government as injurious to public health, agriculture, recreation, wildlife, or property. An invasive species is defined as a plant species that is not native to a specific location and that has a tendency to spread to a degree believed to cause damage to the environment, human economy, or human health.

Noxious weeds and invasive species account for the second most prevalent vegetation type in the analysis area, accounting for 22% of the vegetation in Zones 1 through 5 of the analysis area in the Reserve and 10% in Zone 6. Exotic and invasive grasses include annual bromes (cheatgrass, red brome) and split grasses (*Schismus arabicus*, *S. barbatus*). Characteristic forbs may include tall tumble mustard (*Sisymbrium altissimum*), black mustard (*Brassica nigra*), and African mustard.

Most vegetation communities in the analysis area, as well as all areas that have burned in the last two decades, have become infested with invasive grasses that are continuing to spread. Surveys conducted in March and April of 2020 on the proposed ROW alignments showed 73% of the community was comprised of cheatgrass, redstem storksbill (*Erodium cicutarium*), split/Mediterranean grass, tall tumble mustard, and red brome (Jacobs 2020b). A modeling and mapping effort by The Nature Conservancy (TNC 2011) discovered that vegetation communities within the NCA are 90 to 100% departed ecologically from their original reference community. This is largely because of the rapid proliferation of invasive annual grasses and forbs following fire and the elimination of native shrubs that are slow to recover from fire.

Mapping efforts completed by LANDFIRE in 2014, prior to a 2016 base layer mapping revision (Remap), show a large, almost-solid, exotic herbaceous layer (classified as introduced annual and perennial grasslands and forblands) in the middle of the Reserve covering most of the upper western half of Zone 3. An extensive cover of an exotic herbaceous layer also blankets the eastern bajadas of the Beaver Dam Mountains, just west of Zone 6, providing a readily available source of seeds that could exacerbate the spread of weeds.

Localized vegetation surveys were conducted across the three proposed highway alignments on Federal, State, and private lands within the boundaries of the NCA in March and April of 2020. Survey methods followed the BLM's assessment, inventory, and monitoring (AIM) protocol (Toevs et al. 2011) and returned results that indicate invasive species represent a substantial amount of the plant cover within the ROW areas specifically. Averaged across all plots, approximately one-fourth of these proposed alternative alignments are dominated by native vegetation, predominantly creosote bush, Mormon tea (*Ephedra viridis*), blackbrush, broom snakeweed (*Gutierrezia sarothrae*), Sandberg bluegrass (*Poa secunda*), and big galleta (*Pleuraphis rigida*). Across the 46 plots surveyed, more than 73% of the total foliar cover identified in the AIM plots was made up of five invasive plant species: cheatgrass (46%), redstem storksbill (12%), split/Mediterranean grass (6%), tall tumble mustard (5%), and red brome (4%).

The UDOT ROW Alignment supports a minimum foliar cover of 67% exotic or invasive species, 41% of which is cheatgrass (Jacobs 2020b). The T-Bone Mesa Alignment supports a minimum of 75% foliar cover of exotic or invasive species, of which 52% is cheatgrass (Jacobs 2020b). The Southern Alignment supports a minimum foliar cover of 78% exotic or invasive species, of which 46% cover is cheatgrass, and 14% is split/Mediterranean grass (Jacobs 2020b).

The Final EIS stated that granting a ROW in the NCA could result in the unintentional spread of noxious weeds and invasive species because of ground disturbance and seed dispersal. Exotic invasive species have the potential to spread up to 1 kilometer outside of the ROW via wind dispersal, human activity, and other disturbances. Increases in invasive species would be less for the Red Hills Parkway Expressway Alignment compared to the alternatives within the NCA since this highway already exists and would be minimal for the One-Way Couplet since much of this area has already been disturbed and developed into residential and commercial properties.

3.2.2 Supplemental Analysis

Affected Environment

Invasive annual grasses are regarded as the most important causative factor in increased fire (Brooks 1999, Underwood et al. 2019). As invasive grasses fill interspaces between shrubs, fine fuel continuity is increased, enabling larger and more frequent fires (Smith et al. 2023, Stanton et al. 2023).

Fire hot spots are typically found closer to roads throughout the entire Mojave Desert where invasive plants are more abundant than in areas with lower densities of invasives (Smith et al. 2023, Stanton et al. 2023). Increased human activities and infrastructure have also contributed to the spread of invasive vegetation through ground disturbance.

The proliferation of invasive grasses increases the chance of wildfire ignition, facilitates spread, increases burn extent and intensity, decreases the time between fires, and decreases habitat quality (see Section 3.4; Underwood et al. 2019, FWS 2021b). The impacts of co-occurring invasive plant species on fire regimes and postfire native communities have been assessed in the Mojave Desert (Underwood et al. 2019). These studies have shown that invasive cover increased for the first 20 years postfire and that burned plots exhibited two to five times more invasive cover than unburned plots. Furthermore, invasive cover increased with each additional invasive species in the plot, and native herbaceous species declined when invasive cover ranged from 60 to 70%, resulting in negative impacts to native species abundance and diversity (Underwood et al. 2019). The presence of multiple invasive species led to synergistic effects, exacerbating impacts on native species diversity and ecosystem structure (Underwood et al. 2019).

Between April and May of 2020, the UDWR assessed plant cover composition near plantings within 100 acres of burned tortoise habitat in the NCA that was revegetated in 2016 and 2017. Exotic plant species were found in all monitoring plots across the entire restoration area, with cheatgrass and red brome increasing from 10% (at the time of revegetation) to up to 95% cover (UDWR 2020). This area re-burned in the 2020 Turkey Farm Road fire in the summer after the UDWR surveys. Underwood et al. (2019) observed no amplifying effect from repeat fires on fine fuel load in Mojave Desert experimental plots. Likewise, the 2020 fires in the NCA (see Section 3.4) may not have any additional impact on invasive plant density within these reburned areas beyond effects already observed from previous burns. The further elimination of native shrub species (e.g., creosote bush and blackbrush), and reduction of native forb species by the 2020 fires in previously burned and unburned habitats, represents a decline in Mojave desert tortoise habitat quality that may take decades to centuries to recover (Callison et al. 1985, Brown and Minnich 1986, Hood and Miller 2007, FWS 2011). Abundant winter precipitation in 2022/2023 produced abundant growth of annual and perennial native plants that was subsequently choked by the aggressive growth of exotic mustards (e.g., Sahara mustard, tall tumble mustard, and London rocket [*Sisymbrium irio*]), cheatgrass, red brome, Mediterranean grass, and Russian thistle (*Salsola paulsenii*) in the NCA and Snow Canyon State Park within Zones 2, 3, 4, and 5 of the Reserve (UDWR 2023).

During the spring of 2024, the BLM reassessed the current ecological condition of habitat for Mojave desert tortoise on public land across the three proposed Northern Corridor alignments within the NCA (BLM 2024). This report was released on June 20, 2024, and was made available on the BLM's ePlanning site on June 21, 2024; the public comment period was extended to allow for review of the data, which is included in this document as Appendix B. Survey methods followed the BLM's AIM protocol (Toevs et al. 2011). The initial habitat assessment of the three proposed Northern Corridor alignments in the NCA occurred in March and April 2020 with data collection in 46 terrestrial AIM plots (Jacobs 2020a). The BLM (2024) revisit assessment occurred in March and April 2024 with the collection of 51 terrestrial AIM plots using the same plot layout as in 2020. Forty-four of these plots were located along the three proposed alignments, with 39 of these being a revisit of a previously sampled 2020 plot and five being sampled in new locations to prevent sampling on non-BLM administered lands. The remaining seven plots were sampled within the perimeter of the 2020 Turkey Farm Road fire. Fourteen indicators were chosen as being representative of Mojave desert tortoise habitat conditions and were evaluated at each AIM plot (BLM 2024). There were statistically significant increases in herbaceous litter cover but decreases in soil stability and cover of annual grasses, Mojave desert tortoise-preferred forbs for diet, total foliar, and total forbs along the T-Bone Mesa and Southern Alignments, while the remaining indicators did not differ between 2020 to 2024. Only soil stability, cover of annual grasses, and Mojave desert tortoise-preferred forbs for diet decreased along the UDOT ROW Alignment, while the remaining indicators did not change from 2020 to 2024 (BLM 2024). The average plant cover and heights for all three alignments from the Jacobs (2020b) and BLM (2024) survey data are included in Table 1.

Table 1. Vegetation Cover and Plant Height Data from the AIM Studies for the Northern Corridor Proposed Alignments within the NCA

Indicator	UDOT ROW		T-Bone Mesa		Southern	
	2020	2024	2020	2024	2020	2024
Annual Forb Cover (%)	17.9	16.6	19.7	15.8	21.7	18.5
Annual Grass Cover (%)	50.4	30.6	56.9	29.4	46.1	29.2
Bare Soil Cover (%)	16.9	16.8	10.8	16.1	10.6	13.7
Herbaceous Litter Cover (%)	24.7	39.2	18.2	38.7	19.5	35.3
Tortoise Preferred Forb Diet Cover (%)	8.9	8.3	8.3	8.0	7.1	6.9
Tortoise Preferred Habitat Cover (%)	5.9	5.7	4.8	5.3	3.3	3.3
Perennial Forb Cover	5.7	9.7	3.3	5.9	18.3	8.0
Perennial Grass Cover (%)	5.9	1.8	6.9	2.6	1.8	1.8
Shrub Cover (%)	11.7	15.6	13.1	18.3	14.1	14.1
Soil Stability (unitless)	4.6	3.5	5.1	3.6	5.1	4.2
Total Foliar Cover (%)	66.8	55.5	71.2	53.6	70.4	51.3
Total Forb Cover (%)	22.6	18.5	22.7	16.0	34.1	17.9
Forb (all) Height (cm)	38.5	30.2	46.2	23.8	30.1	24.6
Grass (all) Height (cm)	26.0	22.8	28.0	24.7	26.3	20.1
Herbaceous (all) Height (cm)	30.1	26.7	37.7	26.0	28.7	23.1
Perennial Grass Height (cm)	17.3	24.1	16.4	21.6	17.6	16.7
Shrub Height (cm)	38.3	48.4	73.2	68.7	70.7	52.2
Woody (all) Height (cm)	42.6	48.2	66.4	68.7	58.9	52.2

Comparisons of the current ecological condition along the three proposed alignments within the NCA against terrestrial AIM plots in Northeast Mojave Desert (NE-Mojave) tortoise habitat indicate that there are no appreciable differences between the two. Cover of eight of 14 indicators assessed did not differ between the three proposed alignments and the NE-Mojave habitat. Cover of annual and perennial forbs, an important food source for Mojave desert tortoise, was significantly greater along each of the three alignments compared to the NE-Mojave. Species richness per plot did not differ among the three alignments compared to the NE-Mojave, indicating that there is sufficient vegetation preferred by Mojave desert tortoise for both diet and habitat along each of the alignments. Of concern was the greater annual grass cover in the NCA compared to the NE-Mojave, as invasive annual grasses are regarded as the most important causative factor in increased fire (BLM 2024). Although total species richness (all unique species) per plot did not differ between the 2024 NCA plots and the 2020 Turkey Farm Road fire plots, there were significantly fewer tortoise preferred plant species for both diet and habitat, highlighting the potential risk for long-term degradation of Mojave desert tortoise habitat post fire (BLM 2024).

In April of 2024, UDWR reassessed plant cover composition at the 100-acre restoration site in the NCA where prior surveys had been conducted in 2016 and 2020. The plots surveyed in 2024 included unburned and fire-disturbed habitat and sites where UDWR planted containerized native plants in 2017. UDWR completed 14 transects and observed 28 annual and perennial plant species. The UDWR (2024a) surveys found an increase in cover (since 2016) for six non-native species, including cheatgrass, red brome, redstem storksbill, Russian thistle, Mediterranean grass (*Schismus barbatus*), and foxtail (*Alopecurus* sp.). Bromus sp. and redstem storksbill were found at every plant transect, with the highest average cover class rating of all other species. Mediterranean grass was the only non-native species not detected in 2016 and 2020 (UDWR 2020). The lack of Russian thistle detected in 2020 was attributed to intensive manual

removal by community volunteers in 2019 and 2020 (UDWR 2020). Tall tumble mustard, previously identified as London rocket in UDWR (2020), was the only non-native species whose cover class decreased since initial surveys. Cheatgrass and red brome increased their average cover across the restoration site from 2 to 10% in 2016, 50 to 75% in 2020, and 25 to 50% in 2024. UDWR (2024a) also detected an increase in cover for five of the six containerized native plant species planted in 2017 (UDWR 2020). For example, the percent cover of globe mallow increased from 1 to 5% in prior surveys (i.e., 2016, 2020) to 25 to 50% in 2024, suggesting that this species successfully flowered and contributed seed to the seed bank, helping to accelerate recovery at this site (UDWR 2020, 2024a).

Although there was an increase in the number of annual and perennial plants observed from initial 2016 surveys, and an increase of the native species planted in 2017, the restoration site continued to be dominated by invasive species (UDWR 2024a). UDWR (2024a) recommends habitat management (i.e., actively revegetating disturbed habitat and reducing non-native annual plants through the use of biocontrol) to reduce habitat degradation and ultimately restore burned habitat.

Silverleaf nightshade (*Solanum elaeagnifolium*), whorled milkweed (*Asclepias subverticillata*), halogeton (*Halogeton glomeratus*), and Malta star-thistle (*Centaurea melitensis*), which are designated as Washington County Declared Noxious Weeds Early Detection/Rapid Response species, are being aggressively targeted upon discovery, as these invasive species are relatively new to the area. In 2024, an approximately 3-acre population of Malta star-thistle was identified within the analysis area in the northeast corner of Zone 3 near I-15 (BLM unpublished data). Malta star-thistle is a "high priority, Class 1A Early Detection Rapid Response" species in Washington County. This population is of concern because it occurs in critical habitat for Shivwits milkvetch (*Astragalus ampullarioides*), an endangered species (see Section 3.3) and a traditional plant of the Southern Paiute people. Although the NCA has not been systematically inventoried for the presence of noxious weeds, African mustard, giant reed (*Arundo donax*), Scotch thistle (*Onopordum acanthium*), tamarisk (*Tamarix ramosissima*), and puncturevine (*Tribulus terrestris*) are known to occur in the NCA, and the BLM is treating these species as described in the Integrated Weed Management Plan (BLM 2022a).

Environmental Consequences

UDOT ROW Alignment (Affirm Current ROW Grant)

Construction of the Northern Corridor on the UDOT ROW Alignment would result in ground disturbance, which is known to spread noxious and invasive plants. Vehicular travel on roads can also introduce and spread invasive plant species (FWS 2021b). The increased prevalence of invasive grasses increases the threat of wildfires. Construction of the Northern Corridor highway within the UDOT ROW Alignment has the potential to further introduce ignition sources during construction and through daily vehicle usage. This would increase fire probability and likely increase fire frequency near the highway, which would again lead to an increase in noxious weeds and invasive species.

High occurrence of noxious and invasive weeds already observed within the Reserve contribute to high fuel loads and the potential for new fires to spread beyond previously burned areas (see Section 3.4), thereby increasing the loss of native vegetation and habitat. Because of the high prevalence of invasives already found within the alternative alignments, it is possible the site is already saturated and further disturbances would have negligible effects (Moloney et al. 2019). It is likely that the effect of the 2020 wildfires on noxious and invasive plant density within previously burned areas was inconsequential, as noxious weeds and invasive species were already abundant from past wildfires (Underwood et al. 2019). However, newly burned areas would have an increase in noxious weeds and invasive species, thus spreading the increased threat of future wildfires to new areas within the Reserve.

Under this alternative, construction of the Northern Corridor across the Reserve on the UDOT ROW Alignment would occur, the changed circumstance described in the Amended HCP remains triggered, and Zone 6 would remain as part of the Reserve. Noxious weeds and invasive species are over 50% less abundant in Zone 6 compared to the rest of the Reserve. Current management protects habitat on non-

Federal lands in Zone 6 from development and provides for additional plant and habitat protections that would otherwise not be available. In addition, current management reduces unmanaged motorized and non-motorized recreational activities on and off trails on non-Federal lands in Zone 6, which would reduce habitat loss and degradation, reduce the risk of wildfires, and reduce the spread of noxious weeds and invasive plants.

T-Bone Mesa Alignment
Construction of the Northern Corridor highway on the T-Bone Mesa Alignment would result in similar potential impacts as the UDOT ROW Alignment, although these impacts would be in a different location. Impacts in Zone 6 would also be the same as described for the UDOT ROW Alignment and the additional protections afforded to plant and soil resources would remain in place.

Southern Alignment
Construction of the Northern Corridor highway on the Southern Alignment would result in similar potential impacts as the UDOT ROW Alignment, although these impacts would be in a different location. Impacts in Zone 6 would also be the same as those described for the UDOT ROW Alignment.

Red Hills Parkway Expressway
Modifications to the Red Hills Parkway to make it function as an expressway would result in substantially fewer impacts on native vegetation or the spread of noxious weeds and invasive species when compared to the construction of a new highway within the UDOT ROW Alignment. The Red Hills Parkway is a fenced multi-lane highway, and the modifications required would be limited to the roadway between Skyline Drive and I-15, with the most extensive being made in fully developed private and municipal areas. Under this alternative, the Northern Corridor changed circumstance is not triggered, thus eliminating Zone 6 from the Reserve as mitigation for the Northern Corridor, and non-Federal lands in Zone 6 would be subject to covered activities through the HCP (e.g., land development), as previously analyzed in Section 3.5.2.1 of the Final EIS. Increased activity could potentially increase noxious weeds and invasive species on these non-Federal lands in Zone 6. By selecting this alternative, development of the non-Federal lands within the Zone 6 boundaries may occur. Continued degradation of soils and habitat loss from the use of unmanaged motorized and non-motorized recreational activities on and off trails may also occur.

The BLM would continue to manage 3,471 acres of Federal lands within Zone 6, in conformance with the management goals and decisions from St. George Field Office RMP, as amended in 2021. However, additional resources provided by Washington County under the Northern Corridor changed circumstance would not be available, including funding of law enforcement, public outreach and education, or personnel that would otherwise support management beneficial to native plant communities.

St. George Boulevard/100 South One-Way Couplet
There would be no new impacts resulting from selecting the One-Way Couplet alternative beyond those described in Section 3.2.2.5 of the Final EIS. The potential impacts in Zone 6 would be the same as those described for the Red Hills Parkway Expressway.

Terminate UDOT's ROW
Under this alternative, the Northern Corridor highway would not be developed and there would be no new impacts beyond those described in Section 3.2.2.2 of the Final EIS. The potential impacts in Zone 6 would be the same as those described for the Red Hills Parkway Expressway. Management prescriptions and objectives for BLM-managed lands within Zone 6 would remain unchanged unless the RMP is amended in the future.

3.3 Special Status Plants

Special status plants are those that are proposed or listed as endangered or threatened under the ESA or listed as sensitive by the BLM. BLM Manual 6840 further defines special status plants as species requiring special management consideration to promote their conservation and reduce the likelihood and

need for future listing under the ESA. For the SEIS, the analysis area for special status plants is all Mojave desert tortoise suitable habitat and potential habitat within Washington County, as described in Section 3.2, and includes the Reserve.

3.3.1 2020 Final EIS Summary

Section 3.3 of the Final EIS (pages 3-19 to 3-37) discusses vegetative communities within the Reserve. Special status plants within the analysis area face threats because of their limited distributions and specialized habitat requirements. For example, many of the special status plants grow on soils that do not support most other plants and that are easily erodible or have other properties that can be easily destroyed (NRCS 2011). Recreation on public lands in the analysis area can be destructive to the sensitive soils that many of these plants require. Soil-disturbing activities include off-road vehicle use, mountain biking, and hiking. Plant populations located on private, State, or other non-Federal lands are vulnerable to urban development because of the population growth within the greater St. George metropolitan area. Other threats include utility and transportation corridors, grazing, fire, mining, invasive species, pest infestations, habitat fragmentation, illegal collection, and climate change (NRCS 2011).

Three Federally-listed endangered plant species and three BLM sensitive plant species are known to occur in the Reserve (Tables 2 and 3, respectively). Further information on the ecology of these species and their distribution is found in Section 3.3 of the Final EIS.

Table 2. Federally-listed Endangered Plant Species in the Reserve

Federally-listed Species	Presence in the Reserve
Dwarf bear-poppy (*Arctomecon humilis*)	Occupied habitat (Zone 6) Suitable habitat (Zones 1 through 4 and Zone 6)
Holmgren (Paradox) milkvetch (*Astragalus holmgreniorum*)	Occupied habitat (Zone 6) Suitable habitat (Zone 6) Critical habitat (Zone 6)
Shivwits milkvetch (*Astragalus ampullarioides*)	Occupied habitat (Zone 3) Suitable habitat (Zone 3) Critical habitat (Zone 3)

Table 3. BLM Sensitive Plant Species in the Reserve

BLM Listed Sensitive Species	Presence in the Reserve
Jones' indigobush (*Psorothamnus polydenius* var. *jonesii*)	Occupied habitat (Zone 4)
Parry's sandpaper plant (*Petalonyx parryi*)	Occupied habitat (Zone 4 and Zone 6)
Virgin thistle (*Cirsium virginense*)	Occupied habitat (Zone 3)

The Final EIS concluded that none of the endangered plant species would be impacted by construction or operation of the Northern Corridor within the NCA. The only endangered plant species present in the NCA is Shivwits milkvetch and it is only known to occur in one location in the far northeast corner of the NCA near I-15. None of the proposed alternatives cross near this location. Dwarf bear-poppy and Holmgren milkvetch are present in Zone 6, and the protections afforded these endangered plant species by the current management of Zone 6 in the Reserve are beneficial to the conservation and recovery of these populations.

The Final EIS concluded that construction and operation of the Northern Corridor along the UDOT ROW Alignment, the Southern Alignment, or the Red Hills Parkway Expressway could negatively impact the Virgin thistle, a BLM sensitive species, as there are known populations of this species along Red Hills

Parkway and where the terminus of the UDOT ROW Alignment or Southern Alignment would connect to the Red Hills Parkway. The other two BLM sensitive species do not occur near the Northern Corridor ROW alignments in Zone 3.

3.3.2 Supplemental Analysis

Affected Environment

Holmgren milkvetch, an endangered plant species only known to occur in Washington County, Utah, and Mohave County, Arizona, was identified as present on Federal lands in Zone 6, and critical habitat for this species was also present on these lands. Holmgren milkvetch is likely only found on Federal lands, and, although suitable habitat may exist in a broader area, an extensive vegetation survey on State lands in Zone 6 did not identify the presence of this listed species (Billings and Wheeler 2020). Updated surveys are needed to ascertain the extent of this species in Zone 6.

The newly identified 3-acre population of Malta star-thistle in Zone 3 is in designated critical habitat for Shivwits milkvetch. The BLM removed this infestation of Malta star-thistle where it was growing near Shivwits milkvetch plants. Although not near any of the alternative ROW locations, it is within the analysis area, and it is likely that this species would pose a threat to Shivwits milkvetch if it were to persist, as it is known to outcompete native plants for resources (Utah Weed Supervisors Association 2021).

Dwarf bear-poppy, an endangered species endemic to Washington County and restricted to certain soil types, is only found in nine recognized populations around St. George. In 2019, the Utah Department of Natural Resources (UDNR) performed field surveys and delineated dwarf bear-poppy occupied habitat within State lands in Zone 6. The UDNR-identified State lands contain approximately 10% of the total known population of dwarf bear-poppy plants and 2,589 acres of occupied habitat (Billings and Wheeler 2020, FWS 2021b). Because of the importance of Zone 6 in protecting the limited habitat for this species, the BLM and FWS have undertaken field survey efforts to obtain accurate counts of this species within Zone 6.

The FWS commissioned a dwarf bear-poppy census from 2019 to 2023 throughout the 8,871 acres of suitable habitat within the dwarf bear-poppy Red Bluffs population. Researchers used drones and artificial intelligence-based census methods that detect large adult and vegetative plants but not seedlings due to their small size. Using these methods, researchers found that Zone 6 contains 2,889 acres of occupied and suitable dwarf bear-poppy habitat, 73.8% of which occurs on Federal land and 26.2% on State land (Rominger 2024). The acreage identified for dwarf bear-poppy is larger than reported by the UDNR because it includes occupied and suitable habitat. While the census methods underestimate the total number of dwarf bear-poppy plants across the landscape, these methods avoid disturbance to the fragile gypsum soils and are the only reasonable way to cover the difficult and highly erodible terrain of the Red Bluffs population.

The average abundance estimate of dwarf bear-poppy plants within Zone 6 is 17,289 plants based on the range of 34,120 plants in 2019 to 2,135 plants in 2023 (Table 4). Zone 6 accounts for less than half of the Red Bluffs census area, yet nearly 79% of the poppy population occurs within Zone 6, with 81.6% occurring on Federal land and 18.4% occurring on State land. Almost all of the poppies found outside of Zone 6 in the Red Bluffs population occur on Federal lands (99.9%, data not shown). The dwarf bear-poppy habitat in Zone 6 contains much higher (4.5 times higher) poppy densities than habitat in the remaining Red Bluffs population (Rominger 2024). As such, habitat within Zone 6 is a high conservation priority for the species.

These results increase the range-wide estimated abundance of dwarf bear-poppy to 30,881 plants from the 11,600 plants reported in 2021; the estimate is across several years (FWS 2021c). Dwarf bear-poppy estimated abundance is based on several years of data due to the species' life history strategy.

Table 4. Estimated Number of Dwarf Bear-Poppies in Reserve Zone 6

Year	Federal	State	Total
2019	27,842	6,278	34,120
2020	23,944	5,399	29,343
2021	11,733	2,646	14,378
2022	5,280	1,190	6,470
2023	1,742	393	2,135

Adapted from Rominger 2024.

Despite this increase, State lands within Zone 6 still support approximately 10% of the range wide total of known plants reported in 2021. The population decline from 2019 to 2023 was not unexpected, as the life history strategy for this species involves large sporadic recruitment events followed by a period of decline. The drop in population size from 2021 and 2022 can be explained by the low precipitation in those years, resulting in high poppy mortality. The population decline observed in 2023, based on the demographic data used to determine survival/mortality, may be attributed to the old age of the poppies, as most of the poppies emerged in the large recruitment event of 2017. Another recruitment event occurred in the spring of 2022, although the new poppies were still too small to detect in the 2023 monitoring. However, many new, smaller flowering poppies were directly observed in the field during the annual monitoring conducted in May 2024 (Rominger 2024).

Environment Consequences

UDOT ROW Alignment (Affirm Current ROW Grant)

Construction of the Northern Corridor on the UDOT ROW Alignment would not directly impact any Federally-listed plant species. Shivwits milkvetch is the only Federally-listed plant in the Reserve, and it is not known to occur near any of the alternative alignments. Construction of the UDOT ROW Alignment could adversely impact the BLM sensitive Virgin thistle, as there are known populations of this species where the UDOT ROW Alignment would connect to the Red Hills Parkway.

Construction of the Northern Corridor across the Reserve on the UDOT ROW Alignment would occur and Zone 6 would remain as part of the Reserve. Maintaining Zone 6 as part of the Reserve would protect occupied and suitable habitat for dwarf bear-poppy and Holmgren milkvetch, Holmgren milkvetch critical habitat, and the populations of Parry's sandpaper plant that occur in this area. Current management of the area protects habitat on non-Federal lands in Zone 6 from development and provides for additional plant and habitat protections that would otherwise not be available under the ESA. Current management also reduces unmanaged motorized and non-motorized recreational activities on and off trails on non-Federal lands in Zone 6, which would reduce habitat loss and degradation, reduce the risk of wildfires, and reduce the spread of noxious weeds and invasive plants into Federally-listed and BLM sensitive plant occupied or suitable habitat.

T-Bone Mesa Alignment

Construction of the Northern Corridor highway within the T-Bone Mesa Alignment would not impact any Federally-listed plant species. Virgin thistle populations would not be expected to be adversely impacted by highway construction within the T-Bone Mesa Alignment, as this species is not present where this alignment would connect to Red Hills Parkway. Under this alternative, Zone 6 would remain as part of the Reserve. Maintaining Zone 6 as part of the Reserve would protect occupied and suitable habitat for dwarf bear-poppy and Holmgren milkvetch, Holmgren milkvetch critical habitat, and populations of Parry's sandpaper plant that occur in this area.

Southern Alignment

Although construction of the Northern Corridor highway within the Southern Alignment would not impact any Federally-listed plant species, it could affect the Virgin thistle, as there are known populations of this species where the Southern Alignment would connect to the Red Hills Parkway. Under this

alternative, Zone 6 would remain as part of the Reserve. Maintaining Zone 6 as part of the Reserve would protect occupied and suitable habitat for dwarf bear-poppy and Holmgren milkvetch, Holmgren milkvetch critical habitat, and populations of Parry's sandpaper plant that occur in this area.

Red Hills Parkway Expressway

Selecting the Red Hills Parkway Expressway would not result in any impacts to Federally-listed plant species within the NCA. Virgin thistle populations are known to occur in areas directly adjacent to Red Hills Parkway, including one near the intersection of Skyline Drive. This alternative could result in the loss of individual plants of this species if the expansion of the Red Hills Parkway Expressway ROW were to occur. Impacts to Virgin thistle for this alignment were analyzed in the Final EIS in Section 3.3.

Under this alternative, Zone 6 would not remain as part of the Reserve. The non-Federal lands in Zone 6 are currently protected under the changed circumstance; however, if this alternative is selected, the changed circumstance is not triggered and endangered plants and occupied habitat on non-Federal lands would be subject to development. Within Zone 6, non-Federal lands account for approximately 756 acres of occupied and suitable habitat for dwarf bear poppy, and approximately 10% of range wide total known plants (393 to 6,278 plants, see Table 4). Holmgren milkvetch is likely only found on Federal lands in Zone 6, although suitable habitat may exist in a broader area of Zone 6.

The BLM would continue to manage 3,471 acres of Federal lands within Zone 6, in conformance with decisions from the St. George Field Office RMP, as amended in 2021. The amendments in 2021 increased the level of protection for public land resources through restrictions on certain land uses that can impact Federally-listed native plants and their habitats. However, the additional resources provided by Washington County under the Northern Corridor changed circumstance would not be available, including funding of law enforcement, additional protective fencing, public outreach and education, and personnel that would support management beneficial to special status plants. The 3,341 acres of non-Federal lands within Zone 6 would be available for future development, resulting in the potential loss of dwarf bear-poppy and Parry's sandpaper plants, and direct impacts to occupied and suitable habitat for dwarf bear-poppy and Holmgren milkvetch.

St. George Boulevard/100 South One-Way Couplet

Selecting the One-Way Couplet would not affect Federally-listed or BLM Sensitive plant species, as these species do not occur along either of the streets that would comprise the Couplet. However, under this alternative, Zone 6 would not remain as part of the Reserve and non-Federal lands would be subject to development with no assurance of plant or habitat protections under the ESA, as described for the Red Hills Parkway Expressway.

Terminate UDOT's ROW

Under this alternative, the Northern Corridor highway would not be developed, and Zone 6 would not remain as part of the Reserve. The potential impacts in Zone 6 would be the same as those described for the Red Hills Parkway Expressway. Management of the 3,471 acres of public lands in this Zone would continue to be in conformance with the St. George Field Office RMP, as amended in 2021. However, the non-Federal lands would be available for future development, resulting in potential impacts to occupied and suitable habitat for dwarf bear-poppy and Holmgren milkvetch, and direct impacts to populations of Parry's sandpaper that occur in this area.

3.4 Fire and Fuels Management

Large-scale or frequent wildland fires are not part of the natural fire regime of the Mojave Desert, as desert shrublands are not fire-adapted (Paysen et al. 2000). Wildfire regimes are changing dramatically across North American deserts with the spread of invasive grasses (Stanton et al. 2023). The increase in fine fuels in the spaces between native shrubs due to the presence of invasive annual grasses has resulted in larger and more frequent fires in deserts of North America (Bishop et al. 2019, Fusco et al. 2019). The management of fire and invasive plants must be closely integrated for each to be managed effectively

(Brooks and Pyke 2001). The analysis area for fire focuses primarily on the NCA and Reserve, although the influence of increasing wildfires throughout Washington County and in the northern Mojave Desert is also considered.

3.4.1 2020 Final EIS Summary

Section 3.22 of the Final EIS (pages 3-189 to 3-194) discusses fire and fuels management within the Reserve. Desert shrublands are not fire-adapted species; therefore, large-scale or frequent wildland fires are not part of the natural fire regime of the Mojave Desert (Paysen et al. 2000). Historically, wildfire has been a rare occurrence because the Mojave Desert does not produce enough vegetation to carry a fire.

Large-scale wildfires have become more frequent due primarily to the proliferation of invasive grasses, specifically red brome and cheatgrass (Brown and Minnich 1986, Brooks 1999, Brooks and Esque 2002, McKenzie et al. 2004, UDWR 2021). Additional factors include elevated temperatures and prolonged droughts. Native Mojave Desert species, unaccustomed to frequent large-scale fires, struggle to recover from larger and more-frequent fires, and recovery of associated native plant communities is slow (Brooks and Esque 2002, UDWR 2021). The NCA and the Reserve, including Zone 6, are managed for full fire suppression since the plant communities in these areas are not fire-resistant or resilient. Emergency stabilization and rehabilitation efforts follow each fire incident.

Since 1976, a total of 19,428 acres have burned within Zones 1 through 5 of the Reserve, which includes the NCA, with 42% of all burned areas burning multiple times. Following publication of the Draft EIS, three human-caused wildfires (Turkey Farm Road, Cottonwood Trail, and Lava Ridge) burned approximately 11,750 acres within the NCA and Reserve, of which over 8,800 acres had been burned in prior wildfires. Since much of the previously burned area had already converted to invasive annual grasses and noxious weeds following the initial burns, there was less native vegetation left to burn in these recent fires. In the Final EIS, the BLM and FWS considered the impact these three fires had on the amount and quality of affected Mojave desert tortoise habitat and estimated potential direct impacts to the Mojave desert tortoise population, including mortality and injury.

The Final EIS did not definitively state whether the Northern Corridor highway would have an effect on fire frequency or intensity. The Final EIS stated that granting a ROW in the NCA could result in improved wildfire suppression response, as the roadway would provide quicker access to an area that is not currently easily accessible, and as a linear barrier (i.e., a roadway) may function as a fuel break that may slow or stop the spread of fire. The Final EIS also stated that construction of the Northern Corridor would remove existing vegetation within the ROW corridor, and potentially convert large portions of these areas with ‘Low’ and ‘Low to Moderate’ Vegetation Condition Classes to non-burnable developed land. However, construction activities may introduce noxious weeds and invasive species to the area, as described in Section 3.3, and traveling vehicles along the highway may introduce new ignition sources and increase the likelihood of fire in the area. The areas burned by these fires may give invasive grasses and other nonnative plant species an opportunity to establish themselves in the affected area and alter the Vegetation Condition Classes of lands surrounding the highway.

3.4.2 Supplemental Analysis

Affected Environment

This section discusses climate change and fire, invasive species and fire, and recent wildfires in the Reserve.

Climate Change and Fire

Wildfire activity is undergoing shifts in frequency, intensity, and seasonality in response to climate change. Across the contiguous United States between 1984 and 2020, the number of wildfires increased by 94% and the total burned area increased by 337% (Boisramé et al. 2022, Iglesias et al. 2022, Yu et al. 2023). High fire danger days are expected to increase as much as 41 days more than the historic average,

driven by increased fuel production cycles during wet years followed by more frequent droughts (FWS 2021c, Yu et al. 2023).

Fuel moisture levels are important predictors of wildfire risk. Increased dryness of fuels, driven by drought, increases the ease and risk of ignition and prolongs the fire season (Matthews et al. 2011, Jolly 2015). There is evidence pointing to a global shift towards extreme fuel dryness propelled by climate change. A recent study found a near-universal trend in drying wildland fuels across most of Earth's flammable ecoregions between 1979 and 2019 (Ellis et al. 2022). Notably, strong, widespread drying trends in western North America add to the global evidence (Ellis et al. 2022). These patterns suggest continuous increases in fire-prone fuels if current climatic trends continue.

Invasive Species and Fire

Historically, large fires were rare in the Mojave Desert pre-1970 (Humphrey 1974, Brooks 1999) and were generally characterized by small (generally less than 110 acres) local fires that burned out quickly due to the patchy distribution of Mojave Desert scrub vegetation and lack of fuel in interstitial spaces (Lovich and Bainbridge 1999, Paysen et al. 2000, Brooks and Matchett 2006, UDWR 2021).

In conjunction with climatic changes, wildfire frequency, extent, and intensity within the UVRRU, and the Reserve specifically, have increased because of the increase and establishment of non-native invasive plants (e.g., red brome and cheatgrass) that provide ample dry "bridge" fuels, which allow fires to spread quickly between native plants (Fusco et al. 2019, Stanton et al. 2023). Historically, Mojave Desert ecozones did not produce enough vegetation to sustain fire spread across the landscape. Fires were rare due to lack of fine fuels to facilitate ignition or to "carry" the fire as it spreads. However, with increasing invasive annual grasses and noxious weeds (see Section 3.2), an emerging pattern suggests previously burned areas will burn hotter and larger roughly 12 to 15 years after having been previously burned (UDWR 2020) and may even support fire return intervals as short as 5 to 10 years (Hood and Miller 2007, TNC 2011, FWS 2021b). Areas that burn repeatedly suffer native vegetation loss and see an increase in invasive annual grasses and noxious weeds, which provide more fuel and are more flammable than native vegetation, and thus contribute to increased fire frequency.

After a fire, non-native vegetation is likely to increase in density due to faster post-fire recovery compared to native species, causing further habitat degradation (Boarman 2002). Recurrent fires can alter habitat structure and plant species composition, density, and cover of native plants, including preferred Mojave desert tortoise forage plants (Brooks and Esque 2002, FWS 2021b). Studies have shown that the presence and dominance of invasive annual grasses makes areas more susceptible to recurring fire cycles (Brooks 1999). An increased fire cycle is an ecological threat because most native plant species are poorly adapted to survive fire in the deserts of southwestern North America (Brooks 1999). Fires result in increased inorganic nitrogen in the soils, which can favor invasive annuals over natives, fueling further invasive plant presence and dominance in the ecosystem (Brooks 2003, Esque et al. 2010, Jones et al. 2015). Human presence and activities (i.e., recreation) can increase ecological disturbance, acting as a vector for the introduction and increased spread of non-native and invasive species (Seabloom et al. 2006, Bishop et al. 2019), as well as introducing potential ignition sources (Brooks 1999, Brooks and Esque 2002, BLM 2015, FWS 2021b).

Recent Wildfires

After the Final EIS was published, two additional fires burned in the Reserve in 2020, and there have been four additional small fires (<110 acres) since 2020 (Table 5). In addition to the approximately 11,750 acres burned in the three 2020 wildfires discussed in the Final EIS, two additional human-caused fires burned in the Reserve in 2020: (1) the Snow Canyon fire, which burned 630 acres in the NCA as well as on State Park land; and (2) the 56-acre Volcano fire, which was entirely within Snow Canyon State Park. A total of 12,437 acres were burned in the Reserve because of these five fires, of which 2,583 acres were previously unburned. All five fires that burned within the Reserve were human caused and burned 9,019 acres of tortoise critical habitat (see Section 3.6). Native shrub vegetation was severely

burned throughout surveyed areas within the Cottonwood Trail and Turkey Farm Road fire footprints. Little to no ground cover was present in areas that have experienced multiple burns in the last 20 years (UDWR 2021).

Table 5. Reserve Acres Burned by Wildfires Since 1993

Fire Name	Year	Reserve Acres Burned	Zone 3 Acres Burned*
Millcreek	1993	2,248.0	2,248.0
Sandstone	1993	85.1	0.0
Sandstone	1993	28.8	0.0
T-Bone Hill	1993	92.3	92.3
Twist Hollow	1994	62.3	62.3
Turkey Farm 1	1998	102.8	102.8
Turkey Farm 2	1998	404.7	404.7
Yant Flat	2005	0.3	0.3
Cottonwood	2005	8.2	8.2
Red Cliffs	2005	731.6	731.6
Pit	2005	28.9	0.0
SR 18	2005	65.5	65.5
Diamond Valley Complex	2005	5,835.6	5,835.6
Millcreek	2005	7,696.5	7,696.5
Tortoise	2005	29.7	29.7
Line	2006	9.8	9.8
Bluff	2006	15.2	15.2
Red Hill	2006	38.2	0.0
Red Hills	2011	63.8	63.8
Quail	2012	1,166.5	0.0
Reserve	2012	3,033.3	3,033.3
Turkey Farm Road	2016	12.8	12.8
Turkey Farm Road	2020	10,005.1	10,005.1
Volcano	2020	56.5	0.0
Cottonwood Trail	2020	1,396.9	1,396.9
Lava Ridge	2020	348.3	348.3
Snow Canyon	2020	630.3	630.3
1450	2020	0.3	0.0
Babylon	2021	13.2	0.0
Cottonwood	2022	15.7	15.7
Moe's Valley	2022	0.5	0
Dixie Rock	2023	0.5	0.5

*Acres estimated by digitizing the fire boundary extents and clipping them to the boundary of the Reserve or of Zone 3.

The Turkey Farm Road fire burned 100 acres of previously burned revegetated Mojave desert tortoise habitat within the NCA, decreasing survival of plantings by 50%. Creosote bush had the greatest wildfire mortality with a 6% survival rate post fire (UDWR 2020). Restoration within burned areas in desert ecosystems is difficult and often unsuccessful (Abella and Newton 2009, as cited in TNC 2011) due to altered soil nutrient conditions, the loss of shade, high temperatures, and irregular rainfall patterns. Although some native shrubs are able to resprout and recover within 20 years, they have little chance of recovery within areas burned multiple times in a 20-year period (TNC 2011). Some shrub communities are severely impacted by fire and may take centuries to recover. Though surviving creosote bush have limited sprouting ability after low-intensity fires, they can regrow to their former size within 5 years

(NatureServe 2018). However, big sagebrush lacks morphological or physiological adaptations to survive fire or facilitate rapid recolonization, and blackbrush shrublands, one of the most flammable vegetation communities in the region, can take centuries to recover (Hood and Miller 2007). As previously stated, the landscape is now capable of supporting fire-return intervals as short as 5 to 10 years (Hood and Miller 2007, TNC 2011, FWS 2021b). Fire occurrence at this frequency would prevent most, if not all, recovery of the native shrub communities without active management strategies to reduce fire and invasive grasses and promote native shrub communities.

Since 1993, thirty-two fires have burned a total of 34,227 acres in the Reserve (Table 5); some of these fires have burned the same area more than once. These fires have burned areas as small as 0.5-acre (or less) to over 10,000 acres in the Reserve, and many of the fires were larger than this, as they also burned lands outside of the Reserve (Figure 4). Of these fires, 23 of them have burned in Zone 3, consuming approximately 32,809 acres. The areas burned during the 2020 wildfires did not intersect with the action area for any of the ROW alternatives within the NCA. However, all three action areas intersected with areas burned in fires during previous years (Figure 5). The UDOT ROW Alignment would cross 43.8 acres of previously burned area, which amounts to 15% of the total acreage of that alignment; 20% of the T-bone Mesa Alignment (52.2 acres) and 13% of the Southern Alignment (45.1 acres) would cross previously burned areas.

Zone 6 has been relatively free of any fires during this period except for a small (0.5-acre) fire that burned in Moe's Valley in 2022. However, there have been 33 fires that have burned adjacent to or within 5 miles of Zone 6 since 1993 (Figure 4). The increased threat of larger, catastrophic wildfires is a continued concern for Mojave desert tortoise recovery and management across the species range (FWS 2022a). Direct and indirect impacts to Mojave desert tortoises from wildfires can be numerous and variable. A detailed analysis of these impacts, including impacts resulting from the 2020 wildfires specifically, is provided in Section 3.5.

Environmental Consequences

UDOT ROW Alignment (Affirm Current ROW Grant)

Construction of the Northern Corridor within the UDOT ROW Alignment has the potential to further introduce ignition sources during construction and through daily vehicle usage and increased human presence and activity. Road construction would create a permanent fuel break, and potential weed treatments and road maintenance activities could reduce fuel loads in the short term. These actions may not offset the increase in fire probability and likely increase in fire frequency that would occur from constructing a road in the NCA. All five fires that occurred in 2020 were human caused, and the increased human presence that would result from selecting an alternative within the NCA may increase fire probability and frequency. Native vegetation and wildlife already affected by previous wildfires would have increased difficulties recovering from further population and habitat loss. The proliferation of noxious and invasive plants already observed within the Reserve contributes to high fuel loads and the potential for new fires to spread beyond previously burned areas, thereby increasing loss of native vegetation and habitat. Increased fires, coupled with the loss of native vegetation, would lead to loss of tortoise habitat in Zone 3, as described in more detail in Section 3.5.2 below.

Zone 6 has been relatively untouched by wildfires, and the additional plant and habitat protections that are in place because of the changed circumstance would reduce unmanaged motorized and non-motorized recreational activities on and off trails on non-Federal lands in Zone 6. These protections could reduce habitat loss and degradation, reduce the spread of noxious weeds and invasive plants, and reduce the risk of wildfires in this area.

Figure 4. Fire Perimeters in and near the Reserve

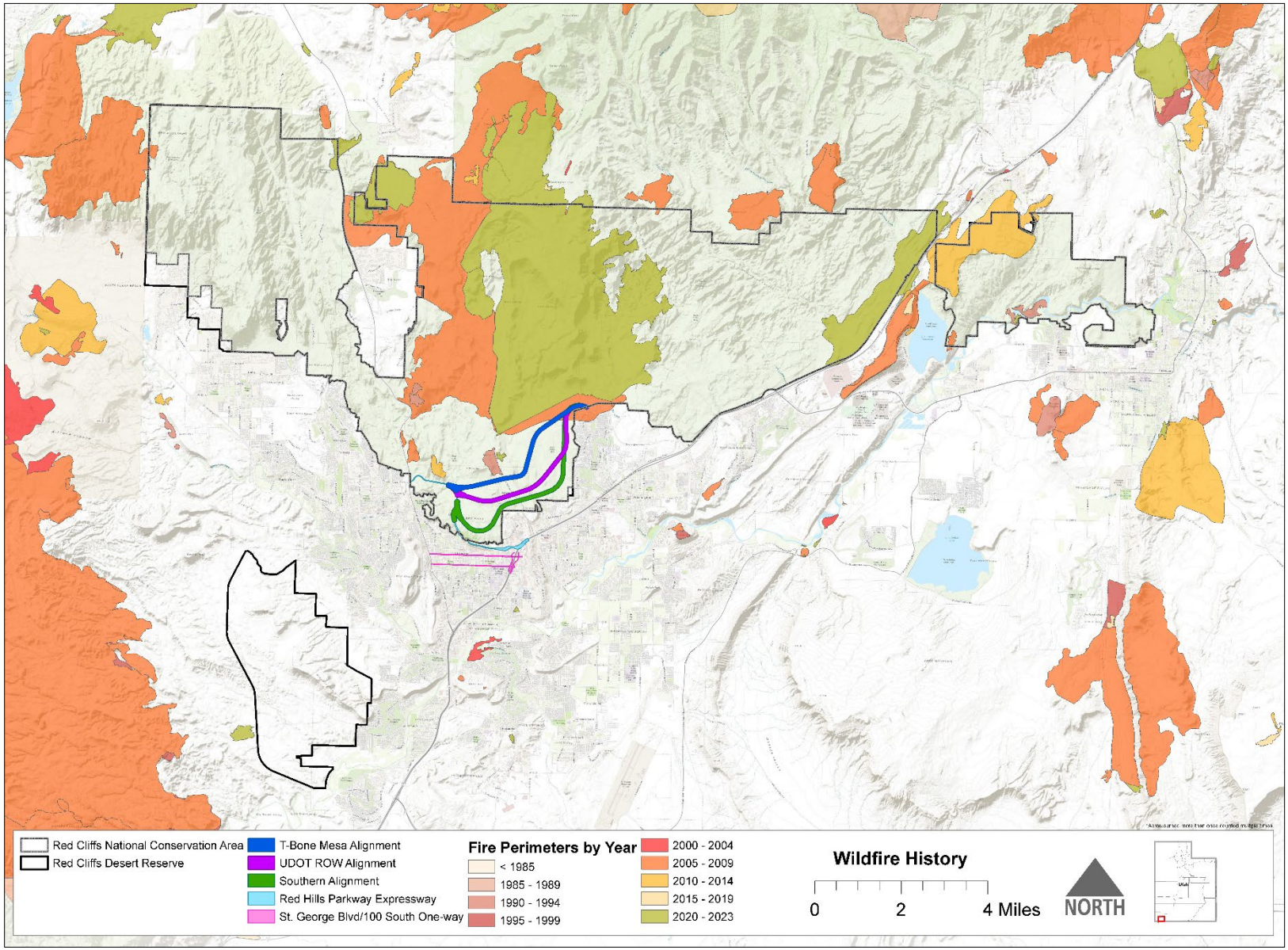
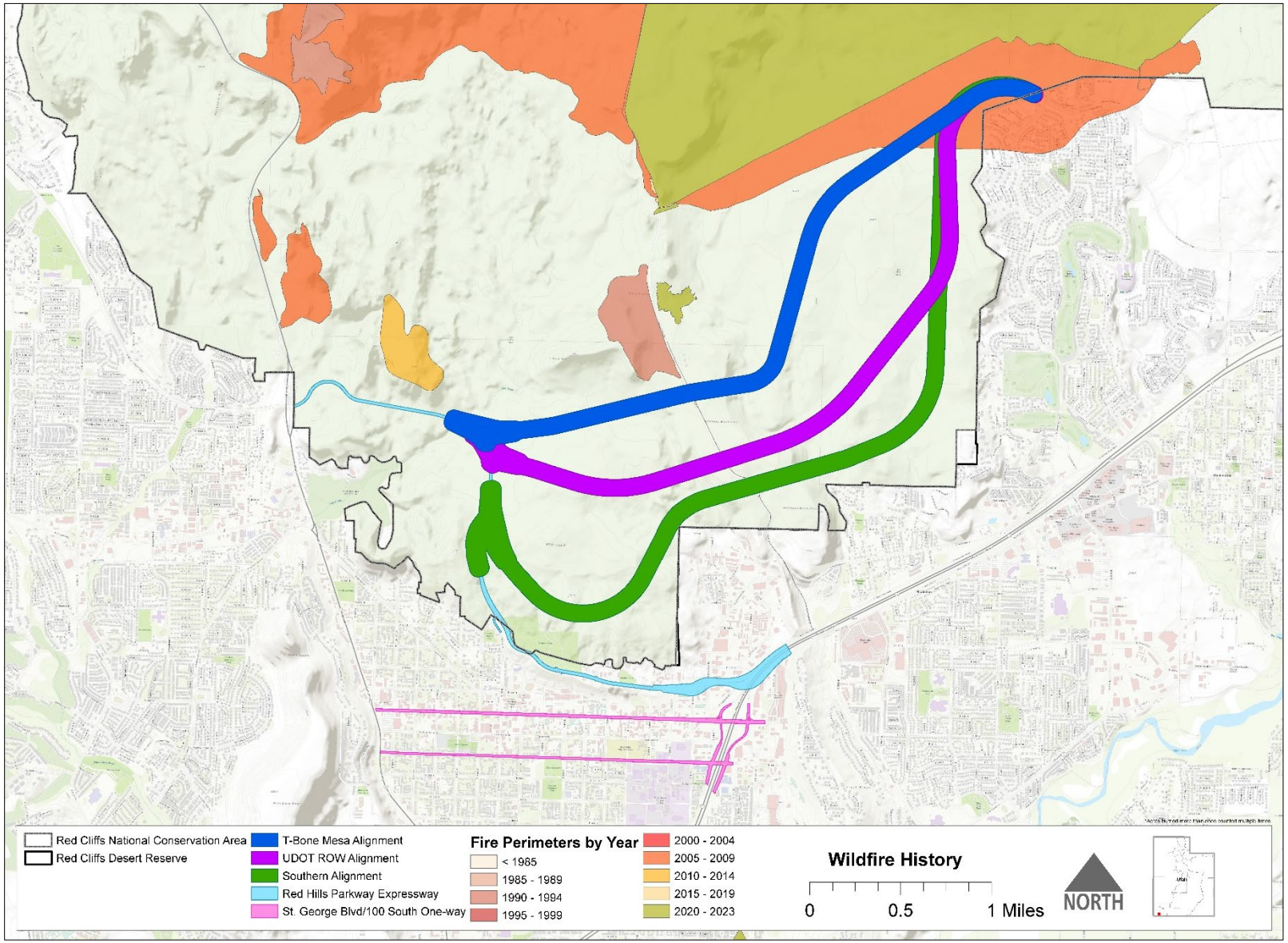


Figure 5. Fire Perimeters near the Northern Corridor Alternatives



T-Bone Mesa Alignment
Construction of the Northern Corridor highway on the T-Bone Mesa Alignment would result in the same potential impacts as the UDOT ROW Alignment, although these impacts would be in a different area. Management of Zone 6 would not change if this alignment were selected, and the additional protections afforded to at-risk native plants and erodible soils would remain in place.

Southern Alignment
Construction of the Northern Corridor highway within the Southern Alignment would result in the same potential impacts as the UDOT ROW Alignment, although these impacts would be in a different area. Management of Zone 6 would not change if this alignment were selected, and the additional protections afforded to at-risk native plants and erodible soils would remain in place.

Red Hills Parkway Expressway
Construction of the Red Hill Parkway Expressway would result in substantially fewer impacts than the alternatives within the NCA, as this alternative would make changes to an existing multi-lane highway to make it function as an expressway. Under this alternative, the Northern Corridor changed circumstance is not triggered, thus eliminating Zone 6 from the Reserve as mitigation for the Northern Corridor. Consequently, non-Federal lands in Zone 6 would be subject to covered activities through the HCP (e.g., land development), as previously analyzed in Section 3.5.2.1 of the Final EIS.

Zone 6 is currently less susceptible to fire, as large wildfires have not occurred in this area and the proliferation of exotic invasive grasses has not occurred. Development of the non-Federal lands within the Zone 6 boundaries and unmanaged motorized and non-motorized recreational activities could all increase the potential for wildfires to be ignited. The funding of additional law enforcement and public education outreach by Washington County would not be continued and both could help to reduce the risk of human-caused wildfires. BLM would continue to manage 3,471 acres of Federal lands within Zone 6 for full suppression of wildfires and would assist with fire-suppression on the non-Federal lands.

St. George Boulevard/100 South One-Way Couplet
There would be no new impacts resulting from selecting the One-Way Couplet, as it lies outside the NCA along existing roads. Current fire and fuels management and wildfire suppression practices within the NCA would be maintained. Impacts to Zone 6 would be the same as described for the Red Hills Parkway Expressway.

Terminate UDOT's ROW
Under this alternative, the Northern Corridor highway would not be constructed and current fire and fuels management and wildfire suppression practices within the NCA would continue, in conformance with management goals, objectives, and decisions from the NCA RMP. Impacts to Zone 6 would be the same as described for the Red Hills Parkway Expressway.

3.5 Special Status Wildlife – Mojave Desert Tortoise

This section focuses specifically on Mojave desert tortoise where new data have been collected or additional analyses completed since publication of the Final EIS. Actions to benefit Mojave desert tortoise habitat would generally be beneficial to other special status species, and activities that result in adverse effects to tortoises would generally result in adverse effects to other special status species as well. The analysis area used for the SEIS is the same analysis area defined in the original Final EIS. This is defined as all potential and suitable Mojave desert tortoise habitat within the Reserve boundary (which includes Zone 6), regardless of landownership (i.e., the BLM, State, or Private).

3.5.1 2020 Final EIS Summary

Section 3.5 of the Final EIS (pages 3-42 to 3-94) discusses special status wildlife within the Reserve, with an emphasis on Mojave desert tortoise. Analysis of project-related direct effects to Mojave desert tortoise from the proposed Northern Corridor was based on the number of acres of lost suitable habitat in the

proposed ROW within Zones 1 through 5 of the Reserve and the number of Mojave desert tortoises to be relocated from the proposed ROW. Indirect effects for the Northern Corridor were evaluated based on the number of acres and the number of Mojave desert tortoise home ranges that may be impacted because of the presence of project activities. Due to habitat fragmentation, indirect effects were quantified using the number of acres of Mojave desert tortoise habitat located between each ROW alternative and the southern Reserve boundary, for which connectivity to the larger tortoise population in Zone 3 may be impaired. The evaluation also considered beneficial management actions that could result from proposed mitigation, such as acres of Mojave desert tortoise habitat with improved conservation status in Zone 6 and installation of culverts under roads to increase habitat connectivity.

The Mojave population of desert tortoise includes all tortoises north and west of the Colorado River in Arizona, Utah, Nevada, and California. Ongoing threats to the species include loss, degradation, and fragmentation of habitat due to development, as well as increased wildfires due to non-native invasive vegetation, disease, road mortality, and predation of eggs and hatchlings (FWS 1994a, 2011). The Mojave desert tortoise was listed as threatened under the ESA in 1990 (FWS 1990). The Final EIS detailed the life history of the Mojave desert tortoise in Section 3.5.1.1. A summary is provided in this section.

The Mojave desert tortoise, which has adapted to the arid Mojave landscape, is most active during spring and early summer (FWS 2008) and forages on herbaceous perennials, grasses, shrubs, and cacti (FWS 2011). These slow-growing tortoises take 13 to 20 years to reach sexual maturity. Female tortoises lay one to 10 eggs, and incubation temperature determines the hatchlings' sex (Rostal et al. 2002). Growth and reproduction increase during years with higher precipitation (FWS 2011). They may use multiple burrows within their range and occasionally venture beyond (O'Connor et al. 1994). During unfavorable conditions, they seek shelter using burrows, rodent holes, and caves (FWS 2011), remaining mostly inactive during droughts (Duda et al. 1999). The typical habitat for Mojave desert tortoises is characterized by creosote bush scrub, with a peak observation frequency between 2,000 and 3,300 feet in elevation (Nussear et al. 2009, FWS 2011).

Threats that result in mortality, permanent habitat loss, habitat fragmentation, and habitat degradation are among the most significant to the Mojave desert tortoise (FWS 1994a, 2011). This includes urbanization and large-scale renewable energy projects, the proliferation of roads and highways, OHV activity, destruction of habitat from wildfire, and invasion by non-native plant species (FWS 2019a). Predation, disease, drought, and climate change also pose risks to their populations (FWS 1994b, 2011).

The Final EIS stated that implementation of the alternatives would result in varying levels of impacts to the Mojave desert tortoise. Issuing a ROW within the NCA under either the T-Bone Mesa, UDOT ROW Alignment, or Southern Alignment would result in direct and indirect impacts to Mojave desert tortoise and their habitat, although the location of the highway ROW, number of affected acres, and number of Mojave desert tortoises would differ amongst alternatives. There would be a direct loss of occupied Mojave desert tortoise habitat and designated critical habitat through displacement, short-distance translocation, destruction of burrows, and indirect effects such as noise, vibration, and habitat fragmentation. The proposed highway would also lead to habitat fragmentation and impact a Mojave desert tortoise population cluster in the Reserve (see further discussion below in Section 3.5.2).

The Final EIS stated that granting a 25-year ITP to Washington County would result in the direct loss of up to 14,466 acres of occupied Mojave desert tortoise habitat and 51,835 acres of potential habitat within the ITP area. Zones 1 through 5 of the Reserve are mitigation for these impacts. Because of additional impacts that would occur under construction and operation of a highway within Zone 3 of the Reserve, Zone 6 was proposed as additional mitigation for the Northern Corridor ROW.

The Final EIS also analyzed the effects of issuing the ITP should the Northern Corridor changed circumstance not be triggered (i.e., if an alternative is selected that is not in the NCA). The HCP analysis area, which included the 3,341 acres of non-Federal lands in Zone 6, accounted for the potential take of these lands from covered activities (i.e., development) under the HCP, without the changed circumstance.

As the agencies have previously analyzed take of desert tortoise from covered activities on non-Federal lands in Zone 6 in the Final EIS, similar effects are anticipated, and the previous analysis has been supplemented with updated information throughout the SEIS. For the complete analysis, refer to Section 3.5.2.1 of the Final EIS.

For the two alternatives located partially or completely outside the NCA, the Final EIS stated that the Red Hills Parkway Expressway Alignment would result in the same types of indirect adverse impacts as the T-Bone Mesa Alignment. However, additional impacts would be minimized, as the highway ROW primarily follows the existing Red Hills Parkway. Red Hills Parkway presently has a wide ROW with tortoise exclusion fencing on both sides that precludes tortoises from unpaved habitat within the ROW; no additional Mojave desert tortoise habitat would be lost from the ROW within Zone 3 of the Reserve, and no short-distance translocation of Mojave desert tortoise was anticipated. Temporary indirect effects from noise, vibrations, and construction-related activities would impact a smaller area, and additional habitat fragmentation would be avoided. The One-way Couplet would involve reconfiguring existing roadways within the City of St. George, causing no disturbance to the Mojave desert tortoise or its habitat.

3.5.2 Supplemental Analysis

Affected Environment

Much of the analysis regarding threats to the Mojave desert tortoise within the Final EIS remains valid. For example, it was well understood that roads disrupt movement patterns, fragment habitat, and cause direct mortality (FWS 2018). They also introduce a suite of potential indirect effects, such as increased thermal stress, noise, increased predator attractants, etc. (FWS 1994b, Latch et al. 2011, Peaden et al. 2017, Berry and Murphy 2019). Roads can act as a vector for the introduction of non-native and invasive plant species, as well as provide human access and disturbance into tortoise habitat (Mortensen et al. 2009, FWS 2021b, Deeley and Petrovskaya 2022). As road density increases, so does the severity of habitat fragmentation and the probability of detrimental human caused effects in a given area (Averill-Murray and Allison 2023). Although this section focuses specifically on Mojave desert tortoises and their habitat, the conclusions would be similar for all wildlife species that rely on native habitat for food, cover, reproduction, or other life history stages.

The section discusses and updates a number of factors that impact Mojave desert tortoise – including fire, invasive plants, habitat fragmentation and connectivity, predation, and climate – and concludes with an updated analysis of Mojave desert tortoise density and abundance and the number of tortoises that would be affected by each alternative.

Desert Tortoise and Fire

As discussed in Section 3.4, the increased threat of large, catastrophic wildfires continues to be a concern for Mojave desert tortoise (FWS 2018, 2022a). In 2005, wildfires heavily impacted the Reserve, including burning 10,244 acres of Mojave desert tortoise critical habitat and 1,267 acres of additional tortoise habitat (FWS 1994a, 2008, 2018; UDWR 2007, 2018, 2021). It is estimated that 15% of adult Mojave desert tortoise within Zone 3 died because of wildfires that year (UDWR 2007). In the Reserve, 65% of Zone 3 burned between 1993 and 2012 (BLM 2020b, FWS 2021b). In the summer and fall of 2020, five human-caused wildfires burned a combined 12,437 acres within the Reserve, of which 9,019 acres were designated Mojave desert tortoise critical habitat (FWS 1994b) and at least 2,583 acres were previously unburned. The 2020 fires included Turkey Farm Road (10,005 acres), Cottonwood Trail (1,397 acres), Lava Ridge (348 acres), Snow Canyon (630 acres), and Volcano (57 acres; Table 5).

Some of the Reserve's most densely occupied tortoise habitat is adjacent to Cottonwood Springs Road where several of these fires burned in 2020 (see Figure 7). The Turkey Farm Road, Cottonwood Trail, Lava Ridge, and Snow Canyon fires predominantly occurred in areas previously burned in 2005. Proximity to roads can result in non-native invasive plant species introduction and wildfire ignition from the roads themselves or human access (Darst et al. 2013, FWS 2021b). For example, in June 2020, the 234-acre Volcano fire (caused by illegal fireworks use along SR 18) burned 57 acres of tortoise habitat in

the Reserve (UDNR 2020). In July 2020, the Turkey Farm Road and Cottonwood Trail fires burned approximately 11,402 acres in Zone 3. The Cottonwood Trail fire was caused by a blown tire on I-15, and the Turkey Farm Road fire was caused by illegal fireworks (FWS 2021b). In October 2020, the Lava Ridge fire burned another 348 acres, and in November, the Snow Canyon fire burned 630 acres of tortoise habitat–both of these were also caused by human-use activities (FWS 2021b). In total, the 2020 wildfires burned 12,381 acres in Zone 3, which is 31.5% of the core tortoise area in the Reserve (UDWR 2018, FWS 2021b). Of these burned acres, 9,019 of these acres were designated Mojave desert tortoise critical habitat (FWS 1994b). Based on this information, and that described in Section 3.4.2, it is highly probable that the Reserve will experience large and small wildfires in the future (FWS 2021b).

Direct impacts to Mojave desert tortoises from wildfires can be variable and include burning fatalities or injuries, dehydration, exposure to high temperatures, or smoke inhalation (Lyon et al. 1978 and 2000, Huff and Smith 2000, Esque et al. 2003). Indirect effects of fire can be significant, including loss of plant cover, exposure to predators and extreme heat, reduced food availability, diversity, quality, change in ecotypes and hydrology, and damage to soil and burrows (Brooks and Esque 2002, Esque et al. 2003, UDWR 2007). High tortoise mortality and indirect effects of fire can severely affect reproduction, juvenile recruitment, and the size and survivorship of tortoise populations (Stubbs et al. 1985, Lambert et al. 1998, Hailey 2000), especially within the UVRRU, which was identified as the smallest and most at-risk recovery unit within the species range (FWS 1994b, 2011).

Regular monitoring of the tortoise population between 2006 and 2019 indicates the population had not recovered from the 2005 wildfires, which resulted in similar percentage losses to the adult Mojave desert tortoise population as the 2020 fires (UDWR 2007, Kellam et al. 2022). The inability to repopulate is a substantial concern for long-lived species with a low reproductive output like the Mojave desert tortoise (Doak et al. 1994, FWS 2019b). Burned areas within the Reserve now support fire return intervals as short as 5 to 10 years (TNC 2011, Moloney et al. 2019), which is less than a third of a tortoise's generation time. Tortoise population stability is predicated on high adult survival (>90%) and sufficient recruitment into adult size classes (Doak et al. 1994); therefore, a short fire return interval may contribute to extirpation of tortoise populations. Reserve Zone 6 is separated from the other zones and may serve as a refuge population less prone to the threats of fire and weeds and may help provide for the long-term protection of tortoises. In addition, the habitat restoration efforts identified in Appendix C would help restore tortoise habitat impacted by fire and weeds.

Desert Tortoise Mortality Surveys From 2020 Fires

In the Final EIS, the BLM and FWS considered the impact that the three earlier 2020 fires had on the amount and quality of affected Mojave desert tortoise habitat, and the potential direct impacts to the Mojave desert tortoise population were estimated, including mortality and injury. Section 7 consultation also included consideration of the three earlier 2020 fires. After publication of the Final EIS, two additional fires burned in the Reserve (see Table 5) and additional detailed tortoise mortality studies were completed. After the 2020 wildfires, the following surveys were conducted to ascertain the direct impacts to the local Mojave desert tortoise populations within Zone 3.

BLM 2020 Cottonwood Trail Fire Tortoise Mortality Surveys

From July 22 to September 8, 2020, systematic searches for fire-killed and injured tortoises were carried out within a 618-acre area of burned tortoise habitat to determine direct tortoise mortality and injury from the 2020 Cottonwood Trail fire in Zone 3 (Kellam et al. 2022). Individual observers walked on 10-meter-wide belt transects at the same rate to provide 100% coverage (Esque et al. 2003, FWS 2017). Surveys were conducted by experienced tortoise surveyors and commenced 1 day after the fire was contained and continued for 49 days after the fire.

As a result of these surveys, 25 tortoise remains were encountered in the Cottonwood Trail fire area, 14 of which (five adults and nine juveniles) were directly attributed to fire (Kellam et al. 2022). Most of the direct tortoise mortality occurred in small washes and open areas containing a high density of non-native

red brome and cheatgrass (Kellam et al. 2022). Three live uninjured tortoises (one adult and two juveniles) and one fire-injured adult tortoise were also encountered (Kellam et al. 2022). A trail camera captured images of a desert woodrat (*Neotoma lepida*) feeding on the fire-affected tissues of the fire-injured tortoise at a burrow site; due to the severity of the desert woodrat-caused injuries, the decision was made to remove the tortoise from the wild on August 22, 2020, for medical treatment (Kellam et al. 2022). The novel observation of a desert woodrat feeding on a live, fire-injured Mojave desert tortoise highlights the potential impacts of desert woodrat carnivory on postfire tortoise survivorship (Kellam et al. 2022). Continued desert woodrat feeding on the tortoise might have led to injuries that confined and eventually killed the tortoise deep in its burrow (Kellam et al. 2022). Therefore, desert woodrat carnivory might contribute to indirect (and undetected) fire-related tortoise mortality (Kellam et al. 2022).

It was estimated that 15% of the adult tortoise population died due to the 2005 fires within the Zone 3 region where the 2020 Cottonwood Trail fire occurred (UDWR 2007). Biannual tortoise population monitoring between 2006 and 2019 indicated the tortoise population had not recovered to pre-2005 population levels (Allison and McLuckie 2018, UDWR 2020). In 2019, the adult tortoise population density for the Zone 3 region where the 2020 Cottonwood Trail fire occurred was estimated at 12.3 tortoises/square kilometer (km^2) (UDWR 2020). Extrapolating from the biannual population surveys (UDWR 2020), it was estimated that approximately 16.3% of the local adult tortoise population within the 250-ha (2.5-km^2) Cottonwood Trail fire survey area died directly from this 2020 fire (Kellam et al. 2022).

Tortoise mortality from the Cottonwood Trail fire (Kellam et al. 2022) is likely underestimated. Juvenile shells are more likely to suffer greater damage in the fire, deteriorate more rapidly than adult shells, or be scavenged by animals and therefore be undetected by surveyors (Turner and Berry 1984, Esque et al. 2003, UDWR 2007). Additionally, some tortoises, both adult and juvenile, with injuries might have retreated and died in deep soil burrows or caves and were undetected during surveys (Esque et al. 2003, UDWR 2007). Therefore, overall direct mortality from the 2020 Cottonwood Trail fire was likely underestimated (Kellam et al. 2022).

UDWR 2020 Turkey Farm Road Fire and Cottonwood Trail Fire Tortoise Mortality Surveys
Surveys were conducted for the Turkey Farm Road and Cottonwood Trail fires to quantify the effects to Mojave desert tortoise and surrounding habitat (UDWR 2021). The sampling methodology used was consistent with the Mojave desert tortoise monitoring program (Anderson and Burnham 1996, UDWR 2020 and 2021). The encounter rate and the two correction factors (see Figure 8 note) provide an estimate of the overall population density within each monitoring area (FWS 2022b). This method differs from the 10-meter-wide belt transects survey method used to provide 100% coverage (Esque et al. 2003, FWS 2017). Population monitoring efforts were concentrated in burned habitat within Zone 3, and long-term monitoring plots, established in 1998, were surveyed (UDWR 2020, 2021). Three field biologists completed Mojave desert tortoise surveys within Zone 3 of the Reserve from April 9, 2021, to June 4, 2021, which was 262 to 318 days, respectively, after the 2020 Cottonwood Trail and Turkey Farm Road fires were contained (UDWR 2021). This contrasts with the Kellam et al. (2022) tortoise mortality surveys conducted 1 to 49 days after the Cottonwood Trail fire was contained, as described above.

Surveyors found the Cottonwood Trail and Turkey Farm Road fires severely burned native shrub vegetation throughout the survey area (UDWR 2021). Large extensive areas were exposed with no to very limited vegetation present (UDWR 2021). In the core of the fires, where some areas have experienced multiple burns in the last 20 years, shrub vegetation was generally not present and there was little to no ground cover (UDWR 2021). A few perennials survived the fire, including desert globemallow (*Sphaeralcea ambigua*), desert marigold (*Baileya multiradiata*), and brittlebush (*Encelia farinosa*); some annuals were present throughout and included Mariposa lily (*Calochortus flexuosus*) and woolly daisy (*Eriophyllum wallacei*) (UDWR 2021). In contrast, vegetation diversity was highest on the edge of fires and included pockets of unburned creosote bush, blackbrush, brittlebush, eastern Mojave buckwheat (*Eriogonum fasciculatum*), and ephedra (*Ephedra spp*.; UDWR 2021). Non-native plants were observed on most transects and included Russian thistle, cheatgrass, and red brome (UDWR 2021).

Overall, relatively similar encounter rates of shells were found per kilometer searched on transects for both fires (UDWR 2021); however, in the Cottonwood Trail fire, many more shells were observed off the transect than in the Turkey Farm Road fire. The overall higher density of shells found in the Cottonwood Trail fire was speculated to be due to fire intensity and intensive surveys completed immediately post fire (Kellam et al. 2022). The Turkey Farm Road fire was ignited in the evening and burned throughout the night, while the Cottonwood Trail fire occurred in the late afternoon when tortoises were likely active (UDWR 2021). Further, several shells in the Cottonwood Trail fire were heavily charred, which may suggest that fire intensity was high (UDWR 2021). Juvenile tortoise mortality was likely underestimated, as their shells are more likely to suffer greater damage in the fire, deteriorate more rapidly, and be more likely to be carried off by scavengers (Turner and Berry 1984, UDWR 2021). A higher number of juvenile tortoises were found in the Cottonwood Trail fire; surveys conducted immediately post-fire were critical in finding the smaller shells and determining cause of death (UDWR 2021, Kellam et al. 2022). In 2021, almost 1-year post-fire, cause of death for four juvenile remains in the Turkey Farm Road fire could not be determined due to the deteriorated state of the shells (UDWR 2021). Post-fire surveys are recommended to be completed immediately after wildfires, as the longer shells are exposed to the elements and scavengers, the more difficult it is to ascertain cause of death (UDWR 2021).

Tortoise encounter rates for the 2021 spring monitoring season were 0.34 adult tortoises per kilometer surveyed, less than the average encounter rate from previous monitoring years (UDWR 2020) but higher than the previous four monitoring years (2013, 2015, 2017 and 2019; UDWR 2021). In addition, the effective strip width was higher than any other previous monitoring year, suggesting that the lack of perennial vegetation in the burned habitat greatly improved the ability to observe tortoises from the transect line and accounted for the relatively high encounter rate in burned habitat (UDWR 2021). In fact, on one transect that overlooked a sandy valley, observers were able to spot a tortoise over 120 meters from the transect line (UDWR 2021).

Monitoring data in 2021 were compared to similar surveys that were carried out in previous years in Zones 2 through 5 and are shown in Table 6 (UDWR 2021). Data from 2024 were not focused on burned areas and are not included in the table. Density estimates of adult tortoises in burned habitat declined from previous monitoring years, although the difference was not significant (UDWR 2021). The annualized adult mortality within burned habitat was much higher than all previous monitoring years except for the post wildfire surveys in 2006, indicating that mortality was very high relative to the number of live tortoises observed in the 2020 spring season (UDWR 2007, 2021).

Table 6. 2021 Monitoring Data for Adult Desert Tortoise in Burned Areas of Reserve Zones 2 through 5*

Year	Density (95%CI)	Abundance (95% CI)	Annualized Mortality
1998 – 2001	22.0 (16.6-29.2)	615 (463-816)	0.19-0.37
2003	15.1 (9.6-23.9)	423 (268-667)	2.96
2005	23.3 (14.8-36.9)	652 (412-1032)	1.00
2007 – 2019	12.7 (10.0-16.2)	355 (280-452)	0.18-1.43
2021	11.5 (7.0-18.6)	320 (197-520)	5

*Data adapted from UDWR 2021, which focused specifically on burned areas. Summary data included density (tortoises per km^2) and abundance (total animals per area sampled) estimates with an associated 95% confidence interval (CI), and annualized mortality rate [(ns/Ny)100%] where ns is the total number of shells observed in burned habitat and Ny is the estimated abundance of live adults for each monitoring year (1998 to 2021). Monitoring years and detection probability were pooled across years: pre-fire (1998-2001, 2005), drought (2003), and post-fire (2007-2019, 2021).

Lava Ridge Fire, Snow Canyon Fire, and Volcano Fire

Tortoise mortality surveys were not completed for the Lava Ridge, Snow Canyon, and Volcano fires due to logistical/staffing constraints and focus of conducting surveys in the higher tortoise density Cottonwood Trail fire and Turkey Farm Road fire burn areas.

Desert Tortoise and Invasive Plants

As discussed in Sections 3.2 and 3.4, invasive plants and wildfires are closely interrelated, and a number of projects have been undertaken to reduce invasive grasses in the Reserve (see Appendix C). Burned native shrubs may take years or even decades to centuries to regrow and recover depending on the severity of the fires and the type of community burned. Changes in vegetative cover from native shrublands to invasive and non-native plants have an adverse effect on food availability and food nutrition, shelter, thermal landscape environments, cover and protection from predators, and soil moisture and temperature for nest construction and egg incubation (Drake et al. 2016, Jennings and Berry 2023). The prevalence of invasive *Bromus* grasses in the diets of juvenile Mojave desert tortoise leads to a host of body and health conditions, including loss of fat, increased muscular atrophy, mucosal inflammation from embedded grass seeds, and increased susceptibility to disease and other health related problems (Drake et al. 2016, FWS 2021b, Jennings and Berry 2023). This in turn leads to reduced recruitment and survivorship in the species as a whole. Desert tortoises exhibit high site-fidelity and will remain in native home ranges despite poor quality habitats and vegetation changes from burn-reburn patterns (Drake et al. 2015, Lovich et al. 2018).

Desert Tortoise and Habitat Fragmentation and Connectivity

Road construction, development, recreation, and other activities can disturb Mojave desert tortoise habitat and result in fragmentation and a decrease in habitat connectivity. Within Zones 1 through 5 of the Reserve, roads have been consolidated and some unpaved non-designated roads have been closed to off-road use or have limited off-road use as a management strategy to reduce fragmentation and restore habitat. Permanent paved roads in the Reserve (i.e., the Red Hills Parkway and Tuacahn Drive) have culverts intended to serve as under-roadway passage structures for Mojave desert tortoise to minimize effects of habitat fragmentation.

Recent culvert studies conducted by Washington County in 2022 and 2023 indicate that tortoises utilize culverts within the Reserve to seek shelter, feeding, or nesting opportunities more than previously recognized (Washington County 2023a, 2023b). In 2022 and 2023, the County monitored six and five culverts, respectively, of varying design within the Reserve using game cameras. Their analysis identified 45 individual tortoises crossing or sheltering within the structures in 2022, and 66 individual tortoises either utilizing the structures for crossing or sheltering in 2023 (Washington County 2023a, 2023b). These data indicate tortoises may regularly utilize under-roadway passage structures (i.e., culverts) for various behaviors when habitat is fragmented by roadways. More information is needed to understand if usage is limited by passage design or other ecological, biological, or environmental conditions and how culverts should be spaced to provide adequate connectivity. Overall, there is evidence that tortoises utilize culverts; however, the effectiveness of tortoise passage structures in aiding long-term population health and habitat connectivity for Mojave desert tortoise is unknown.

Desert Tortoise and Predation

Ravens are highly opportunistic, human-subsidized scavengers and predators in the Mojave Desert, with populations that have dramatically increased over the last 50 years (Kristan et al. 2004, Harju et al. 2021, FWS 2023, WCHCP-FWS 2024). Recent evidence further indicates that expansion of the raven's range and population density are key ecological drivers in the decrease of juvenile tortoises and observed adult Mojave desert tortoise density declines (Kristan and Boarman 2003, Allison and McLuckie 2018, Holcomb et al. 2021, FWS 2023, WCHCP-FWS 2024). Therefore, raven predation has been identified as a primary threat to the Mojave desert tortoise (FWS 1994a, 2011, 2023).

From 2015 through 2021, Washington County HCP staff conducted raven nest surveys within and adjacent to the Reserve and documented 53 total nests (including 20 nesting territories) and 40 juvenile tortoise carcasses that were attributed to raven predation (Schijf 2021, 2023; WCHCP-FWS 2024). Carcass persistence rates can be very low in desert habitats; therefore, the observed carcasses likely represent only a small portion of the actual number of tortoise carcasses (WCHCP-FWS 2024).

In the spring of 2022, Washington County HCP staff (with assistance from the BLM, Snow Canyon State Park, and volunteers) conducted raven point-count surveys throughout 176,606 acres (714.7 km^2) of Mojave desert tortoise habitat in the UVRRU (WCHCP-FWS 2024). Using a distance analysis, raven density was estimated to be 2.7 ravens/km^2 across the UVRRU. Raven detection rates were higher outside of the Reserve as compared to inside of the Reserve, with hotspots being identified in the Sand Mountain/Warner Valley area (Schijf 2023, WCHCP-FWS 2024). The FWS estimates that the average annual survival probability for juvenile tortoises decreases below 0.77 when raven density exceeds 0.89 raven/km^2 or within approximately 1.7 kilometers of an active raven nest (Holcomb et al. 2021). A tortoise population experiencing an average annual juvenile survival probability of less than 0.77 is expected to exhibit a negative population expansion rate, and in some instances may be functionally extinct because of low or no recruitment into adult age-class (Holcomb et al. 2021).

During the spring of 2022, Washington County HCP staff deployed Techno Tortoises (i.e., artificial juvenile tortoise shells that can be equipped with cameras, non-lethal sprays, and other technology) at randomized stations within the raven point-count survey area to document and assess the frequency of raven "predated" Techno Tortoises, and to assess how decoy "survival" may translate to juvenile tortoise survival (WCHCP-FWS 2024). Based on the 2022 Washington County Techno Tortoise survey results, tortoises are being depredated at an unsustainable rate (i.e., there is an 18.4% chance of tortoise mortality by raven predation annually compared to an estimated maximum rate of 7.8% to sustain tortoise populations; Holcomb et al. 2021, WCHCP-FWS 2024). The 2022 Washington County raven point-count population and Techno Tortoise predation surveys showed a substantial raven population that is likely contributing to tortoise population declines in the UVRRU and Reserve that may lead to localized to widespread functional extinction due to low 0 to 10-year-old annual survival rates (WCHCP-FWS 2024).

Over the last year, Washington County, the FWS, UDWR, and BLM have undertaken planning efforts for raven management in the County to benefit tortoise conservation. In the spring of 2024, working under a Federal depredation permit held by the FWS, Washington County began treating raven nests through egg addling[10] to terminate embryo development (WCHCP-FWS 2024). Eleven raven nests within and surrounding the Reserve on non-NCA lands were treated.

Ravens are often found at higher densities along roadsides than other less disturbed habitats (Knight and Kawashima 1993). Adult ravens use roads to forage for human-produced foods, trash and garbage, and road-killed animals (Boarman 1993, Boarman and Heinrich 2020), and raven nest productivity increases by nest proximity to roads (Kristan and Boarman 2007). Being that raven densities are higher outside of the Reserve (WCHCP-FWS 2024), the creation and use of a highway within currently undeveloped tortoise habitat may increase adult raven populations and nesting productivity in the Reserve, as the highway would likely produce human-subsidized food resources, and associated highway structures (i.e., fence posts, lighting and traffic signal poles, and signs) would create artificial raven perching opportunities that increase the potential of tortoise predation (Boarman 1993, Boarman et al. 2006, Kristan and Boarman 2007, Fleischer et al. 2008). Similarly, development of non-Federal lands in Zone 6 would likely increase human-subsidized food resources and have similar impacts as construction in the NCA.

Animals would have direct access to each of the proposed highway alignments in the Reserve at their respective east and west entrances (at Green Spring Drive and Red Hills Parkway) and at the at-grade intersection at Cottonwood Springs Road. Though each of the highway alignments within the Reserve would provide fencing with tortoise-exclusion mesh (at the bottom) along the ROW corridor, some

[10] Egg addling is a method that stops embryo development in eggs by shaking, puncturing, or oiling them, and then returning them to the nest.

wildlife species are able to climb through or over the fences and birds can also be struck and killed by vehicles on the roadway, thereby creating food subsidies for ravens.

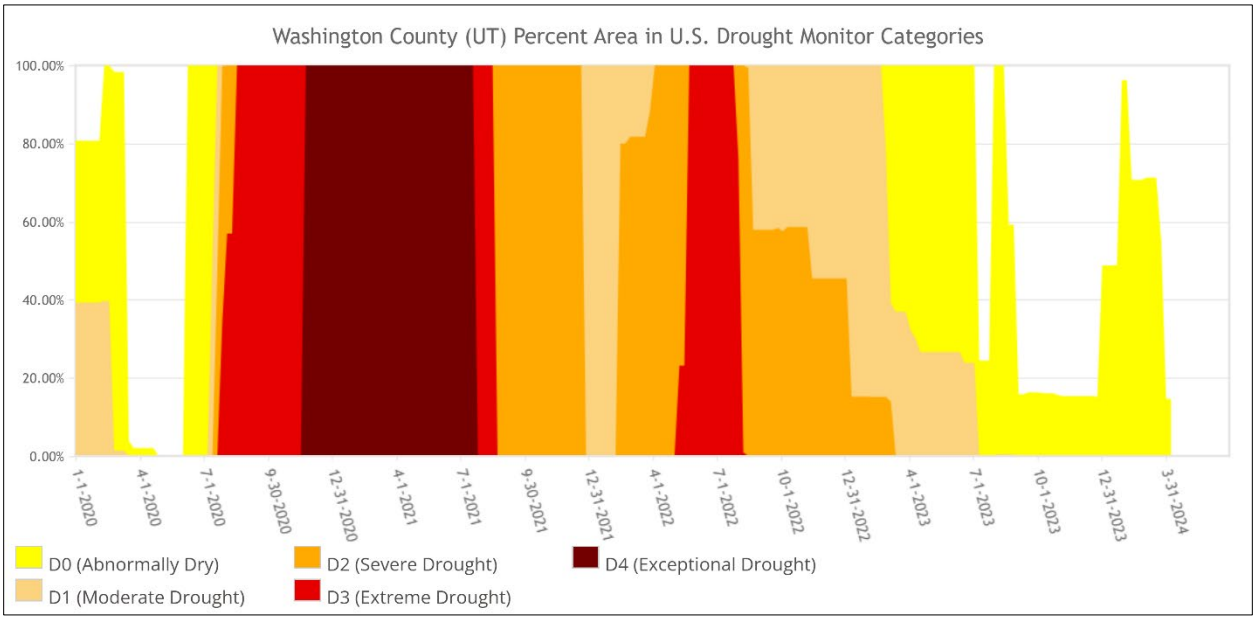
Desert Tortoise and Climate

Climate change not only presents itself as a departure from historical averages but also an increase in extreme events such as record heat and long periods of dry or wet weather. Climate in the southwestern United States from 2000 through 2021 was the driest 22-year period in over 1,200 years (Williams et al. 2022, FWS 2022a). Washington County experienced record drought and extreme climate events from 2019 to 2023, including the hottest and driest and wettest periods on record going back to 1893. For example:

- On July 10, 2021, a high temperature reading of 117 degrees Fahrenheit (°F) in St. George tied the all-time Utah maximum temperature record (NWS 2022).
- In July 2023, daytime highs across St. George averaged 107.4°F, which is more than 5°F warmer than St. George's historical average for the month and made it the city's hottest July on record (NWS 2023).
- From June 18 to November 19, 2019, no measurable rainfall (at least 0.01 inches) was recorded in St. George, Utah, for 155 consecutive days, which was the longest dry streak since records began in 1893 (NOAA 2019, WU 2019).
- From October 1, 2022, to September 30, 2023, St. George recorded the largest amount of rainfall and precipitation (15.8 inches) in a water year since local weather records started being kept in 1893 (NWS 2023).

The "Exceptional, Extreme, and Severe" drought conditions during 2020-2022 in Washington County (USDM 2024; see Figure 6) had a serious impact on wildlife populations in the Reserve, including Mojave desert tortoise who were observed to have fewer nests and eggs during the spring and summer of 2021 and 2022 (Kellam 2022a, Kellam 2022b).

Figure 6. U.S. Drought Monitor Data for Washington County, Utah



Data from U.S. Drought Monitor website, https://droughtmonitor.unl.edu/DmData/TimeSeries.aspx, 4-17-2024 (USDM 2024).

Droughts are a frequent and natural part of Utah's climate (Frankson et al. 2017), and it is anticipated that drought conditions will intensify due to temperature increases that are predicted for the American Southwest (Gonzalez et al. 2018, Rangwala 2020, Williams et al. 2022). These increased drought conditions may impact Mojave desert tortoises and their habitat depending on the severity and duration of the drought (FWS 2021b). Drought conditions limit spring, summer, and fall forage for tortoises and contribute to the establishment of non-native invasive annual grasses (Melgoza et al. 1990, USDA 2013). Extended periods of drought can lead to physiological effects to tortoises, including stress, dehydration, malnutrition, starvation, and death, as well as reducing overall activity, limiting opportunities to interact or breed (FWS 2011). Therefore, recurring or long-term droughts may impact tortoise population resiliency by reducing survivorship, recruitment, and population sizes (FWS 2019c, 2021b).

For example, within the Reserve, a severe drought in 2002 resulted in no perennial or annual plant growth that year (UDWR 2018, 2024b; Washington County 2020). Abnormal tortoise behavior was observed (including failure to hibernate), there was an increase in clinical signs of upper respiratory tract disease (e.g., damp or wet nares, discharge, and one or both nares completely impacted; Berry and Christopher 2001), and the presence of emaciated tortoises was recorded (UDWR 2018, Washington County 2020). In 2003, one year following the severe drought, surveys identified 2.7 times the normal amount of shell remains and a corresponding decrease in the percent of tortoises with clinical signs of upper respiratory tract disease, likely due to sick tortoises unable to survive the extreme drought (UDWR 2018, 2024c). Reflective of these losses, the estimated tortoise population in 2003 had dropped to 16.5 individuals/km^2 from the 28.3 individuals/km^2 recorded in 2001, and the annualized mortality rate was estimated at 34%, indicating a severe reduction in tortoise survival (UDWR 2018, 2024c).

Upper respiratory tract disease can be aggravated by drought (Jacobson et al. 1991, FWS 2021c). Because mycoplasmal infections are dependent upon higher densities of the host (Tracy et al. 2004, FWS 2021c), the disease has higher prevalence in dense desert tortoise populations (e.g., as found within the UVRRU and the Reserve). In 2023, 9% (15 of 163 tortoises observed) of tortoises in Reserve Zones 2, 3, 4, and 5 had clinical signs of upper respiratory tract disease (UDWR 2024c). Tortoises have evolved in arid environments for millions of years and have numerous adaptations for living in areas where drought is a relatively common periodic event (Nagy and Medica 1986; Peterson 1996a, 1996b; Berry et al. 2002). However, if droughts are severe and prolonged, as in 2002, tortoises will eventually succumb from lack of food and water (Jacobson et al. 1991, Berry et al. 2002). Increases in mortality may result for tortoises infected with upper respiratory tract disease due to the drought-aggravated effects of this disease (Jacobson et al. 1991, Berry et al. 2002, Longshore et al. 2003, FWS 2021c).

Changes in temperature affect rate of tortoise egg development and incubation timing (Rostal et al. 1994, Lewis-Winokur and Winokur 1995). For Mojave desert tortoise, higher temperatures influence sex during embryo development; consequently, sustained high temperatures could result in all female clutches (FWS 2021b). Although reptile species with temperature-dependent sex determination have adapted to shifting temperature during natural climatic change (Booth 2006), a more rapid rate of change in temperature may be limited by the adaptive capacity of the Mojave desert tortoise (FWS 2011, 2021b; Lovich et al. 2012, 2017).

Precipitation events can affect Mojave desert tortoise clutch health (e.g., drought results in reduced clutch frequency, while increased rainfall may increase clutch frequency) (Lovich et al. 1999, 2015; FWS 2021b). Increased precipitation and changes in vegetative cover can result in increased flooding in desert environments (FWS 2021b). In future conditions with increased flood events, tortoise individuals could become entrapped in burrows more frequently, especially during times of the year when they are typically hibernating (Lovich et al. 2011; FWS 2011, 2021b; Berry and Murphy 2019). Increased frequency and severity of flooding may also increase the probability of individuals being washed into culvert debris piles adjacent to roads, as tortoises frequent washes (Lovich et al. 2011). In addition, tortoise-proof fences are often breached during flood events, resulting in a higher potential for vehicular collisions (FWS 2011, 2021b). Overall, increased flood events have the potential to directly impact Mojave desert tortoise mortality and injury rates (FWS 2021b).

Several local-level climate models projected substantial reductions in and movement upslope of suitable Mojave desert tortoise habitat under the anticipated effects of climate change (FWS 2022a). For example, at moderate predictions of climate change (+2 degrees Celsius [°C] maximum July temperature, -50 millimeters annual precipitation), modeled Mojave desert tortoise habitat at Joshua Tree National Park shrank by nearly 66% in the Mojave Desert portion and nearly 88% in the Sonoran Desert portion of the park (Barrows 2011, FWS 2022a). Similarly, models of the region surrounding Lake Mead National Recreation Area using a similar range of climate projections as those above predicted habitat reductions of up to 77% (Barrows and Murphy 2011, FWS 2022a).

In conclusion, climate change has been identified as a primary threat to Mojave desert tortoise (FWS 2022a). The combined effects of global climate change (i.e., increased ambient temperatures and altered precipitation patterns) and drought may increasingly influence the long-term persistence of the Mojave desert tortoise, including within the UVRRU and Reserve (FWS 2011, 2021b, 2022a).

Desert Tortoise Abundance and Density

In 1998, the UDWR adopted line-distance sampling to monitor Mojave desert tortoise populations across Zones 2 through 5 of the Reserve. A subset of tortoises is monitored with radio telemetry to determine surface activity during the survey periods. The UDWR has reported density and abundance for Management Zones 2, 3, and 5 for all years of the study (i.e., typically biannually, 1998 to 2023; UDWR 2024b). In the 2023 line-distance sampling surveys, the UDWR estimated there are 2,425 adult tortoises within Zones 2, 3, and 5 of the Reserve, with the majority found in Zone 3 (1,681 adult tortoises; Table 7; UDWR 2024). This abundance is the highest recorded since 2005. In addition, the 2024 UDWR monitoring data also reported the lowest ever mortality rate for Mojave desert tortoise in the Reserve. These abundance and mortality estimates are likely influenced by high densities within Zone 2 (34.2 tortoises/km^2), the translocation of displaced tortoises into Zone 4 (UDWR 2024c), and the favorable environmental conditions observed in 2023.

The FWS estimated the minimum density and abundance of adult Mojave desert tortoise by year for Zone 3 using UDWR's available data. The FWS estimates are not corrected for the percent of tortoises above ground or visible in burrow, while UDWR's data are corrected using telemetry data and survey effort. The FWS estimated that the minimum number of tortoises in 2023 was 1,614 adult tortoises in Zone 3 (Table 7).

Table 7. Estimated Adult Desert Tortoise Abundance and Density Estimates in Zone 3, 2017 to 2023

Survey Year	FWS Estimated Minimum Desert Tortoise Abundance	FWS Estimated Minimum Density*	UDWR Estimated Desert Tortoise Abundance	UDWR Estimated Adjusted Density
2017	1,538	9.7 (7.3 to 12.8, 95% CI)	1,824	19.0 (14.4-25.2, 95% CI)
2019	1,064	6.7 (4.7 to 9.5, 95% CI)	1,209	12.6 (9.0 to 17.7(, 95% CI)
2023	1,614	10.1 (7.4 to 13.8, 95% CI)	1,681	17.5 (13.3 to 23.1, 95% CI)

*See note on Figure 8 for definitions of FWS Estimated Density and UDWR Estimated Adjusted Density. CI=95%. UDWR estimates taken from UDWR 2024c, which re-analyzed previous year's estimates and pooled the detection function across all years of the study.

Detection of tortoises aboveground, which depends on temperature, the timing and amount of rainfall, and food plant availability, can vary greatly from year-to-year independent of survey effort (Duda et al. 1999, Freilich et al. 2000, Lovich et al. 2014). Desert tortoises seek shelter during unfavorable conditions and remain mostly inactive during droughts (Duda et al. 1999, Freilich et al. 2000). Wet years with good germination of annual food plants are the best years to locate desert tortoises due to increased surface activity (Duda et al. 1999, Freilich et al. 2000, Lovich et al. 2014).

Record winter/spring precipitation and low spring temperatures in the Reserve during 2023 (NWS 2022, 2023) increased plant growth, which likely increased surface activity of tortoises and the number of tortoises detected during surveys that year (UDWR 2024c). The severe drought conditions in the Reserve during 2018-2019 likely influenced a decrease in the number of tortoises observed during the spring 2019 tortoise surveys (UDWR 2020, USDM 2024). Therefore, the increase in tortoise observations/estimated abundance in Reserve Zone 3 from 2019 (1,181 tortoises) to 2023 (1,681 tortoises) was likely strongly influenced by the change from severe drought to the wettest water year on record in St. George (UDWR 2020, 2024b; NWS 2022, 2023; USDM 2024). Tortoise density and abundance data from a single year are not indicative of a declining or increasing population and should be considered in the context of long-term monitoring data available.

Washington County HCP staff conducted drone surveys over Zones 2 through 5 of the Reserve in May of 2023. Previously established pedestrian survey transects were photographed by aerial drones to generate density and abundance estimates for adult Mojave desert tortoise in each zone. This experimental drone survey methodology was successfully implemented in Zone 6 in 2022 (Washington County 2022). Using this methodology, it was estimated that Zones 2 through 5 of the Reserve continue to support a high number (2,779) and dense (20.1/km^2) number of tortoises, consistent with previous estimates from pedestrian line-transect surveys. Drone surveys in Zone 3 (Washington County 2023a) estimated a density of 12.8 tortoises/km^2 (95% CI: 8.2 to 19.8) and an abundance of 1,223 adult tortoises (95% CI: 790 to 1898). While the 2023 Zone 3 drone surveys estimated a lower density and abundance than the 2023 pedestrian line-transects (see Table 7), there is large overlap in the 95% CIs, suggesting the difference is not statistically significant.

Drone surveys are a novel methodology, and the CIs (95%) are accordingly large due to potential bias and other sampling errors. In particular, this novel technique may not account for the mobility of tortoises and potential for double-counting individuals, as well as differences between juvenile and adult detection due to the use of aerial photography in classification, among other errors. The 2022 Zone 6 drone surveys, where this methodology was first implemented in the Reserve, were adjusted with a correction factor to account for differences in detection between pedestrian line-transect surveys and drone surveys (Washington County 2022). The drone estimates for the 2023 surveys in Zone 3 were not adjusted, likely because the 2023 pedestrian line-transect data were not available at the time. Therefore, the differences between drone surveys and pedestrian surveys may become even less once the correction factors are applied.

Relative density of Mojave desert tortoise is high in Zones 1 through 5 of the Reserve, especially in the unburned habitat, such as the southern portions of Zone 3 where the Northern Corridor alignments are located (SEIS Figure 7; UDWR 2024c Figure 8). Relative observation density of Mojave desert tortoise throughout Zone 3 of the Reserve was mapped based on Mojave desert tortoise line transect survey data collected by UDWR in the Reserve between 2007 and 2023. Those survey data were used to generate a kernel density surface[11] that models the relative density of adult Mojave desert tortoise observations on the landscape (Figure 7). This model reflects observation density but does not reflect imperfect detection nor areas that were not sampled due to the systematic spacing of transects. However, this analysis reveals that observed tortoises are not distributed evenly, and there are clusters located near the southern reaches of unburned habitat in Zone 3. In addition, a high number of desert tortoises were found west of Cottonwood Springs Road in Reserve Zone 3 (an area the UDOT ROW Alignment, T-Bone Mesa Alignment, and Southern Alignments would bisect; Figure 7) and other similar unburned areas in the Reserve containing high native shrub and annual plant diversity (UDWR 2024c).

[11] Kernel density is a geoprocessing tool used to estimate density from point-based or line-based data. Kernel density estimation has been widely used for various purposes, such as point or line data smoothing, risk mapping, and hot spot detection.

Figure 7. Relative Observation Density of Desert Tortoise in Zone 3 of the Reserve, 2007 to 2023

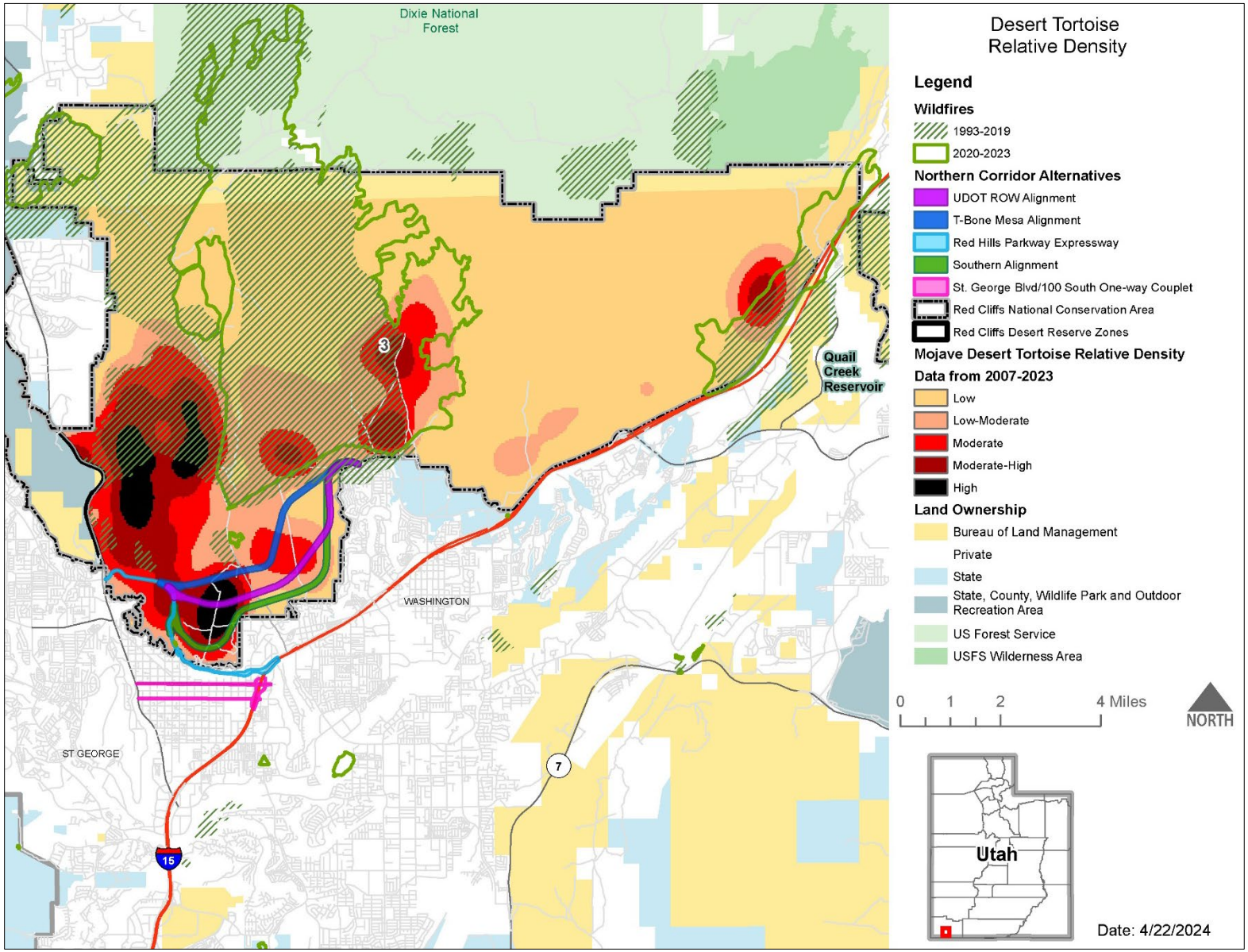
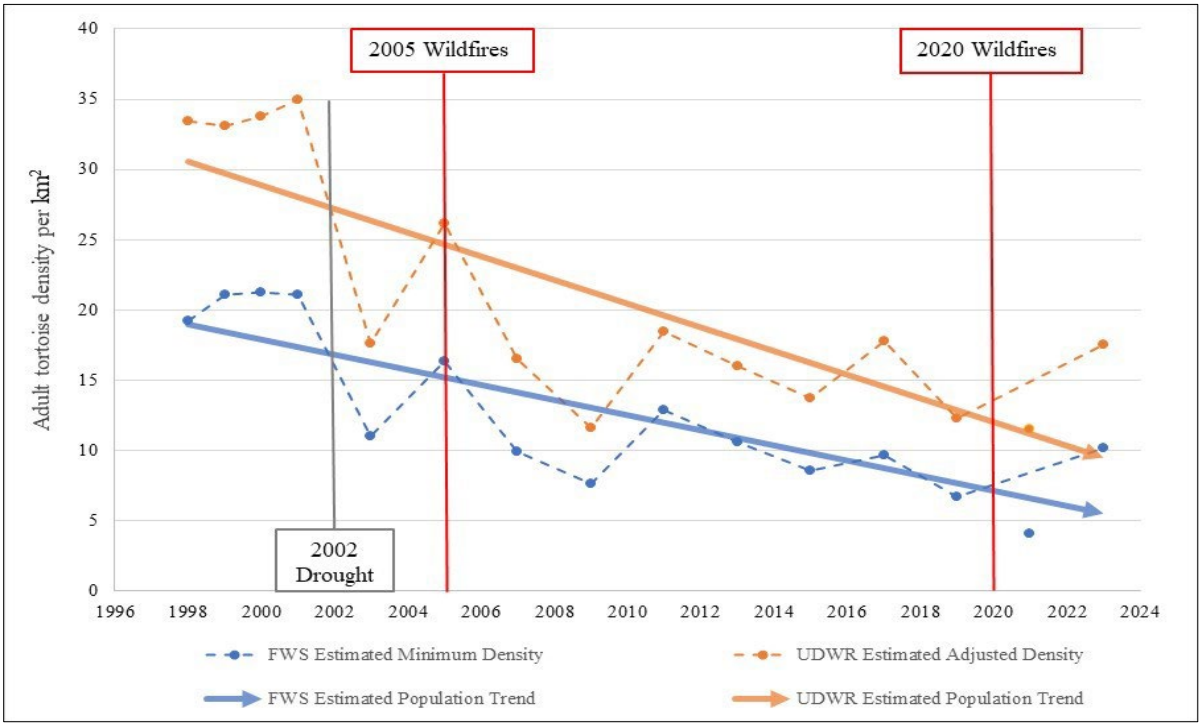


Figure 8. Estimated Adult Desert Tortoise Density in Zone 3 of the Reserve, 1998 to 2023*



*FWS Estimated Density – This analysis shows the estimated minimum density of tortoise by year for Zone 3 of the Reserve and overall population trend data using UDWR's available line-distance monitoring data. These data are not corrected for tortoises not visible, or that may be in burrows, or for the level of survey effort (i.e., amount of area that is not surveyed). This means actual densities are likely higher and these data represent the minimum density and abundance in Zone 3. UDWR Adjusted Density – These data are adjusted for tortoises not visible and the survey effort (i.e., unsurveyed areas). See UDWR 2024c for more detailed methodology.

Although the population in Reserve Zones 1 through 5 is considered relatively stable, over 25 years of monitoring by the UDWR has observed a localized decline of adult tortoise densities in Zone 3 (Figure 8). During the first several years of monitoring (1998 to 2001), tortoise densities were consistently high; however, following stochastic events, including drought (e.g., 2002) and wildfire (e.g., 2005), tortoise densities decreased over 50%, from an estimated 3,409 adult tortoises in 2001 to 1,681 adults by 2023 (UDWR 2024c). While monitoring indicates populations may have stabilized since 2009 in Zones 1 through 5 (UDWR 2024c), overall, density and abundance estimates show a decreasing trend since monitoring began (see Figure 8 and Table 6), and continued monitoring is necessary to assess the long-term trends of tortoise abundance in the Reserve. It could take years or generations (a generation for desert tortoises is estimated to be approximately 25 years [USFWS 2011]) to detect actual changes in desert tortoise population trends due to stochastic events. Desert tortoises are slow to mature (12 to 20 years for an individual to reach sexual maturity); therefore, it can take decades to detect the effects of stochastic events (i.e., wildfire) on tortoise recruitment.

Juvenile and immature tortoises are more difficult to observe than adults, due in part to their small size, and their numbers are often underrepresented in monitoring efforts (Wilbur 1975, Bourn and Coe 1978, Berry and Turner 1986, Wilson et al. 1994, UDWR 2024c). Most tortoises encountered during 2023 monitoring in the Reserve were reproductive adults (85%); 15% of the tortoises observed had a carapace (hard upper shell) length of less than 180 millimeters, which was indicative of juvenile and immature tortoises (UDWR 2024c). The percentage of juvenile and immature tortoises observed in 2023 in the Reserve was below average from previous years (19%; 1998-2019), which varied from 13% in monitoring year 2000 to 26% in 1998 (UDWR 2024c). Allison and McLuckie (2018) determined that the

odds of encountering a juvenile from 1999 to 2014, not only in the Reserve but in all recovery units across the tortoises' range, have declined since 2007. This may reflect reduced reproduction and increased mortality across the range of the desert tortoise, a result primarily of drought, predation (e.g., ravens), and habitat degradation (e.g., from fire) (Darst et al. 2013; UDWR 2024c; FWS 2019a, 2021c, 2022a).

Desert Tortoise in Zone 6

Analysis in the Final EIS on Zone 6 remains largely relevant to this discussion (see Final EIS, pages 3-62 and 3-83), especially since the future management of non-Federal lands in Zone 6 depends in large part on which alternative is selected. Since publication of the Final EIS, however, there are new data that provide refined density and abundance estimates for Zone 6.

Zone 6 represents a large and contiguous block of habitat in Washington County and protects the largest known sub-population of tortoises that would otherwise be subject to take on non-Federal lands under the Amended HCP ITP. Approximately 6,760 acres across Zone 6 are considered occupied Mojave desert tortoise habitat (53 acres were not included as suitable Mojave desert tortoise habitat based on United States Geological Survey modeled criteria).

Pedestrian line-transect surveys conducted in 2017 on 5,150 acres within Zone 6 and adjacent habitat revealed a much larger population of Mojave desert tortoise in the area than previously identified. In 2022, Washington County HCP staff used a combination of pedestrian line-transects and experimental drone surveys, as described in the previous section, in Zone 6 to establish improved baseline abundance and density estimates, including in previously unsurveyed acreage in the Red Bluffs ACEC. Spatial overlap of the two survey methods was used to calibrate the methods and ensure tortoise estimates generated by the novel drone-based approach were within the range of line-transect generated estimates. Pedestrian line-transects were not walked in the ACEC due to the presence of sensitive soils for the endangered dwarf bear-poppy. Due to a higher detection rate of pedestrian line-transects, a correction factor was applied to calibrate the drone methodology used in the ACEC (Washington County 2022).

The 2022 surveys in Zone 6 areas found tortoise densities approximately 10% higher than the 2017 surveys, indicating that Zone 6 supports a relatively high density of adult Mojave desert tortoises. Drone surveys conducted in the ACEC (Washington County 2022) found significantly higher densities (31.4 tortoises/km^2 [95% CI: 20.5 to 47.4]) than those used in the Final EIS (1.3 tortoises/km^2). Due to the previous likely underestimate of abundance, particularly on unsurveyed ACEC lands, the Zone 6 estimates have been updated based on this new information (FWS 2023). Non-Federal lands in Zone 6 are estimated to support an abundance of 328 tortoises (95% CI: 242 to 445) and Federal lands support an abundance of 408 tortoises (95% CI: 275 to 598) (see Table 8). The total area of Zone 6 is estimated to support an abundance of 736 tortoises (95% CI: 517 to 1,043), indicating Zone 6 supports a relatively large and dense population of tortoises within the UVRRU. Current calculations vary slightly from those presented in the final survey report (Washington County 2022) to account for approximately 500 acres of unsurveyed habitat. The 95% CIs for both estimates overlap, suggesting the differences are not statistically significant.

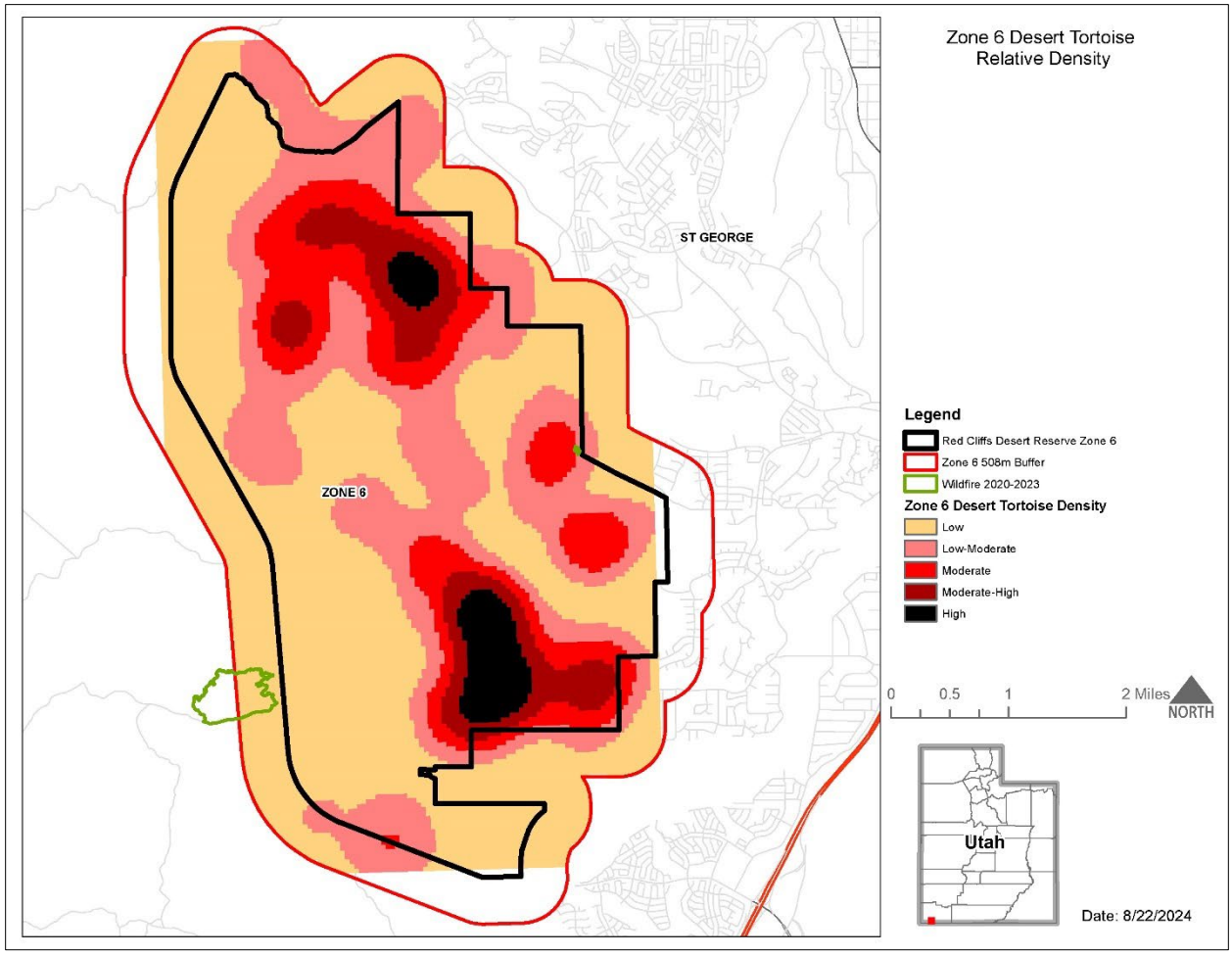
Zone 6 serves as a refuge for tortoises relocated from elsewhere in the County (e.g., adjacent developments or clearances). UDWR records since 2008 show that there have been a total of 59 tortoise relocations, with 56 of those releases within the current boundaries of Zone 6 and three just outside of the boundary (< 400 meters from the Zone 6 boundary). Of those tortoises, 45 were unique individuals, 12 were recaptures of previously relocated tortoises, and two were relocations that were found on a dirt road/parking lot within Zone 6 and moved a short distance out of harm's way.

The survey data in Zone 6 were used to generate a kernel density surface to model the relative density of adult Mojave desert tortoise observations on the landscape in Zone 6, similar to what is described above in Zone 3 (see Figure 7). While the observational data are not as abundant as elsewhere in the Reserve due to its relatively new status, the data nevertheless show that tortoises are not distributed evenly in Zone 6, and that there are several clusters spread throughout Zone 6 on both Federal and non-Federal lands (Figure 9).

Table 8. Abundance of Adult Mojave Desert Tortoise in Zone 6 of the Reserve, 2022

Habitat Unit	Survey Area and Observations	Estimated Density	Number of Adult Mojave Desert Tortoise
Non-Federal lands in Zone 6 (Systematic line-distance survey data in 2017 and 2022)	13.52 km^2 (3,340 acres) total survey area	24.3 tortoises/km^2	328 (95% CI: 242 – 445)
Federal lands in Zone 6 (Systematic line-distance survey data in 2017 and 2022 and drone survey data in 2022)	14.04 km^2 (3,469 acres) total survey area ACEC lands: 9.44 km^2 surveyed Non-ACEC lands: 4.60 km^2 surveyed	ACEC lands: 31.4 tortoises/km^2 Non-ACEC lands: 24.3 tortoises/km^2	408 (95% CI: 275 – 598)

Figure 9. Relative Observation Density of Desert Tortoise in Zone 6 of the Reserve, 2017 to 2022



Note: Land ownership within and around Zone 6 is not shown here but rather in Figure 2, so as not to obscure the density data.

The long-term abundance and density trends within Zone 6 are unknown because of its recent addition to the Reserve. Due to the lack of long-term monitoring in Zone 6, which is limited to systematic surveys from 2017 and 2022, trends previous to those years cannot be inferred. Survey estimates from 2017 and 2022 indicate tortoise populations in Zone 6 have likely remained stable or slightly increased over the past 5 years (Washington County 2022).

The establishment of Zone 6 provided conservation benefits to the desert tortoise and increased the existing acreage of the Reserve by approximately 11%. The addition of Zone 6 to the Reserve provides additional protection to approximately 736 adult desert tortoises and 6,813 acres of habitat (both Federal and non-Federal; Table 8). Habitat in Zone 6 has not been impacted by fires in the recent past (only one fire has burned near Zone 6 between 2020 and 2023) and is separated from the other zones geographically. As such, the tortoises in Zone 6 may serve as a population less prone to the threats of weeds, fire, and disease found in Zones 1 through 5 of the Reserve and may therefore preserve genetic and behavioral representation. The protection of this additional habitat may increase the viability of desert tortoises by increasing the number of tortoises living within protected habitat and providing increased resiliency and redundancy against the cumulative threats they face in the UVRRU (FWS 2021c).

Desert Tortoise in the Upper Virgin River Recovery Unit

A range-wide Mojave desert tortoise population estimate in 2014 documented a decline of almost 125,000 adult tortoises over a 10-year period, representing a nearly 37% overall population decline (Allison and McLuckie 2018). According to overall extrapolated density estimates within the UVRRU, densities of Mojave desert tortoise in the UVRRU are declining at a rate of approximately 3.2% per year, lower than other tortoise populations across the range, including Colorado Desert (4.5%), Eastern Mojave (11.2%), and Western Mojave (7.1%) (Allison and McLuckie 2018). If tortoises in the UVRRU continue this downward trajectory at the same rate of decline (3.2%), they could become more vulnerable to future stochastic events and habitat impacts, particularly considering the small size of the UVRRU and its proximity to growing urbanized areas.

Densities within the UVRRU are currently higher than many other Mojave desert tortoise populations range-wide. Densities across the range outside of the UVVRU are thought to range from 1.7 to 14.2 tortoises per km^2 (FWS 2020). While the UVRRU hosts a higher density of adult Mojave desert tortoises than any other Mojave desert tortoise conservation area (Berry and Murphy 2019), the small geographic size of the Reserve and UVRRU increases the vulnerability of the population. Therefore, the long-term survival and population viability of Mojave desert tortoises in the UVRRU and Reserve will depend upon the reduction, avoidance, and mitigation of primary threats to the species.

Large expanses of high-quality tortoise habitat are necessary to provide resilience to populations, as they fluctuate due to threats (Averill-Murray et al. 2021, FWS 2022a). Primary threats to Mojave desert tortoise in the UVRRU and Reserve include wildfire, invasive plants, drought, habitat degradation, fragmentation and loss, human access, recreation, paved and unpaved roads, disease, and predation (FWS 2011, 2021b, 2022a). Tortoise habitat bordering the Reserve is rapidly changing, and areas that were once accessible to tortoises are now inaccessible due to development, preventing immigration from adjacent tortoise populations. As habitat is fragmented and lost, habitat patches become smaller, patch populations (e.g., clusters of tortoises) have fewer tortoises and become more disjunct, extinction probabilities within patches increase, and the number of occupied patches decreases (Fahrig 2002, Ovaskainen et al. 2002, FWS 2022a). Human activities can also have negative impacts on tortoise populations and illegal collection and intentional killing may be a factor contributing to tortoise declines (Grandmaison 2012). Although many human related threats have been removed or minimized within the Reserve (e.g., grazing, off-road vehicles, and dumping/littering), recreational impacts, habitat fragmentation, habitat degradation, and utility and maintenance are continued cumulative threats to tortoise populations.

Environmental Consequences

Tables 9 and 10 provide specific information on impacts to Mojave desert tortoise habitat from the Northern Corridor alternatives (adapted from Section 3.5.2 of the Final EIS). The estimated number of Mojave desert tortoise to be relocated from the ROW and within the area that may experience indirect effects from the ROW is based upon estimates of abundance of Mojave desert tortoise in Zone 3 for 2007-2023 (UDWR 2024c) using a kernel density analysis (refer to Figure 7).

Total adult tortoises impacted by indirect effects include all Reserve lands within the 508-meter buffer (or 300-foot buffer if within a previously established roadway) to the north of each alternative ROW, and any additional fragmented habitat south of each ROW.[12] This analysis follows the methodology and assumptions used in the Final EIS (data from 2007-2017) with updated tortoise data through 2023 (see Final EIS pages 3-73 and 3-78 and Table 7 above).

A buffer is not used in discussing impacts to Zone 6 because no ROW application has been submitted for this area; however, if development were to occur in this area in the future, indirect impacts could be expanded to Federal lands. As stated above, the effects of issuing the ITP without the Northern Corridor changed circumstance are analyzed in Section 3.5.2.1 of the Final EIS.

Because Mojave desert tortoises move around, the exact number of tortoises that need to be moved out of the ROW or that may experience indirect effects may be more or less under each of the three proposed alignments through the Reserve. Permanently modified habitat, loss of areas with concentrated tortoise use, and habitat fragmentation may result in long-term consequences to the conservation of the Mojave desert tortoise.

As the UDWR survey data indicates (Figure 7), tortoise observations are not distributed evenly in Zone 3. The BLM and FWS used this information to better estimate the number of tortoises that could be impacted by the ROW alternatives instead of using the overall density for Zone 3. These estimates, updated to include tortoise data through 2023, are shown in Table 11. The number of Mojave desert tortoises affected differs from those previously analyzed in the Final EIS, likely due to the change in tortoise abundance within Zone 3 from 2017, which was the last year of survey data available prior to the Final EIS (1,824 in 2017 and 1,681 in 2023; Table 7), and changes in locations of tortoise observations since 2017. The acres of designated critical habitat affected have not changed from the Final EIS (Table 10).

UDOT ROW Alignment (Affirm Current ROW Grant)

Construction and operation of a Northern Corridor within the NCA under the UDOT ROW Alignment would cause direct loss of occupied tortoise habitat, displacement and short-distance translocation of tortoises, and destruction of burrows. Indirect effects include increased threat of wildfire by providing additional ignition sources from construction and vehicles, as well as facilitating additional spread of noxious weeds and invasive vegetation contributing to increased fuel load. This could result in further direct tortoise mortality, as well as increased habitat loss and degradation if wildfires occurred on previously unburned areas. Shortened fire return intervals due to increased ignition sources and fuels may contribute to the extirpation of Mojave desert tortoise populations within the UVRRU and Reserve.

[12] The 508-meter buffer is the generally accepted annual home range area of adult desert tortoises, although home range sizes vary between males and females and are influenced by resources, location, and weather (Franks et al. 2011, FWS 2011).

Table 9. Impacted Acres of Desert Tortoise Habitat from Northern Corridor Alternatives (adapted from Final EIS Table 3.5-11)

Alternative	Total ROW (acres)	ROW within Reserve (acres)	508-meter Buffer of ROW within Reserve (acres)	Fragmented Habitat* inside Reserve (acres)	Total Indirect Impacts (acres)	Total Zone 6 Impacts** (acres)
UDOT ROW Alignment	300	275	1,733	1,335	2,333	0
T-Bone Mesa Alignment	279	255	1,811	2,313	3,278	0
Southern Alignment	373	340	1,996	650	1,883	0
Red Hills Parkway Expressway	68	11	11	0	11	3,341
St. George Boulevard/ 100 South One-way Couplet	45	0	0	0	0	3,341
Terminate UDOT's ROW	0	0	0	0	0	3,341

*Fragmented habitat, as used here, refers to the number of acres of tortoise habitat that would remain between the alternative alignment and the southern boundary of Zone 3 once the highway was constructed. This fragmented habitat would potentially impair connectivity to the larger tortoise population.
**Total Zone 6 impacts include acres of non-Federal lands in Zone 6 that would no longer be included in the Reserve and may be subject to covered activities under an amended ITP should the respective alternative be selected.

Table 10. Desert Tortoise Critical Habitat Impacted in the Reserve (adapted from Final EIS Table 3.5-12)

Alternative	Lost Critical Habitat within Reserve (acres)	Percent of Total Critical Habitat Lost from Reserve (%)	Disturbed and Fragmented Critical Habitat (Total Indirect Impacts) (acres)
UDOT ROW Alignment	275	0.59	2,333
T-Bone Mesa Alignment	255	0.54	3,278
Southern Alignment	340	0.73	1,883*
Red Hills Parkway Expressway	0	0	11**
St. George Boulevard/100 South One-way Couplet	0	0	0
Terminate UDOT's ROW	0	0	0

*An error in the Final EIS stated disturbed and fragmented critical habitat acres for the Southern Alignment to be 833 acres. This has been corrected in the SEIS to accurately reflect the 1,883 acres of disturbed and fragmented critical habitat.
**The 11 acres of "Disturbed and Fragmented Critical Habitat" is within the existing 300-foot-wide Red Hills Parkway ROW, which has tortoise exclusion fencing on both sides that precludes tortoises from using habitat within the ROW that was originally designated as critical habitat. Therefore, the disturbance/fragmentation of 11 acres of "critical habitat" within the existing ROW is a legacy fragmentation/loss that would have no new direct/indirect impact on tortoises. No additional Mojave desert tortoise habitat would be lost from the ROW within Zone 3 of the Reserve under this alternative, and it is not anticipated that Mojave desert tortoise short-distance translocation would be necessary.

Table 11. Potential Number of Adult Tortoises Impacted in the Reserve

Alternative	Potential Number of Adult Tortoises Translocated (within ROW)	Number of Adult Tortoises with Indirect Impacts (from ROW)	Number of Tortoises Subject to Take in Zone 6*	Total Number of Tortoises Affected by the Alternative
UDOT ROW Alignment	31	275	0	306
T-Bone Mesa Alignment	27	357	0	384
Southern Alignment	31	189	0	220
Red Hills Parkway Expressway	0	3	328	331
St. George Boulevard/100 South One-way Couplet	0	0	328	328
Terminate UDOT's ROW	0	0	328	328

*Under the Red Hills Parkway Expressway, One-way Couplet, or Terminate UDOT's ROW alternatives, the non-Federal lands in Zone 6 could be developed, as described in Section 2.2. As per HCP protocols, surveys would be conducted and tortoises would be relocated prior to development.

Additionally, tortoises would be affected by disturbance from noise and vibrations associated with construction and use of the highway, facilitating human intrusion into Mojave desert tortoise habitat, spreading trash and toxins, influencing predator abundance and distribution, disrupting home range and landscape movement patterns, and fragmenting habitat within lands specifically identified for the protection and long-term management of Mojave desert tortoise. Highway traffic may also indirectly depress tortoise populations adjacent to the road because of the changes in energy expenditure in this location. For instance, one study found that when in a resting state, female tortoises near a highway were not as likely to stay in a resting state and were more likely to switch to a traveling state, resulting in an increased expenditure in energy (Harju et al. 2024). When in a traveling state, females near a highway were more likely to continue traveling and less likely to switch into a resting state.

Direct and indirect impacts of this alternative remain similar to those analyzed in the Final EIS for the ITP (Final EIS page 3-77). Using the best available survey data (up to 2023), 306 Mojave desert tortoise would be affected under this alternative. Under this alternative, the FWS would affirm the ITP under the Northern Corridor changed circumstance and incidental take of Mojave desert tortoise associated with 3,341 acres of tortoise habitat on non-Federal lands within Zone 6 would not be part of the County's ITP. In addition, the County would continue their obligations under the Northern Corridor changed circumstance, including funding of law enforcement, public outreach and education, and personnel that would support tortoise-related management as well as financial resources to support fire management and habitat restoration and tortoise passage structures.

T-Bone Mesa Alignment

Construction and operation of a Northern Corridor within the NCA along the T-Bone Mesa Alignment would result in similar impacts to tortoises as the UDOT ROW Alignment. Differences in habitat lost and habitat fragmented under each alternative can be found in Table 10. Table 11 shows that the number of tortoises that would be directly and indirectly impacted under the T-Bone Mesa Alignment (384 tortoises) would be more than the UDOT ROW Alignment (306 tortoises). The impacts in Zone 6 would be the same as the UDOT ROW Alignment.

Southern Alignment

Construction and operation of a Northern Corridor within the NCA along the Southern Alignment would result in similar impacts to tortoises as the UDOT ROW Alignment. Table 11 shows that the number of tortoises that would be directly and indirectly impacted under the Southern Alignment (220 tortoises) would be less than both the UDOT ROW Alignment and the T-Bone Mesa Alignment. The impacts in Zone 6 would be the same as the UDOT ROW Alignment.

Red Hills Parkway Expressway

No additional Mojave desert tortoise habitat in Zone 3 would be lost by selecting the Red Hills Parkway Expressway (see note to Table 10). Consequently, the acres of habitat that could be impacted from the expressway construction under this alternative would be fewer than that of the three alternatives located wholly within the NCA. The potential number of adult tortoises translocated from within the ROW for this alternative would be zero, and the number of adult tortoises with indirect impacts from the ROW estimated to be three. These tortoises may be indirectly impacted, for instance, by road noise and vehicle vibrations; however, these would not be new disturbances, as the roadway already exists.

Under this alternative, the Northern Corridor changed circumstance would not be triggered, thus eliminating Zone 6 from the Reserve as mitigation for the Northern Corridor highway. The FWS would amend the ITP to allow for incidental take of Mojave desert tortoise on 3,341 acres of non-Federal lands in Zone 6 that would be subject to covered activities through the HCP (e.g., land development). By selecting this alternative, Mojave desert tortoises on non-Federal lands in Zone 6 (328 tortoises, see Table 11) could be subject to incidental take from covered activities. Mojave desert tortoises displaced by development would be translocated (i.e., moved outside their home range) to appropriate locations facilitated by the County's Mojave desert tortoise conservation program, in coordination with UDWR. Translocations would occur over the term of the ITP (25 years) or until such time that all covered activities are finished, or all clearances have been completed and there would be no more need for salvage collection.

Section 3.5.2.1 of the Final EIS analyzed the effects of issuing the ITP should the Northern Corridor changed circumstance not be triggered (i.e., if an alternative is selected that is not in the NCA). The HCP analysis area included the 3,341 acres of non-Federal lands in Zone 6 and accounted for the potential take of tortoise on these lands under the HCP and ITP, without the changed circumstance.

Under this alternative, the non-Federal lands within Zone 6 would no longer be a part of the Reserve and are likely to become available for future development, resulting in potential direct impacts to tortoise habitat, fragmentation, and potentially increasing the threats of wildfires. The effects of any future potential development would be dependent on the type of development, and therefore cannot be exactly quantified in this analysis. With the elimination of Zone 6, the habitat on non-Federal lands would be subject to degradation and loss from the use of unmanaged motorized and non-motorized recreational activities on and off trails. In addition, tortoise habitat could be at a greater risk of wildfires due to dispersed camping.

If the ITP is amended, the management prescriptions for Federal lands managed by the BLM within Zone 6 that were put in place by the 2021 amendment to the St. George Field Office RMP would remain in place-until such time as the RMP is revised or amended in the future. The special management protections for the 2,345 acres of the Red Bluff ACEC that are within Zone 6 would also remain in place. No direct effects to tortoises located on Federal lands would be anticipated under this alternative.

As previously described (Section 2.2), additional resources provided by the County under the Northern Corridor changed circumstance would also not be available to benefit Mojave desert tortoise. Zone 6 is currently functioning as part of the Reserve and the County's commitments and actions taken to date have resulted in conservation benefit in Zone 6 and across the Reserve that would no longer remain if a Northern Corridor ROW were not approved within the NCA. Without the changed circumstance triggered, there would be a reduction of additional HCP money and conservation commitments under the changed circumstance would cease or would have to be funded by alternative means. This includes

funding of law enforcement, public outreach and education, or personnel that would support tortoise-related management. In addition, financial resources to support fire management, habitat restoration, tortoise passage structures, and other conservation actions would also not be available. Other direct and indirect impacts of the ITP without the Northern Corridor changed circumstance remain similar to those analyzed in the Final EIS (page 3-74).

St. George Boulevard/100 South One-way Couplet

The One-way Couplet would involve reconfiguring existing roadways within the City of St. George, causing no additional disturbance to the Mojave desert tortoise or its habitat in the NCA. If this alternative is selected, Zone 6 would no longer be part of the Reserve and impacts would be the same as those described for the Red Hills Parkway Expressway for Zone 6.

Terminate UDOT's ROW

Termination of UDOT's ROW would result in no additional disturbances to the Mojave desert tortoise or its habitat within the NCA. The Northern Corridor changed circumstance would not be triggered and Zone 6 would no longer be part of the Reserve, resulting in impacts that would be the same as what is described for the Red Hills Parkway Expressway for Zone 6.

3.6 ESA Section 6 Land Acquisition Grants

Section 6 of the ESA authorizes grants to States for conservation efforts on non-Federal lands through what is commonly referred to as the Cooperative Endangered Species Conservation Fund. This analysis identifies properties—hereafter referred to as Section 6 lands—that have been acquired using Section 6 grants awarded to the State of Utah, UDWR. The analysis area for the evaluation of impacts is the Reserve boundary, and potential impacts are analyzed for the proposed Northern Corridor alternatives; no Section 6 lands occur in Zone 6.

3.6.1 2020 Final EIS Summary

Section 3.6 of the Final EIS (pages 3-94 to 3-102) discusses ESA Section 6 land acquisition grants within the Reserve. Within the Reserve, all Section 6 lands were acquired using HCP Land Acquisition Grants. States awarded Section 6 grants must manage these land grants in accordance with the executed grant agreements. If compliance with the terms and conditions of the executed grant agreements for long-term conservation cannot be achieved, then the property or properties acquired through the grant or property used to match the grant funds is subject to transfer, replacement, or repayment to the United States Government.

The Final EIS stated that the Cooperative Endangered Species Conservation Fund had been used to acquire approximately 3,059 acres of private in-holdings within Zones 1 through 5 of the Reserve. The parcels that may be affected by the Northern Corridor were purchased between 2003 and 2015 by the State through HCP Land Acquisition Grants. The purpose of these grants is to complement an existing Habitat Conservation Program, in this case, Washington County's Amended HCP. All of the lands acquired have a similar grant objective, or long-term conservation goal, which is "to be operated by the UDWR and/or Utah Division of Parks and Recreation, Snow Canyon State Park as a wildlife preserve for the Mojave desert tortoise and other wildlife biodiversity species, in accordance with the Washington County Habitat Conservation Plan and the Desert Tortoise Recovery Plan, and for limited, controlled public access for wildlife viewing." These lands are managed in keeping with this objective.

The Turkey Farm Road and Lava Ridge fires affected approximately 764 acres of Section 6 lands east of Cottonwood Springs Road within the Reserve. The extent of the damage on Section 6 lands was unknown at the time of the Final EIS but was anticipated to include wildlife and habitat loss. While degradation of these parcels may have compromised the existing conservation value of these parcels through permanent and temporary habitat loss, the lands are still managed in accordance with the executed grant agreements.

The Final EIS found that the One-way Couplet would have no direct or indirect impacts to Section 6 lands. One Section 6 parcel is located directly adjacent to Red Hills Parkway at its western terminus with Bluff Street; the Red Hills Parkway Expressway would not require further expansion of the road or ROW acquisition within 1 kilometer of this location. Therefore, no physical encroachment or fragmentation of Section 6 lands would occur. The parcel would retain its conservation value and continue to serve its intended purpose, and the Red Hills Parkway Expressway would comply with the terms and conditions for long-term conservation set forth in the grant.

The Final EIS found that five Section 6 parcels are either wholly or partially within 1 kilometer of the proposed ROW for the T-Bone Mesa Alignment. All these parcels are within areas of primarily medium to low relative tortoise density in Zone 3 of the Reserve and, in total, amount to approximately 765 acres. Three parcels provide valuable, relatively continuous habitat east of Cottonwood Springs Road—which acts as a barrier to Mojave desert tortoise—by linking State-owned lands with BLM-managed lands in this core zone of the Reserve. Two of these parcels comprise approximately 671 contiguous acres. Bounded by development to the south, east, and west, Parcel 5 currently serves as a buffer between existing development in the City of St. George and the open space of the Reserve. While this parcel has been incorporated into the Reserve since its purchase in 2015, fencing still exists on the northern boundary of the parcel. If the T-Bone Mesa Alignment were selected, a total of approximately 418 acres of Section 6 lands would be lost, accounting for approximately 14% of Section 6 lands within the Reserve.

The Final EIS found that four Section 6 parcels are either wholly or partially within 1 kilometer of the UDOT ROW Alignment, totaling approximately 705 acres. The UDOT ROW Alignment would generally have the same direct and indirect impacts to three of the parcels as described for the T-Bone Mesa Alignment, including the assessment of remaining conservation value. However, the UDOT ROW Alignment would result in less direct habitat loss and potential fragmentation. A total of approximately 341 acres of Section 6 lands would be lost, accounting for approximately 11% of existing Section 6 lands within the Reserve.

The Final EIS found that the Southern Alignment would have slightly more physical encroachment on Section 6 lands and more total acres of indirect impacts because of proximity to the road and overall fragmentation. If the Southern Alignment were selected, a total of approximately 355 acres of Section 6 lands would be lost, accounting for approximately 12% of existing Section 6 lands within the Reserve.

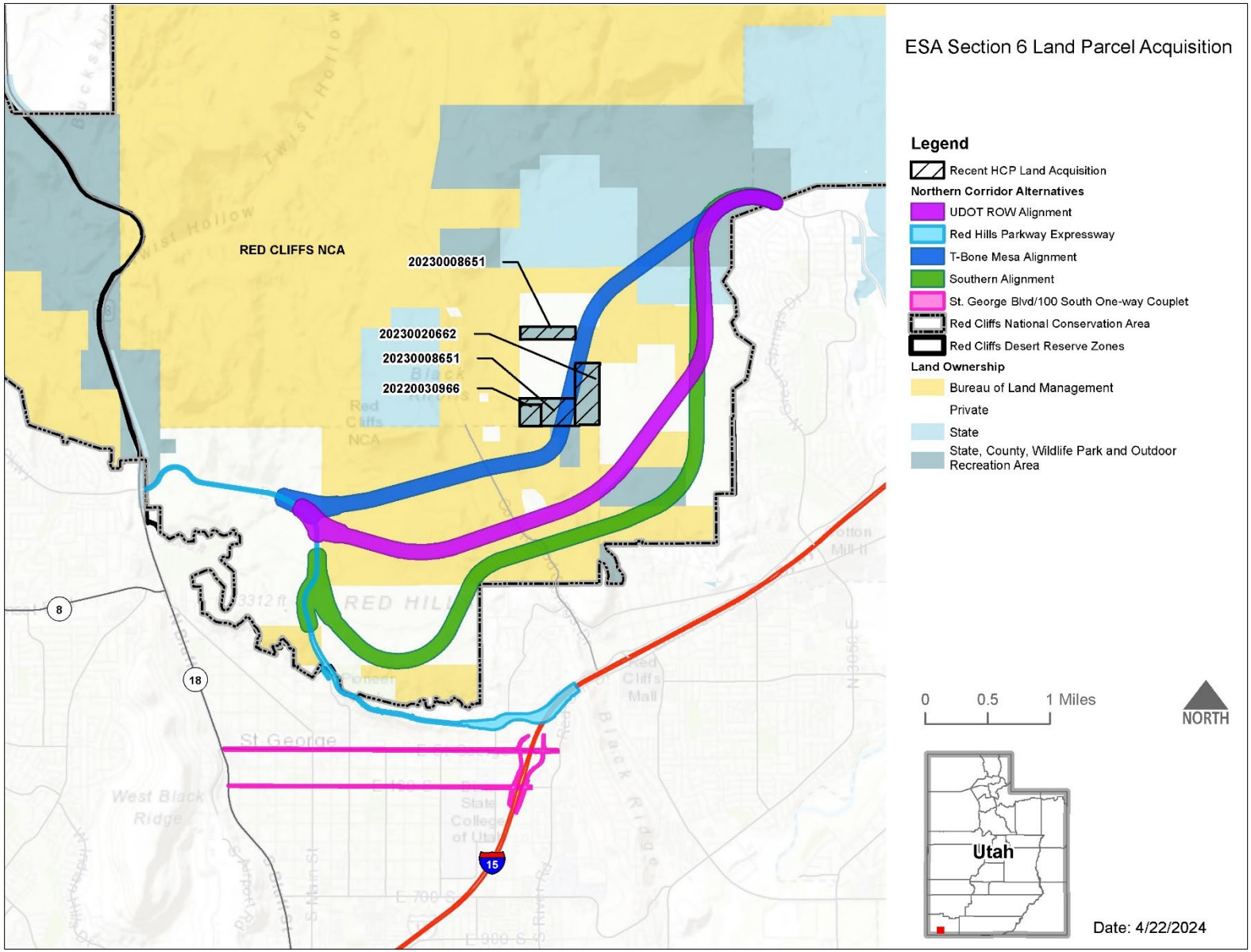
3.6.2 Supplemental Analysis

Affected Environment

Since the Final EIS, the FWS awarded one Section 6 HCP land acquisition grant to the UDWR for acquisition of land within the Reserve and three newly acquired Section 6 land parcels have been added (Figure 10). These are Parcel 20230008651 (46 acres; comprised of County parcel 6602-A and 6602-B), Parcel 20220030966 (12 acres; County parcel 6600-NP-9), and Parcel 20230020662 (62 acres; County parcel 6810-D-12). These parcels have been acquired in part with grant funds provided by the FWS, pursuant to the ESA Section 6 Grant Program, and are to be managed for the purpose of this grant, in accordance with applicable Federal and State law.

The newly acquired parcels consist of approximately 120 acres and are located in an area that has moderate tortoise density and high tortoise connectivity. To adequately assess potential changes to these lands, consideration must be given to the purpose of the grant and the associated land's conservation value with respect to the agreed upon conservation purposes. The analysis considers direct impacts to the parcels themselves and indirect impacts (up to 1 kilometer) that may result from proximity to the proposed Northern Corridor. It also considers how Section 6 lands work in concert to achieve the long-term conservation goal of the grants and the indirect effects that may occur.

Figure 10. Recent Section 6 Land Acquisitions in the Reserve



Indicators for changes to Section 6 lands include encroachment or proximity impacts to these lands that result in the parcel (or parcels) no longer complementing Washington County's Amended HCP and, therefore, not meeting the long-term conservation goal or purpose, resulting in a violation of executed grant agreement terms and conditions. Consideration of degradation in conservation value takes into account potential impacts to Mojave desert tortoise and other special status wildlife, general wildlife, and wildlife viewing opportunities for the public, as follows:

- Portions of Section 6 lands within ROWs of the Northern Corridor alternatives would result in a direct loss of habitat to Mojave desert tortoise and other wildlife species.
- Portions of Section 6 lands within 508 meters of the proposed ROWs would result in indirect impacts to Mojave desert tortoise from disturbance.
- Portions of Section 6 lands within 1 kilometer of the proposed ROWs would result in indirect impacts to special status and general wildlife species because of habitat degradation.

Environmental Consequences

UDOT ROW Alignment (Affirm Current ROW Grant)

None of the newly acquired parcels would be directly encroached upon by the UDOT ROW Alignment (Table 12); there would not be a direct loss of habitat for Mojave desert tortoise and other wildlife species within these lands. Approximately 6 acres of Parcel 20230020662 is located within 508 meters of the UDOT ROW Alignment, resulting in indirect disturbance to Mojave desert tortoise on 10% of the parcel. The entirety of this parcel is within 1 kilometer of this ROW, resulting in indirect degradation of 62 acres of habitat for special status and general wildlife species. Portions of Parcels 20220030966 and 20230008651 are also located within 1 kilometer of this ROW. Approximately 9 acres of habitat for special status and general wildlife species within Parcel 20220030966 and 24 acres within Parcel 20230008651 would be indirectly impacted due to degradation (representing 75% and 52% of the parcel acreage, respectively).

The ROW would fragment the habitat to the south and east between the parcels and the Reserve boundary. For all wildlife that may inhabit these Section 6 lands, construction of the roadway would result in habitat loss within the ROW and further habitat degradation because of fragmentation and road proximity impacts (i.e., noise and visual intrusion) (Table 13). While Section 6 land would remain following fragmentation, the conservation value of the remaining lands may be degraded so it no longer meets the intended purpose of long-term conservation. Overall, this alternative would result in indirect impacts to Mojave desert tortoise from disturbance of 5% of the newly acquired parcels within 508 meters of the ROW and indirect habitat degradation on 79% of the parcels within 1 kilometer of the ROW.

These new Section 6 lands, when added to those that were disclosed in the Final EIS, indicate a total of 825 acres of Section 6 lands that could be directly or indirectly impacted by the UDOT ROW Alignment. This would include 47 acres that would be directly impacted within the ROW, 292 acres that are within 508 meters of ROW, and 665 acres that are within 1 kilometer of the ROW.

Table 12. UDOT ROW Alignment Habitat Loss and Proximity-Related Degradation on New Section 6 Lands

Parcel No.	Parcel Size (acres)*	Acres within ROW	Acres within 508 Meters	Acres within 1 Kilometer
20230008651	46	0	0	24
20220030966	12	0	0	9
20230020662	62	0	6	62
Total	**120**	**0**	**6**	**95**

*Acres were calculated with a GIS and are rounded to the nearest acre. These totals may differ from deeded acreage. 1 kilometer and 508 meters are measured from the 500-foot proposed ROWs.

Table 13. UDOT ROW Alignment Section 6 Lands Fragmentation

Parcel No.	Parcel Size (acres)	Acres Remaining after ROW Encumbrance	Acres That May Remain for Desert Tortoise*	Acres That May Remain for Other Wildlife Species
20230008651	46	46 (no change)	46 (no change)	22
20220030966	12	12 (no change)	12 (no change)	3
20230020662	62	62 (no change)	56	0
Total	**120**	**120**	**114**	**25**

*Acres remaining for Mojave desert tortoise were calculated after deducting the ROW and 508 meters from the ROW. For other species, habitat remaining was calculated after deducting the ROW and 1 kilometer from the ROW.

T-Bone Mesa Alignment

Under this alternative, the BLM would affirm the ROW grant to UDOT across public lands in the NCA but show the T-Bone Mesa Alignment as the approved highway corridor. Portions of two of the new Section 6 parcels would be directly encroached upon by the T-Bone Mesa Alignment; approximately 11 acres of Parcel 20230008651 and 5 acres of Parcel 20230020662 would be crossed by this alignment (Table 14). There would be a direct loss of habitat for Mojave desert tortoise and other wildlife species within these lands, representing 24% of Parcel 20230008651 and 8% of Parcel 20230020662. Approximately 44 acres of Parcel 20230008651 is located within 508 meters of the T-Bone Mesa Alignment ROW, resulting in indirect disturbance to Mojave desert tortoise on 96% of the parcel. The entirety of Parcels 20220030966 and 20230020662 are located within 508 meters of the alignment, resulting in indirect disturbance to Mojave desert tortoise on 100% of those lands. The entirety of the three newly acquired parcels is located within 1 kilometer of this ROW, resulting in indirect degradation of 120 acres of habitat for special status and general wildlife species on these lands.

The T-Bone Mesa Alignment would fragment the habitat to the south and east between the parcels and the Reserve boundary. For all wildlife that may inhabit these Section 6 lands, construction of the roadway would result in habitat loss within the ROW and further habitat degradation because of fragmentation and road proximity impacts (i.e., noise and visual intrusion) (Table 15). While Section 6 lands would remain following fragmentation, the conservation value of the remaining lands may be degraded so it no longer meets the intended purpose of long-term conservation. Overall, this alternative would result in direct impacts to 13% of the lands within the newly acquired parcels, indirect impacts to Mojave desert tortoise from disturbance of 98% of the parcels within 508 meters of the ROW, and indirect habitat degradation on 100% of the parcels within 1 kilometer of the ROW.

These new Section 6 lands, when added to those that were disclosed in the Final EIS, indicate a total of 885 acres of Section 6 lands that could be directly or indirectly impacted by the T-Bone Mesa Alignment. This would include 82 acres that would be directly impacted within the ROW, 470 acres that are within 508 meters of ROW, and 679 acres that are within 1 kilometer of the ROW.

Table 14. T-Bone Mesa Alignment Habitat Loss and Proximity-Related Degradation on Section 6 Lands

Parcel No.	Parcel Size (acres)*	Acres within ROW	Acres within 508 Meters	Acres within 1 Kilometer
20230008651	46	11	44	46
20220030966	12	0	12	12
20230020662	62	5	62	62
Total	**120**	**16**	**118**	**120**

*See note on Table 12.

Table 15. T-Bone Mesa Alignment Section 6 Lands Fragmentation

Parcel No.	Parcel Size (acres)	Acres Remaining after ROW Encumbrance	Acres That May Remain for Desert Tortoise*	Acres That May Remain for Other Wildlife Species
20230008651	46	35	2	0
20220030966	12	12 (no change)	0	0
20230020662	62	57	0	0
Total	**120**	**104**	**2**	**0**

*See note on Table 13.

Southern Alignment

Under this alternative, the BLM would affirm the ROW grant to UDOT across public lands in the NCA but show the Southern Alignment as the approved highway corridor. None of the new Section 6 parcels would be directly encroached upon by the Southern Alignment (Table 16); there would not be a direct loss of habitat for Mojave desert tortoise and other wildlife species within these lands. Furthermore, none of the newly acquired parcels are located within 508 meters of the Southern Alignment ROW; therefore, there would be no indirect disturbance to Mojave desert tortoise. Neither Parcel 20230008651 nor Parcel 20220030966 are located within 1 kilometer of the ROW. Parcel 20230020662 is the only newly acquired parcel that is located within 1 kilometer of this ROW, resulting in indirect degradation to approximately 19 acres of habitat for special status and general wildlife species (representing 30% of the parcel acreage). For all wildlife that may inhabit these Section 6 lands, construction of the roadway would result in habitat degradation because of fragmentation and road proximity impacts (i.e., noise and visual intrusion).

The Southern Alignment nearly skirts the southern border of the NCA, thus reducing the amount of habitat fragmentation between the parcel and the boundary (Table 17). While Section 6 lands would remain following fragmentation, the conservation value of the remaining lands may be degraded so it no longer meets the intended purpose of long-term conservation. Overall, this alternative would result in indirect habitat degradation on approximately 16% of the newly acquired parcels within 1 kilometer of the ROW.

These new Section 6 lands, when added to those that were disclosed in the Final EIS, indicate a total of 705 acres of Section 6 lands that could be directly or indirectly impacted by the Southern Alignment. This would include 49 acres that would be directly impacted within the ROW, 294 acres that are within 508 meters of ROW, and 596 acres that are within 1 kilometer of the ROW.

Table 16. Southern Alignment Habitat Loss and Proximity-Related Degradation on Section 6 Lands

Parcel No.	Parcel Size (acres)*	Acres within ROW	Acres within 508 Meters	Acres within 1 Kilometer
20230008651	46	0	0	0
20220030966	12	0	0	0
20230020662	62	0	0	19
Total	**120**	**0**	**0**	**19**

*See note on Table 12.

Table 17. Southern Alignment Section 6 Lands Fragmentation

Parcel No.	Parcel Size (acres)	Acres Remaining after ROW Encumbrance	Acres That May Remain for Desert Tortoise*	Acres That May Remain for Other Wildlife Species
20230008651	46	46 (no change)	46 (no change)	46 (no change)
20220030966	12	12 (no change)	12 (no change)	12 (no change)
20230020662	62	62 (no change)	62 (no change)	43
Total	**120**	**120**	**120**	**101**

*See note on Table 13.

Red Hills Parkway Expressway
The Red Hills Parkway Expressway Alternative proposes changes to the existing four lane Red Hills Parkway. Under this alternative, UDOT would no longer hold the ROW grant for the Northern Corridor and no new road would be built in the NCA. There would be no direct or indirect impacts on any of the new Section 6 parcels under this alternative because they all are more than 1 kilometer in distance from this alternative. Under this alternative, the newly acquired parcels would retain their conservation value and continue to serve their intended purpose. There would not be any additional impacts to Section 6 lands beyond those described in the Final EIS.

St. George Boulevard/100 South One-way Couplet
The One-way Couplet proposes changes to two existing city streets, St. George Boulevard and 100 South. There would be no direct or indirect impacts on any of the new Section 6 parcels under this alternative because they all are more than 1 kilometer in distance from this alternative. Under this alternative, the newly acquired parcels would retain their conservation value and continue to serve their intended purpose. There would not be any additional impacts to Section 6 lands beyond those described in the Final EIS.

Terminate UDOT's ROW
Under this alternative, UDOT would no longer hold the ROW grant for the Northern Corridor across the NCA. There would be no direct or indirect changes to any of the Section 6 lands, and they would retain their conservation value and continue to serve their intended purpose.

3.7 Land and Water Conservation Fund Lands

This analysis identifies properties acquired or developed through grants and Congressional appropriations from the LWCF Act of 1965 (54 U.S.C. 200301 et seq.) that may be affected by the Northern Corridor alternatives analyzed in this SEIS. These lands are sometimes referred to as Section 6(f) properties. This analysis focuses on properties crossed by the Northern Corridor alternatives; no LWCF lands are located within Zone 6.

3.7.1 2020 Final EIS Summary

Section 3.16 of the Final EIS (pages 3-168 to 3-171) discusses LWCF lands within the Reserve. The LWCF Act established a funding source to assist states and Federal agencies in acquiring certain lands for recreation and other conservation purposes. The LWCF has a Federal agency component (54 U.S.C. 200306) and a State and local government component (54 U.S.C. 200305), which have different uses and requirements. Federal agencies (i.e., the BLM) may use LWCF to purchase private in-holdings to meet resource management objectives. For State and local governments, funds from the LWCF are allocated to a State for the planning, acquisition, and development of needed land and water public outdoor recreation projects. Section 6(f)(3), as described in 36 CFR 59.3(a), is the cornerstone of Federal efforts that ensure Federal investments in State LWCF assistance are being maintained for public outdoor recreation use. Once land has been purchased or developed (partially or entirely) with LWCF assistance from the State side of the LWCF program, it cannot be wholly or partially converted to a use other than public outdoor recreation use(s) without the approval of the National Park Service. The LWCF Act, as amended, does not include these provisions for funds allocated for Federal purposes. Lands acquired for Federal purposes are administered by the respective Federal land management agency and are subject to other laws.

Since the establishment of the Reserve, the BLM has acquired private property parcels for the purposes of land tenure consolidation and wildlife habitat acquisition. The majority of these acquisitions were made with LWCF funds and are consistent with the agency's acquisition authority under 43 U.S.C. 1715, which post-dates LWCF and is part of the larger comprehensive statutory scheme for public lands management established by the FLPMA (43 U.S.C. 1701 et seq.). The Final EIS concluded that private land parcels previously acquired by BLM with LWCF funds would be encumbered by constructing the Northern Corridor under the UDOT ROW Alignment, T-Bone Mesa Alignment, or Southern Alignment. However,

these alignments would not wholly or partially convert any State LWCF properties to non-recreational use. The Federal LWCF parcels that may be encumbered are generally in open areas of the NCA that do not contain designated trails or other formal recreation resources.

Pioneer Park, located on Red Hills Parkway just north of downtown St. George, is the only State LWCF/Section 6(f) property located within the Northern Corridor analysis area. The Final EIS stated that the Red Hills Parkway Expressway would require acquiring a ROW over approximately 0.9 acre of additional land in Pioneer Park. This would likely constitute a conversion of use under State LWCF requirements. The acquisition would occur directly adjacent to the existing Red Hills Parkway and would encumber areas not actively used for recreation. The existing ROW for Red Hills Parkway already encumbers approximately 2 acres of Federal LWCF land. Because of the small amount of additional potentially encumbered acreage (0.2 acre) and its location directly adjacent to the existing Red Hills Parkway, the Final EIS found that there would be no impact to Federal LWCF lands under the Red Hills Parkway Expressway. No LWCF lands would be affected by the One-way Couplet.

The BLM's review of the warranty deeds did not reveal any reference to the LWCF, limitations on additional encumbrances, or other restrictions on the LWCF parcels identified in the Final EIS. Lands that are acquired pursuant to 43 U.S.C. 1715 are subsequently managed in accordance with the governing land use plan. The wildlife habitat acquired was for the endangered Mojave desert tortoise, consistent with the Amended HCP Implementation Agreement. The Final EIS determined that due to the small amount of acreage potentially encumbered within the ROW corridor under the T-Bone Mesa Alignment, UDOT ROW Alignment, and Southern Alignment, NCA lands would continue to fulfill wildlife habitat purposes.

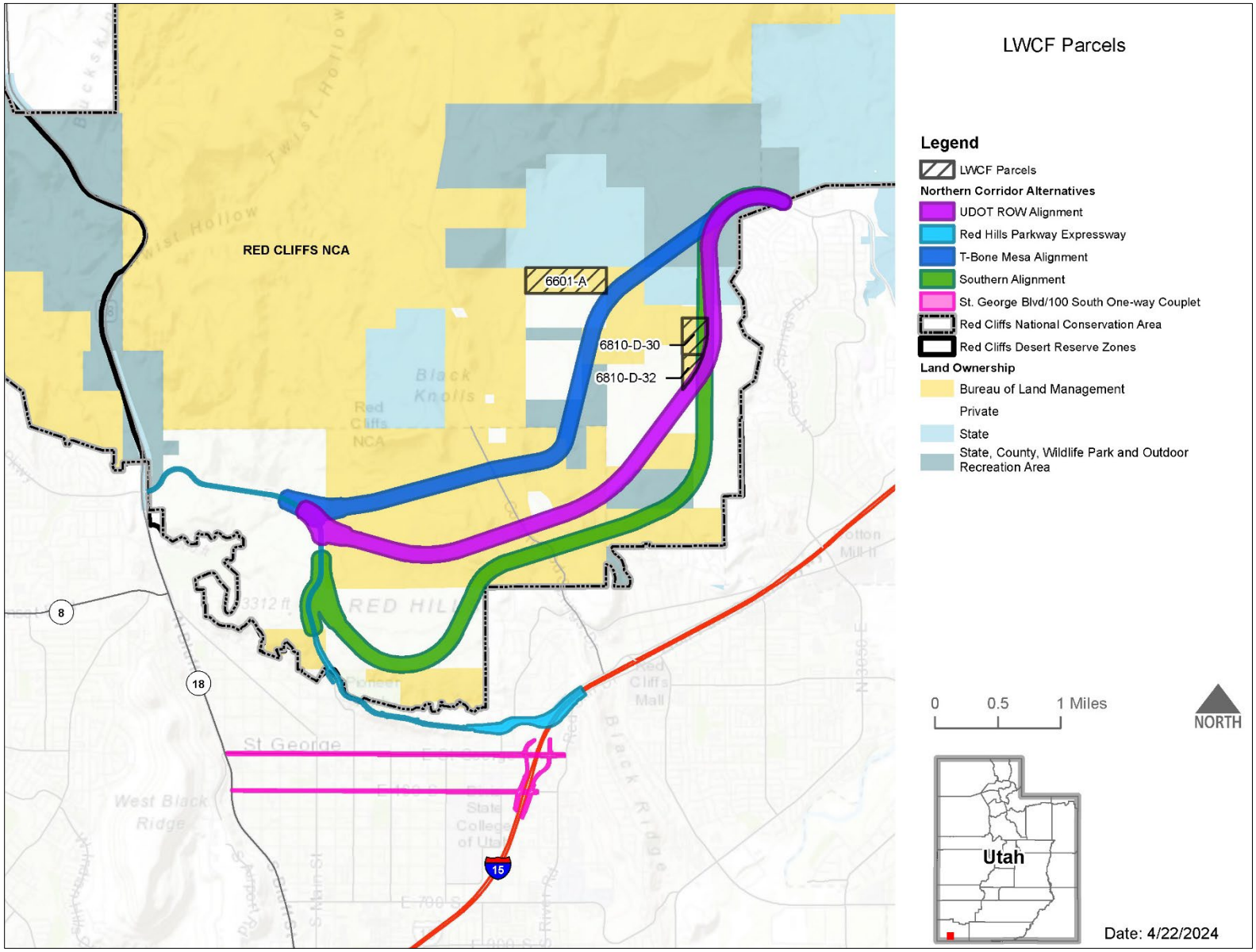
3.7.2 Supplemental Analysis

Affected Environment

Three parcels of Federal LWCF lands have been newly acquired in the NCA since the Final EIS was completed (Figure 11). These are Parcel 6601-A (53.3 acres), Parcel 6810-D-30 (11 acres), and Parcel 6810-D-32 (23 acres). Parcels 6601-A and 6810-D-32 were purchased with LWCF funding, and Parcel 6810-D-30 was purchased with Washington County Lands Acquisition Funding. Acquisition of non-Federal land in Washington County conforms to management direction and decisions in the Red Cliffs NCA RMP, as amended, which prioritizes acquisitions of NCA inholdings containing Mojave desert tortoise habitat. The RMP states "Any land or interest in land that is located in the National Conservation Area that is acquired by the United States Shall (1) become part of the National Conservation Area; and (2) be managed in accordance with (A) the Federal Land Policy and Management Act of 1976 as amended, (B) this section and (c) any other applicable law (including regulations) (OPLMA section 1974 (f))."

Both State and Federal types of acquisitions are analyzed for direct impacts associated with encumbrance, and additional impacts are analyzed associated with State acquisitions that include whether the State LWCF parcel—the boundaries of which are detailed in the grant application and may differ from the parcel or current recreation boundary—would be wholly or partially converted to a non-conforming use. Whole or partial conversion of a State LWCF parcel is based on whether construction would (1) terminate the public outdoor recreation use, (2) convey a property interest for a private or non-public outdoor recreational use, or (3) result in the loss of recreational viability of the remaining property if a partial conversion occurs. If a State LWCF property is wholly or partially converted to a non-public outdoor recreational use, land of equal value, location, and usefulness would be identified for mitigation in accordance with 36 CFR 59.3, "Conversion Requirements." Conversion and replacement would require approval from the National Park Service and may be subject to subsequent NEPA documentation, as determined by the National Park Service. Details of the process and prerequisites for conversions can be found in the Land and Water Conservation Fund State Assistance Federal Financial Assistance Manual (NPS 2023).

Figure 11. Recent Land and Water Conservation Fund Act Land Acquisitions in the Reserve



Environmental Consequences

UDOT ROW Alignment (Affirm Current ROW Grant)

Under this alternative, the UDOT ROW Alignment would not directly encumber any of the newly acquired LWCF parcels.

T-Bone Mesa Alignment

Under this alternative, the BLM would affirm the ROW grant to UDOT across public lands in the NCA but show the T-Bone Mesa Alignment as the approved highway corridor. The T-Bone Mesa Alignment Alternative would directly encumber a portion of one of the newly acquired LWCF parcels. As shown in Table 18, approximately 0.13 acre of Parcel 6601-A, or 0.24% of the 53-acre parcel, is located within the 500-foot corridor alignment for this alternative. Direct and indirect impacts would be similar to those described in Section 3.16 of the Final EIS.

Table 18. Direct Impacts to Federal LWCF Lands within the T-Bone Mesa Alignment.

BLM Case Number	Total Acres	T-Bone Mesa Alignment (acres within 500-foot corridor)
6601-A	53.28	0.13
6810-D-30	11.01	0
6810-D-32	23.08	0
Total	**87.37**	**0.13**

Southern Alignment

Under this alternative, the BLM would affirm the ROW grant to UDOT across public lands in the NCA but show the Southern Alignment as the approved highway corridor. The Southern Alignment Alternative would directly encumber a portion of two of the newly acquired LWCF parcels. As shown in Table 19, approximately 8.89 acres of Parcel 6810-D-30 and 1.34 acres of Parcel 6810-D-32 are located within the 500-foot corridor alignment for this alternative. Approximately 38% of Parcel 6810-D-30 and 12% of Parcel 6810-D-32 would potentially be encumbered under this alternative. Direct and indirect impacts would be similar to those described in Section 3.16 of the Final EIS.

Table 19. Direct Impacts to Federal LWCF Lands within the Southern Alignment.

BLM Case Number	Total Acres	Southern Alignment (acres within 500-foot corridor)
6601-A	53.28	0
6810-D-32	11.01	1.34
6810-D-30	23.08	8.89
Total	**87.37**	**10.23**

Red Hills Parkway Expressway

The Red Hills Parkway Expressway Alternative proposes changes to Red Hills Parkway instead of a new road corridor across public lands within the NCA. Eleven acres of the NCA are within the existing 300-foot-wide Red Hills Parkway ROW (see note to Table 10). As discussed in the Final EIS, this Alternative would further encumber approximately 0.9 acres of an LWCF parcel previously acquired by the State. However, the alternative would not encumber any of the newly acquired LWCF parcels. There would be no additional impacts to these lands from this alternative beyond those disclosed in the Final EIS.

St. George Boulevard/100 South One-way Couplet

The One-way Couplet Alternative proposes changes to two existing streets – St. George Boulevard and 100 South – rather than the construction of a new highway across public lands within the NCA. This alternative would not encumber any of the newly-acquired LWCF parcels. There would be no additional impacts to these lands from this alternative beyond those disclosed in the Final EIS.

Terminate UDOT's ROW

Under this alternative, UDOT would no longer hold the ROW grant for the Northern Corridor across public lands in the NCA. Because there would be no highway constructed under this alternative, there would be no impacts to LWCF lands.

3.8 National Conservation Area

Congress designates public lands managed by the BLM as National Conservation Areas to conserve, protect, and enhance these lands and their resources for the benefit and enjoyment of present and future generations. NCAs offer exceptional scientific, cultural, ecological, historical, and recreational value. The management emphasis of a given NCA is provided by Congress in the individual statute that establishes the NCA. The designating statutory authority for the Red Cliffs NCA is 16 U.S.C. 460www, as described in Section 1.2. The analysis area is the Red Cliffs NCA.

3.8.1 2020 Final EIS Summary

Section 3.18 of the Final EIS (pages 3-176 to 3-179) discusses the NCA and focuses on those lands in the NCA that would be impacted by the proposed Northern Corridor ROW. BLM Manual 6220, *National Monuments, National Conservation Areas, and Similar Designations*, directs the BLM to analyze the impacts on the NCA's objects and values to determine consistency of a proposed ROW with the NCA's purposes, and directs the BLM to consider protection of the purposes for which it was established in the NEPA analysis. As stated in Section 1.2, the purposes for designation of the Red Cliffs NCA are to conserve, protect, and enhance for the benefit and enjoyment of present and future generations the ecological, scenic, wildlife, recreational, cultural, historical, natural, educational, and scientific resources of the NCA and to protect each species that is in the NCA and listed as a threatened or endangered species under the ESA. Table 20 was presented in the Final EIS as a reference between the NCA's objects and values and the corresponding sections of the Final EIS where analysis of the potential effects to the resources is located.

The Final EIS assessed the impacts of the project on the NCA's objects and values in accordance with BLM Manual 6220, Section 1.6, which describes specific direction for Compatibility of Uses (Section C) and Rights-of-way and Transportation and Utility Corridors (Section E), as follows (the lists that follow are excerpts of relevant information from Manual 6220; additional direction is contained in Manual 6220):

(C) Compatibility of Uses

(1) Site-specific activities in Monuments and NCAs will be managed in a manner that is compatible with the protection of the objects and values for which these areas were designated. Multiple uses may be allowed to the extent they are consistent with the applicable designating authority, other applicable laws, and with the applicable land use plan.

(2) Through the NEPA process, the manager with decision-making authority for a Monument or NCA will evaluate discretionary uses and will analyze whether the impacts of the proposed use in the Monument or NCA or similarly designated area are consistent with the protection of the area's objects and values. As part of this analysis, the manager will consider the severity, duration, timing, and direct and indirect and cumulative effects of the proposed use. If necessary and appropriate, the BLM may use the land use planning process to consider whether to change discretionary use authorizations.

Table 20. Red Cliffs NCA Objects and Values and Corresponding Resource Sections in the Final EIS

Objects and Values	Final EIS Resource Section Number
Ecological	Vegetative communities, including noxious weeds and invasive species (3.2); special status plants (3.3); general wildlife (3.4); special status wildlife (3.5); wetlands, floodplains, and waters of the U.S. (3.10); water resources (3.11); fire and fuels management (3.22)
Scenic	Visual resources (3.13)
Wildlife	General wildlife (3.4), special status wildlife (3.5)
Recreational	Recreation and visitor services (3.15), BLM transportation and travel management (3.17)
Cultural	Cultural resources and Native American concerns (3.14)
Historical	Cultural resources and Native American concerns (3.14)
Natural	Vegetative communities, including noxious weeds and invasive species (3.2); special status plants (3.3); general wildlife (3.4); special status wildlife (3.5); geology, mineral resources, and soils (3.7); paleontology (3.8); wetlands, floodplains, and waters of the U.S. (3.10).; water resources (3.11); fire and fuels management (3.22)
Educational	Educational values are associated with all resources
Scientific	Scientific values are associated with all resources
Species protection, including those identified as threatened or endangered under the ESA	Vegetative communities, including noxious weeds and invasive species (3.2), special status plants (3.3), general wildlife (3.4), special status wildlife (3.5)

(E) Rights-of-way and Transportation and Utility Corridors

(2) When processing a new ROW application, to the greatest extent possible, through the NEPA process, the BLM will:

a. determine consistency of the ROW with the Monument or NCA's objects and values;
b. consider routing or siting the ROW outside of the Monument or NCA;

(7) To the greatest extent possible, subject to applicable law, the BLM should through land use planning and project-level processes and decisions, avoid granting new ROWs in Monuments and NCAs and similar designations. In deciding whether to approve ROWs in these components of the National Landscape Conservation System, the BLM shall consider whether ROW proposals are consistent with the authority that designated the component. Subject to applicable law, the BLM shall exercise its discretion to deny ROW applications in Monuments and NCAs and similar designations if they are inconsistent with the component's designating authority.

(8) To the greatest extent possible, subject to applicable law, the BLM should through land use planning and project-level processes and decisions, avoid designating or authorizing use of transportation or utility corridors within Monuments and NCAs. To that end, and consistent with applicable law, when developing or revising land use plans for Monuments and NCAs, the BLM will consider:

b. not designating any new transportation or utility corridors within the Monument or NCA if the BLM determines that the corridor would be incompatible with the designating authority or the purposes for which the Monument or NCA was designated.

The BLM worked with UDOT, FWS, and other partners to identify additional measures that would conserve, protect, and enhance the purposes of the NCA and reduce the potential impacts of BLM issuing a ROW to UDOT for the construction of the Northern Corridor. As a result of those conversations, UDOT submitted a revised Plan of Development containing additional design features of the proposed action for environmental protection. In addition, the BLM, in collaboration with the FWS and other partners, identified additional mitigation measures that were applicable to the issuance of the ROW across the Red Cliffs NCA for the Northern Corridor (refer to Section 2.2.9 of the Final EIS).

3.8.2 Supplemental Analysis

In the August 2023 Settlement Agreement, the BLM committed to the following:

> *Prior to any new decision on the ROW application, BLM agrees to make a compatibility determination to ensure that the decision is compatible with law, regulation, and policy for a National Conservation Area, consistent with the Omnibus Public Lands Management Act, the Federal Land Policy and Management Act, and those versions of BLM Manual 6220 and BLM's National Monument, National Conservation Areas, and Similar Designations Compatibility Analysis Framework in effect at the time of the decision.*

Therefore, a compatibility determination will be completed once the analysis for the SEIS is complete. The compatibility determination, which will be included in the BLM's ROD, will assess the impacts of the selected ROW alternative on the NCA's purposes, based on the analysis of effects in the Final EIS and the SEIS.

3.9 Cultural Resources and Native American Concerns

Conservation, protection, and enhancement of cultural and historical resources were identified as one of the primary purposes for the Congressional designation of the NCA. Cultural resources are defined as any prehistoric or historic district, site, building, structure, object, or isolated find, including those resources that are or are not eligible for listing in the NRHP. An historic property is defined as any prehistoric or historic district, site, building, structure, or object included in, or eligible for inclusion in, the NRHP maintained by the Secretary of the Interior (36 CFR 800.16(l)(1)). The assessment of impacts to historic properties occurs within an Area of Potential Effects, which is a geographic area within which an undertaking (i.e., project) may directly or indirectly cause alterations in the character or use of historic properties (36 CFR 800.16(d)). Issuance of a ROW by the BLM and the issuance or amendment of an ITP by the FWS are Federal undertakings and are subject to Section 106 of the NHPA.

For the three alternatives located entirely within the NCA, the Area of Potential Effects is a 700-foot-wide corridor along each of the proposed Northern Corridor alignments, as described in Section 3.14 of the Final EIS. Multiple prior Class III level archaeological field investigations have inventoried the entire length of the Red Hills Parkway and documented sites along the route. Therefore, the Area of Potential Effects for the Red Hills Parkway Expressway was defined as a 200-foot-wide corridor for additional Class III surveys and site re-visits to provide adequate coverage for the proposed changes to the roadway. The Area of Potential Effects for the Reconnaissance Level Survey for Historic Structures for the Red Hills Parkway Expressway and the One-Way Couplet alternatives was defined as one legal parcel in width along these existing roadways.

3.9.1 2020 Final EIS Summary

Section 3.14 of the Final EIS (pages 3-143 to 3-154) discusses Cultural Resources and Native American Concerns for the Northern Corridor and provides a cultural history of the area, as well as the results of the investigations carried out in support of Section 106 compliance and the NEPA process for the Final EIS. Between 2020 and 2021, the BLM consulted with the SHPO and received concurrence with the adequacy of its definition of the Areas of Potential Effects described above for each of the five alternative highway alignments. The identification efforts within the Areas of Potential Effects were accomplished through

literature reviews and Class III level field investigations, including the intensive pedestrian survey for archaeological sites (Tuttle Collins et al. 2020) and a Reconnaissance Level Survey for historic structures along the Red Hills Parkway and One-Way Couplet streets (Pearson and Calkins 2020). The BLM completed evaluations of eligibility for listing to the NRHP for cultural resources documented within the Areas of Potential Effect and made preliminary determinations of effect for historic properties identified within the Areas of Potential Effects.

The number of NRHP eligible properties in each alignment's Area of Potential Effects is shown in Table 21. The historic properties listed within each alignment may be adversely affected by the construction, operation, and maintenance of the highway. However, due to the topography of the alignment and the types and locations of historic properties, construction within each of the alignments could have dissimilar levels of direct and indirect effects to these historic properties, as discussed in the Final EIS. Based on the conceptual engineering designs available for the Red Hills Parkway Expressway and the One-way Couplet, the historic structures located along the Parkway, St. George Boulevard, and 100 South are unlikely to be adversely affected by the implementation of either alternative.

Table 21. Historic Properties in Each Northern Corridor Alignment

Alignment	Prehistoric	Multi-Component	Historic	Historic Structure	Total
UDOT ROW Alignment	2	2	4	0	8
T-Bone Mesa Alignment	2	1	3	0	6
Southern Alignment	2	1	2	0	5
Red Hills Parkway Expressway	0	0	1	1*	2
St. George Boulevard/100 South One-way Couplet	0	0	0	63	63

*This historic structure is also Site 42WS4989, which includes a water tank and associated features.

The Final EIS presented the number of cultural resources within each of the alignments that were evaluated as not being eligible for listing to the NRHP (See Table 22).

Table 22. Cultural Resources Not Eligible for NRHP Listing in Each Northern Corridor Alignment

Alignment	Prehistoric	Multi-Component	Historic	Historic Structure	Total
UDOT ROW Alignment	3	0	5	0	8
T-Bone Mesa Alignment	2	0	3	0	5
Southern Alignment	0	0	2	0	2
Red Hills Parkway Expressway	0	2	2	5	9
St. George Boulevard/100 South One-way Couplet	0	0	0	70	70

A records search was completed for Zone 6 for the Final EIS. It showed that approximately 23.8% (1,621 acres) of Zone 6 were previously surveyed, through 20 cultural resources investigations, and 14 historic properties recorded. (see Table 3.14-3 in the Final EIS).

In the NOI to prepare an EIS (FR 84: 66692-66694), the BLM and FWS notified the public that they would coordinate their public involvement obligations under the NHPA (54 U.S.C. 100101 et seq.) through the NEPA process, as provided for in 36 CFR 800.2(d)(3). The BLM and the FWS independently initiated the Section 106 process, as it related to their respective decisions, by establishing the undertaking, identifying and consulting with interested parties, identifying points in the process to seek input from the public, and notifying the public of proposed actions. The BLM and FWS consulted jointly

and independently with the Utah SHPO and Indian Tribes regarding efforts to identify cultural resources and evaluate them for NRHP eligibility (36 CFR 800.4) and assess effects of the project on historic properties by applying the criteria of adverse effect (36 CFR 800.5). This process is described in more detail in Section 4.2.

Concurrent with the NEPA process for the Final EIS, the BLM assessed the potential effects on historic properties of issuing a ROW for the Northern Corridor highway within the UDOT Alignment alternative. The BLM did not resolve the potential adverse effects to historic properties that could result from its decision prior to the approval of the undertaking. However, a stipulation requiring UDOT to avoid, minimize, or mitigate adverse effects was included in the ROD and the ROW grant. This stipulation prohibited the issuance of a Notice to Proceed with construction and operation of the highway to UDOT until a Final Plan of Development had been submitted to the BLM, a Memorandum of Agreement (MOA) had been executed, and approved treatments implemented to resolve adverse effects to historic properties.[13] As part of the Settlement Agreement, the BLM has agreed to complete its requirements under Section 106 of the NHPA to resolve adverse effects to historic properties prior to issuing a decision regarding the undertaking.

For the ITP, the FWS determined that it could not fully anticipate the effects to historic properties prior to issuance of the ITP. The FWS worked with the Utah SHPO, Washington County, and other Consulting Parties to develop a Programmatic Agreement (PA), as authorized by 36 CFR 800.14(b). The PA was limited to the authorized activities in the ITP and conservation measures in the HCP that would result in take of desert tortoises and that may have the potential to cause adverse effects to historic properties, both with and without the Northern Corridor changed circumstance. The PA was signed by the FWS, SHPO, Washington County, and Consulting Parties in December of 2020 to resolve future, but presently unknown, effects to historic properties on non-Federal lands that could be developed following the FWS's issuance of the ITP to Washington County. Signing of the PA concluded FWS obligations under the NHPA.

3.9.2 Supplemental Analysis

Affected Environment

On August 23, 2023, the Sugarloaf Hillside Sign, also known as Dixie Rock, was listed on the NRHP after the Final EIS was completed. This site consists of five white painted letters spelling out the word DIXIE on the vertical face of a prominent sugarloaf shaped sandstone formation, located within the City of St. George's Pioneer Park, adjacent to Red Hills Parkway.

On February 2, 2024, UDOT provided the BLM with the GIS shapefiles of its 30% engineering design plan for the UDOT ROW Alignment. These plans were not available when the Final EIS was published and may be subject to further changes.

In 2024, the BLM updated the literature review for Zone 6 having located archaeological survey records that were not available in 2020. While this review increased the number of surveys previously conducted in Zone 6, it did not change the number of sites that had been previously documented (14). There have been 24 cultural resource surveys previously conducted in Zone 6 on both Federal and non-Federal lands and no new surveys have been conducted in Zone 6 since 2020. In the approximately 24% of Zone 6 that has been surveyed, there are 34 recorded archaeological sites, including sites that have been evaluated as being eligible for listing in the NRHP, sites have been evaluated as not being eligible for listing, and sites

[13] While an MOA was identified as part of the 2020 Final EIS process, further consultations between the BLM and Utah SHPO (as part of the Section 106 and SEIS processes) have determined that a Programmatic Agreement is more appropriate for this project. Additional details are provided in Section 4.2.

that have not been evaluated for eligibility[14] (see Table 23). Since the non-Federal lands in Zone 6 have not been fully inventoried to identify historic properties, additional eligible sites may be present that could be subject to adverse effects related to development. The 23 recorded sites on BLM-managed public lands, and any additional sites located on public lands in Zone 6 that have not yet been identified by field investigations, would continue to be managed in compliance with the legal requirements of the NHPA and the management decisions from the St. George Field Office RMP, as amended in 2021, that limited certain land uses, such as dispersed camping or physical geocaches that have the potential to impact cultural resources.

Table 23. Recorded Archaeological Sites in Zone 6

Land Status	Total No. of Sites	Prehistoric	Historic	Eligible	Unevaluated	Not Eligible	Within ACEC
BLM	23	23	0	11	7	5	2
TLA	11*	7*	4	4	1	6*	N/A
Total	34	30	4	15	8	11	2

*One of these sites is also on private land.

Environmental Consequences

UDOT ROW Alignment (Affirm Current ROW Grant)

Construction of the Northern Corridor highway within the UDOT ROW Alignment may affect up to eight historic properties: two prehistoric sites, four historic sites, and two multi-component sites. The 30% engineering design plans that were provided by UDOT in 2024, indicate that four historic properties previously identified within the ROW (see Table 22) could be avoided, including two prehistoric sites, one historic site, and one multi-component site. These historic properties are located within the 700-foot-wide Area of Potential Effects for the UDOT ROW alignment and within the 500-foot-wide authorized UDOT ROW at variable distances, ranging from 26 to 125 feet from the edge of the proposed highway.

UDOT's 30% design plans for the Northern Corridor highway are not final engineering designs, and while it appears that as many as four historic properties could be avoided, there could be indirect effects, such as increased erosional runoff from the highway, that result in adverse effects. If the UDOT ROW grant is affirmed, it is still reasonably foreseeable that eight historic properties may be adversely affected, either directly or indirectly by the construction, maintenance, and use of the highway within the UDOT ROW Alignment. The number of historic properties that may have adverse effects is likely to change with further developments in engineering design changes.

The UDOT ROW Alignment would not require FWS to amend Washington County's ITP, and protections for cultural resources on non-Federal lands in Zone 6 would remain in place. Therefore, direct and indirect impacts to cultural resources in this area would remain unchanged from current conditions.

T-Bone Mesa Alignment

There are no new survey data or engineering design plans for the T-Bone Mesa Alignment. The Final EIS conclusion that construction of a highway in the T-Bone Mesa Alignment may affect up to six historic properties (two prehistoric sites, three historic sites, and one multi-component site) is still valid. The T-Bone Mesa Alignment would not require the FWS to amend Washington County's ITP, and protections for cultural resources on non-Federal lands in Zone 6 would continue as a result. Therefore, direct and indirect impacts to cultural resources in this area would remain unchanged from current conditions.

[14] Unevaluated sites are treated as eligible for NRHP listing until a final determination is made.

Southern Alignment

There are no new survey data or engineering design plans for the Southern Alignment. The Final EIS conclusion that construction of a highway in the Southern Alignment may affect up to five historic properties (two prehistoric sites, two historic sites, and one multi-component site) is still valid. The Southern Alignment would not require the FWS to amend Washington County's ITP, and protections for cultural resources on non-Federal lands in Zone 6 would continue as a result. Therefore, direct and indirect impacts to cultural resources in this area would remain unchanged from current conditions.

Red Hills Parkway Expressway

There are no new survey data or engineering design plans for the Red Hills Parkway Expressway. The Final EIS conclusion that the Red Hills Parkway Expressway may affect two historic properties (one historic site and one historic structure within a site) is still valid. Based on the 2020 conceptual engineering design for Red Hills Parkway, the Sugarloaf Hillside Sign (Dixie Rock) was outside the Area of Potential Effect, as the letters are on a cliff face high above the existing highway. The BLM evaluated that the Sugarloaf Hillside Sign would not experience direct effects from changing Red Hills Parkway into an expressway. Engineering design for the Expressway shows no changes that would result in direct or adverse impacts to the integrity of this site. The highway is currently a four-lane roadway and changing it into an expressway would not cause substantive changes in the viewshed of the Sugarloaf Hillside Sign. As the Parkway is already a busy highway, increased traffic would not introduce new visual or audible elements that would directly diminish the integrity of this site or change the character of the property's use. If this alternative is chosen, further design work may be necessary to mitigate the impacts to the Pioneer Park parking lot. The proposed widening of the Parkway would be west of Dixie Rock and Pioneer Park. Access to the Park and nearby Red Hills Desert Garden may be impacted by construction but would otherwise be left unaffected.

The Red Hills Parkway Expressway would require the FWS to amend Washington County's ITP to allow covered activities to occur on non-Federal lands in Zone 6. The FWS, Utah SHPO, TLA, the Utah Public Lands Policy Coordinating Office (PLPCO), and Washington County have executed a PA to ensure compliance with Section 106 of the NHPA for covered activities under the ITP. Undertakings on lands managed by the TLA (2,767 acres) in Zone 6 would be subject to compliance with applicable state laws and regulations prior to development.[15] Any undertakings on lands owned by UDOT (70 acres) in Zone 6 would continue to be subject to applicable state laws and regulations prior to any development; no sites are currently known on these acres. The 450 acres owned by Washington County in Zone 6 are subject to deed restrictions with TLA. Although no sites are currently known on these acres, the land would be subject to applicable state laws and regulations prior to any development.

Private and municipal lands in Zone 6 (54 acres) are not subject to the NHPA or Utah State Code Annotated 9-8-404 regulations prior to development. Of the 54 acres, 14 acres have been previously surveyed, and one site recorded, but evaluated as not being eligible for the NRHP. The remaining acreage would lose the current protections afforded by Zone 6.

The BLM, in consultation with the Utah SHPO, Tribes, and other Consulting Parties, has developed a PA that will serve as binding commitment to resolve potential adverse effects to historic properties on State, County, and private land in Zone 6. This PA includes the stipulations that will be carried out to identify, evaluate, and avoid, minimize, or appropriately mitigate adverse effects to historic properties on State and County-owned land that are slated for development, in compliance with applicable state laws and

15 Undertakings (i.e., projects) on State lands, including TLA lands, are required to comply with Utah Code Annotated 9-8-404 regulations, which include field surveys and consultation with the Utah SHPO to avoid, minimize, and mitigate adverse effects to historic properties.

regulations. On private and municipal lands in Zone 6, the PA stipulations require that the BLM conduct Class III surveys to identify and evaluate historic properties if the private landowners grant the agency permission to conduct these surveys. As the BLM has no authority to require the private or municipal landowner to avoid or minimize effects to historic properties on their lands, the agency has committed to mitigate for the potential loss of historic properties through the development of two interpretive panels placed on Federal lands within Zone 6 and in the Red Cliffs NCA with themes focused on prehistoric and historic period resource use in this area.

St. George Boulevard/100 South One-way Couplet

There are no new survey data or design plans for the One-way Couplet. The Final EIS concluded that the 63 historic properties, all historic structures located along St. George Boulevard or 100 South would be unlikely to have adverse effects from converting the two streets into a one-way couplet.

Terminate UDOT's ROW

Under this alternative, UDOT would no longer hold a ROW grant for the Northern Corridor across public lands in the NCA. Historic properties and other cultural resources on public lands in the NCA. Under this alternative, the impacts to historic properties on Federal and non-Federal lands in Zone 6 would be the same as those described under the Red Hills Parkway Expressway.

3.10 Environmental Justice

Environmental Justice (EJ) is the just treatment and meaningful involvement of all people regardless of race, color, national origin, Tribal affiliation, disability, or income in agency decision-making and other Federal activities that affect human health and environment. The goal of EJ is that people 1) are fully protected from disproportionate and adverse human health and environmental effects, risks, and hazards, including those related to climate change, the cumulative impacts of environmental and other burdens, and the legacy of racism or other structural or systemic barriers; and 2) have equitable access to a healthy, sustainable, and resilient environment in which to live, play, work, learn, grow, worship, and engage in cultural and subsistence practices. Executive Order (EO) 12898 (Federal Register 1994), "Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations," EO 14096 (Federal Register 2023), "Revitalizing Our Nation's Commitment to Environmental Justice For All," and BLM IM 2022-059 (BLM 2022c), "Environmental Justice Implementation" direct Federal agencies, including the BLM, to identify minority, low-income, and American Indian/Alaska Native populations that could be disproportionately and adversely impacted by a Federal action.

3.10.1 Final EIS Summary

Section 3.27 of the Final EIS (pages 3-219 to 3-221) discusses EJ communities. In the Final EIS, 11 block groups were identified within the analysis area and compared to State of Utah thresholds to identify EJ populations. Low-income, minority, and American Indian EJ populations were present within the analysis area, and each EJ community of concern was present in multiple block groups.

The Final EIS concluded that implementation of any of the action alternatives would cause temporary construction-related impacts; however, this would affect the communities as a whole and was not expected to disproportionately affect any EJ populations. Under the One-way Couplet Alternative, temporary and permanent modifications to existing transit routes along 100 South would impact transit riders who are more likely to be members of an EJ community; therefore, impacts to the transit system in this area would affect EJ communities disproportionately. Land-use restrictions established by the addition of Zone 6 would affect all populations that recreate in the area equally.

3.10.2 Supplemental Analysis

Affected Environment

EJ affected environment analysis begins with a baseline analysis that reports data on census block groups that have been screened for whether they meet minimum thresholds for a designated reference area. These data were extracted from the United States Census Bureau's American Community Survey (ACS) 5-year data tables. The EJ analysis area was identified as selected United States Census block groups in Washington County, Utah. Block groups are a geographical unit used by the U.S. Census Bureau to tabulate data and are typically comprised of around 600 to 3,000 people. Reference areas enable comparison between geographies to identify EJ population concentrations. Commonly used reference areas used in the BLM EJ analysis include "State" reference areas (which describes the entire population of the selected State demographic), "State non-metro" reference areas (which describes the entire population of the selected State demographic minus U.S. Department of Labor defined urban counties and metropolitan statistical areas), and "County" reference areas (which describes the entire population of a county). State reference areas are usually preferred if the project occurs in an urban area. State non-metro reference areas are often preferred if the project occurs in a predominantly rural area and/or if the project occurs in a State with a large demographic rural/urban divide. County reference areas are useful if the project is geographically small with a small analysis area. The State of Utah was selected as the reference area for this project, as the project occurs in an urban environment and the analysis area encompasses a large portion of the county. It is important to note that just because a population meets or exceeds the reference threshold does not mean that the project and/or alternatives will impact those communities of concern in a disproportionate and adverse manner. CEQ guidance directs that adverse health and environmental effects be evaluated against an appropriate reference area to determine whether minority, low-income populations, and/or American Indian and Alaska Native communities are present and may be potentially impacted by project actions and alternatives (CEQ 1997).

For this analysis, an updated EJ baseline analysis was completed for selected block groups in Washington County using updated census data and an expanded analysis area. There are 87 census block groups in the analysis area selected due to their proximity to the project area or potential to be affected by one or more alternatives.

The BLM has adopted the following criteria in determining whether a population is an EJ population (BLM 2022b):

- The BLM defines a minority individual as a person who does not identify as White or a person of race who identifies as Hispanic or Latino. Census block group minority data can be derived from several public facing tools, including the Environmental Protection Agency's EJScreen tool and/or U.S. Census Bureau ACS 5-Year Table B03002, "Hispanic or Latino Origin by Race." The BLM uses two thresholds in EJ screenings for minority populations:
    - The 50% threshold: The 50% threshold is met when ≥50 percent of the block group population is made up of minority populations, as defined above.
    - The meaningfully greater analysis (MGA) threshold: The MGA threshold is met when the percentage of minorities in the population is ≥110% of the percentage of minorities in the reference area population.
- The BLM defines low-income individuals as those who live at or below 200% of the poverty threshold. Census block group low-income data can be derived from several public facing tools, including the Environmental Protection Agency's EJScreen tool and/or U.S. Census Bureau ACS 5-Year Table C17002, "Ratio of Income to Poverty Level in the Past 12 Months." The BLM uses two thresholds in EJ screenings for low-income populations:
    - The 50% threshold: The 50% threshold is met when ≥50% of the population is low-income, as defined above.

    - The low-income threshold: The low-income threshold is met when the percentage of low-income individuals in the population is equal to or greater than the percentage of low-income individuals in the reference area population.

- The BLM defines American Indian/Alaska Native populations as those who identify as American Indian and Alaska Native alone or in combination with one or more other races (as calculated by the United States Census Bureau). Census block group American Indian/Alaska Native data can be derived from the U.S. Census Bureau ACS 5-Year Table B02010, "American Indian and Alaska Native Alone or in Combination with One or More Other Races." The American Indian/Alaska Native threshold is met when the percentage of the population identifying as defined above is equal to or greater than the reference population.

EO 14096 requests that federal agencies consider populations defined as limited English proficient and disabled. The CEQ confirms that EO 14096 "compliments" rather than supplants EO 12898. As of the publication of this document, the BLM has not received specific implementation guidance for analyzing limited English proficient and disabled populations in NEPA affects analysis. Until implementation guidance has been received by the BLM, the following practices are considered:

- Limited English proficient populations are identified when populations speak a language other than English at home and they speak English less than "very well." Limited English proficient data can be derived from the U.S. Census Bureau ACS 5-Year Table S1601, "Language Spoken at Home." Until the BLM receives implementation guidance, limited English proficient populations are identified using a no threshold approach. Data are reported at the county level.
- The Census Bureau collects information about non-institutionalized populations with disabilities and displays that data in ACS 5-Year Table S1810, "Disability Characteristics." A disability is identified when individuals report any kind of disability, regardless of the type of disability. Until the BLM receives implementation guidance, disabled populations are identified using a no threshold approach. Data are reported at the county level.

Low-income, minority, and American Indian/Alaska Native populations are present in the analysis area, as shown in Figures 12 through 14, respectively, and intersect with the project area under each of the alternatives. Low-income, minority, and American Indian/Alaska Native populations in and around Zone 6 of the Reserve are shown in Figures 15 through 17.

Overall, 27.6% of the analysis area populations were identified as low-income populations. A total of 43 block groups (49.4%) in the analysis area met or exceeded the State of Utah's low-income threshold (24.7%). Approximately 17.2% of the analysis area are identified as minority populations. A total of 18 block groups (20.7%) in the analysis area met or exceeded the State of Utah's MGA minority threshold (25.0%). Approximately 1.8% of the analysis area identified as American Indian or Alaska Native, and 19 block groups (21.8%) in the analysis area met or exceeded the State of Utah's American Indian and Alaska Native threshold (2.0%). Based on the above identification metrics, 3.1% of Washington County, Utah residents are limited English proficient. Of Washington County, Utah's total civilian non-institutionalized population, 12.5% have a reported disability.

EJ analyses use baseline data to, among other things, inform outreach processes and help bolster opportunities for EJ communities to participate meaningfully. An outreach plan to EJ communities was developed by the BLM, consistent with Instruction Memorandum 2022-059 (BLM 2022c) and was implemented as part of public outreach activities during the SEIS process (see Section 4.1 and Appendix E). Information received as a result of that outreach has been incorporated into the analysis below, as applicable.

Figure 12. Low-Income Environmental Justice Population Census Block Groups near the Project Area

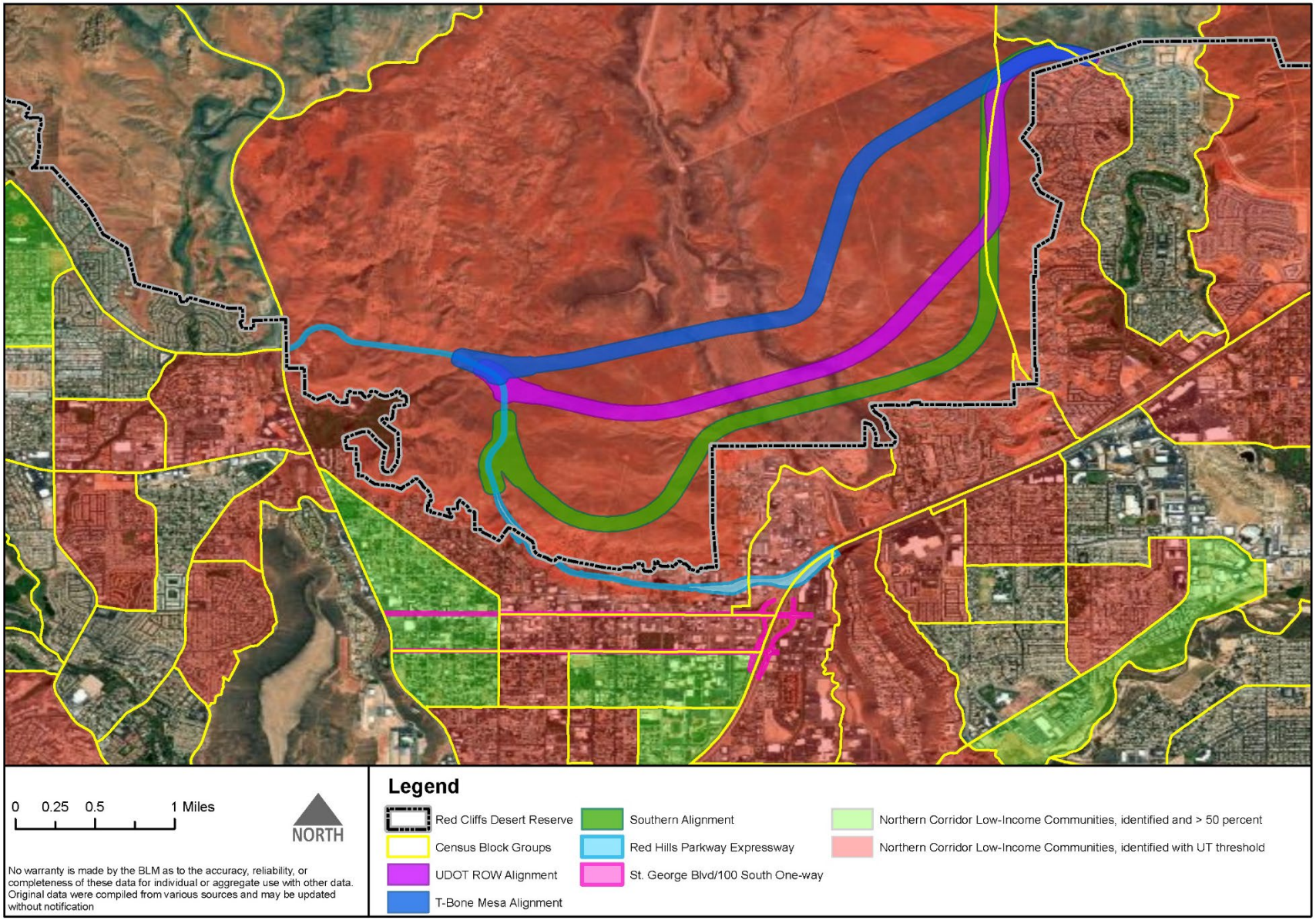


Figure 13. Minority Environmental Justice Population Census Block Groups near the Project Area

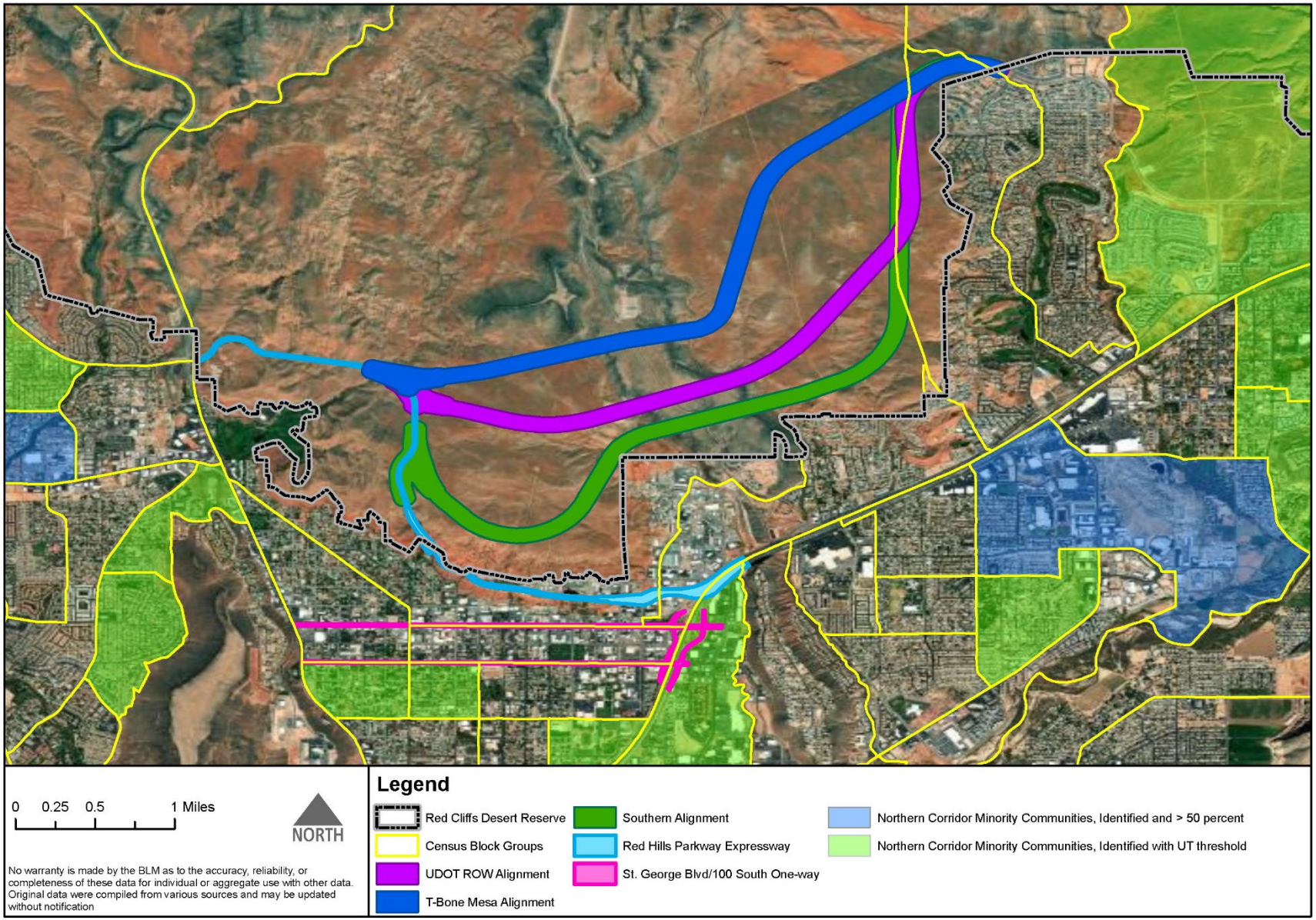


Figure 14. American Indian and Alaska Native Environmental Justice Census Block Groups near the Project Area

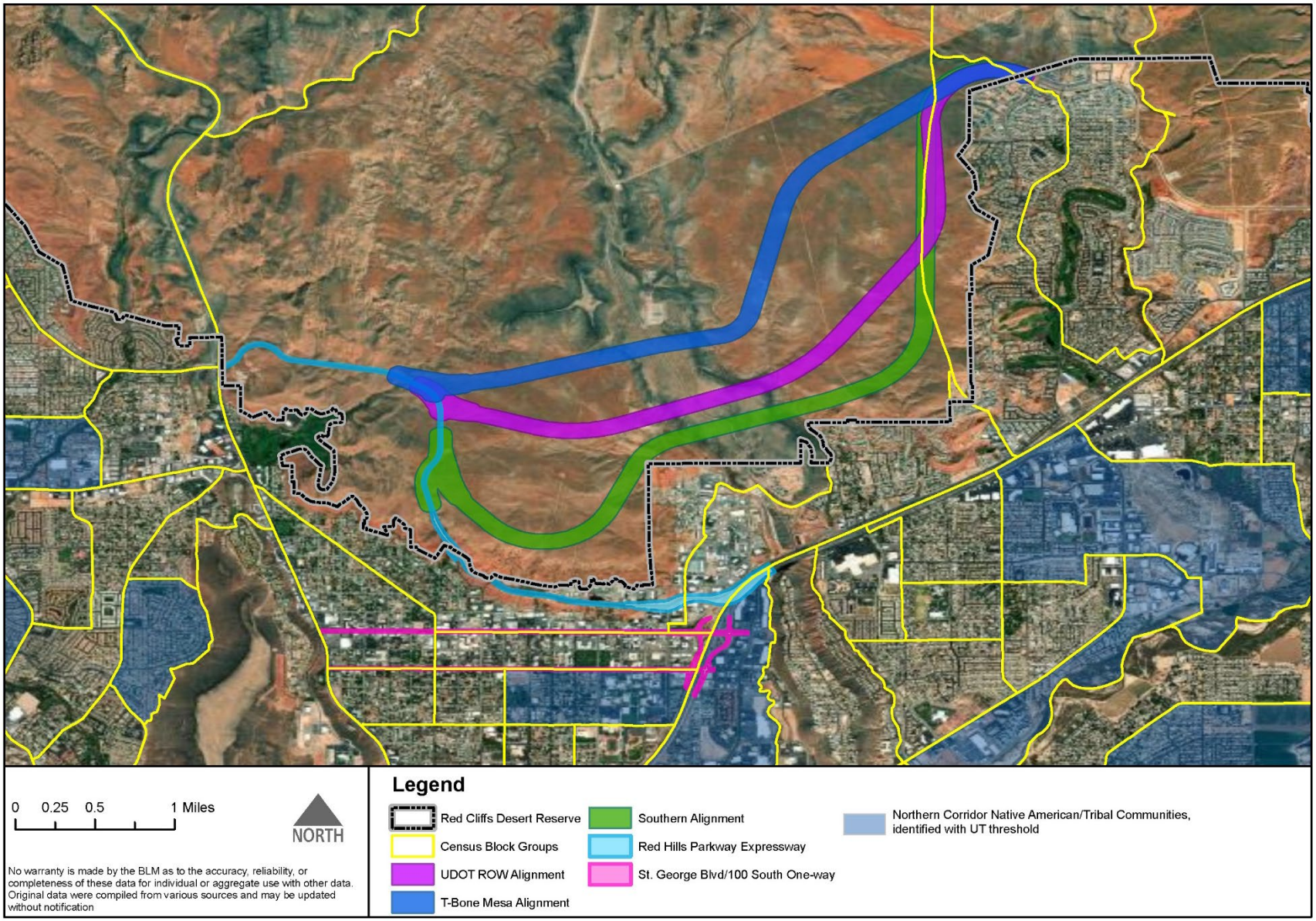


Figure 15. Low-Income Environmental Justice Population Census Block Groups near Zone 6

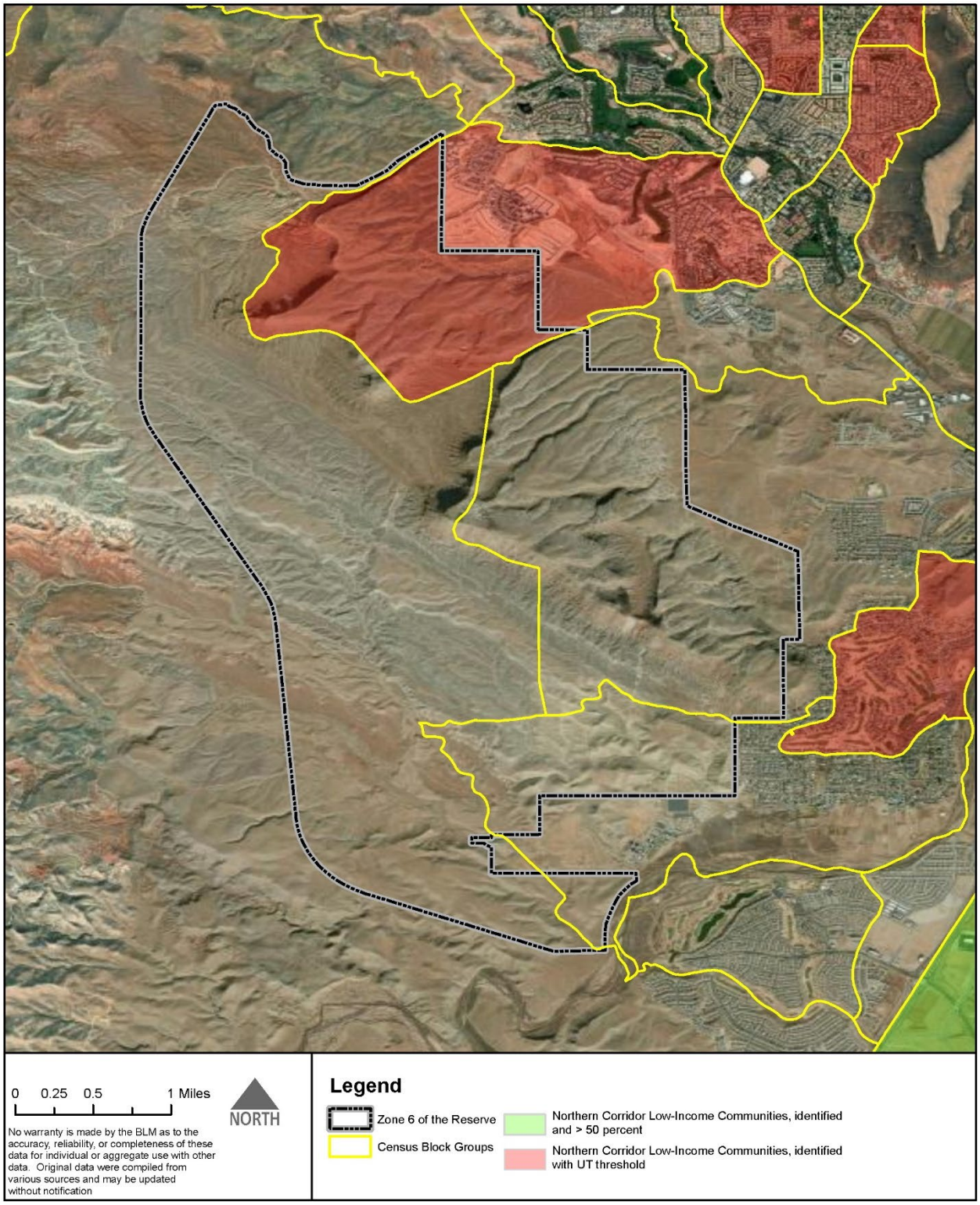


Figure 16. Minority Environmental Justice Population Census Block Groups near Zone 6

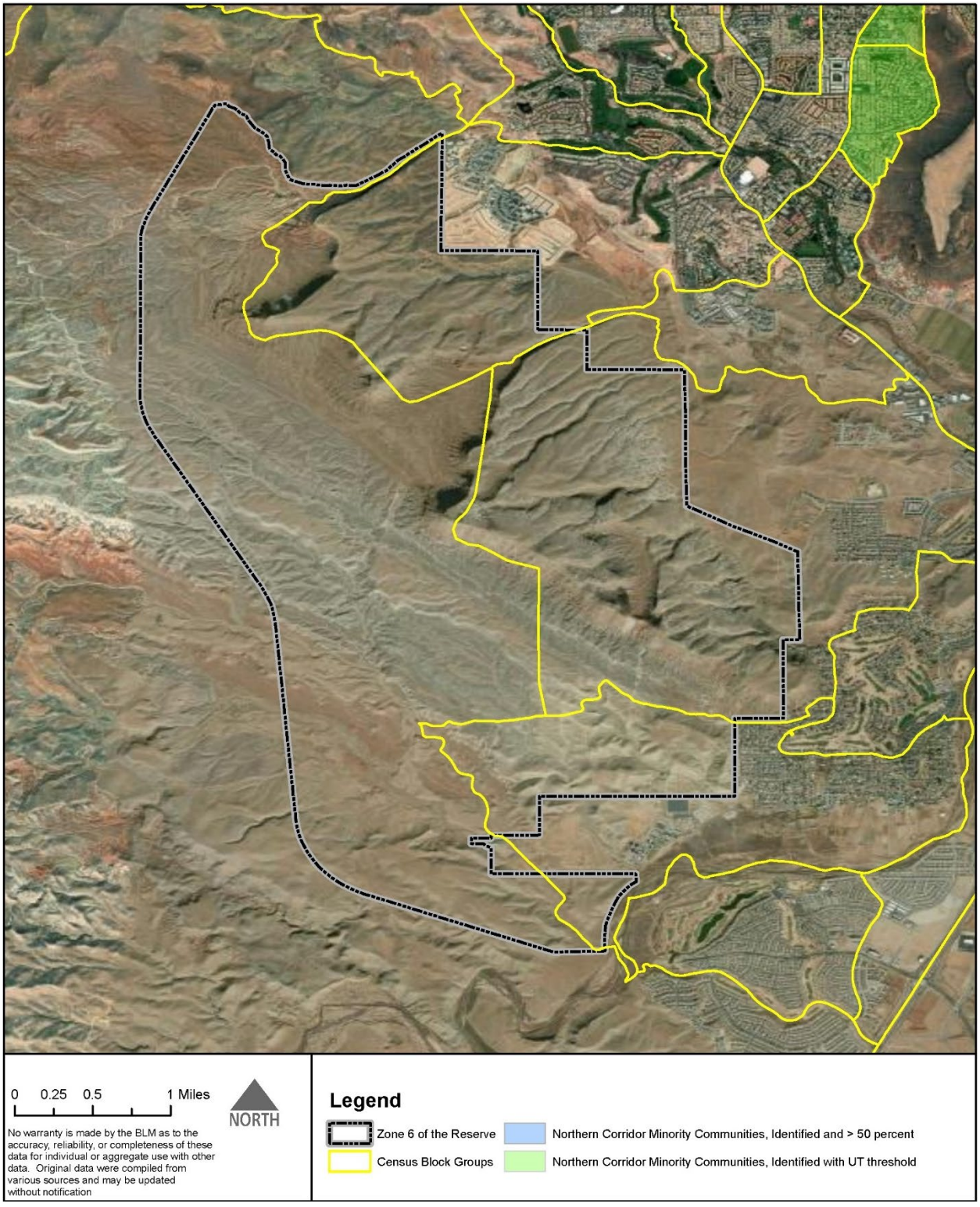
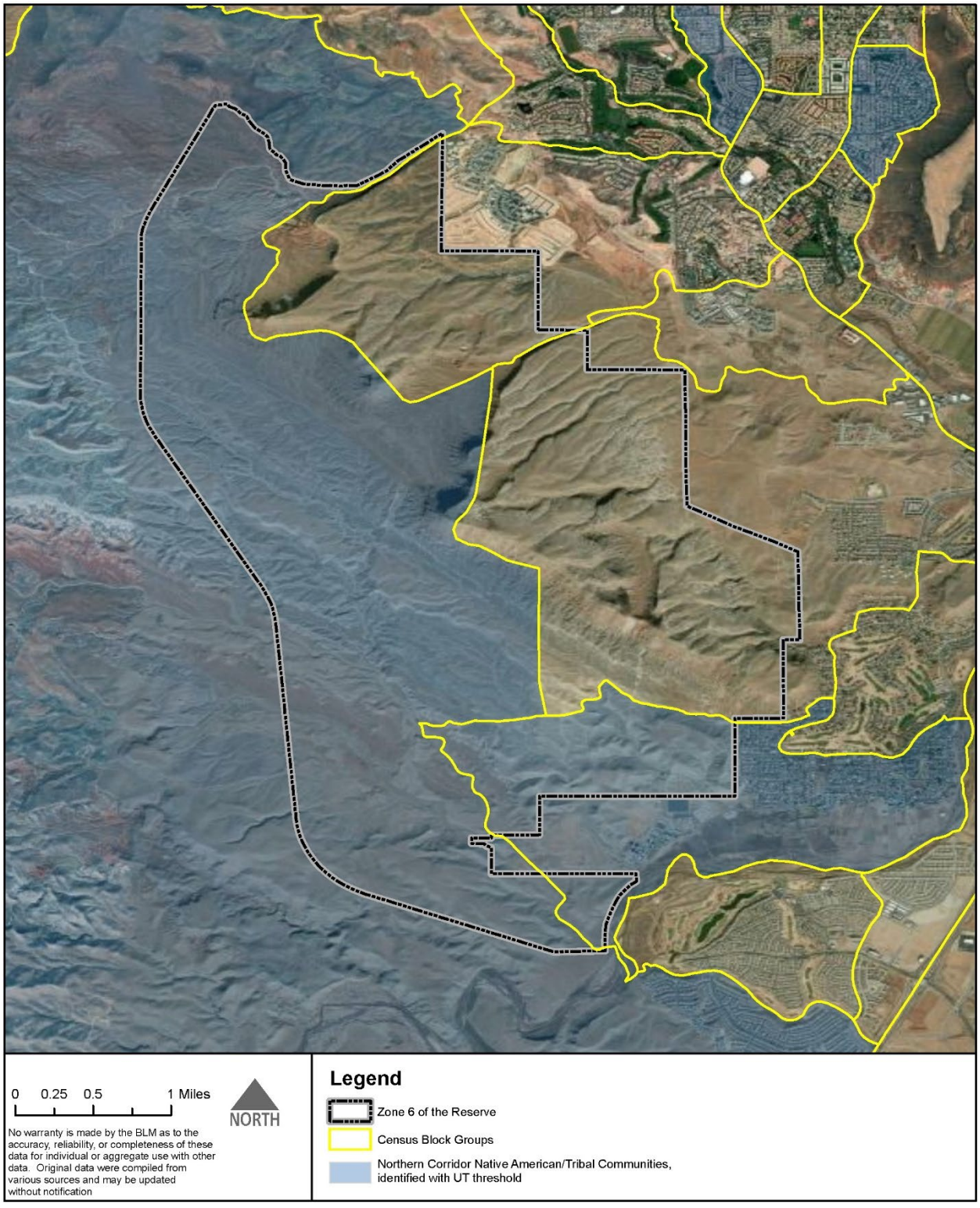


Figure 17. American Indian and Alaska Native Environmental Justice Census Block Groups near Zone 6



Outreach was performed as part of the public comment period on the Draft SEIS to ensure EJ communities were aware of the action (Appendix E). EJ communities of concern were invited to participate in the comment process and were offered a variety of ways to view data and submit comments. Translation services were also offered upon request. In response to this outreach that occurred, updated information was received regarding several locations or communities in the area that were of concern or had concerns, including the Switchpoint Community Resource Center, a non-profit homeless and other services provider located in the Red Hills area; Legacy Elementary in downtown St. George; and Utah Tech University. Legacy Elementary is a Title 1, English/Spanish language dual immersion school that was built to support the minority and low-income populations living in downtown St. George. The school was built on 100 South as a project between the City and Washington County School District specifically because the lower traffic volumes along 100 South allowed for the walkability to and from the school. Switchpoint is a joint project between St. George and Switchpoint, the non-profit entity that operates St. George's homeless shelter, that is located along the current proposed alignment for the Red Hills Parkway Expressway alternative. The Switchpoint affordable permanent housing facility has 60 current units and another 50 planned units and serves as a home for previously unhoused persons. Following the public comment period, at the request of some cooperating agencies, the BLM reached out to the Switchpoint facility directly by phone and e-mail to solicit feedback on proposed project.

EJ analysis can be enhanced by incorporating ancillary demographic data to help define legacy pollution, climate change vulnerability, transportation issues, and other critical community concerns. Public facing demographic tools, such as the Environmental Protection Agency's EJScreen and CEQ's Climate and Economic Justice Screening Tool, are helpful. The Climate and Economic Justice Screening Tool displays populations and communities in census tracts (which are comprised of multiple census block groups) that are overburdened and underserved; such populations are considered disadvantaged communities. In the analysis area, three census tracts are described as disadvantaged. Census tract 49053270700, which is less than 1 mile northwest of the western edge of the Red Hills Parkway Expressway, is considered a low-income EJ census tract in the 96th percentile nationally for projected wildfire risk, in the 96th percentile nationally for expected building rate loss resulting from natural hazards each year, and in the 98th percentile nationally for modeled toxic concentrations of wastewater discharge. Census tract 49053271300, which is located in the City of St. George and contains Utah Tech University, is considered a low-income and minority census tract in the 99th percentile nationally for projected wildfire risk. Census tract 49053271400, which includes Walt Brooks Stadium, is also a low-income and minority census tract in the 98th percentile nationally for wildfire risk, in the 96th percentile nationally due to a share of homes without indoor kitchens or plumbing, and in the 95th percentile nationally for modeled toxic concentrations of wastewater discharge.

Environmental Consequences

Potential impacts under all action alternatives include impacts associated with temporary construction, such as noise and dust, and temporary interruptions and changes to transit routes and traffic patterns, as well as other impacts described in the 2020 Final EIS. Land use changes in Zone 6 could also impact these populations depending on the selected alternative. The majority of block groups that directly contain or are intersected by the potential highway alignments and Zone 6 are identified as low-income populations. As such, these low-income communities may be impacted at a higher level than some other populations because of proximity to the project area.

EJ impact analysis incorporates baseline data, comments and participation from community members obtained as a result of outreach efforts, and cross-cutting aggregate analysis that synthesizes impacts from other resources and describes potential disproportionate and adverse impacts to EJ communities.

UDOT ROW Alignment (Affirm Current ROW Grant)

Three census block groups intersect with the UDOT ROW Alignment. Two of these block groups were identified as low-income populations. No minority or American Indian and Alaska Native populations intersect with this alignment. Four census block groups intersect with Zone 6. One of these block groups

was identified as a low-income population, and two of these block groups were identified as American Indian and Alaska Native populations. None of the block groups intersecting Zone 6 were identified as minority populations.

The increased probability of wildfire under this alternative could cause adverse impacts on human safety and well-being. This would disproportionately and adversely affect EJ communities located proximal to the route due to factors such as smoke exposure and the prevalence of outdoor work performed by sectors of these communities. Research has confirmed that EJ communities are more susceptible to disproportionate and adverse air quality impacts for a variety of reasons.[16]

The Climate and Economic Justice Screening Tool (CEQ 2022) is used to identify community vulnerabilities. The tool identified communities in the northern part of St. George and in tracts that contain the UDOT ROW Alignment, T-Bone Mesa Alignment, Southern Alignment, and Red Hills Parkway Expressway alternatives to be in the 94th percentile for projected wildfire risk and 97th percentile for economic loss to building value resulting from natural hazards each year. Increased ignition sources from construction and day-to-day use of a highway would increase these risks and affect the identified EJ populations. Many individuals in the identified low-income populations could be renters lacking renters' insurance or without means to replace lost residences or possessions should a fire take their property.

The UDOT ROW Alignment would bisect the NCA. There is a potential impact to the area's sense of place and access to the benefits of solitude, recreation access, and open space. While these impacts, should they occur, would be felt across all community demographics, some EJ communities (low-income and disabled specifically) may not be able to access alternate open spaces. This qualifies as a potential disproportionate and adverse impact.

As most block groups in the analysis area represent small geographic areas, adjacent block groups that do not directly intersect or contain portions of the action alternative would likely experience similar disproportionate and adverse impacts as well.

T-Bone Mesa Alignment

Three census block groups intersect with the T-Bone Mesa Alignment. Two of these block groups were identified as low-income populations. No minority or American Indian and Alaska Native populations intersect with this alignment. The census block groups in Zone 6 would be the same as those described under the UDOT ROW Alignment. The same disproportionate and adverse impacts as those described under the UDOT ROW Alignment would also occur under the T-Bone Mesa Alignment, impacting the EJ populations near the proposed ROW.

Southern Alignment

Three census block groups intersect with the Southern Alignment. Two of these block groups were identified as low-income populations. No minority or American Indian and Alaska Native populations intersect with this alignment. The census block groups in Zone 6 would be the same as those described under the UDOT ROW Alignment. The same impacts as those described under the UDOT ROW Alignment would also occur under the Southern Alignment, impacting the EJ populations near the proposed ROW.

Red Hills Parkway Expressway

Three census block groups intersect with the Red Hills Parkway Expressway. All three intersecting block groups were identified as low-income populations, one was identified as a minority population, and two were identified as American Indian and Alaska Native populations. The census block groups in Zone 6 would be the same as those described under the UDOT ROW Alignment. Selection of this alternative

16 See https://www.epa.gov/ej-research/epa-research-environmental-justice-and-air-pollution.

would result in the elimination of Reserve Zone 6 and non-Federal lands could be developed. While the exact nature and timing of this potential development is unknown and not within the agencies' control and does not need to be known for this analysis, it is reasonable to anticipate that it could happen. Development of non-Federal lands would not be expected to have disproportionate effects on the low-income or American Indian and Alaska Native block groups that intersect Zone 6. Currently, there are no residential areas or homes within Zone 6. The residential areas adjacent to Zone 6 that may abut any future development in this area would likely experience similar but not disproportionate impacts.

In addition to the 94th percentile nationally for projected wildfire risk, and 97th percentile nationally for economic loss to building value resulting from natural hazards each year, block groups near the Red Hills Parkway Expressway are in the 96th percentile nationally for fatalities and injuries resulting from natural hazards each year. Impacts under this alternative would be similar to those described for the UDOT ROW Alignment, although to a lesser extent, as fire risk is decreased under this alternative. Fire risks and impacts are described in more detail in Section 3.4.

The preliminary design of the Red Hills Parkway Expressway alternative would impact the Switchpoint facility. Current highway expansion plans and the construction of the proposed interchange at 1000 East and Red Hills Parkway would require the removal of the buildings, displacing the low-income residents. The loss of the Switchpoint facility would be a considerable disproportionate and adverse impact to low-income and disabled EJ communities. There is a social cost to losing unhomed shelter facilities that could ripple across other social and economic sectors. A more detailed design is needed to determine the exact extent of these impacts as some impacts may be avoidable or minimized through design modifications.

St. George Boulevard/100 South One-way Couplet

Six census block groups intersect with the One-way Couplet. All six intersecting block groups were identified as low-income populations, three were identified as minority populations, and three were identified as American Indian and Alaska Native populations. The potential impacts to census block groups in Zone 6 would be the same as those described under the Red Hills Parkway Expressway.

The One-way Couplet alternative impacts EJ communities in multiple disproportionate and adverse ways. Populations that border the action area for this alternative are already at a high risk of wildfire (99th percentile nationally for projected wildfire risk and 98th percentile nationally for economic loss to building value) resulting from natural hazards each year; however, construction and road use activities are not likely to lead to additional wildfire risk because no new road would be constructed in a previously roadless area. EJ populations near this alternative would still experience the temporary construction related impacts previously described in the Final EIS. These populations experience a high low-income factor and are in the 90th percentile nationally for diesel particulate matter exposure. Changing traffic patterns in this area could also change both diesel and non-diesel particulate matter exposure, which could increase public health issues for these populations. Routing increased traffic through this area would increase exhaust and may impact walkability and community connectivity in the area. Increased traffic and idling would have adverse effects on the neighborhood and communities living and using these areas by dividing public facilities, such as the Vernon Worthen Park and playground and the Town Square and its play areas, from the remainder of the neighborhood. Increased traffic, potential for human hazards, and noise, as well as decreased air quality, walkability, and accessibility to homes and businesses, are all potential impacts from this alternative. There would also be impacts to downtown non-market values such as the sense of place.

As a result of the EJ Outreach Plan, adverse and disproportionate impacts were identified that would occur, affecting populations near this alternative. Input was received expressing concern about endangering pedestrian traffic associated with Legacy Elementary. Utah Tech University described concerns related to impacts from more automobiles traveling through campus, including separation of the University campus from student housing and impacts to pedestrian traffic and the general feel and walkability of the area. Additionally, this alternative was described as adversely impacting a downtown high density housing area by separating it from downtown businesses, parks, and government buildings.

The City of St. George transit hub located along 100 South may also need to be relocated under this alternative, removing it from its location near student housing and other downtown communities.

Increased traffic flows would likely decrease community walkability and neighborhood accessibility by local low-income, minority, and disabled EJ communities. EO 14096 identifies "the routing of highways and other transportation corridors in ways that divide neighborhoods" as a disproportionate and adverse impact. There is potential for the One-Way Couplet to function as a division. This impact would be described as major, localized, and potentially permanent.

Terminate UDOT's ROW

Under this alternative, UDOT would no longer hold the ROW grant for the Northern Corridor across public lands in the NCA. This would result in no impacts to any census block groups within the NCA. Four census block groups intersect with Zone 6. One of these block groups was identified as a low-income population, and two of these block groups were identified as American Indian and Alaska Native populations. None of the block groups intersecting Zone 6 were identified as minority populations. Selection of this alternative would result in the elimination of Reserve Zone 6 and non-Federal lands could be developed. While the exact nature and timing of this potential development is unknown and not within the agencies' control and does not need to be known for this analysis, it is reasonable to anticipate that it could happen. Development of non-Federal lands would not be expected to have disproportionate effects on the low-income or American Indian and Alaska Native block groups that intersect Zone 6, as described under the Red Hills Parkway Expressway Alternative.

3.11 Socioeconomics

The geographic area of analysis to evaluate potential socioeconomic effects of the proposed actions and alternatives is Washington County, Utah. In addition, this section includes the traffic and transportation effects of the proposed actions and alternatives. The primary geographic area of analysis to evaluate the traffic and transportation effects is the same as in the Final EIS and includes the transportation system within the northern City of St. George, Washington City, City of Santa Clara, and City of Ivins metropolitan areas.

3.11.1 2020 Final EIS Summary

Section 3.26 of the Final EIS (pages 3-204 to 3-219) discusses socioeconomics. The Final EIS detailed the socioeconomic conditions in Washington County, Utah, and the potential effects from each of the alternatives based on data from 2015 to 2019. Sections 3.26.1.1 through 3.26.1.3, as well as Tables 3.26-1 and 3.26-2, in the Final EIS provide detailed demographics, employment and income statistics, and land use and value information for that time frame. A traffic and transportation analysis to forecast future travel demands for the St. George urbanized area (included in Appendix L of the Final EIS) was used to inform the potential traffic and transportation effects resulting from the Northern Corridor alternatives.

The traffic and transportation effects are based on future 2050 travel demand forecasts for Washington County that were developed using the DMPO Travel Demand Model. The traffic and transportation analysis methodology, study, intersections and roadways, and results are detailed in the *Northern Corridor Highway Alternatives Development Report* (Jacobs 2020a) and the *Preliminary Northern Corridor Traffic Analysis Memorandum* (Horrocks Engineers 2020), included as Appendixes J and L, respectively, in the Final EIS.

The conclusions discussed below were made in the Final EIS. Under the No Action Alternative, congestion on existing roadways in the St. George area would continue to increase. This may cause longer travel times, increased vehicle emissions, and increased noise.

Properties would be encumbered under each of the three ROW alignments within the NCA (UDOT ROW Application, T-Bone Mesa Alignment, , and Southern Alignment). Acreages that would be encumbered under each alternative are shown in Tables 3.26-3 through 3.26-5 within the 2020 Final EIS.

Existing neighborhoods adjacent to where the highway would connect to existing infrastructure would experience increases in traffic and noise, while increased traffic resulting from expected population growth would be mitigated elsewhere due to the presence of an alternative route. Residential properties would likely also be adversely affected by changes in property values or aesthetic features of the Reserve. Other potential effects include restricted livestock grazing in Zone 6 and induced growth to undeveloped areas.

The Red Hills Parkway Expressway would impact property access between 200 East and 900 East and may necessitate either relocating or closing access to certain properties (refer to Table 3.26-6 within the Final EIS for specific property impacts). Road widening would entail partial and full property acquisitions, which could alter current land use, potentially leading to the relocation of 13 commercial or city utility properties.

The One-way Couplet would impact downtown St. George, affecting social, economic, and walkability aspects within 0.25 mile of St. George Boulevard and 100 South. The impact on commercial and residential property values in the area of the 100 South Couplet is unknown. Some property would need to be acquired under this alternative (specific property impacts can be found in Table 3.26-7 in the 2020 Final EIS).

3.11.2 Supplemental Analysis

Since publication of the Final EIS, several land transfers have occurred that change land ownership of the T-Bone Mesa and Southern Alignments from what was described in the Final EIS in Section 3.26.2. These new land transfers are discussed in Sections 3.6 and 3.7 under ESA Section 6 and LWCF Lands, respectively, and are not repeated here. Ownership of acreages that would be encumbered under the UDOT ROW Alignment, Red Hills Parkway Expressway, or the One-way Couplet have not changed since the Final EIS. This supplemental analysis focuses on updated demographics in Washington County in regard to the rapid population growth the area has experienced in the last several years.

As stated in Section 1.8, the DMPO commissioned Horrocks Engineers (2024a) to update the traffic analysis reflective of the recent growth in the greater St. George metropolitan area. The Draft SEIS provided qualitative information regarding traffic data and stated that results were expected to be similar to those presented in the Final EIS but may be increased overall due to the overall increase in population. While the updated traffic analysis was not available at the time of publication of the Draft SEIS, it is included in Appendix D and summarized in the sections below. The analysis and comparison of direct and indirect impacts described in Section 3.26.2.2 of the Final EIS largely remain relevant. Therefore, the supplemental information presented below compares the level of service at key intersections for each of the alternatives and contrasts the results of the updated traffic analysis with those presented in the previous traffic analysis that was included in the Final EIS.

Affected Environment

Washington County's population was 197,680 in 2022 (the most recent year with available data), a 19.3% increase over the 2017 population data published in the Final EIS. Over that same time frame, the population of the State of Utah grew by 9.0%. Demographics have also shifted with a substantial increase in minority and Hispanic populations (Table 24). Employment, income, and educational attainment have also increased in Washington County and the State of Utah (Table 25). Median home values have increased in both Washington County and the State of Utah to $528,400 and $499,500, respectively; this is in comparison to $240,300 and $238,300, respectively, as reported in the Final EIS.

Table 24. Minority and Hispanic Populations in Washington County and Utah for the years 2020 and 2022

Year	Geography	Percent White	Percent Minority	Percent Hispanic*
2020	Washington County	90	10	10
	Utah	87	13	14
2022	Washington County	88	12	11.1
	Utah	82.4	17.6	14.6
Percent Change	Washington County	-2.2	20.0	11.0
	Utah	-5.3	35.4	4.3

*The Hispanic demographic is also included in the percent minority. The total population can be obtained by summing White and Minority populations.

Table 25. Employment and Income in Washington County and Utah for the years 2020 and 2022

Year	Geography	Unemployment Rate	Per Capita Income	Bachelor's Degree or higher
2020	Washington County	3.4	$29,886	29.2
	Utah	3.6	$30,986	34.7
2022	Washington County	3.1	$36,047	36.6
	Utah	3.4	$37,023	37.9
Percent Change	Washington County	-8.8	20.6	25.3
	Utah	-5.6	19.5	9.2

Additional outreach was completed as part of the public comment period on the Draft SEIS to ensure EJ communities were aware of the action and were invited to participate in the process (Appendix E). In response to this outreach, information was provided about a number of facilities or businesses that could be impacted along the Red Hills Parkway Expressway Alignment, including:

- Switchpoint Community Resource Center – a non-profit homeless and other services provider located in the Red Hills area.
- St. George's Public Works facilities.
- Fueling yard.
- Suntran bus facilities.
- Vehicle repair and maintenance facilities.
- Energy Services and Water Services facilities.
- Washington County Water Conservancy District headquarters.
- Red Hills Desert Garden.

In addition, critical public water infrastructure, pumping stations, two large water storage tanks, and the storm drain detention facility could also be impacted. Information about potential impacts related to the One-Way Couplet was also provided to Utah Tech University and Legacy Elementary in downtown St. George.

Environmental Consequences

The environmental consequences of implementing any of the alternatives on property, infrastructure, traffic, and other socioeconomic factors is presented below. Traffic analyses were performed based on standard traffic analyses methodologies using industry-accepted traffic analysis software programs. Results are presented by reporting the projected 2050 evening peak hour (i.e., highest hour volume) intersection level of service, which is a measurement of average intersection delay and travel time. Level of Service A correlates to free-flow operations with very little delay and almost no congestion, while Level of Service F represents intersection failure manifested by extreme congestion with large delay, long

queues, and traffic demand that exceeds the capacity of the intersection. Level of Service D is generally accepted as the target level-of-service value for intersections in urbanized areas and was used as the threshold value in this analysis. The key intersections along the primary east-west roadways evaluated in this analysis include Bluff Street/Sunset Boulevard, Bluff Street/St. George Boulevard, Red Hills Parkway/1000 East, St. George Boulevard/1000 East, and Green Spring Drive/Telegraph Street. As stated above, the analysis and comparison of direct and indirect impacts described in Section 3.26.2.2 of the Final EIS largely remain relevant. The results of the updated traffic analysis are presented in Table 26 and Appendix D.

Table 26. 2050 PM Peak Hour Alternative Level of Service Comparison

Intersection	Terminate UDOT's ROW	UDOT ROW Alignment	T-Bone Mesa Alignment	Southern Alignment	Red Hills Parkway Expressway	One-way Couplet
Red Hills Parkway/ Bluff Street	B	B	B	B	B	B
Sunset Boulevard/ Bluff Street	D	D	D	D	C	D
St. George Boulevard/ Bluff Street	F	E	E	F	E	D
St. George Boulevard/ Main Street	C	C	B	C	B	B
St. George Boulevard/ 1000 East	F	D	D	F	D	C
I-15 Exit 8 Southbound Ramps	F	D	D	E	D	D
I-15 Exit 8 Northbound Ramps	C	C	C	C	C	C
St. George Boulevard/ River Road	D	D	D	D	D	D
Red Hills Parkway/ 200 East	A	A	A	A	A	A
Red Hills Parkway/ 1000 East	F	C	C	E	C	D
I-15 Exit 10	C	C	C	C	C	C
Green Spring Drive/ Buena Vista	C	C	C	C	C	D
Green Spring Drive/ Telegraph Street	E	D	D	E	D	E
I-15 Exit 13 Southbound Ramps	B	C	C	C	B	B
I-15 Exit 13 Northbound Ramps	B	C	C	B	B	B

UDOT ROW Alignment (Affirm Current ROW Grant)

There is no change to property impacts beyond what was disclosed in the Final EIS. Zone 6 would be retained as part of the Reserve, and current land uses within the Zone would be maintained. The increased likelihood of wildfire ignition associated with this alignment could cause adverse impacts on human safety and well-being.

Construction of the Northern Corridor on the UDOT ROW Alignment would help to relieve congestion on existing roadways in the St. George area. Under the UDOT ROW Alignment, operations in 2050 at the key intersections would be improved compared to the Terminate UDOT's ROW, including at the St. George Boulevard/1000 East, Red Hills Parkway/1000 East, and Green Spring/Telegraph Street intersections and the I-15 Exit 8 Southbound Ramps. The St. George Boulevard/Bluff Street intersection would operate at Level of Service E; however, all other key intersections would operate at or above Level of Service D. No intersections would operate at Level of Service F.

As described in the EJ analysis, the UDOT ROW Alignment would bisect the NCA. There is a potential impact to the area sense of place and access to the benefits of solitude, recreation access, and open space. These could result in substantial non-market value effects to community way of life and culture. It is unclear whether an alignment through the NCA would impact tourism in the analysis area and visitor perception of the NCA.

T-Bone Mesa Alignment

There is no change to property impacts for this alternative beyond what was disclosed in the Final EIS and updated by the newly-acquired parcels described in Sections 3.6 and 3.7. The T-Bone Mesa Alignment would be expected to have fewer impacts on the property values (and quality of life values related to highway noise, vehicle lights, and emissions) for the residents of the Green Spring developments that are along the boundary of the NCA, when compared to the UDOT ROW and Southern Alignments, although this is not quantified.

The reason for this expectation is that the T-Bone Alignment diverts north and west away from these subdivisions almost immediately, while the UDOT ROW and Southern Alignments follow a joint, single, southerly path much closer to the subdivisions along the boundary of the NCA, before separating as they turn west at varying distances from the southern boundary of the NCA. The increased likelihood of wildfire ignition associated with this alignment could still cause adverse impacts on human safety and well-being. Zone 6 would be retained as part of the Reserve, and current land uses within the Zone would be maintained.

Construction of the Northern Corridor on the T-Bone Mesa Alignment would help to relieve congestion on existing roadways in the St. George area. Under the T-Bone Mesa Alignment, operations in 2050 at the key intersections would be improved compared to the Terminate UDOT's ROW, other than the Bluff Street/Sunset Boulevard intersection, which would be projected to operate at Level of Service E. All other key study intersections would operate at or above Level of Service D.

As with the UDOT ROW Alignment, there is a potential impact to the area sense of place and access to the benefits of solitude, recreation access, and open space. These could result in substantial non-market value effects to community way of life and culture.

Southern Alignment

There is no change to property impacts for this alternative beyond what was disclosed in the Final EIS and updated by the newly acquired parcels described in Sections 3.6 and 3.7. Construction of the Northern Corridor highway on the Southern Alignment would result in similar potential impacts to traffic as the UDOT ROW Alignment, although these impacts would be in a different area. The increased likelihood of wildfire ignition associated with this alignment could still cause adverse impacts on human safety and well-being. Zone 6 would be retained as part of the Reserve, and current land uses within the Zone would be maintained.

Under the Southern Alignment, operations in 2050 at the key intersections of St. George Boulevard/Bluff Street and St. George Boulevard/1000 East would be at a Level of Service F, with Level of Service E operations at Red Hills Parkway/1000 East, Green Spring/Telegraph Street intersections, and the I-15 Exit 8 Southbound Ramps, all similar to the Terminate UDOT's ROW. In this regard, there is little to no improvement in operations at any of the key intersections when compared to the Terminate UDOT's ROW.

As with the UDOT ROW and T-Bone Mesa alignments, there is a potential impact to the area sense of place and access to the benefits of solitude, recreation access, and open space. These could result in substantial non-market value effects to community way of life and culture.

Red Hills Parkway Expressway

Under this alternative, a new highway would not be constructed within the NCA. Instead, the Red Hills Parkway would be modified and expanded (see Section 2.3.4) to a grade-separated expressway between I-15 and Bluff Street. Construction of the Northern Corridor on this alignment would help to relieve congestion in the St. George area. As indicated in Table 3.26-6 of the Final EIS, it is anticipated that 26.5 acres of property along Red Hills Parkway would need to be acquired to accommodate necessary road widening and improvements. This alternative would impact access to several properties, and there may be disruptions to underground infrastructure or facilities or businesses, including Switchpoint, Pioneer Park, St. George's Public Works facilities, WCWCD headquarters, and others.

The relocation of structures and property acquisitions or changed access required to implement this alternative would have adverse socioeconomic effects; however, exact impacts cannot be determined until a more detailed design is completed. Should the Switchpoint facility, for example, require relocation, socioeconomic costs would go beyond replacement costs to purchase a suitable facility that is geographically appropriate (should it exist); the social cost of losing low-income and unhoused community living facilities could ripple across other analysis area social and economic sectors, including law enforcement, health care, and social services. The proposed widening of the Parkway would be primarily east of Dixie Rock and Pioneer Park. Access to the Park and nearby Red Hills Desert Garden may be impacted by construction and the limitations of right-only driveways as compared to the current two-way access. Increased traffic could impact sense of place; however, since the road is already a four-lane road, it would not introduce new visual or audible elements that would directly diminish the integrity of this site or change the character of the property's use.

There may be additional expenses associated with these acquisitions due to the increase in property values in Washington County. Zone 6 would not be retained under this alternative and the 3,341 acres of non-Federal lands would be available for development under the amended ITP. Localized impacts related to construction and additional growth in that area would occur, although they cannot be quantified at this time because the nature of any potential development is not known.

Construction of the Northern Corridor on the Red Hills Parkway Expressway may help to relieve congestion on existing roadways in the St. George area. Under the Red Hills Parkway Expressway, operations in 2050 at the key intersections would be improved over the Terminate UDOT's ROW alternative, including the St. George Boulevard/1000 East, Red Hills Parkway/1000 East, and Green Spring/Telegraph Street intersections and the I-15 Exit 8 Southbound Ramps. The St. George Boulevard/Bluff Street intersection would continue to operate at Level of Service E; however, all other key intersections would operate at or above Level of Service D. No intersections would operate at Level of Service F.

St. George Boulevard/100 South One-way Couplet

Under this alternative, modifications to the St. George Boulevard and 100 South would be undertaken to create a one-way couplet (see Section 2.3.5). The impact on commercial and residential property values from this alternative is unknown. However, modifications to traffic patterns in this heavily built-up area may decrease pedestrian walkability and accessibility to homes and businesses in the area, including

impacts to the St. George Town Square that is located on 100 South, and have adverse social and economic impacts on local businesses. Other roadways in the area would also likely be impacted by this alternative, including the north-south connecting roadways. There could also be impacts to downtown non-market values (i.e., the sense of place) and the pedestrian-friendly atmosphere would be impacted. Increased traffic and idling along 100 South to Vernon Worthen Park and playground, as well as the Town Square and its play areas, would have adverse effects on the neighborhood and communities living and using these areas by dividing these facilities from the remainder of the neighborhood. Traffic from this alternative would also impact students attending Legacy Elementary and Utah Tech University. Utah Tech has developed the area surrounding 100 South and 1000 East as a hub for student housing and many students walk to campus. The City of St. George transit hub located along 100 South may also need to be relocated under this alternative, removing it from its location near student housing.

Zone 6 would not be retained under this alternative, and the 3,341 acres of non-Federal lands would be available for development under the amended ITP. Localized impacts related to construction and additional growth in that area would occur, although they cannot be quantified at this time because the nature of any potential development is not known.

Under the One-way Couplet Alternative, operations in 2050 at most key intersections would be improved over the Terminate UDOT's ROW Alternative, including the St. George Boulevard/Bluff Street, St. George Boulevard/1000 East, Red Hills Parkway/1000 East, and the I-15 Exit 8 Southbound Ramps. The Green Spring Drive/Telegraph Street intersection would operate at Level of Service E. All other key study intersections would operate at or above Level of Service D. No intersections would operate at Level of Service F.

Terminate UDOT's ROW

Under this alternative, UDOT would no longer hold the ROW grant for the Northern Corridor across public lands in the NCA. As detailed in Section 3.11.1, congestion on existing roadways in the St. George area would continue to increase, which would cause longer travel times, increased vehicle emissions, and increased noise. St. George Boulevard/Bluff Street, St. George Boulevard/1000 East, I-15 Exit 8 Southbound Ramps, and Red Hills Parkway/1000 East would operate at Level of Service F. Zone 6 would not be retained under this alternative, and the 3,341 acres of non-Federal lands would be available for development under the amended ITP. Localized impacts related to construction and additional growth in that area would occur, although they cannot be quantified at this time.

3.12 Cumulative Impacts

Cumulative impacts are effects on the environment that result from the incremental effects of implementing any of the alternatives analyzed in this SEIS in combination with the effects of other past, present, and reasonably foreseeable actions. Cumulative impacts can result from individually minor, but collectively significant, actions taking place over a period of time, regardless of what agency or person undertakes such other actions (40 CFR Part 1508.1(g)(3)). Cumulative effects are analyzed only for those resources where there is a direct or indirect impact resulting from any of the proposed actions. The area analyzed for cumulative impacts, which varies by environmental resource, is described below for each resource.

3.12.1 Past, Present, and Reasonably Foreseeable Future Actions

A summary of the cumulative impacts described in the Final EIS is provided. The cumulative effects analysis in the Final EIS identified reasonably foreseeable future actions and provided that list in Table 3.28-2 of the Final EIS. Several of the projects on that list have been started or completed since publication of the Final EIS and are now part of the affected environment described in this SEIS for each resource. These include the following related to transportation, grazing, and land transfer actions:

- Washington City, Washington Parkway, and Greens Springs to I-15 – 2.66 miles of roadway near the Red Cliffs NCA connecting Washington Parkway to the northern end of Green Spring Drive.

- UDOT, Region 4, I-15, and Various Projects – Proposed improvements along I-15 from St. George to Leeds; the approximate total length of improvements is 18 to 20 miles.
- Questar Natural Gas Pipeline – Buried natural gas pipeline within Red Hills Parkway.
- BLM grazing permit transfer applications.
- BLM parcel acquisitions within Reserve Zone 3 using LWCF, as described in the SEIS in Sections 3.6 and 3.7.
- Washington County parcel acquisitions within the Reserve.

For all resources, the impacts of the past and present actions contribute to the current condition and are captured in the baseline description of the affected environment for that resource in Sections 3.2 through 3.11. For the cumulative effects analysis for the SEIS, the reasonably foreseeable future projects listed in Table 3.28-2 of the Final EIS that have not been started, and any new or future projects that were not known or planned at the time of the Final EIS, are listed in Table 27 and considered in this analysis. None of the projects listed in Table 27 are anticipated to occur in Zone 6 and consequently, there are no known or reasonably foreseeable developments that could impact desert tortoises or their habitat in this area. If Zone 6 is eliminated, it is likely that development would occur on the non-Federal lands in Zone 6. The nature of any development that may occur is unknown at this time and would be dependent on the type of development. Nevertheless, the impacts of potential development do not need to be known for this analysis, as the potential for take of desert tortoises (if development were to occur) has already been analyzed in the Final EIS. Resources evaluated for cumulative effects are presented in the same order as discussed earlier in this chapter.

Table 27. Reasonably Foreseeable Future Projects or Actions

Action or Project	Description	Disturbance or Description of Impacts
Transportation		
Washington City, Long Valley Road Extension	Long Valley Road is the principal access for the future Trails Development in Long Valley, southeast of Washington City.	The road is proposed to be 4,877 feet in length and 110 feet wide.
UDOT, Region 4 SR 9, Various projects	New interchanges at Telegraph, Purgatory, Sand Hollow Road, 3400 West, 2800 West; widening of I-15 to 2700 West.	Proposed improvements on SR 9 in Washington City and Hurricane City.
UDOT, Region 4, Purgatory Road	Extend 5300 West from SR 9 to Washington Dam Road.	New 5-mile-long roadway beginning in Hurricane City and ending in Washington City.
Hurricane, Various widening and new construction	DMPO 2023 – 2032: Seven new roadway construction projects; Two roadway widening/reconstruction projects.	Projects vary in length from 0.5 to 2.2 miles.
Hurricane, Various widening and new construction	DMPO 2033 - 2042: Thirteen new roadway construction projects; One roadway reconstruction.	Projects vary in length from 0.5 to 6.8 miles.
Ivins, Various projects	DMPO 2023– 2032: Western North, Old Highway 91 to 400 East; City Boundary to 400 East. DMPO 2033 – 2042: Red Mountain Boulevard, Old Highway 91 to Center Street.	New roadway construction from 0.5 to 1.2 miles long. New roadway construction from 1.5 miles long.

Action or Project	Description	Disturbance or Description of Impacts
Santa Clara and Ivins, Various projects	DMPO 2023 – 2032: Red Mountain Drive, Pioneer Parkway to Western; Western Corridor North, 400 East to City Boundary; Plantations Drive, Dixie Drive to Sunbrook to Western Corridor. DMPO 2033 – 2042: Pioneer Parkway, Lava Flow to Red Mountain Drive; Santa Clara Drive to Western Corridor Connector.	New roadway construction from 0.7 to 0.9 mile long. New roadway construction of 3.0 and 1.52 miles. New roadway construction 1.5 miles long each.
City of St. George, Various projects	DMPO 2023–2042: Seven new roadway construction projects and three widening and reconstruction projects. Includes 3.0-mile Cottonwood Springs Drive from Red Hills Parkway to Northern Corridor, and 0.5-mile New Interchange at West end of Northern Corridor.	New roadway construction from 0.3 to 4.3 miles in length, roadway widening and reconstruction from 0.5 to 1.9 miles long. The 3-mile Cottonwood Springs Drive from Red Hills Parkway to Northern Corridor new construction project, and 0.5-mile New Interchange at West end of Northern Corridor widening, and reconstruction project are within the NCA and designated Mojave desert tortoise critical habitat; see DMPO (2023) Appendix B, Projects and Phasing Map 1.
UDOT, Region 4, or Hurricane (TBD), new construction	DMPO 2023–2050: "Babylon" State road, from Old Highway 91 to Hurricane.	The planned 4-mile "Babylon" new State road construction project is within the NCA and designated Mojave desert tortoise critical habitat; see DMPO (2023) Appendix B, Projects and Phasing Map 1.
UDOT, Region 4, City of St. George, Western Corridor and I-15 corridor projects	DMPO 2043-2050: Western Corridor, Sun River Parkway to Gap Canyon Parkway, new State highway construction project.	10.0 miles of new roadway construction. Two new roadways (0.5 and 1.8 miles long) and one 3.0-mile-long widening project in or near the I-15 corridor. The 10-mile Western Corridor, Sun River Parkway to Gap Canyon Parkway, new State highway construction project would run alongside the western boundary of Zone 6. In fact, the western boundary of Zone 6 was defined in anticipation of that project; see DMPO (2023) Appendix B, Projects and Phasing Map 1. This project is within Mojave desert tortoise and Federally-listed plant species habitats.
City of St. George, Warner Valley Area	DMPO 2043-2050: Warner Valley Road to Southern Parkway to the road through Warner Valley and	30.8 miles of new construction plus 4.9 miles of widening between River Road and Warner Valley.

Action or Project	Description	Disturbance or Description of Impacts
	Pecan Road to Honeymoon Trail Road.	
Comprehensive Travel and Transportation Management Plan for the BLM St. George Field Office in Washington County	Completion of a Comprehensive Travel and Transportation Management Plan for BLM-administered lands in Washington County, including the BLM St. George Field Office and Red Cliffs NCA. The BLM would designate motorized, mechanized, and non-mechanized routes.	Designation of routes would occur throughout the county. After routes are designated, OHV use would be managed as limited to designated routes, which would reduce OHV use on existing, undesignated routes.
Public Works		
Utah Board of Water Resources	Lake Powell Pipeline project would deliver water from Lake Powell near Glenn Canyon Dam in Page, Arizona, to Sand Hollow Reservoir near St. George, Utah.	Approximately 140 miles of underground pipeline, five pumping stations, and six hydroelectric facilities are proposed.
Development		
DiVario Development	Master-planned community.	730 acres proposed adjacent to the northeastern border of current Zone 6.
The Trails Development	Master-planned community.	605.61 acres proposed within the recently completed Brennan/BLM land exchange, 6 miles east of St. George, 1.5 miles from St. George Airport.
Apple Valley	Master-planned community.	200 acres proposed off Cinder Road consisting of a hotel and 22-single-family detached housing units.
Solara	Master-planned community.	200 acres south of Anderson Junction, east of Silver Reef.
Recreation Tours, Events, Special Recreation Permits		
BLM permit applications, Various tours and events	115 permitted uses for activities, including adventure tours, hunting, all-terrain-vehicle tours, races, film shoots, etc. This includes Red Rock Rampage, Huntsman World Senior Games, Interscholastic Cycling Association High School Championship, and tri-State all-terrain-vehicle events. None of these permit applications are in the Red Cliffs NCA. There are no Special Recreation Permits that authorize motorized tours, races, or other events on public lands in Zone 6.	St. George Field Office – Washington County (various locations). Kanab Field Office, Arizona Strip Field Office.

Action or Project	Description	Disturbance or Description of Impacts
BLM permit applications, Shooting Range	Proposal for a long-distance rifle range to address potential conflicts with other recreational users. The BLM is working with the County to relocate the current proposed location.	County proposal located in Cove Wash; may infringe on the Red Bluff ACEC.
Ivins Public Works, Regional Park and Cemetery	The outdoor recreation area would contain a regional park, a disc golf course, a junior mountain biking trail, and a trail system that connects to existing trails. The public works facility and yard would consist of an office, a fleet maintenance facility, various storage areas, covered employee parking, and a public garbage area.	72-acre parcel. Southwest side of Old Hwy 91, at the intersection of Old Hwy 91 and Main St.
Land and Facilities Management		
City of St. George, Reserve Boundary Adjustment	St. George has proposed a minor boundary adjustment to allow for construction of an access road from their Water, Power, and Streets yard.	Removal of 0.65 acre from Reserve Zone 3 in exchange for 0.65 acre (also in Zone 3); construction of access road in area of adjusted boundary.
Land Tenure Adjustments and Land Use Authorizations		
Various proposed parcel acquisitions	Proposed acquisitions within Zone 3 of the Reserve.	Washington County HCP Funds, 22.2-acre parcel; Nature Conservancy, 2.2-acre parcel; UDNR, 2.2-acre parcel; LWCF, 15.2 acres remaining of 44.4-acre parcel; ESA Section 6 funds, UDWR and unnamed private landowner, approximately 200 acres.
BLM acquisition through land exchange	Proposed land exchange with WCWCD.	Land exchange with the WCWCD involving two parcels. The non-Federal parcel is approximately 89.43 acres and the Federal parcel is 929.14 acres.

3.12.2 Vegetative Communities, including Noxious Weeds and Invasive Species

The cumulative impact analysis area for the evaluation of impacts on vegetative communities, and, in particular, noxious weeds and invasive species, is the same as used in the Final EIS (Section 3.28.2, BLM 2020a), which was defined as potential and suitable modeled desert tortoise habitat (up to 4,500-feet elevation) in Washington County (excluding the Northeastern Mojave Recovery Unit).

2020 Final EIS Summary

The Final EIS stated in Section 3.28.2 that the HCP, which addresses development on Mojave desert tortoise habitat on non-Federal, non-Tribal land in most of Washington County, involves a substantial amount of acreage, which would lead to vegetation loss from all alternatives. The cumulative effects of project-related activities, combined with additional ground-disturbing actions identified in Section 3.28.2, were identified as a threat to native vegetation communities.

Supplemental Analysis

Since publication of the Final EIS, several projects or actions listed in Table 3.28-2 of the Final EIS have been completed. The effects of those projects are now considered as part of the affected environment baseline for vegetative communities. Completed transportation projects include the construction and expansion of roads near the NCA. Although these projects did not directly occur on NCA lands, all projects identified that have the potential for ground-disturbing activities within previously undeveloped land have the potential to exacerbate the proliferation of non-native and invasive plant species, which could spread into the NCA leading to further habitat degradation and increased wildfire risk.

Additional reasonably foreseeable actions not included in Table 3.28-2 of the Final EIS that have been identified since the Final EIS are included in Table 27. All actions have the potential for ground disturbance and to contribute to cumulative effects on vegetation resources. Effects would be similar to those disclosed in Section 3.28.2 of the Final EIS. The identified development and transportation projects, such as the Western Corridor (which is located near the boundary of Zone 6) listed in Table 27, would remove, destroy, or degrade soil and native vegetation communities. The removal or degradation of native vegetation would potentially exacerbate the spread of invasive species, particularly given the compounding impacts of climate change and wildfire threats. As development occurs, the potential for fire increases. Increased recreation use would increase the risk for cheatgrass expansion and human caused fires in Zone 6 as well. All projects identified that have the potential for ground-disturbing activities within previously undeveloped land would adversely impact native vegetation communities, as well as potentially increase the spread of noxious and invasive species.

Utah's Watershed Restoration Initiative, a partnership-based program to improve high priority watersheds throughout the state, has undertaken several projects in the Reserve. The Watershed Restoration Initiative has focused on improving three ecosystem values: 1) watershed health and biological diversity, 2) water quality and yield, and 3) opportunities for sustainable uses of natural resources. A list of projects that have occurred in the Reserve is provided in Appendix C. More information about each of these projects can be found at https://watershed.utah.gov. These projects are designed to improve the native plant communities in the Reserve and reduce the impact of invasive species.

3.12.3 Special Status Plants

The cumulative impact analysis area for special status plants is the same as the analysis area identified for Vegetative Communities in Section 3.12.1.

2020 Final EIS Summary

Any ground-disturbing activities that occur within suitable and occupied habitat would have cumulative effects on the special status plants present in the analysis area. Projects outlined in Table 3.28-2 of the Final EIS (i.e., road widening and new road construction) may overlap with occupied habitat for various special status plant species, adversely affecting them or their habitat. Furthermore, the impact of climate change, soil erosion, and recreational activities compound the threats to suitable habitat for special status plants within the analysis area.

Supplemental Analysis

As described above for vegetative communities, completed transportation projects include the construction and expansion of roads near the NCA. Although these projects did not directly occur on NCA lands, any projects that occurred in potentially suitable habitat for special status plants described in Section 3.4 of this SEIS have the potential to contribute to cumulative effects.

Additional reasonably foreseeable actions that have been identified since the Final EIS are included in Table 27. All actions that have the potential for ground disturbance in suitable habitat for special status plants would have the potential to contribute to cumulative effects to this resource. Additional foreseeable and planned projects (i.e., as road construction and associated developments) would add to habitat loss and fragmentation. In particular, the Western Corridor would have deleterious impacts to Holmgren milkvetch and dwarf bear poppy by destroying individual plants and specialized pollinators, and by

destroying and fragmenting associated suitable habitat. Effects would be similar to those disclosed in Section 3.28.3 of the Final EIS. The degradation of suitable habitat for special status species would be exacerbated by the spread of invasive species associated with ground disturbing activities, particularly given the compounding impacts of climate change and wildfire threats. Any of the planned projects that include a Federal nexus would require avoidance and minimization measures that would help to reduce or mitigate impacts to special status species.

3.12.4 Fire and Fuels Management

The cumulative impact analysis area for fire and fuels management is the same as used in the Final EIS (Section 3.28.22), which was defined as the NCA and Reserve, although the influence of increasing wildfires throughout Washington County and in the northern Mojave Desert was also considered.

2020 Final EIS Summary

The Final EIS stated in Section 3.28.22 that foreseeable actions impacting fire management are related to projects with potential human-caused wildfire risks or those affecting fuel loading or vegetation cover types. While the T-Bone Mesa, UDOT ROW, and Southern Alignments would impact fire and fuels management in the NCA, aside from the completion of the Comprehensive Travel and Transportation Management Plan for the BLM St. George Field Office, there were no other foreseeable actions identified in the area that would have contributed to cumulative effects to fire and fuels management. The potential for climate change to exacerbate fire risks by altering plant growth, increasing drought frequency, and facilitating the expansion of invasive grasses was identified in the Final EIS as contributing to cumulative effects.

Supplemental Analysis

Table 27 includes additional foreseeable actions identified since the Final EIS. Effects would be similar to those disclosed in Section 3.28.5 of the Final EIS. Reasonably foreseeable road or other development projects identified in Table 27 that are near the NCA may provide additional vectors for ignition sources for wildfires that could spread into the NCA. Increased recreation use would increase the risk for cheatgrass expansion and human caused fires in Zone 6.

3.12.5 Special Status Wildlife

The cumulative impact analysis area for special status wildlife is the same as the analysis area identified above for vegetation in Section 3.12.1.

2020 Final EIS Summary

The Final EIS stated in Section 3.28.5 that all alternatives, along with foreseeable land development and transportation projects, would contribute to habitat loss for special status wildlife in the analysis area; in particular, impacting the desert tortoise. While roadway improvements in the Red Hills Parkway Expressway and One-way Couplet alternatives were identified as having negligible cumulative impacts, the analysis showed the T-Bone Mesa, UDOT ROW, and Southern Alignments could moderately affect wildlife habitats due to habitat loss. Projects listed in Table 3.28-2 of the Final EIS, including the Western Corridor, would further fragment tortoise habitat. The Final EIS identified measures like ESA Section 7 consultation and fencing to mitigate some of the potential impacts. The combination of the proposed actions (HCP, Zone 6, and ROW) would contribute to beneficial and adverse cumulative effects to Mojave desert tortoise.

Supplemental Analysis

Additional reasonably foreseeable actions identified in Table 27 that have the potential for ground disturbance in suitable habitat would have the potential to contribute to cumulative effects to special status wildlife. Effects would be similar to those disclosed in Section 3.28.5 of the Final EIS. Road construction and widening projects completed since publication of the Final EIS have contributed to the incremental habitat loss for special status wildlife species. Additional foreseeable and planned projects (i.e., road construction and associated developments for recreation), as well as the widening of SR 318,

would add to habitat loss and fragmentation. The implementation of the project, combined with the ground-disturbing projects listed in Table 27, would result in incremental cumulative impacts to special status wildlife within the analysis area.

Of particular note are the planned 3.0-mile Cottonwood Springs Drive from Red Hills Parkway to the proposed Northern Corridor, the 0.5-mile new interchange at the west end of the Northern Corridor project that would be undertaken by the City of St. George, and UDOT/Hurricane's 4.0-mile Babylon Road project that would connect Old Highway 91 to Hurricane along the existing Babylon Road. These three projects would be located in occupied Mojave desert tortoise critical habitat within the NCA. The DMPO's 2023-2050 Regional Transportation Plan text and Appendix B, Projects and Phasing Map 1 include the long planned 4-mile "Babylon" new State road construction project, which is within the NCA and in designated Mojave desert tortoise critical habitat. Though this project is in the "Unfunded" category, funding could occur at any time now through 2050.

In addition, the planned Western Corridor would directly abut the western boundary of Zone 6. The Western Corridor would result in direct impacts to tortoise, including loss/degradation of occupied tortoise habitat, loss of habitat connectivity (including between the UVRRU and Northeastern Mojave Recovery Unit), increased threats of fire, and the spread of exotic/invasive plants and of raven subsidies (e.g., roadkill). These potential impacts have already been analyzed in the Final EIS under alternatives where the changed circumstance does not occur. Increased recreation use would increase the risk for cheatgrass expansion and human caused fires in Zone 6.

3.12.6 ESA Section 6 Land Acquisition Grants

The cumulative impact analysis area for the evaluation of impacts to ESA Section 6 Land Acquisition Grants is the same as was used in Section 3.28.2 of the Final EIS, which was the Reserve boundary, although no Section 6 lands occur in Zone 6 of the Reserve.

2020 Final EIS Summary

The Final EIS stated in Section 3.28.6 that no reasonably foreseeable actions identified in Table 3.28-2 of the Final EIS would affect ESA Section 6 lands within the analysis area, with the exception of a potential increase in Section 6 lands within the Reserve. The Final EIS stated that the increase of stressors affecting desert tortoise could also result in the incremental degradation of Section 6 lands that could adversely affect their long-term conservation goals.

Supplemental Analysis

Since publication of the Final EIS, there has been an increase in Section 6 lands within the Reserve, as identified in the affected environment. Similar to the effects disclosed in Section 3.28.6 of the Final EIS, additional reasonably foreseeable actions included in Table 27 would not affect ESA Section 6 lands within the Reserve. With few exceptions, none of the actions listed in Table 27 would be within the NCA where ESA Section 6 lands have been acquired. For transportation projects near or within the NCA (e.g., Cottonwood Springs Drive), additional ground disturbance could lead to degradation of native vegetation and potentially exacerbate the spread of invasive species, which could degrade ESA Section 6 lands that may have been acquired near these areas.

3.12.7 Land and Water Conservation Fund Lands

The cumulative impact analysis area for LWCF lands is the same as was used in Section 3.28.2 of the Final EIS, which was the boundaries of LWCF properties within the Reserve and NCA.

2020 Final EIS Summary

The Final EIS stated in Section 3.28.16 that land tenure acquisitions and land use authorizations would offset some of the loss from Federal LWCF impacts by incorporating private in-holdings into the NCA. No reasonably foreseeable actions identified in Table 3.28-2 of the Final EIS would affect State LWCF lands within the analysis area.

Supplemental Analysis

Since publication of the Final EIS, there have been additional lands acquired with LWCF funding in the NCA/Reserve, as identified in the affected environment. Additional reasonably foreseeable actions that have been identified since the Final EIS are included in Table 27. Similar to the effects disclosed in Section 3.28.16 of the Final EIS, additional reasonably foreseeable actions included in Table 27 would not affect LWCF lands within the Reserve. With few exceptions, none of the actions listed in Table 27 would be within the NCA where LWCF lands have been acquired. For projects near or within the NCA, additional ground disturbance could lead to degradation of native vegetation and potentially exacerbate the spread of invasive species, which could degrade LWCF lands that may have been acquired near these areas.

3.12.8 National Conservation Area

The cumulative impact analysis area for the evaluation of impacts to the NCA is the same as used in Section 3.28.18 of the Final EIS, which was the NCA boundary.

2020 Final EIS Summary

Section 3.28.18 of the Final EIS stated that the cumulative impacts on the NCA's objects and values were described in other cumulative resource sections. That is, wildlife values were discussed in General Wildlife (Section 3.28.4) and Special Status Wildlife (Section 3.28.5); ecological values were addressed in Vegetative Communities Including Noxious Weeds and Invasive Species (Section 3.28.2); Special Status Plants (Section 3.28.3); General Wildlife (Section 3.28.4); Special Status Wildlife (Section 3.28.5); and Fire and Fuels Management (Section 3.28.22). Table 3.28-3 in the Final EIS includes details about which sections of the cumulative effects analysis discuss which resources.

Supplemental Analysis

For this supplemental analysis, cumulative effects to the NCA's objects and values are described in other resource sections, similar to the Final EIS. As part of the Settlement Agreement, the BLM agreed to complete a compatibility determination, which will be included in the ROD for the SEIS.

3.12.9 Cultural Resources and Native American Concerns

The cumulative impact analysis area for evaluation of impacts to Cultural Resources and Native American Concerns consists of areas within the proposed alternative alignments for the Northern Corridor, the non-Federal lands within the HCP Permit Area, and Zone 6. This includes all areas where Federal actions may directly or indirectly impact cultural resources.

2020 Final EIS Summary

The Final EIS stated in Section 3.28.14 that the T-Bone Mesa, UDOT ROW, Southern Alignment, and the Red Hills Parkway Expressway alternatives, along with foreseeable land development and transportation projects, would contribute to the gradual loss of cultural resources in the area, with the T-Bone Mesa, UDOT ROW, and Southern Alignments having the most impact due to highway improvements. Construction projects like the Washington Parkway, the proposed Western Corridor, and DiVario Development pose risks to cultural resources because of ground-disturbing activities, particularly on lands that are undeveloped. The construction of residences for the DiVario Development would result in ground-disturbing activities and have the potential for adverse effects to archaeological resources. The completion of BLM land acquisitions of non-Federal lands within the NCA would have beneficial impacts on cultural resources if those resources were present on acquired parcels. A number of measures (i.e., the Amended HCP and Comprehensive Travel and Transportation Management Plan) were identified that would result in a reduction in impacts to cultural resources. Overall, the impacts of the actions analyzed in the Final EIS, in addition to reasonably foreseeable future actions, would result in loss and adverse impacts on cultural resources in the analysis area. Compliance with cultural resource laws would help to minimize cumulative effects on cultural heritage.

Supplemental Analysis

All actions in Table 27 that have the potential for ground disturbance could contribute to cumulative effects to cultural resources. Effects would be similar to those disclosed in Section 3.28.14 of the Final EIS. If the ongoing Red Cliffs/Warner Valley Land Exchange is approved, one historic property within the UDOT ROW Alignment would be acquired by the BLM through this exchange. Overall, the impacts of the actions analyzed in the Final EIS, in addition to reasonably foreseeable future actions, would result in the incremental loss and adverse impacts on cultural resources in the analysis area.

3.12.10 Environmental Justice

The cumulative impact analysis area for impacts to EJ was the same as used in the Final EIS (Section 3.28.27), which was Washington County. The effects to EJ populations from all Federal actions analyzed in the Final EIS would occur in Washington County.

2020 Final EIS Summary

The Final EIS stated in Section 3.28.27 that no reasonably foreseeable actions identified in Table 3.28-2 of the Final EIS would disproportionately affect EJ populations within the analysis area.

Supplemental Analysis

A more robust EJ analysis was conducted in this SEIS in accordance with additional guidance on EJ described in Section 3.10.2. Reasonably foreseeable actions related to construction and development of some of the projects identified in Table 27 would have temporary impacts (i.e., noise and fugitive dust) that could affect both EJ and non-EJ communities. These impacts would disproportionately impact EJ communities if projects were concentrated closer to these communities than non-EJ communities; impacts from these other projects should include an analysis to determine and mitigate their impacts to EJ communities.

3.12.11 Socioeconomics

The cumulative impact analysis area for impacts to socioeconomics was the same as used in the Final EIS (Section 3.28.26), which was Washington County. The socioeconomic impacts of all Federal actions analyzed in the Final EIS would occur in Washington County.

2020 Final EIS Summary

The Final EIS stated in Section 3.28.26 that the actions outlined in Table 3.28-2 of the Final EIS could affect social and economic activity in the county, particularly with projects like the Northern Corridor and other construction projects boosting construction jobs and local spending. These infrastructure developments aim to accommodate a growing population and enhance socioeconomic activity, although they may also entail displacing existing residences and utilities and altering access to land use. Despite projected population growth and potential impacts on recreational demand and landscape aesthetics, the cumulative effects of these actions are not expected to affect the availability of homes, schools, or community services.

Supplemental Analysis

Reasonably foreseeable actions related to construction and development of some of the projects discussed in Table 27 may have socioeconomic impacts, depending on their location. Effects to socioeconomics would be similar to those disclosed in Section 3.28.14 of the Final EIS. Current and forecasted population growth within Washington County is increasing housing and infrastructure demand but also increasing property values. An increasing population increases socioeconomic opportunities and job creation. Localized impacts related to construction and additional growth in a particular area may occur under some projects. Similar to the conclusions in the Final EIS, the cumulative effects of these actions are not expected to have a negative impact on socioeconomics in the greater St. George metropolitan area.

4 CONSULTATION AND COORDINATION

This chapter describes efforts completed by the BLM and the FWS to comply with legal requirements to involve the public in the development of the SEIS and consult and coordinate with various government agencies. These efforts included the following:

- Public involvement and scoping.
- Consulting with applicable Federal agencies.
- Consulting with American Indian Tribal governments.
- Identifying, designating, and working with State and local governments and Cooperating Agencies to identify "any known inconsistencies with State or local plans, policies or programs" (43 CFR 1610.3-2(e)).

A list of preparers of the SEIS is also presented.

4.1 Public Involvement and Scoping

The scoping period for the SEIS began with the publication of the NOI in the FR on November 16, 2023, and extended through December 28, 2023. The BLM and the FWS initiated the scoping process to solicit public and agency comments and identify issues to be addressed in the SEIS. A public scoping meeting was held on December 6, 2023, at the Dixie Convention Center in St. George. In total, 8,993 submissions were received from the public during the scoping period. Information about the scoping meeting, comments received, and comment analysis can be found in the Final Northern Corridor SEIS Scoping Report available on the BLM's ePlanning website.[17]

The public comment period for the Draft SEIS began with the publication of the NOA, published in the FR on May 10, 2024, informing the public of the availability of the Draft SEIS for public comment. The availability of the Draft SEIS was also announced on the ePlanning website. The publication of the NOA signaled the start of a 45-day public comment period, originally scheduled to end on June 24, 2024. An updated traffic analysis for the Northern Corridor was released by the Dixie Metropolitan Planning Office on June 20, 2024 (see Appendix D for updated traffic analysis). A report of the field results of the updated vegetation monitoring for the three Northern Corridor alternatives in the NCA was also released on June 20, 2024 (see Appendix B). Both of these reports were made available on the BLM's ePlanning site on June 21, 2024, and the public comment period was extended to July 9, 2024, to allow for a total 60-day public comment period.

During the public comment period, the BLM and FWS hosted one public meeting to provide an overview of the Draft SEIS and answer questions from the public. The meeting was held June 4, 2024, at 5:00 p.m. at the Dixie Convention Center in St. George, Utah.

An outreach plan to EJ communities was developed by the BLM, consistent with Instruction Memorandum 2022-059 (BLM 2022c) and EO 14096 and was implemented as part of public outreach activities that took place during the SEIS process (see Appendix E). During the SEIS process, and in conjunction with the release of the Draft SEIS, the BLM emailed letters to a number of minority populations, low-income populations, and Tribes informing them of the opportunity for meaningful involvement in the BLM decision-making processes that affect their lives, livelihoods, and health. This was in addition to the BLM's responsibility to consult with Federally-recognized Tribes, as outlined in Department and BLM policies, and described in more detail in Section 4.2. Information received as a result of the outreach plan has been included in Sections 3.10 and 3.11.

[17] https://ow.ly/pgkG50Q7AyR

Comments on the Draft SEIS were accepted by the BLM and FWS via ePlanning and through mail to the BLM office, as well as through comment forms provided at the public meeting. The BLM and FWS reviewed and considered all comments received on the Draft SEIS. In total, 4,255 submissions were received from the public during the comment period. The BLM and FWS responded to substantive comments and the draft document was modified, as appropriate, based on public comments; all substantive comments and responses were incorporated into the SEIS and are included as Appendix F. The NOA of the Final SEIS will be announced in the FR, and the document will be posted on the ePlanning website. After a 30-day period of availability for the Final SEIS, a BLM ROD, and potentially a FWS ROD, will be published.

4.2 Agency Consultation and Coordination

4.2.1 Endangered Species Act Section 7 Consultation

Section 7(a)(2) of the ESA requires that each Federal agency ensure that any action it authorizes, funds, or carries out is not likely to jeopardize the continued existence of a listed species or result in the destruction or adverse modification of designated critical habitat. If an action agency determines a proposed action may affect listed species or designated critical habitat, consultation between that agency and the FWS is required under Section 7 of the ESA.

In 2020, the FWS considered Washington County's request to renew its ITP through Section 10 of the ESA as otherwise legal activities are conducted that may affect listed species in Washington County, Utah. As a part of this process, the FWS completed an intra-agency Section 7 consultation regarding the potential effects of issuing an ITP to Washington County and found that the action, as proposed, was not likely to jeopardize the continued existence of the desert tortoise, Holmgren milkvetch, Shivwits milkvetch, dwarf bear-poppy, Siler pincushion cactus, Gierisch mallow, and Fickeisen plains cactus, or result in the adverse modification of critical habitat for desert tortoise, Holmgren milkvetch, Shivwits milkvetch, Gierisch mallow, or Fickeisen plains cactus (FWS 2021c). A Biological Opinion for the Amended Washington County HCP was issued on January 12, 2021.

The FWS completed an inter-agency Section 7 consultation with the BLM regarding the potential effects of BLM's issuance of the Northern Corridor ROW to UDOT. The BLM submitted a Biological Assessment to the FWS to initiate the formal Section 7 consultation process on September 23, 2020. A Biological Opinion for the Northern Corridor highway was issued on January 12, 2021. The Biological Opinion included three Federal actions on the part of the BLM from its responsibility under the FLPMA: 1) Issuance of a ROW to UDOT to construct a road through the NCA; 2) Amendment of the Red Cliffs NCA RMP to allow for a ROW in the NCA; and 3) Amendment of the St. George Field Office RMP to facilitate the expansion of the Reserve to change management prescriptions on 3,471 acres of BLM-administered land within the 6,813 acre Zone 6 conservation area comprised of predominantly BLM and TLA land to offset the effects of the Northern Corridor ROW within the Reserve.

As part of the Settlement Agreement, on January 8, 2024, the BLM requested that the FWS rescind its Biological Opinion pending reconsideration of the ROW. On March 8, 2024, the FWS issued an Amended Biological Opinion. Because the original Biological Opinion covered three Federal actions, including the Northern Corridor highway ROW, Red Cliffs NCA RMP Amendment, and St. George Field Office RMP Amendment, the amended Biological Opinion only considered the amendments to the RMPs for effects to the Mojave desert tortoise and desert tortoise designated critical habitat. As a result, the amended Biological Opinion withdrew the portions of the original Biological Opinion related to the Northern Corridor ROW. The FWS stated that subsequent affirmation, or affirmation with modifications, of a ROW would require additional Section 7 consultation.

4.2.2 National Historic Preservation Act Section 106 Consultation

Section 106 consultations on the Northern Corridor Project were initiated in 2020 and have continued during the preparation of the SEIS. Table 28 summarizes the Section 106 process and includes the date when specific steps in the process were completed. Table 29 identifies the dates and content of the consultations and the dates when concurrence was received from the Utah SHPO.

As described in Section 3.9.1, the BLM and the FWS have independently and jointly consulted with the Utah SHPO and culturally affiliated Indian Tribes regarding efforts to identify cultural resources within the Area of Potential Effects, evaluate them for NRHP eligibility (36 CFR 800.4), and assess effects of their undertaking on historic properties by applying the criteria of adverse effect (36 CFR 800.5). The BLM also consulted with TLA and UDWR and agreed to be the lead agency for Section 106 compliance efforts for those alignments of the proposed Northern Corridor undertaking that involved state lands.

Table 28. Steps in NHPA Section 106 Process

Section 106 Steps	BLM Northern Corridor Section 106 Efforts
Initiation of Section 106 process Completed: April 17, 2020	• Define the Area of Potential Effects: 700-foot-wide corridor centered along NCA Alignments, 200-foot-wide Areas of Potential Effects for Red Hills Parkway (50-feet-wide on either side of the existing road), and one-lot wide on either side of the roads for the One-Way Couplet. • Literature review within 0.25 miles of the Area of Potential Effects; all alignments. • Initial Tribal consultation letters. • Initial SHPO consultation letter.
Identification of historic properties Completed: August 7, 2020	• Class III archaeological survey of UDOT ROW Alignment, T-Bone Mesa Alignment, Southern Alignment, and Red Hills Parkway Expressway. • Reconnaissance level survey of historic structures on Red Hills Parkway Expressway and One-Way Couplet. • Tribal consultation letters.
Evaluate the eligibilities of historic properties within the Area of Potential Effects for the NRHP Completed: August 7, 2020	• UDOT ROW Alignment: Eight historic properties and eight sites not eligible for the NRHP. • T-Bone Mesa Alignment: Six historic properties and five sites not eligible for the NRHP. • Southern Alignment: Five historic properties and two sites not eligible for the NRHP. • Red Hills Parkway Expressway: Two historic properties and nine sites not eligible for the NRHP. • Structures for the One-Way Couplet: 139 historic structures and 63 structures eligible for the NRHP; 70 structures are not eligible for the NRHP.
Evaluate the effects to historic properties Completed: October 5, 2020	• The UDOT ROW Alignment would likely have adverse effects to eight historic properties. (Note: Evaluation was only completed on the Preferred Alternative identified in the Final EIS in 2020. As described below, ongoing consultation is occurring on all the alternatives as part of the supplemental process). • The T-Bone Mesa Alignment would likely have adverse effects to six historic properties.

Section 106 Steps	BLM Northern Corridor Section 106 Efforts
	• The Southern Alignment would likely have adverse effects to five historic properties. • The BLM is not fully able to determine the effects of the Red Hills Parkway Expressway, the One-Way Couplet, or Terminating the UDOT ROW because it is reasonably foreseeable that the sites on non-Federal lands in Zone 6 may lose their enhanced protections.
Resolve adverse effects to historic properties through PA	• Consulting Parties invited to participate in development of an MOA via letter dated April 1, 2024, acceptances sent via email and hard copy letter to BLM. • Virtual Kick-off Meeting for MOA held with Utah SHPO and Consulting Parties on May 20, 2024. • Utah SHPO, in letter dated July 3, 2024, recommended the development of a Programmatic Agreement, because effects to historic properties in Zone 6 on non-Federal land cannot be fully determined prior to the approval of this complex undertaking. The BLM committed to pursue a phased identification effort and evaluation, pursuant to 36 CFR 800.4 (b) (2) and develop a PA in consultation with Utah SHPO, pursuant to 36CFR 800.14 (b)(1) (ii) and 800.14 (b) (3). • Virtual meetings held with Consulting Parties to develop recitations and stipulations for the PA and identify Invited Signatories and Concurring Parties on August 9, 2024, and September 26, 2024. • Final PA transmitted to Invited Signatories (UDOT and SITLA) and Concurring Parties (Paiute Indian Tribe of Utah, Shivwits Band of Paiute, PLPCO, Washington County, City of St. George, and Conserve Southwest Utah for signatures on October 15, 2024. • Final PA transmitted to Utah SHPO for signature on November 1, 2024.

Table 29. Timeline of BLM's Consultations with the Utah SHPO for the Northern Corridor Project

Date	Letter	SHPO Case No.	Content
February 5, 2020	Initial Consultation Letter to SHPO	20-0386	Description of project, and submission of a Tribal consultation list Concurrence received: February 10, 2020
April 17, 2020	Area of Potential Effects Consultation Letter to SHPO	20-1117	Description of project, consultation on Area of Potential Effects for all alternatives, description of identification efforts for historic properties (archaeological sites and historic structures), and consultation on the Consulting Party list. Concurrence received: April 20, 2020
August 7, 2020	Eligibilities Consultation Letter to SHPO	20-2753	Submission of historic structures report and Class III cultural resources inventory report (U20ST0150). Asked for concurrence on determination of eligibilities for archaeological sites (29 total sites, 17 eligible) and structures (139 historic structures, 64 eligible). Concurrence received: August 26, 2020

Date	Letter	SHPO Case No.	Content
October 5, 2020	Effects Consultation Letter to SHPO	20-3358	Asked for concurrence on BLM's determination that the construction, use, and maintenance of the UDOT Alignment Alternative may cause adverse effects to eight eligible archaeological sites in UDOT Alternative Alignment. Concurrence received: October 5, 2020
December 10, 2020	Red Cliffs NCA RMP Amendments Consultation Letter to SHPO	20-4173	Described proposed amendment and alternatives to the Red Cliffs NCA RMP, to allow the granting of a ROW for the Northern Corridor and asked for concurrence on the BLM's no adverse effects determination for this proposed action. Concurrence received: December 10, 2020
December 10, 2020	St. George Field Office RMP Amendments Consultation Letter to SHPO	20-4173	Described proposed amendment and alternatives to the St. George Field Office RMP to create and manage a sixth zone of the Reserve as a mitigation reserve for Mojave desert tortoise, as well as close this area to future ROWs, mineral development, livestock grazing, dispersed camping, and target shooting. The BLM asked for concurrence on its no adverse effects determination. Concurrence received: December 12, 2020
April 30, 2024	Effects Consultation, T-Bone and Southern Alignment	24-1091	Requested concurrence with adverse effects to historic properties determination for construction, use, and maintenance of Northern Corridor highway, if UDOT ROW is affirmed with modifications for either of these alternatives. Concurrence received May 6, 2024
June 10, 2024	Effects Consultation, Red Hills Parkway Express, One-Way Couplet, and Terminate UDOT ROW alternatives	24-1468	Requested concurrence with determination of "No Adverse Effect" to historic properties if UDOT ROW were terminated and either the Red Hills Parkway Expressway or the One-Way Couplet were selected. SHPO response received on July 3, 2024, but did not concur with this determination and recommended development of a PA. Under 36 CFR 800.5(a)(1), the agency assesses if its undertaking has the potential to cause adverse effects, both directly or indirectly, to historic properties and "adverse effects may include reasonably foreseeable effects caused by the undertaking that may occur later in time." It was the opinion of the SHPO that termination of the UDOT ROW would lead to development and other activities on the non-Federal lands, which have a potential to have reasonably foreseeable adverse effects to historic properties that the BLM still needs to analyze and resolve to conclude its

Date	Letter	SHPO Case No.	Content
			Section 106 compliance responsibilities. The SHPO recommended either enhanced efforts to identify historic properties on non-Federal lands or shifting the currently initiated MOA to a PA that could allow for phased implementation of inventories and findings of effect.
July 12, 2024	Initiated Consultation on Preparation of PA	24-1713	Provided detailed information on land ownership in Zone 6, prior archaeological surveys completed, and findings of those surveys in that zone. Requested concurrence with development of PA, as appropriate, for this project to conclude BLM Section 106 responsibilities. Concurrence received July 15, 2024

The FWS consultation process culminated in the development and signing of a PA to resolve future, but presently unknown, effects of the FWS's issuance of an ITP to Washington County. The decisions available in this SEIS do not change the implementation of the FWS ITP PA as it considers effects to historic properties both with and without the changed circumstance; thus, the PA remains valid for all available alternatives in this SEIS and will not be reevaluated as part of the SEIS process. Refer to Section 4.2.2 of the Final EIS for a complete history of FWS compliance under Section 106 Consultation.

To resolve potential adverse effects to historic properties that could result from BLM's decision related to the Northern Corridor highway alternatives, the agency has consulted with the Utah SHPO, culturally affiliated Indian Tribes, other Federal and State agencies with involvement in the undertaking, representatives of local governments, the project proponent, and organizations and individuals with a demonstrated interest in the undertaking. On December 1, 2023, via email, the BLM consulted with the Utah SHPO to identify consulting parties for the development of binding commitment measures, initially anticipated to be through a Memorandum of Agreement (MOA), to resolve potential adverse effects to historic properties. Further consultations with the Utah SHPO in June and July of 2024 determined that a PA would be a more appropriate agreement document due to the complexities associated with the Northern Corridor undertaking.

The BLM consulted with the Advisory Council on Historic Preservation (ACHP) and submitted a formal invitation to the ACHP to participate in the development of an MOA on January 31, 2024; it declined to participate through a letter dated February 12, 2024. On July 19, 2024, the BLM invited the ACHP to participate in the development of the PA for this undertaking. In a letter dated August 2, 2024, and follow-up emails on August 21 and 26, 2024, the ACHP declined to participate in the development of the PA, as this project does not currently meet the criteria specified in 36 CFR Part 800 Appendix A (c) or Component 5 of the BLM National PA. However, the ACHP reserved the right to participate on its own initiative or at the request of the SHPO, Tribe, or other party and may elect to participate in the future.

The BLM, in consultation with the Utah SHPO and invited Consulting Parties, developed a PA in accordance with CFR 800.14(b)(3). Table 30 lists the Tribes, State agencies, representatives of local governments, the project proponent, and organizations that were invited to participate in the development of the PA. A PA is a document that records the terms and conditions agreed upon to resolve the potential adverse effects of a complex undertaking because the agency cannot fully determine how a particular undertaking may affect historic properties or the location of historic properties and their significance and character prior to approving a project. A PA – rather than an MOA – is the appropriate document for this process because of the uncertainties with some of the alternatives, especially related to the non-Federal

lands in Zone 6 on non-Federal lands that may lose their enhanced protections and be subject to development and other activities that have a potential to have reasonably foreseeable adverse effects to historic properties.

Appendix G includes the Final PA that will be executed between the BLM and Utah SHPO, with UDOT and Utah State Institutional Trust Lands as Invited Signatories, and the Paiute Indian Tribe of Utah, Shivwits Band of Paiute, PLPCO, Washington County, City of St. George, and Conserve Southwest Utah as Concurring Parties. The stipulations of the PA require that consultations be conducted with Tribes to determine if a project has the potential for the inadvertent discovery of human remains or cultural items, as defined under 43 CFR 10.2. If so, the BLM will consult with Tribes on the development of a Plan of Action, in accordance with the Native American Graves Protection and Repatriation Act. The Plan of Action will outline protocols for the protection and treatment of human remains or cultural items that may be inadvertently discovered on Federal lands during project construction, and if necessary, outline protocols for the protection and treatment of human remains or cultural items that may be inadvertent discoveries that may occur during archaeological date recovery testing or excavation. On private and municipal lands in Zone 6, the PA stipulations require that the BLM conduct Class III surveys to identify and evaluate historic properties if the private landowners grant the agency permission to conduct these surveys. As the BLM has no authority to require the private or municipal landowner to avoid or minimize effects to historic properties on their lands, the agency has committed to mitigate for the potential loss of historic properties through the development of two interpretive panels with themes focused on prehistoric and historic period resource use in this area.

Table 30. Invited Stakeholders and Consulting Parties for the Programmatic Agreement

Consulting Party	Invite Sent	Response
Cedar Band of Paiutes	4/1/2024	No response
Chemehuevi Indian Tribe	4/1/2024	No response
City of Santa Clara	4/1/2024	No response
City of Santa Clara Certified Local Government	4/1/2024	No response
City of St. George	4/1/2024	4/2/24 – accepted
City of St. George Certified Local Government	4/1/2024	4/5/24 – accepted
City of Washington	4/1/2024	4/2/24 – accepted
City of Washington Certified Local Government	4/1/2024	No response
Conserve Southwest Utah	4/1/2024	4/3/24 – accepted
His Family Matters	4/1/2024	No response
Indian Peaks Band of Paiutes	4/1/2024	No response
Kaibab Band of Paiute Indians	4/1/2024	No response
Kanosh Band of Paiutes	4/1/2024	No response
Koosharem Band of Paiutes	4/1/2024	No response
Las Vegas Paiute Tribe	4/1/2024	No response
Moapa Band of Paiutes	4/1/2024	No response
Navajo Nation	4/1/2024	4/16/24 – requested follow up call to discuss; 5/2/24 – accepted
Paiute Indian Tribe of Utah	4/1/2024	4/9/24 – accepted
Pueblo of Zuni	4/1/2024	No response
San Juan Southern Paiute Tribe	4/1/2024	No response
Shivwits Band of Paiutes	4/1/2024	5/1/24 – accepted at 5/1/24 Cooperating Agency meeting
The Church of Jesus Christ of Latter-day Saints, Latter-day Saints Church History Department	4/1/2024	No response

Consulting Party	Invite Sent	Response
The Hopi Tribe	4/1/2024	No response, but were provided all Consulting Party communications
Utah Department of Natural Resources	4/1/2024	4/9/24 – accepted, to be represented by PLPCO
UDOT	4/1/2024	4/2/24 – accepted
Utah Division of Wildlife Resources	4/1/2024	4/9/24 – accepted, to be represented by PLPCO
Utah Professional Archaeological Council	4/1/2024	4/15/24 – accepted
Utah Public Land Coordinating Office (PLPCO	4/1/2024	4/17/24 – accepted
Utah Rock Art Research Association	4/1/2024	No response
Utah SHPO	4/1/2024	Required Signatory
Utah Statewide Archaeological Society	4/2/2024	4/3/24 – following up with USAS/CVAS leadership, 5/2/24 – declined
Utah State Institutional Trust Land (TLA)	4/1/2024	4/11/24 – accepted
Washington County Historical Society	4/1/2024	No response
Washington County, Utah	4/1/2024	4/5/24 – accepted

4.2.3 American Indian Tribal Consultation and Coordination

Federal law requires the BLM and FWS to consult with American Indian Tribes during the NEPA process. In December 2019, the BLM and FWS initiated government-to-government consultations with 14 American Indian Tribes and Bands that claim affiliation to southwestern Utah, requesting information about sacred sites or places of traditional cultural importance. These Tribes and Bands include the Hopi Tribe, Kaibab Band of Paiute Indians, the Las Vegas Paiute Tribe, the Moapa Band of Paiute Indians, the Navajo Nation, the Paiute Indian Tribe of Utah (including the Indian Peaks Band of Paiutes, the Cedar Band of Paiutes, the Shivwits Band of Paiutes, the Koosharem Band of Paiutes, and the Kanosh Band of Paiutes), the San Juan Southern Paiute Tribe, the Pueblo of Zuni, and the Chemehuevi Indian Tribe. Responses have been received from the Navajo Nation, the Hopi Tribe, and the Paiute Indian Tribe of Utah. The FWS sent another letter in April 2020 to these same 14 American Indian Tribes and Bands and associated Tribal Historic Preservation Offices that claim affiliation to southwestern Utah, requesting information about sacred sites or places of traditional cultural importance.

On December 30, 2019, the Hopi Tribe responded to this initial consultation and the FWS letter, stating concerns that the proposed Northern Corridor would adversely impact cultural and natural resources important to the Tribe. The Hopi Tribe responded several times between 2019 and 2020, stating that the project would have adverse effects to cultural resources significant to the Hopi, that they would like a Hopi Traditional Cultural Properties Study of the Area of Potential Effects, and that the project is an "outrageous double cross for the Mojave desert tortoise." The Hopi Tribe also asked the ACHP to reconsider declining their involvement with the project (see Section 4.2.2). The Navajo Nation was the only other tribe to respond to this initial consultation in 2019, and they stated that they were not concerned about the project. The BLM presented information on the proposed Northern Corridor Project and the two RMP amendments at the February 10, 2020, Tribal Council meeting of the Paiute Indian Tribe of Utah.

The BLM and FWS reinitiated government-to-government consultation with these same 14 Tribes and Bands in October 2023. The Paiute Indian Tribe of Utah's Cultural Resource Manager requested a meeting with the BLM in November of 2023. The BLM met with the Paiute Indian Tribe of Utah's Chairwoman and Cultural Resource Manager on December 6, 2023; they expressed interest in becoming a Cooperating Agency for the project, informed the BLM that the project area is important to the Southern

Paiute, that the tortoise is a sacred animal that they do not want removed from their homes, and that there may be an important spring and waterfall within the project area. The Shivwits Band of Paiutes responded on February 28, 2024, and requested to participate as a Cooperating Agency. They informed the BLM of the Tribe's role as a partner entity under the Amended HCP to Washington County and that the Band wished to share knowledge on the project area. The Navajo Nation once again indicated that they were not concerned about the project. As of this publication, no other Tribe or Band has responded with concerns about the project in response to the agencies' joint October 2023 letter. Tribal consultations have been ongoing throughout this NEPA process.

On March 28, 2024, government-to-government letters were sent to 14 culturally affiliated Tribes inviting them to participate as Consulting Parties in the development of a PA that would serve as a binding commitment to resolve adverse effects that could result from the decision made for the Northern Corridor Project at the conclusion of the SEIS process. On April 24, 2024, emails and hard copy letters were sent to 14 culturally affiliated Tribes notifying them that the Draft SEIS would be published on May 3, 2024, initiating the 45-day comment period, and providing links to the ePlanning site where comments were to be posted. An update was sent on May 2, 2024, alerting recipients of the delay in the publication date of the SEIS and informing them that the public comment period would begin 1 week later on May 10, 2024. The Shivwits Band of Paiutes sent a letter during the public review of the Draft SEIS. No other tribe responded with comments on the Draft SEIS.

A brief description of the Tribal consultation letters sent regarding the Northern Corridor Project and the responses received are summarized in Table 31.

Table 31. BLM and FWS Northern Corridor Tribal Consultation

Date	Letter	Content	Responses
December 17, 2019	Initial Government-to-Government Letter to 14 Culturally Affiliated Tribes, Bands, and associated Cultural and Historic Preservation staff (17 letters). Joint BLM and FWS letter.	This letter initiated Government-to-Government consultation on the Northern Corridor highway, described the project, and provided notification of a NOI published in the FR that would initiate a 30-day public scoping period for the EIS for a single EIS that would analyze the ROW application, RMP amendments, and the Issuance of an ITP to Washington County.	*December 30, 2019*: The Hopi expressed that they were concerned that: (1) the Northern Corridor highway would have adverse effects to cultural resources significant to the Hopi, (2) the project is "an outrageous double cross for the desert tortoise," and (3) they supported the BLM denial of the ROW. The Hopi Tribe also requested a Traditional Cultural Properties Study of the Area of Potential Effects. The Navajo Nation responded in 2020 and said they did not have concerns with this project.
April 22, 2020	Second Tribal Consultation Letter to 14 culturally affiliated Tribes. Consulting for FWS only.	This letter described the project, defined the Area of Potential Effects, as well as efforts to identify historic properties in the Area of Potential Effects.	*May 2020:* The Hopi responded and stated they had interest in any tortoise shells for ceremonial activities.

Date	Letter	Content	Responses
June 1, 2020	Third Tribal Consultation Letter to 14 culturally affiliated Tribes. Consulting for BLM only.	This letter described the project, defined the Area of Potential Effects, as well as efforts to identify historic properties within the Area of Potential Effects. Copies of the Class III survey report requested by the Hopi Tribe were transmitted to the Tribe.	*June 8, 2020*: The Hopi acknowledged receipt of information about the results of the Class III survey and reiterated their previous concerns. *October 5, 2020*: The Hopi acknowledged receipt of the Class III survey information and reviewed it, asked for a copy of the EIS, and reiterated their previous concerns about the project. *December 15, 2020*: Hopi letter to the ACHP asking the ACHP to reconsider declining their involvement in the project.
October 12, 2023	Fourth Tribal Consultation Letter to 14 culturally affiliated tribes (18 letters). Joint BLM and FWS letter.	This letter re-initiated Government-to-Government consultation and provided notification that a NOI would be published in the FR because of the BLM's and FWS's intent to prepare a SEIS to reanalyze granting a ROW to UDOT for the Northern Corridor highway. Also, it provided a summary of the project from 2019 to 2023, and updates on the project and Section 106 process.	The Navajo Nation responded in 2023 and said they do not have concerns with this project. *November 14, 2023*: Paiute Indian Tribe of Utah asked for meeting. The BLM met with the Cultural Resource Manager and Chairwoman on December 6, 2023. They informed the BLM that the project area is important to the Southern Paiute, that the tortoise is a sacred animal that they do not want removed from their homes, and that there is an important spring and waterfall that may be within the project area. *February 28, 2024:* The Shivwits Band of Paiutes requested to participate as a Cooperating Agency. They informed the BLM that the Tribe serves as a partner entity under the Amended HCP to Washington County by monitoring tortoises on Shivwits land, and that the Band wished to share knowledge on the project area.
March 28, 2024	Government-to-government letters were sent to 14 culturally affiliated Tribes.	The letter invited Tribes to participate as Consulting Parties in the development of an agreement document that would serve as a binding commitment to resolve adverse effects that could result from the decision made for the Northern Corridor Project at the conclusion of the SEIS process.	*April 9, 2024*: The Paiute Indian Tribe of Utah accepted the invitation to participate as a Consulting Party. *May 1, 2024:* The Shivwits Band of Paiutes accepted the invitation to participate as a Consulting Party. *May 2, 2024*: The Navajo Nation accepted the invitation to participate as a Consulting Party.

Date	Letter	Content	Responses
April 24, 2024	Email and hard copy letters were sent to 14 culturally affiliated Tribes.	Notifications to Tribes that the Draft SEIS would be published on May 3, 2024, initiating the 45-day comment period, and providing links to the ePlanning site where comments were to be posted.	*July 9, 2024*: Shivwits Band of Paiutes responded with comments on the Draft SEIS that expressed their support for affirming UDOT's ROW and Washington County's ITP. The letter expressed support for a comprehensive approach to ensuring desert tortoise habitat is protected and stressed the importance of accommodating growth in an environmentally responsible manner, with the population growth that is occurring in Washington County. The letter stated that mitigation efforts identified by Washington County allow for crucial infrastructure, while mitigating environmental impacts as best possible. They stated they have been involved in the Habitat Conservation Advisory Committee, which has been crucial in ensuring their expertise and knowledge in land stewardship contributes to managing the Reserve. As the Band closest to the NCA, they stated it is crucial their voice and recommendations are heard, and they noted that, although the Plaintiffs included input from another Tribe, the Shivwits Band of Paiutes did not provide any input.

4.2.4 Cooperating Agencies

Federal regulations direct the BLM and FWS to invite eligible Federal agencies, State and local governments, and Federally recognized American Indian Tribes to participate as Cooperating Agencies when drafting the SEIS. The groups listed in Table 32 accepted invitations to participate as Cooperating Agencies in the preparation of the SEIS.

Table 32. Cooperating Agencies

Cooperating Agencies
City of Hurricane
City of Ivins
City of St. George
Dixie Metropolitan Planning Organization
Paiute Indian Tribe of Utah
Santa Clara City
Shivwits Band of Paiutes
State of Utah – Public Lands Policy Coordinating Office
Utah Department of Environmental Quality
Utah Trust Lands Administration
Washington City

The BLM and FWS communicated with the Cooperating Agencies to review alternatives and the analysis in the SEIS. This process included Cooperating Agency meetings and conference calls completed on February 15, 2024, March 22, 2024, May 1, 2024, August 9, 2024, and August 28, 2024. During these meetings, the BLM and FWS discussed with Cooperating Agencies, at the appropriate review time, the following:

- Issues raised during scoping.
- Alternatives developed for consideration in the Draft SEIS.
- Preliminary portions of the Draft SEIS.
- Public comments on the Draft SEIS.
- Preliminary portions of the Final SEIS.

4.2.5 List of Preparers

This SEIS was prepared by an interdisciplinary team of resource professionals from the BLM and FWS, with assistance from North Wind Group (North Wind) and Galileo Project, LLC (Galileo). A list of the names and roles and responsibilities of the preparers is provided in Table 33.

Table 33. List of Preparers

Name	Agency	Role or Responsibility
Chiasson, Katherine	BLM	NEPA document review.
Cleek, Katherine	BLM	Cultural resources and Native American concerns.
Ferris-Rowley, Dawna	BLM	Project Manager, cultural resources, NCA compatibility, and NEPA document review.
Fockler, Matt	BLM	Environmental Justice, socioeconomics, and NEPA document review.
Gaddis, Ben	BLM	NEPA document review.
Kellam, John	BLM	Biological resources, vegetation, noxious weeds and invasive species, and NEPA document review.
Moffit, Melinda	BLM	NEPA document review.
Peterson, Shawn	BLM	Fire and fuels management.
Taylor, Stephanie	BLM	Biological and botanical resources and NEPA document review.
Tibbetts, Gloria	BLM	District Manager, NEPA document review.
Trujillo, Stephanie	BLM	Lands and realty, NEPA document review.
White, Ali	BLM	Geographic Information Systems.
FWS Utah Field Office	FWS	ESA Section 6 lands, NEPA document review, threatened and endangered species, biological resources, and cultural resources.
North Wind Group	North Wind	NEPA document development.
Galileo Project, LLC	Galileo	Project Management Assistance.

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