

Red Cliffs Desert Reserve Habitat Management Plan

(Revised March 2025)

Background

The 1995 Washington County Habitat Conservation Plan (HCP) set aside 62,000 acres of Mojave desert tortoise (*Gopherus agassizii*; hereafter tortoise) critical and buffer habitat as the Red Cliffs Desert Reserve (RCDR) to assist the recovery of the tortoise in the Upper Virgin River Recovery Unit (Washington County 1995, as amended). In response to large destructive wildfires that burned ~25% of the RCDR in 2005, the Habitat Conservation Technical Committee (TC) created a Habitat Management Plan (HMP) for the RCDR in 2009. In 2018, the Washington County Habitat Conservation Advisory Committee (HCAC) asked the TC to evaluate the HMP and provide updates for the HCP renewal process. During the June 2018 TC meeting, TC members met with fire experts from the Bureau of Land Management (BLM) and the Utah Division of Forestry, Fire & State Lands to assess the 2009 HMP. A revised HMP, completed in 2019, incorporated new and ongoing fire/habitat management priorities, strategies, and actions within the RCDR.

In the summer and fall of 2020, five human-caused wildfires burned a combined 12,437 acres within the RCDR, of which 9,019 acres were designated Mojave desert tortoise critical habitat (**FWS 1994**) and at least 2,583 acres were previously unburned.

In 2022, the BLM St. George Field Office completed a Programmatic Environmental Assessment (EA) and Integrated Weed Management Plan (IWMP) for the control and eradication of nonnative noxious and invasive plant species within the Red Cliffs National Conservation Area (NCA), which shares a similar administrative boundary with the RCDR. In 2024, the HCAC approved a 5-year Fire and Fuels Management Plan for the Reserve. This revised 2025 HMP provides updates to the 2019 HMP and incorporates the 5-year fuels plan.

RCDR HMP

The proliferation of nonnative annual grasses and resulting wildfires has raised concerns about long-term management of the habitat and recovery of tortoises within the RCDR. In 2025, wildfire continues to be one of the greatest threats to tortoise habitat. The two primary goals of the RCDR HMP are: (1) protect remaining unburned tortoise habitat; and (2) restore burned tortoise habitat (see Sections 1.1–2.2 below). The TC has identified action items to achieve each of these goals. Table 1 identifies the priority and status of the six highest priority RCDR HMP action items.

The intent of the HMP is to integrate HMP priorities and action items with those found in the Red Cliffs NCA Record of Decision and Resource Management Plan (BLM 2016a, as amended), Southern Utah Support Area Fire Management Plan (BLM 2004), BLM St.

George Field Office (SGFO) Programmatic Wildland Fire Emergency Stabilization and Rehabilitation Plan (BLM 2008), Southwest Utah Regional Wildfire Protection Plan (FCAG 2007), and other Federal, State, and local fire management plans.

Table 1: Six Priority RCDR HMP Action Items

Priority	Action Item	Current Status
1	<p>Control non-native species: prioritizing treatment of primary and secondary roadsides (paved and dirt), trailheads, and right-of-ways (ROWs) with herbicides to create and maintain firebreaks within and adjacent to the RCDR/NCA.</p>	<p>Washington County, HCP, BLM, Snow Canyon State Park (SCSP), Utah Department of Natural Resources (UDNR), Utah Division of Wildlife Resources (UDWR), Utah Department of Transportation (UDOT), Utah Trust Lands Administration (TLA), and other state and local agency and organization staff (hereafter, the RCDR/NCA stakeholders) have coordinated efforts to control noxious and invasive non-native plant species adjacent to roads, trailheads, and ROWs within and adjacent to the RCDR/NCA. These treatment efforts have used truck booms, manual hand sprayers, and aerial methods and approved Rejuvra and Plateau (or type) herbicide.</p> <p>There are ongoing/annual RCDR/NCA stakeholder projects to manually remove noxious weeds/invasive species, including Sahara mustard (<i>Brassica tournefortii</i>) silverleaf “purple” nightshade (<i>Solanum elaeagnifolium</i>), Scotch thistle (<i>Onopordum acanthium</i>), Russian thistle (<i>Salsola</i> spp.), and other non-native species.</p> <p>The RCDR/NCA stakeholders are actively writing grant proposals, acquiring funds, herbicide and application equipment, creating contracts, and working collaboratively to implement treatment projects within and adjacent to the RCDR/NCA.</p>

Priority	Action Item	Current Status
2	Create islands of vegetation	<p>Since 2016, the BLM and UDWR, with assistance from HCP and other RCDR/NCA stakeholders, have planted > 12,000 native plants in fire-damaged tortoise habitat. Habitat rehabilitation focus areas are identified based on: (1) the location (and abundance) of live tortoise, tortoise remains, and burrows; (2) friable soils, and topographic/hydrologic features benefitting plants; and (3) site access. The primary habitat rehabilitation goals are: (1) reestablishing shrubs, forbs, and grasses that are beneficial to desert tortoise and other wildlife; and (2) creating “fertile” islands that can act as seed banks from which native plants can disperse to surrounding fire-damaged lands and would also reduce fine fuel loads from annual brome grasses and thus the risk of future high intensity wildfire. Collaborative habitat rehabilitation projects occur almost on an annual basis within the RCDR/NCA.</p>
Priority	Action Item	Current Status
3	Maintain communication between fire agencies and with the public	<p>The HCP Administration, BLM, SCSP, UDWR and other partnering agencies will continue to coordinate public outreach. Continue to acquire/update geographic information system (GIS) fire perimeter-area and fire risk data/databases/maps, and distribute them to interagency-management stakeholders. Maps will be utilized for project prioritization.</p>
Priority	Action Item	Current Status
4	Monitor treated areas	<p>The RCDR/NCA stakeholders actively collect baseline information on the existing condition of plant species and habitats pre- and post-treatment in project areas. This monitoring program helps, in anticipating the future effects of vegetation treatments on native and non-native species, and adaptive management to obtain desired results from herbicide treatments.</p>

Priority	Action Item	Current Status
5	Research/Monitor Methodology (reduce fuel)	Continue to conduct literature reviews of new fuel reduction/fire management techniques. Coordinate with the U.S. Forest Service (USFS) for fuel monitoring and reduction projects on USFS lands adjacent to the RCDR/NCA, where fires often originate.
6	Soil stabilization (e.g., gully plugs, straw mats, erosion fabrics, biocrust, inoculation, and/or native plant species).	Continue to pursue, including literature reviews of new research and effective techniques/species.

Goal 1: Protect unburned tortoise habitat

Objectives

1.1 Treat road edges to reduce the build-up of fuel sources and minimize the potential for human caused fires. Treatment may include mowing, grazing, herbicides, or other appropriate methods.

Strategy 1.1.1: Continue to identify and prioritize roadside areas suitable for treatment. Pursue the necessary city, county, or state partnerships for treating priority areas.

Action Item 1.1.1. (A): Continue treatment Cottonwood Road corridor.

Action Item 1.1.1. (B): Continue treatment of SR-18 corridor.

Action Item 1.1.1. (C): Continue treatment of I-15 corridor.

Action Item 1.1.1. (D): Continue treatment of Red Hills Parkway corridor.

Action Item 1.1.1. (E): Continue treatment of Tuacahn Drive corridor.

Action Item 1.1.1. (F): Continue treatment of Red Cliffs Recreation Area Road.

Action Item 1.1.1 (G): Continue treatment of other roads as identified.

Strategy 1.1.2: Research and monitor the effectiveness of different treatment methods on existing plant communities and tortoises.

Action Item 1.1.2 (A): Pursue research plots to assess the effectiveness of pre-emergent herbicides (e.g., Esplanade, Plateau) and other herbicide chemical/vegetation control methods.

Action Item 1.1.2 (B): Pursue roadside research plots to assess the effectiveness of focused grazing.

Action Item 1.1.2 (C): Pursue roadside test plots to assess the effectiveness of compaction, grading, or other mechanical methods.

1.2 Establish and/or maintain firebreaks in priority areas.

Strategy 1.2.1: Establish firebreaks through use of native fire-resistant plant species.

Action Item 1.2.1 (A): Pursue outplanting or seeding of warm season fire-resistant grasses (e.g., side oats grama and Purple threeawn) and other suitable perennials in priority areas.

Action Item 1.2.1 (B): Continue prioritizing roads and ROW's that can serve as firebreaks; establish research plots in priority areas.

Strategy 1.2.2: Maintain existing trails and roads to serve as strategic firebreaks. Require ROW holders to maintain ROWs/roads through stipulations.

Action Item 1.2.2. (A): Identify trails/roads where approved chemical methods can be applied.

Action Item 1.2.2. (B): BLM will work on effective ROW stipulations and ROW monitoring.

1.3 Improve the public's understanding of fire impacts on the RCDR.

Strategy 1.3.1: Increase public education at trailheads, along roads, ROW areas, and any other area of community interface.

Action Item 1.3.1. (A): Install informational signs along priority corridors to convey current fire danger. Priority corridors include Cottonwood Road, Turkey Farm Road, SR-18, and Snow Canyon Drive.

Action Item 1.3.1. (B): Maintain and improve fire education information for trailheads and kiosks. Identify whether current fire education messaging is sufficient at trailheads.

Action Item 1.3.1 (C): Produce and distribute fire awareness publications relative to the RCDR.

Strategy 1.3.2: Maintain open communication and work cooperatively with other RCDR partners to effectively manage tortoises and fire management issues in the RCDR.

Action Item 1.3.2. (A): Add a fire awareness component into RCDR tortoise awareness training.

Action Item 1.3.2 (B): Review the fire information maps on an annual basis; update fire information and maps as needed and distribute to the appropriate agencies.

Action Item 1.3.2 (C): Work with local media outlets to provide pre-fire season public service announcements or other appropriate public information.

Action Item 1.3.2 (D): Coordinate with the USFS to implement fuel monitoring/reduction projects, and strategies to reduce fires spreading from USFS lands onto the RCDR.

1.4 Control nonnative and invasive plant species in areas other than roads, ROWs, or trails.

Strategy 1.4.1: Reduce the role of nonnative plants in the fire cycle.

Action Item 1.4.1. (A): Inventory and map nonnative/invasive plant species present in the RCDR. Examples of species to target include Russian thistle, silverleaf “Purple” nightshade, and Sahara mustard. Use inventory maps to determine priority treatment areas for tortoise, including USGS cheatgrass mapping and TNC’s Landscape Conservation Forecasting (LCF) mapping.

Action Item 1.4.1. (B): Develop and implement a plan for controlling nonnative/invasive species identified as fire hazards in the RCDR. Assess and use different control methods as appropriate.

Action Item 1.4.1. (C): Outplant or reseed control areas with native species that will out-compete nonnatives.

Goal 2: Restore burned habitat

Objectives:

2.1 Restore vegetation within burned areas.

Strategy 2.1.1: Assess and prioritize fire units for habitat restoration work.

Action Item 2.1.1. (A): Create a GIS/working map of the RCDR that includes land ownership/management boundaries, ROWs, restoration areas, recreation trails, roads, vegetation (including unburned islands), sensitive species, and soil types.

Strategy 2.1.2: Reestablish native plant species (especially ones that benefit tortoise).

Action Item 2.1.2. (A): Create restoration plots (i.e., islands of vegetation) within burned areas using native plant species.

Action Item 2.1.2. (B): Monitor restoration plots to determine the efficacy of outplanting or reseeding techniques and help refine methods.

Action Item 2.1.2. (C): Outplant or reseed priority restoration sites based on monitoring results, as determined by inventory maps created by USGS and TNC.

2.2 Monitor human impacts in burned areas.

Strategy 2.2.1: Continue monitoring recreation impacts in burned areas

Action Item 2.2.1. (A): Identify, repair and restore damaged trails, signs, fences, and other infrastructure.

Action Item 2.2.1. (B): Improve trail markings to prevent trail proliferation and off-trail use.

Action Item 2.2.1. (C): Increase or improve public education regarding fire impacts and/or restoration efforts at trailheads and along trails.

Action Item 2.2.1. (D): Stabilize soils in problem areas using gully plugs, straw mats, erosion fabrics, biocrusts, and/or native plant species.

Action Item 2.2.1. (E): Close trails as necessary to protect tortoises and habitat.

5-Year Fire and Fuels Management Plan for Red Cliffs Desert Reserve

Prepared by Washington County HCP Technical Committee in 2024, revised March 2025

Background & Introduction

At the November 2023 Habitat Conservation Advisory Committee (HCAC) meeting, BLM, UDNR and County officials presented new information regarding fire prevention and restoration activities in the Reserve. Through its Watershed Restoration Initiative (WRI), and in collaboration with HCP funds, UDNR recently treated state lands with Rejuvra to reduce the threat of fire from Green Springs and east towards I-15. In December 2022, The BLM St. George Field Office completed a Programmatic Environmental Assessment (EA) and Integrated Weed Management Plan (IWMP) for the control and eradication of nonnative noxious and invasive plant species within the Beaver Dam Wash and Red Cliffs National Conservation Areas (NCAs), Utah. With new information and tools available, HCAC members felt inclined to address the ongoing fire threat by increasing fire management funds above the typical annual average. The purpose of additional funding was in support of greater fuels management across a broader landscape and in support of a long-term strategy that will complement the new BLM's IWMP for the NCAs. The TC was given the following assignment in support of this plan:

Develop a long-term strategy (5-10-year plan) to treat various sub-sections of the Reserve on an annual basis. Identify the potential best methods to reduce fuels, improve restoration success and estimate costs for desired treatments in each area. Consider how these activities can be integrated to utilize funds from WRI, BLM and HCP. Add this strategy as an appendix or as a separate chapter in RCDR Habitat Fire Management Plan.

This document is intended to complement existing documents that already guide habitat management efforts in the RCDR, including the RCDR Habitat/Fire Management Plan, and BLM's IWMP for the NCAs. The strategies and associated funding mechanisms identified here are intended to provide further guidance under the framework of those existing plans. While this plan estimates costs and potential funding sources, the amount available each year to implement projects is unknown due to variability in annual agency budgets and grant availability.

Managing Agencies and Potential Funding Sources

Funding each year is unknown due to varying budgets, grant availability and success rate in getting grant awards. We expect annual funding may fluctuate between \$300,000 – 800,000. Below is a list of potential funding sources to help implement this plan:

- Bureau of Land Management (BLM) – \$100,000 - 500,000 annually in base funding, infrastructure bill funding, national grants, US Fish and Wildlife Service grants, Landscape Conservation Forecasting funding from the Cedar City Field Office.
- Utah Department of Natural Resources (UDNR) – Watershed Restoration Initiative (WRI), awards vary based on project need and funding availability. While funding can be competitive, some projects have received up to \$500,000 in annual funding.
- Washington County HCP – \$5,000 – 15,000 annually. Primarily supports purchase of herbicides (Rejuvra) for project partners, but has flexible spending depending on needs and annual budget, up to \$500,000 over the life of the permit.
- Washington County Weeds – In-kind support for fuel break establishment and maintenance on all identified ROWs where time, funding and land access allow. The County Weeds Supervisor may also submit applications for Invasive Species Mitigation (ISM) grants, SITLA grants, and State Forestry and Fire grants.
- State Institutional Trust Lands Administration (SITLA) – Noxious weed fund is \$70-80,000 statewide funding per year. Realistic annual funding for our area would likely be \$5,000-10,000. Grants are generally awarded through the County Weed Supervisor. Stewardship funding may also be available.
- Utah Department of Transportation (UDOT) – Currently treats I-15 with Plateau/Panoramic each year extending 16 feet on each side of the ROW. The ROW is mowed at least once to twice annually. SR-18 is mowed annually in late summer.
- Snow Canyon State Park – Manages weeds along park roads and trailheads with a budget of \$1,000-2,000 annually. Park staff also performs tumbleweed control within the main canyon and experimental Plateau/Panoramic treatments in the campground.
- US Forest Service (USFS) – Manages Dixie National Forest lands immediately north of the Reserve. The Pine Valley Ranger District recently proposed a watershed fuel break project which will create a fuel break along Forest System Roads and private property boundaries to increase community safety, create defensible safe space for firefighting personnel, and increase the likelihood of effective fire suppression to reduce fire spread into the Reserve. The general location of this project is Forest

Service Road (FSR) 033 from the private boundary north of the Blake Gubler Trailhead south to the FSR 031 intersection and spur FSR 322 (Figure 1).

Objective 1. Establish, enhance and maintain fuel breaks within the RCDR to reduce spread of fire and to reduce dry fuels near ignition sources.

Methods

Establishing and maintaining effective fuel breaks is the top priority of this plan. As a result, each fuel break listed in Table 1 should be assessed annually each December -February to determine if herbicide treatment is needed that year. Treatments should be preventative and prioritized before areas are overgrown and fuel breaks are compromised. We expect that Rejuvra treatments may be effective for approximately 3-5 years, while areas treated with Plateau/Panoramic will last 1 year. As a result, the cost estimates reported below in Table 1 are only expected to occur every 3-5 years depending on the treatment intensity and duration of its effectiveness.

Fuel break treatment areas include all major trailheads in tortoise habitat, primary and secondary roads and right-of-ways in or adjacent to the Reserve. Trailheads should be treated with a truck boom or by manual hand sprayers up to approximately 100 meters surrounding the trailhead. Minor roads/right-of-ways should be treated with a vehicle sprayer or by hand approximately 10 meters on each side of the road, while 30-100 meters of aerial treatments is recommended along primary/secondary roads and right-of-ways. Treatments should be conducted primarily during the tortoise less active season (December 1 to February 14) when tortoises are in underground burrows or dens for the winter and their above-ground activity is reduced. Exceptions could be made if summer or fall precipitation results in invasive fuels growing out of control.

Figure 1. Fuel break treatment areas within the Red Cliffs Desert Reserve, Washington County, Utah.

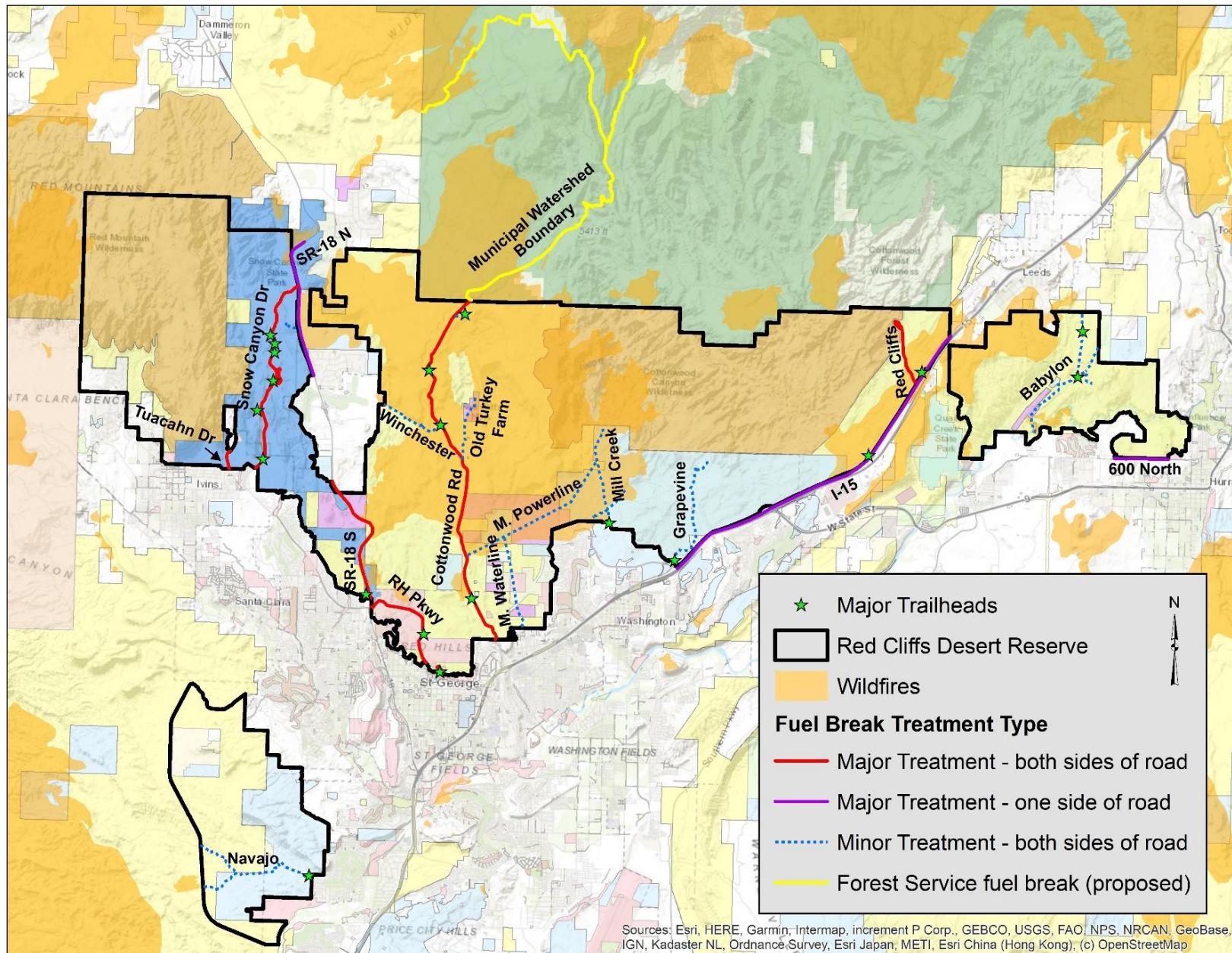


Table 1. Location, description and estimated costs of fuel breaks within the Red Cliffs Desert Reserve, Washington County, Utah. Treatment area includes both sides of road (Both), west side of road (West side), and perimeter of trailhead (Perimeter).

Treatment Areas *	Fuel Break Length (miles)**	Fuel Break Area (acres)	Treatment Area	Estimated Herbicide costs ***	Managing Agencies & Potential Funding Sources
Zone 2					
Snow Canyon Dr	9	33	Both	\$1,980	Snow Canyon SP, UDOT, Ivins City, BLM, County HCP & Weeds
Headquarters/CG/Sand Dunes	0.85	3	Perimeter	\$180	
Tuacahn Dr	0.8	3	Both	\$180	
SR-18 North	3	11	West side	\$660	
SR-18 South	6	20.5	Both	\$1,230	
Overlook Road	1	3.5	Both	\$215	
Trailheads	0.85	3	Perimeter	\$180	
Zone 3					
Winchester	3	11	Both	\$660	BLM, SITLA, County HCP & Weeds, UDWR, St. George City, Washington City, UDOT
Red Hills Parkway	4.5	16.5	Both	\$984	
Cottonwood Rd/Mesa Rim turnoff/ Turkey Farm	20	73	Both	\$4,380	
Mill Creek	5.5	20	Both	\$1,200	
Middleton Powerline	7	25.5	Both	\$1,530	
Grapevine	5.5	20	Both	\$1,200	
I-15	8	29	North side	\$1,740	
Red Cliffs Rec Area/CG	3.5	17.5	Both	\$760	
Trailheads	1	3.5	Perimeter	\$210	
Zone 4					
Babylon Rd/Road to Sand Cove Campground	8	30	Both	\$1,800	BLM, UDWR
Trailheads	0.2	0.7	Perimeter	\$43	
Zone 5					
600 North	1.2	4.4	North side	\$264	BLM, County HCP & Weeds, Hurricane City
Zone 6					
Navajo Dr & Bloomington Cave	5.5	20	Both	\$1,200	BLM, SITLA, County HCP & Weeds, St. George City
Bear Claw Poppy Trailhead	0.4	1.5	Perimeter	\$90	
Total	95	350		\$ 20,686	

* Zone 1 fire management is conducted primarily by the City of Ivins and Kayenta.

** Linear mileage doubled for roads treated on each side.

*** Cost per acre estimated at \$60/acre assuming treatment with both Rejuvra and Plateau/Panoramic.

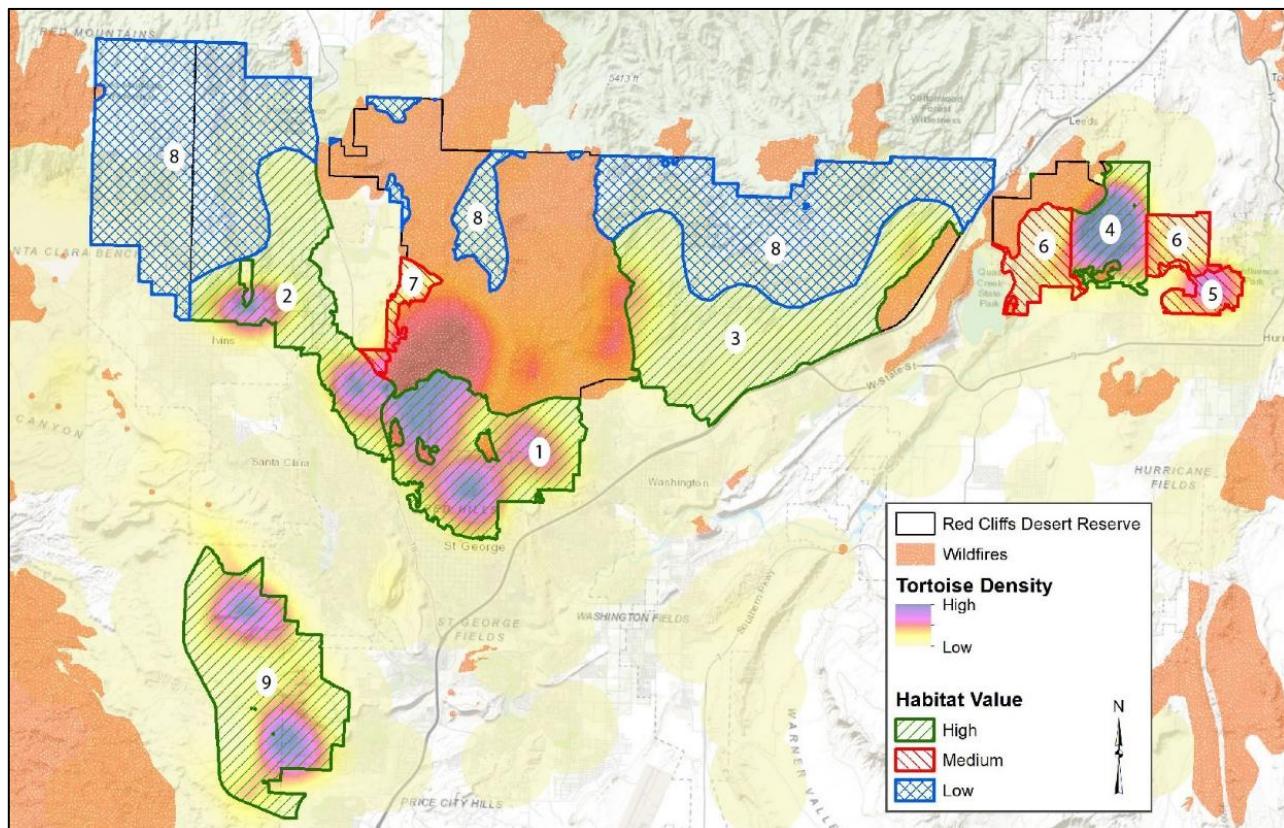
Objective 2. Protect unburned tortoise habitat in the RCDR through an annual herbicide treatment plan.

Methods

Strategically conduct treatments at edges of burned areas and adjacent edges of unburned areas to reduce dry fuel loads, with the objective of reducing or slowing spread of fire from burned to unburned habitats. Aerial treatments will be conducted by helicopter, plane, or drone. Additional treatments may be conducted with truck boom along roads or drivable urban edges. Coordinate with US Forest Service to reduce fire danger on Dixie NF north of the RCDR and with UDOT to reduce fires from adjacent highways.

Below is a tentative plan that identifies up to nine different treatment areas over a 5-year period. They are prioritized into “High,” “Medium,” and “Low” categories based on the density of tortoises, quality of habitat, and vulnerability to fires (e.g., proximity to human populations, recreational use, etc.). Each polygon is unlikely to receive 100% treatment coverage due to concerns with eliminating native annual plant species from the landscape, which serve as important forage for desert tortoises and other wildlife. However, strategic treatment strips (e.g. 100 meters), would be identified to reduce the risk of fire spreading into these unburned habitats. Prioritization of these areas may be adjusted annually under adaptive management to reassess their priority based on emerging threats, past success/failure, or funding limitations. In no more than 5 years, the plan will be updated to consider past achievements and to re-establish goals for another 5-year period.

Figure 2. Unburned habitat herbicide treatment areas (1-9) within the Red Cliffs Desert Reserve, Washington County, Utah.



Unburned Area	Ownership & Managing Agencies	Description	Acres *	Priority Level
1	BLM, UDWR, SG City, SITLA, County, Private	Zone 3, high tortoise density, large area	5,485	High
2	SCSP, BLM, Ivins City	Zone 2, high tortoise density, fragmented habitat	5,440	High
3	SITLA, BLM	Zone 3, medium tortoise density, large area	8,145	High
4	BLM	Zone 4, high tortoise density, small area	1,920	High
5	BLM	Zone 5, high tortoise density, but small isolated habitat	720	Medium
6	BLM	Zone 4, low tortoise density, medium size area	2,280	Medium
7	BLM, SCSP	Zone 3, medium tortoise density, fragmented by fire	605	Medium
8	BLM, SCSP, Private	Zone 1 and upland habitat of Zones 2-3, low tortoise density	21,360	Low
9**	BLM, SITLA, County, Private	Zone 6, high tortoise density, large area, area may be elevated in priority in future based on protected status	6,800	Low

* This figure represents the total acreage within each polygon. However, due to concerns about eliminating tortoise forage, it is unlikely that the maximum acreage amount listed will be treated each year.

** Zone 6 was previously ranked as # 2 priority. However, since it was removed from RCDR in 2024, its priority for treatment is now #9. The 2024 FWS decision to amend the County ITP remains under litigation and Zone 6 could later be re-added to the RCDR. If that occurs, the ranking would return to # 2 priority.

Table 3. Estimated costs for treating unburned habitat in 2025-2029, Red Cliffs Desert Reserve, Washington County, Utah. Method of chemical application could include helicopter, plane, truck boom, or drone. Actual estimated treatment acreage excludes areas previously identified as roadside/right-of-way fuel breaks.

Year	Treatment Areas *	Unburned Habitat Acreage	Actual Estimated Treatment Acreage	Estimated Costs **
2025	1	≤ 5,485	375	\$8,200 - \$30,000
2026	2	≤ 5,440	575	\$12,600 - \$46,100
2027	3	≤ 8,145	420	\$9,200 - \$33,700
2028	4-5	≤ 2,640	260	5,700 - \$20,900
2029	6-7	≤ 2,884	600	\$13,150 - \$48,100

*Treatment Areas 8 and 9 would only be treated after 1-7 are complete and if sufficient funds are available.

** Range of cost estimates are based on helicopter-only treatments of \$15-20/acre without chemical plus an additional \$9-60/acre with chemical. Low end of estimate is for Plateau/Panoramic only treatments at 6 oz/acre plus Grounded 10 oz/acre. High end of estimate adds Rejuvra at 6 oz/acre plus Plateau/Panoramic at 8 oz/acre, and Grounded. Costs are estimates as of December 2024, and are subject to change.

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