



United States Department of the Interior

BUREAU OF LAND MANAGEMENT
Arizona Strip District Office
345 East Riverside Drive
St. George, Utah 84790
www.blm.gov/az



In Reply Refer

August 9, 2007

NOTICE OF AVAILABILITY
Environmental Assessment AZ-120-2007-0021
Paria/Buckskin Tamarisk and Russian Olive Eradication

Vermilion Cliffs National Monument/Arizona Strip District
Bureau of Land Management
345 East Riverside Drive
St. George, Utah 84790
435-688-3200

Kanab Resource Area/Cedar City District
Bureau of Land Management
318 North First East
Kanab, Utah 84741

Dear Interested Party:

Please be advised that an Environmental Assessment (EA-AZ-120-2007-0021) has been prepared for the proposed Paria/Buckskin Tamarisk and Russian Olive Eradication. This EA is a public document, and it is available for your review and comment.

BLM would use contractors, volunteers, and/or agency personnel to cut tamarisk and Russian olive along a 20-mile stretch of the Paria River from the wilderness boundary in Utah to the confluence with Wrather Canyon in Arizona, and along a one mile section of Buckskin Gulch upstream from the confluence with the Paria River. Hand-pulling, cutting, lopping, and cut-stump herbicide application would be used to remove tamarisk and Russian olive, depending on the age of individual stems, the density of stands, and the degree of intermingling with native vegetation. Cut material would be piled and burned.

This proposed action is in conformance with the Arizona Strip Resource Management Plan (1992) and the Paria Management Framework Plan (1981) and includes mitigation measures to protect National Monument objects, wilderness, wild and scenic rivers, cultural resources, and wildlife.

Copies of the EA are available upon request from, and written comments may be submitted to:

Tim Duck
Fuels Program Manager
Arizona Strip BLM
345 E Riverside Drive
St George UT 84790.
Phone 435-688-3238 (desk) or 435-688-3363 (fax),
email tim_duck@blm.gov.

This EA has also been posted on the Arizona Strip Field Office's web home page http://www.blm.gov/az/st/en/fo/arizona_strip_field.html and the Utah Environmental Notification Bulletin Board <https://www.blm.gov/ut/enbb/index.php>. The deadline for receipt of comments is **September 10, 2007**. Public comments are welcome and encouraged.

By law, the names and addresses of those commenting are available for public review during regular business hours. Before including your address, phone number, e-mail address, or other personal identifying information in your comment, you should be aware that your entire comment – including your personal identifying information – may be made publicly available at any time. While you can ask us in your comment to withhold your personal identifying information from public review, we cannot guarantee that we will be able to do so. All comments from organizations or businesses will be available for public inspection in their entirety.

Sincerely,

Becky Hammond
Arizona Strip Field Office Manager

**United States Department of the Interior
Bureau of Land Management**

**Environmental Assessment AZ-120-2007-0021
August 2007**

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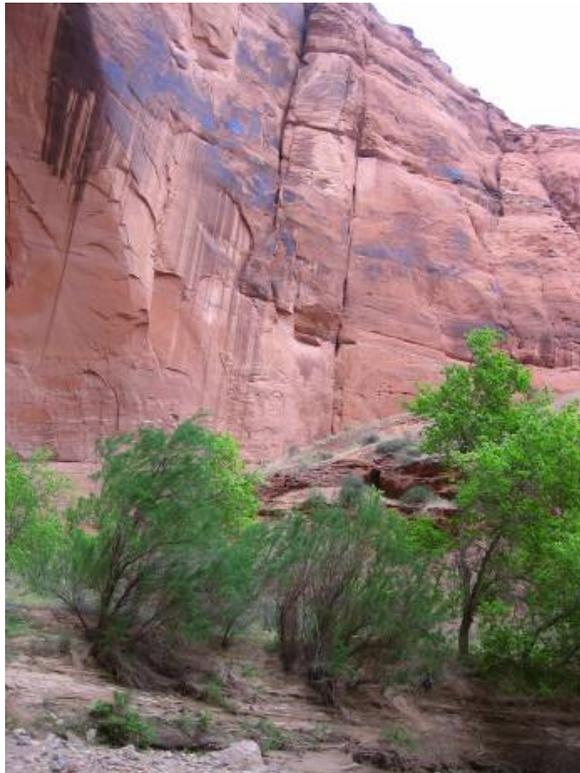


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Paria/Buckskin Tamarisk and Russian Olive Eradication

EA-AZ-120-2007-0021

1.0 PURPOSE & NEED

1.1 Introduction

This Environmental Assessment (EA) has been prepared to disclose and analyze the environmental consequences of the Paria/Buckskin Tamarisk and Russian Olive Eradication Project as proposed by BLM. The EA is a site-specific analysis of potential impacts that could result with the implementation of the proposed action or no action. The EA assists the BLM in project planning and ensuring compliance with the National Environmental Policy Act (NEPA), and in making a determination as to whether any “significant” impacts could result from the analyzed actions. “Significance” is defined by NEPA and is found in regulation 40 CFR 1508.27. An EA provides evidence for determining whether to prepare an Environmental Impact Statement (EIS) or a statement of “Finding of No Significant Impact” (FONSI). If the decision maker determines that this project has “significant” impacts, then an EIS would be prepared for the project. If not, a Decision Record may be signed for the EA approving the selected alternative, whether the proposed action or another alternative. A Decision Record (DR), including a FONSI statement, documents the reasons why implementation of the selected alternative would not result in “significant” environmental impacts (effects) beyond those already addressed in Arizona Strip Resource Management Plan (1992, as amended), and the Paria Management Framework Plan (1981).

1.2 Background

The Paria Canyon - Vermilion Cliffs Wilderness Area contains 112,500 acres (92,500 acres in Coconino County, Arizona and 20,000 acres in Kane County, Utah) of public lands managed by the Bureau of Land Management. The area is approximately 10 to 30 miles west of Page, Arizona. Included are 35 miles of the Paria River Canyon, 15 miles of the Buckskin Gulch, Coyote Buttes, and the Vermilion Cliffs from Lee’s Ferry to House Rock Valley (Map 1).

In Arizona, the Paria Canyon - Vermilion Cliffs Wilderness is part of the Vermilion Cliffs National Monument. The National Monument encompasses approximately 293,000 acres of land, approximately 280,000 acres of which are managed by the BLM. Its centerpiece is the majestic Paria Plateau, a grand terrace lying between two great geologic structures, the East Kaibab and the Echo Cliffs monoclines. The Paria River Canyon winds along the east side of the plateau to the Colorado River.

In Utah, the Paria Canyon - Vermilion Cliffs Wilderness is part of the BLM Kanab Field Office. With the state boundary at the confluence of Paria Canyon and Buckskin Gulch, most of the steep-walled, slot canyon terrain of Buckskin Gulch and upper Paria Canyon lie in Utah. Below the confluence, the canyon, while still steep, begins to widen, with the walls gradually falling away as the river cuts through softer geologic layers. Several other side canyons such as Wrather and Bush Head intersect lower Paria Canyon. Access into these canyons is limited to four trailheads and one un-maintained access point.

There is a combination of day use and overnight (including multi-night) use. Use is highest during the spring of each year, with a secondary peak during the fall. All use in Paria Canyon and Buckskin Gulch requires a permit.

The canyons provide opportunities for a primitive experience and solitude; the area is generally natural and undisturbed. Recreation typically includes hiking, backpacking, and some horseback riding. The most concentrated use is from the White House Trailhead south to below the confluence of the Paria and Buckskin, and through the Buckskin. Visitors hike from Wire Pass or the Buckskin Trailhead through the Buckskin Gulch to the confluence with the Paria, and then out to the White House Trailhead. Many do this 22 mile trek in one day, while others camp overnight, either climbing out of the Buckskin at the Middle Route, on one of the terraces or simply staying “on the beach”.

Many of the terraces have become dominated by non-native tamarisk (sometimes referred to as salt cedar). Non-native Russian olive trees (*Elaeagnus angustifolia*) have also become numerous along the river. Tamarisk (*Tamarix sp.*) is a shrub or tree that grows in dense stands at springs and along rivers and streams. Tamarisk, introduced into the U.S. in the 19th century as an erosion control agent, spread throughout the West and caused major changes to riparian ecosystems.

The impacts caused by tamarisk are well documented. These prolific non-natives displace native vegetation and animals, alter soil salinity, and increase fire frequency and hazard. Tamarisk spreads by seed and can propagate from buried or submerged stems. It can replace or displace native woody species, such as cottonwood, willow and mesquite, which occupy similar habitats, especially when timing and amount of peak water discharge, salinity, temperature, and substrate texture have been altered by human activities. Stands of tamarisk generally have lower wildlife values compared to stands of native vegetation, although tamarisk can be important to some bird species as nesting habitat. Russian olive, while not as aggressive and disruptive as tamarisk, can displace native trees.

Tamarisk is a facultative phreatophyte, meaning that it can draw water from underground sources but once established it can survive without access to ground water. It consumes large quantities of water, possibly more than woody native plant species that occupy similar habitats. Tamarisk is tolerant of highly saline habitats, and it concentrates salts in its leaves. Over time, as leaf litter accumulates under tamarisk plants, the surface soil can become highly saline, thus impeding future colonization by many native plant species. . Mature plants are capable of producing 2.5×10^8 tiny, wind-dispersed seeds per year.

Tamarisk is resistant to control. Simple cutting is ineffective as the plant will reestablish within one-three years. Burning alone is also ineffective. Tamarisk can be controlled by five principal methods: 1) applying herbicide to foliage of intact plants; 2) removing aboveground stems by burning or mechanical means followed by foliar application of herbicide; 3) cutting stems close to the ground followed by application of herbicide to the cut stems; 4) spraying basal bark with herbicide; and 5) digging or pulling plants.

BLM proposes to use hand tools such as hand saws and loppers to cut tamarisk and Russian olive along a 20-mile section of the Paria River and in the lower Buckskin Canyon. Most of the project area included in this EA contains sparse to moderate densities of tamarisk that are interspersed with

native vegetation. Seedlings would be pulled directly from the ground, stems < 3 m in height and younger than one year (saplings) would receive a basal bark herbicide treatment, and mature trees would be cut near the ground and the stumps would immediately be treated with herbicide. The debris would be piled along the banks of the Paria River (above high water mark) and in Buckskin Gulch. The piles would be moved to below the average high water mark immediately prior to burning, and then burned.

Areas formerly covered by tamarisk would be closely monitored for natural reestablishment of native species. Post-treatment monitoring data would be used to determine the success of removal and natural reestablishment of vegetation. This information would then be used to determine the feasibility and appropriate course of action for future plans to remove tamarisk and Russian olive in large, densely infested sections downstream of the project area. Thus, information gained from this project would be used to adaptively manage non-native species in the Paria River, and in other areas with similar management issues. This EA will analyze potential impacts of tamarisk and Russian olive removal along the Paria River.

1.3 Need for the Proposed Action

Dense thickets of tamarisk dominate the banks and terraces along the Paria River. These non-natives alter the ecosystem and adversely affect native vegetation and wildlife. Tamarisk alters soil salinity and can draw large amount of water from the river system. Tamarisk thickets reduce the quality of the recreational experience for visitors to the canyon. Tamarisk is a hazardous fuel type that can burn intensely and damage vegetation and cultural resources, as well as threaten the safety of visitors. Non-native Russian olive has also invaded the riparian corridor of the Paria River. Russian olive forms monotypic stands and can alter soil nutrient cycling, flow hydrology, and vegetation structure. Russian olive can be difficult to eradicate once it has become established.

The proposed action outlines the first step towards a plan to eradicate tamarisk and Russian olive from the Paria River watershed and restore native riparian communities. The removal of tamarisk and Russian olive and subsequent success of natural reestablishment of native species needs to be evaluated to determine the feasibility of implementing larger-scale removals in the lower portion of the watershed. The proposed action would enable the BLM to work within an adaptive management framework to conduct small-scale removals of tamarisk in the upper portion of the stream, to monitor the success of natural reestablishment of vegetation in areas formerly dominated by tamarisk with native species, and to evaluate the success of the project as a whole to inform plans for larger-scale removal projects in the future.

1.4 Purposes of the Proposed Action

The purpose of the proposed action is to remove non-native shrubs and trees to facilitate native plants and wildlife to recover, improving ecosystem function and reducing hazardous fuels.

Project Goals

~ Restore natural conditions in the Paria Canyon and Buckskin Gulch by eradicating non-native shrubs and trees such as tamarisk and Russian olive

- ~ Protect wilderness/wild & scenic river character
- ~ Avoid adversely impacting significant cultural resources
- ~ Protect primitive recreation opportunities and reduce the impact of implementation actions on visitors
- ~ Protect and preserve sensitive wildlife species by implementing actions that have the least impact
- ~ Reduce hazardous fuels to reduce the risk of wildfire and wildfire intensity and severity
- ~ Interpret project goals and objectives to visitors
- ~ Evaluate treatment option success

Project Objectives

- ~ Reduce tamarisk cover by more than 90% immediately after the initial treatment
- ~ Reduce tamarisk cover by more than 95% within the treatment area within five years
- ~ Reduce Russian olive and other non-native trees by more than 95% immediately after the initial treatment
- ~ Increase recruitment of native riparian vegetation in treatment areas by allowing natural reestablishment of native species.

1.5 Conformance with BLM Land Use Plans

Alternative A (proposed action) and the No Action Alternative are in conformance with the Arizona Strip District Resource Management Plan (RMP, December 1990, as amended). Applicable Arizona Strip District RMP Decisions:

FM05 Allow prescribed fire in wilderness areas if it benefits wilderness resources and as specified in the wilderness management plan.

RP02 Maintain, restore, or improve riparian areas to achieve a healthy and productive ecological condition for maximum long-term benefits. This can be accomplished using fire, mechanical, chemical or biological means.

RR03 Provide recreation settings where traditional, backcountry, and extensive recreation activities such as camping, hunting, and sightseeing are possible and the experience opportunities for such activities, as defined by the Recreation Opportunity Spectrum, are high.

SR04 Management activities will not be allowed to damage the existing eligibility, classification, or suitability of the Paria River. Outstanding remarkable values of the river area must be protected

and to the extent practicable, enhanced. The free-flowing characteristics of the river segment cannot be modified.

TE02 Prior to surface disturbing activity on public land a special status species review will be conducted by a qualified specialist.

TE11 Activities that could occur within one mile of an active peregrine eyrie, or "historic" or "superior" nesting habitat (RMP Map 8), between March 1 and August 1, may not be allowed if it's determined by the BLM that the peregrine would be adversely affected. The one mile buffer indicates the point at which a thorough impact evaluation, considering topographic and other factors, will begin.

VR07 Implement actions to restore and/or maintain natural conditions or appearance in all areas.

VM33 Vegetative treatments will be implemented: where plant cover or soil productivity is being lost; to achieve a desired plant community; to improve habitat conditions for wildlife; or to meet activity plan objectives.

VM35 Manage vegetation cover towards ecological stability and sound long-term protective soil cover using mechanical, chemical, biological or fire as tools for accomplishment.

VM46 Management practices to achieve desired plant communities will consider protection and conservation of known cultural resources, including historical sites, and prehistoric sites and plants of significance to Native American peoples.

WS01 Manage vegetation cover towards ecological stability and sound long-term protective soil cover using mechanical, chemical, biological or fire as tools for accomplishment.

Alternative A (proposed action) and the No Action Alternative are in conformance with the Paria Management Framework Plan (Paria MFP, 1981).

Paria MFP Decision

WL-1 Improve 3,263 acres of riparian habitat and 4,081 acres of other phreatophytic acres on public lands from poor or fair ecological condition to good ecological condition

1.6 Relationship to Statutes, Regulations, or other Plans

1.6.1 Paria Canyon – Vermilion Cliffs Final Wilderness Plan

The Paria Canyon – Vermilion Cliffs Final Wilderness Plan (BLM, 1986) declares that tamarisk has the potential of posing a significant threat to other resource values, and directs that “Tamarix invasion of spring areas will be controlled on an as-needed basis using the minimum tools necessary”, and “Where control is considered necessary an eradication plan will be developed and analyzed in an environmental assessment involving public participation.”

1.6.2 Wild and Scenic River Act

The Paria River was determined to be eligible for inclusion in the Wild and Scenic Rivers System because it meets the definition of a free-flowing stream from above the Utah-Arizona State line to the Glen Canyon National Recreation Area.

The Arizona portion of the Paria, as well as four miles in Utah immediately north of the state line is suitable for inclusion into the Wild and Scenic Rivers System. The Paria River was classified as Wild, being free of impoundments, generally inaccessible except by trail, with essentially primitive shorelines, and with unpolluted waters. The river has several outstandingly remarkable values: scenic, recreational, riparian vegetation, fish and wildlife habitat, cultural resources, and geologic.

1.6.3 Paria Resource Conservation Area Plan

This area is within the 227,000 acre Canyons/Plateaus of the Paria Resource Conservation Area. This resource conservation area has cultural, recreation, scenic, wilderness, and wildlife values that are protected by management prescriptions designed to minimize impacts from human activities.

1.6.4 Vermilion Cliffs National Monument

The Vermilion Cliffs became a National Monument on November 9, 2000, through Presidential proclamation. The Monument was created to protect geologic, cultural, and biological resources.

1.6.5 Arizona Department of Environmental Quality Smoke Management

Prior to conducting a prescribed burn in Arizona BLM would request a permit for smoke from ADEQ. BLM would not burn unless a permit was issued. BLM would conduct the burn in accordance to all applicable requirements established by ADEQ, and would provide ADEQ with a report of burn accomplishments.

1.6.6 Utah Department of Environmental Quality Interagency Smoke Management Program

Prior to conducting a prescribed burn in Utah BLM would request a permit for smoke from UDEQ. BLM would not burn unless a permit was issued. BLM would conduct the burn in accordance to all applicable requirements established by UDEQ, and would provide UDEQ with a report of burn accomplishments.

1.6.7 Standards and Guidelines for Rangeland Health

The Arizona Standards and Guidelines for Rangeland Health include the following:

Standard 1: Upland Sites: Upland soils exhibit infiltration, permeability, and erosion rates that are appropriate to soil type, climate, and landform (ecological site).

Standard 2: Riparian-Wetland Sites: Riparian-wetland areas are in properly functioning condition.

Standard 3: Desired Plant Communities: Productive and diverse upland and riparian-wetland plant communities of native species exist and are maintained.

Treatment of non-native plants would reduce the chance of the ecosystem becoming at risk of failing to meet standards. The proposed project would be in compliance with the Arizona Standards and Guidelines for Rangeland Health and would not preclude attainment of any of the three standards.

1.7 Identification of Issues:

Air Quality

- Burning material may affect the Class I Airshed
- Burning material may affect visitors

Cultural

- Cutting and removing vegetation may affect cultural resources
- Burning vegetation may affect cultural resources

Hazardous Materials

- Transportation and use of herbicide
- Transportation and use of fuel for burning

Invasive, Non-native Species

- Potential for introduction/establishment of invasive, non-native species

Monument Objects

- Treatment may affect Monument Objects

Recreation

- Treatment operations may impair visitor experience (solitude)
- Burning material may affect visitors – safety
- Removal of non-native vegetation may change visitor experience/opportunity

Riparian

- Impact of herbicide on non-target species
- Impact of treatment on native riparian ecosystem

Special Status Species

- Potential for removal of vegetation to affect special status species or their habitat

Visual Resources

- Visual resources may be impaired during the project and for a substantial period of time following completion.

Water Quality (drinking or ground)

- Transportation and use of herbicide

- Transportation and use of fuel for burning
- Non-native vegetation water use

Wild & Scenic River

- Treatment may affect Wild and Scenic River qualities

Wilderness

- Treatment may affect appearance of naturalness
- Minimum tool

Wildlife

- Treatment operations may affect peregrine falcon populations
- Treatment operations may affect bighorn sheep
- Removal of non-native vegetation may affect wildlife populations

1.8 Summary

This chapter has presented the purpose and need of the proposed project, as well as the relevant issues. In order to meet the purpose and need of the proposed project in a way that resolves the issues, the BLM has developed a proposed action which is presented in Chapter 2 along with a No Action Alternative,. The potential environmental impacts or consequences resulting from the implementation of each alternative are then analyzed in Chapter 4 for each of the identified issues.

2.0 DESCRIPTION OF ALTERNATIVES

2.1 Introduction

The goals of the project are to remove non-native shrubs and trees, reduce hazardous fuels and restore ecosystem function along a 20-mile stretch of the Paria River and Buckskin Gulch. Alternatives were considered based on the following criteria:

- ~ Likelihood of successfully eliminating or reducing non-natives
- ~ National Monument, Wilderness, and Wild & Scenic River Policies
- ~ Minimizing impacts on visitors to the canyon
- ~ Minimizing impacts on sensitive cultural and biological resources

2.2 Alternative A – Proposed Action

BLM would use contractors, volunteers, and/or agency personnel to cut tamarisk and Russian olive along a 20-mile stretch of the Paria River from the wilderness boundary in Utah to the confluence with Wrath Canyon in Arizona, and along a one mile section of Buckskin Gulch upstream from the confluence with the Paria River. One of the following methods would be used to remove tamarisk

and Russian olive, depending on the age of individual stems, the density of stands, and the degree of intermingling with native vegetation.

Hand-pulling: Personnel could hand pull smaller shrubs and stems from the ground. Hand tools, including picks, pulaskis, and shovels may be used to loosen the soil surrounding the larger plants and then the entire root system would be removed.

Basal-bark: This treatment would primarily be used on immature trees under one year in age and up to 3m tall. BLM, volunteers, or private contractor employees, certified in herbicide application by the States of Utah and Arizona, and under the supervision of a person certified by BLM's course 9000-1 would apply Triclopyr - Garlon 3a (near water) or Garlon 4 (away from water on terraces) - using hand-applicators to the base of the tree at manufacturer-recommended rates.

Cut-stump: This treatment would primarily be used on mature stems. Shrubs and trees along the banks and on the terraces would be cut or lopped at or near ground level and herbicide would be applied within a few minutes of cutting. Crews would use hand saws and loppers; no mechanized equipment such as chainsaws would be used. BLM, volunteers, or private contractor employees, certified in herbicide application by the States of Utah and Arizona, under the supervision of a person certified by BLM's course 9000-1 would apply Triclopyr - Garlon 3a or Garlon 4 (depending on distance from water) - using hand-applicators to the cut stems at manufacturer-recommended rates.

Cut material would be scattered in those areas where only small amounts of material were treated. In areas of heavier concentrations, cut material would be cut into smaller pieces to facilitate handling. The cut material would be piled along the banks of the Paria River (above high water mark). The piles would be moved to below the high water mark immediately prior to burning, and burned in accordance with an approved pile burn plan. Piles would be kept small, less than ten feet in diameter and less than four feet tall.

Piled material would be allowed to cure as necessary to allow consumption by burning. Piles would be ignited using handheld devices such as drip torches. Piles would be allowed to burn out, and then mopped up. Residual vegetation would be scattered or re-piled and burned as necessary. It is anticipated that piles would be burned within one month after the material was cut, although they could remain in place for up to six months. Piles would be burned as soon as practical to reduce the availability of firewood for visitors, and to minimize the likelihood of flooding sweeping the piles downstream.

Crews would hike in carrying camping gear, supplies, and tools. Crew size would be restricted to ten in accordance with party size restrictions for the public. Crews would camp at existing sites in the canyon, remaining for one to six nights. Project personnel would conduct all activities in accordance with existing wilderness area policies, utilizing a *Leave No Trace* approach.

Treatment activities would be scheduled for early spring and late fall to avoid peak visitor use. However, because of the time required for the cut tamarisk to cure, burning of cut vegetation would likely take place during peak spring visitation. Visitor permits could be reduced by the number of project personnel in accordance with visitor use limits established for the area. The project is

anticipated to begin in the fall of 2007. Removals would occur intermittently over a period of up to five years. Crews would enter the area as needed over the next ten years to re-treat tamarisk and Russian olive that were missed during the initial treatment, or where resprouting occurs. Monitoring would occur in the fall, throughout the duration of the project.

Prior to implementation, the area to be treated would be inventoried for cultural and biological resources by qualified individuals. Areas containing cultural resources eligible for inclusion in the National Register would be avoided.

Prior to implementation, BLM would apply for herbicide use permits from the states of Utah and Arizona. Personnel would comply with all of the terms and conditions of the permits.

Prior to implementation of burning, BLM would apply for smoke permits from the states of Utah and Arizona. Personnel would comply with all of the terms and conditions of the permits.

BLM would develop an information/education program that would include signs at the trailheads and brochures/handouts to be included in permit packages for registered visitors.

Information on the project would be presented on the BLM website for the Paria with clear language explaining the tamarisk removal project, why it is occurring, and when it would be conducted. No permits would be issued without the participants having full knowledge of what to expect in the Paria Canyon and/or Buckskin Gulch.

Staff at the Paria Contact Station, the Kanab Field Office, and the Grand Staircase-Escalante National Monument Visitor Center would be briefed on the project specifics and be given educational handouts to dispense to the general public.

Project personnel would receive a briefing on the goals and objectives of the treatment, to include information on sensitive cultural and biological resources in the area. The briefing would include information on employee and visitor safety.

Treatment areas would be monitored on a yearly basis to evaluate the success of removal treatments, and for colonization of native and non-native vegetation. This would be done primarily through the use of pre-established photo-monitoring plots and transects distributed throughout the study area. Re-sprouts of treated tamarisk would be re-treated, and newly colonized non-native species would be removed. Monitoring would occur for a minimum of 15 years, but would likely continue beyond that time frame.

2.3 Alternative B – No Action

Under the No Action Alternative BLM would continue to manage the Paria Wilderness under existing plans and policies.

BLM personnel would continue to hand cut and/or pull small tamarisk plants from the soil on an occasional basis, though no comprehensive non-native species control would occur. Hand cutting

Comment [DK1]: What does this mean? I think we need to be more specific. Can I conduct this monitoring during annual recreational impact monitoring trips each fall? Or does it require a subject matter expert?

would generally occur in and around terrace campsites where individual plants were encroaching on campsites and access trails. BLM would continue to monitor vegetation conditions in the canyons.

2.4 Alternatives Considered, but Eliminated from Further Analysis

The use of prescribed fire, cutting, or herbicide treatments on their own on standing tamarisk and Russian olive was considered but eliminated from further analysis as an alternative. Tamarisk and Russian olive both resprout quickly after fire, and therefore a fire-only alternative would not meet the objectives of long-term eradication of this species without follow-up herbicide treatments. Tamarisk and Russian olive would also resprout vigorously after cutting without immediate application of herbicide, so this treatment also was eliminated. Herbicide treatment by itself is also ineffective on mature trees, and this treatment was eliminated from consideration as well.

The use of helicopters to deliver personnel and equipment into the project area was considered but dropped due to the steep, narrow canyon and lack of suitable landing sites. The use of helicopters would also impair quiet and solitude within the wilderness, and is not necessary for the completion of the project.

The use of chainsaws to cut tamarisk and Russian olive was considered but dropped due to the impact their use would have on quiet and solitude in the steep, narrow canyon where sounds echo. The use of mechanized equipment can be authorized within wilderness, but in this case it has been determined that hand tools are the minimum tool and that the project can be completed without the use of chainsaws.

2.5 Summary Comparison of Alternatives

	A- Preferred Action	B – No Action
Area treated	20-mile stretch of the Paria River from the wilderness boundary in Utah to the near the confluence with Wrather Canyon in Arizona in addition to a one-mile stretch of Buckskin Gulch upstream from the confluence with the Paria River.	0
Removal methods used	Cut-stump, basal bark, or hand pull	None
Disposal of cut stems	Scatter or burn in piles	N/A
Restoration	Allow passive (natural) revegetation	None
Monitoring	Establish photo-plots and collect data to monitor success of removal and revegetation in treatment areas	None
Follow-up	Annual re-treatments would continue as necessary for a minimum of ten years	N/A
Project timing	Removal treatments would begin in the Fall of 2007	N/A
Project duration	Five to fifteen years	N/A

3.0 AFFECTED ENVIRONMENT

3.1 Introduction

This chapter presents the affected existing environment as identified in the Interdisciplinary Team Analysis Record Checklist found in Appendix A and presented in Chapter 1 of this assessment. This chapter provides the baseline for comparison of impacts/consequences described in Chapter 4.

3.2 General Setting

The Paria Canyon - Vermilion Cliffs Wilderness Area contains 112,500 acres (92,500 acres in Coconino County, Arizona and 20,000 acres in Kane County, Utah) of public lands managed by the Bureau of Land Management. The area is approximately 10 to 30 miles west of Page, Arizona. Included are 35 miles of the Paria River Canyon, 15 miles of the Buckskin Gulch, Coyote Buttes, and the Vermilion Cliffs from Lee's Ferry to House Rock Valley (Map 1).

In Arizona, the wilderness area is part of the Vermilion Cliffs National Monument. The National Monument encompasses approximately 293,000 acres, approximately 280,000 acres of which are managed by the Bureau of Land Management (BLM). Its centerpiece is the majestic Paria Plateau. The Paria River Canyon winds along the east side of the plateau to the Colorado River.

The steep-walled, narrow canyons of the Paria include Wire Pass, Buckskin Gulch, the Paria River, and several other side canyons such as Wrather and Bushhead. Access into these canyons is limited to a few trailheads. There is a combination of day use and overnight (including multi-night) use. Use is highest during the spring of each year, with a secondary peak during the fall.

3.3 Critical Elements of the Human Environment Not Affected By This Proposal

Environmental Justice

Executive Order 12898, General Actions to Address Environmental Justice in Minority Populations and Low-Income Populations, requires all Federal agencies to incorporate environmental justice into their missions by identifying and addressing disproportionately high and adverse human health or environmental effects of their programs and policies on minorities and low-income populations and communities. The proposed action would not have health or environmental effects on minorities or low-income populations or communities as defined in the Environmental Protection Agency's Environmental Justice Guidance (1998). Therefore, environmental justice will not be analyzed.

Floodplain

Executive Order 11988, Floodplain Management, requires an examination of impact to floodplains. Executive Order 11988 requires all Federal agencies to avoid construction in the 100-year floodplain unless no other practical alternative exists. This project does not propose any construction, and there would be either no impacts or negligible impacts to floodplains. Therefore, this topic was eliminated.

Native American Religious Concerns

The Paria River was used by Native Americans and possesses some significance to a number of tribes in the region. The proposed action would not have any effect on any traditional uses nor would it alter the religious significance of the area. Therefore, Native American religious concerns will not be addressed as an impact topic.

Prime and Unique Farmlands

In August 1980, the Council on Environmental Quality (CEQ) directed that Federal agencies must assess the effects of their actions on farmland soils classified by the U.S. Department of Agriculture's Natural Resources Conservation Service (NRCS) as prime or unique. Prime or unique farmland is defined as soil that particularly produces general crops such as common foods, forage, fiber, and oil seed; unique farmland produces specialty crops such as fruits, vegetables, and nuts. According to NRCS, none of the soils in the project area are classified as prime and unique farmlands. Therefore, the topic of prime and unique farmlands will not be analyzed.

Socioeconomic Environment

The proposed action would neither change local and regional land use nor impact local businesses or other agencies. Due to the remote location, difficulty and regulation of access to project areas, impacts to other entities would not occur. Therefore, socioeconomic environment will not be addressed as an impact topic

3.4 Critical Elements of the Human Environment and Other Resources Brought Forward for Analysis

- ~ Air Quality
- ~ Cultural Resources
- ~ Hazardous Materials
- ~ Invasive, Non-native Species
- ~ National Monument Objects
- ~ Recreation
- ~ Riparian
- ~ Special Status Species
- ~ Visual Resources
- ~ Water Quality (drinking or ground)
- ~ Wild & Scenic Rivers
- ~ Wilderness
- ~ Wildlife

3.4.1 Air Quality

The existing air quality in the project area is typical of undeveloped regions in the western United States. Air quality in the project area is generally good, although regional haze can impair vistas.

Regional haze is most common in the summer, although visibility in general remains very good. In general, winters are clean and clear, although local inversions may trap pollutants in the canyon.

Clean Air Act, as amended (42 USC 7401 et seq.), provides direction for air quality. The Paria Wilderness is designated a Class I area. Maximum allowable increases of sulfur dioxide (SO₂), particulate matter (TSP), and nitrogen oxides (NO_x) beyond baseline concentrations established for Class I areas cannot be exceeded. The Act also sets a national goal to restore natural visibility to Class I areas. Section 118 of the Clean Air Act requires all Federal facilities to comply with existing Federal, state, and local air pollution control laws and regulations.

3.4.2 Cultural Resources

Cultural resources are any site, structure, object, landscape, or natural resource feature assigned traditional, legendary, religious, subsistence, or other significance in the cultural system of a group traditionally associated with it. The Paria Canyon is traditionally affiliated with the following Indian tribes: Havasupai, Hopi, Hualapai, Kaibab-Paiute, Navajo Nation, Paiute Indians Utah, Pueblo of Zuni, White Mountain Apache and San Juan Southern Paiutes.

Archaeological and historical resources are defined as any material remains or physical evidence of past human life or activities which are of archeological or historical interest. This also includes the effects of human activities on the environment. These materials are capable of revealing scientific or humanistic information through research.

Cultural landscapes are defined as a geographic area, including both cultural and natural resources, and the wildlife or domestic animals therein, associated with a historic event, activity, or person, or exhibiting other cultural or aesthetic values. Within the project area, there are no historic designed landscapes documented, however, historic sites, vernacular landscapes and ethnographic landscapes may exist.

Tamarisk, known as "*Pa'ante maav*" is considered a culturally significant plant to the southern Paiute and is described in their Plant Reference Guide Book:

"the stems or branches of the pa'ante maav are used for building shade houses and cradle boards. The young shoots are fashioned into arrows. Dead wood is used for fuel. The young shoots can be stored, but branches for shade house construction are harvested in spring and summer, because the leaved branches provide the shade. Harvest techniques serve the management function of pruning, which fosters new growth. Cuttings are also transplanted near homes".

The most sensitive cultural or archaeological resources are (both prehistoric and historic) rock art, habitation sites, and artifact scatters. These resources are found through out the Paria Canyon area. Most of these resources are related to Native American Indian use of the canyon and some minor Anglo-European use as well (Judd Hollow Pump, and rock inscriptions related to John D. Lee).

3.4.3 Hazardous Materials

Herbicide

Triclopyr (Garlon) is a selective systemic herbicide that targets woody and herbaceous broad-leaved plants. Garlon 3a is labeled for aquatic use so is safe to use near/on water, and is relatively non-toxic to aquatic vertebrates and invertebrates; The ester form (Garlon 4) is toxic to aquatic life, and should not be used close to the water. Both forms are relatively non-toxic to terrestrial vertebrates and invertebrates. Triclopyr has an average soil half-life of 30 days. Triclopyr is most effectively used when applied with a surfactant to the basal bark or to cut stumps. Garlon 3a would be used to treat trees that are close to the water, and Garlon 4 would be used to treat trees on terraces that are far away from the edge of water or saturated soil.

Drip Torch Fuel

Drip-torches are standard tools for igniting piles. They are filled with a mix of diesel and unleaded gasoline (total contents 1.5 gallons each) and when lit personnel can control the amount of fuel that is dripped onto the substance to be burned. Drip-torches would only be filled away from the river and care would be taken to ensure that no fuel was spilled.

3.4.4 Invasive, Non-native Species

Non-native tamarisk trees and shrubs are common along the banks and terraces of the Paria and Buckskin. Non-native Russian olives trees have also become numerous along the river. Tamarisk is a shrub or tree that grows in dense stands at springs and along rivers and streams. Tamarisk, introduced into the U.S. in the 19th century as an erosion control agent, spread throughout the West and caused major changes to riparian ecosystems.

The impacts caused by tamarisk are well documented. These prolific non-natives displace native vegetation and animals, alter soil salinity, and increase fire frequency and hazard. Tamarisk spreads by seed and can propagate from buried or submerged stems. It can replace or displace native woody species, such as cottonwood, willow and mesquite, which occupy similar habitats, especially when timing and amount of peak water discharge, salinity, temperature, and substrate texture have been altered. Stands of tamarisk generally have lower wildlife values compared to stands of native vegetation, although tamarisk can be important to some bird species as nesting habitat.

Tamarisk is a facultative phreatophyte, meaning that it can draw water from underground sources but once established it can survive without access to ground water. It consumes large quantities of water, possibly more than woody native plant species that occupy similar habitats. Tamarisk is tolerant of highly saline habitats, and it concentrates salts in its leaves. Over time, as leaf litter accumulates under tamarisk plants, the surface soil can become highly saline, thus impeding future colonization by many native plant species. . Mature plants are capable of producing 2.5×10^8 tiny, wind-dispersed seeds per year.

Russian-olive is native to southern Europe, central Asia, and the western Himalayas. It was introduced to North America during colonial times and was widely planted in the western United

States. It has been especially invasive in wet-saline riparian environments, yet it continues to be grown and planted in the West. New Mexico and Colorado are the only states currently listing it as legally noxious. Several counties in Utah have also listed it as a noxious weed.

Russian-olive replaces native cottonwood and willow stands in wet saline bottomlands. Once established, Russian-olive stands are very stable. Studies that have compared native willow sites to Russian olive reported that willow sites had higher species richness and density, and more foraging guilds and nesting guilds than Russian-olive sites. The shift from native to exotic dominated riparian habitats may result in a loss of avifaunal diversity.

3.4.5 National Monument Objects

On November 9, 2000, President Clinton established the Vermilion Cliffs National Monument under authority from Section 2 of the Antiquities Act, 16 U.S.C. 431, which authorizes the President to establish as national monuments “historic landmarks, historic and prehistoric structures, and other objects of historic or scientific interest that are situated upon the lands owned or controlled by the Government of the United States....”

The Antiquities Act authorizes the President, as part of his declaration of a national monument, to reserve land, "the limits of which in all cases shall be confined to the smallest area compatible with the proper care and management of the objects to be protected." These objects include the geological, archeological, historic and biological objects identified in the Proclamation.

The geologic structure, stratigraphy and erosional processes in the monument combine to create unique landforms of incredible shape, color and beauty, which draw visitors from around the world.

The monument contains archaeological resources of Archaic and Ancestral Puebloan origin. These resources are significant because of their abundance, good condition and scientific potential. Historic resources, such as ranch structures and corrals, fences, water tanks, mines, and historic routes, exist in nearly their original context. They provide an opportunity for public interpretation and education of the historical and social significance of these early lifestyles.

The monument is remote and unfragmented. It supports ecological processes that provide opportunities to study functioning physical and natural systems.

The monument contains a sense of solitude through natural settings that provide for rugged recreation opportunities.

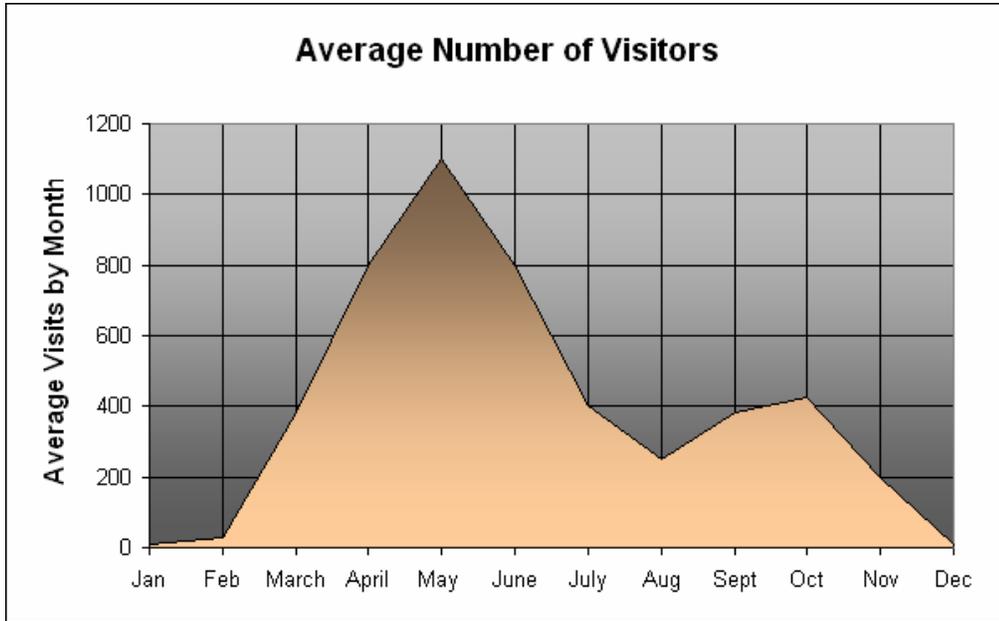
3.4.6 Recreation

The Paria Canyon-Vermilion Cliffs Wilderness Management Plan (1983) contains detailed recreation information.

The steep-walled, narrow canyons of the Paria include Wire Pass, Buckskin Gulch, the Paria River, and several other side canyons such as Wrath and Bushhead. Access into these canyons is limited to a few trailheads. There is a combination of day use and overnight (including multi-night) use.

Table 1 contains information on visitors to the canyons from 1999 through 2005, while Figure 1 contains average monthly use in a typical year. Use is highest during the spring of each year, with a secondary peak during the fall.

TABLE 1 – PARIA CANYON VISITOR DAYS							
Area Component	Paria Canyon / Coyote Buttes Visitor Statistics FY99 – FY05						
	FY99	FY00	FY01	FY02	FY03	FY04	FY05
Paria Canyon Overnight	9,583	10,072	10,233	11,131	11,603	10,365	11,431
Paria Canyon Day Use	3,492	4,407	3,803	4,716	4,183	4,210	4,017
Totals	13,075	14,479	14,036	15,847	15,786	14,575	15,448



Overnight visitor use in the canyons is limited to no more than 20 entries per day, and entry is by permit only. This is a cumulative total from all trailheads and access points. Permits for overnight use can be obtained online or at the BLM offices in St. George and Kanab, Utah. The cost is \$5 per person, per day. Day-use permits are issued using self-service envelopes and fee tubes at the trailheads. The cost is \$5 per person, per day and there are no visitor use limits for day trips. Party or group size is limited to ten persons in the canyons. This applies to both day and overnight use. Collecting firewood and building fires is prohibited in the canyons.

Details on management of the Paria Special Management Area and information on permit availability can be found online at <https://www.blm.gov/az/asfo/paria/index.htm>.

The visitor use limits in the canyons create outstanding opportunities for primitive recreation and

solitude. The area is generally natural and undisturbed, and management consists of low levels of rules, regulations, and ranger presence. There are no signs or marked trails in the canyons. Recreational use typically includes hiking and backpacking.

Although there is usually some water flowing in the Paria, visitors generally prefer to obtain drinking water from one of the springs. This concentrates use on terraces near springs. The terrace across from Big Spring is the classic example.

Human waste is a significant problem in Paria Canyon and Buckskin Gulch. These narrow canyons concentrate human waste in a very small area. Each permit includes "Human Waste Bags" for each member of a group that are easy to use, secure, airtight, and contain chemicals that neutralize odors.

3.4.7 Riparian

The Paria shoreline consists primarily of narrow strips of sandy, wooded terraces, although in the upper canyon the shorelines are sheer canyon walls. Riparian vegetation such as willow, box elder, and cottonwood grows along the shoreline. Exotic species such as Russian olive and salt cedar have become established.

Cattle and people have trampled the streambank in some locations, but the overall streambank condition is good. Historic livestock grazing may have had an adverse impact on riparian vegetation, but changes in management have improved conditions. Representatives of different species and age classes are present.

On the terraces in the Paria, increased numbers of visitors are expanding perennial plant loss through the creation of new trails, toilets, and tent sites in previously undisturbed areas. Trees are damaged, during the creation of new campsites, and for firewood.

3.4.8 Special Status Species

According to information provided by the U.S. Fish and Wildlife Service, Paria Canyon provides habitat for Welsh's milkweed (*Asclepias Welshii*), humpback chub (*Gila cypha*), razorback sucker (*Xyrauchen texanus*), bald eagles (*Haliaeetus leucocephalus*), Mexican spotted owls (*Strix occidentalis lucida*), and southwestern willow flycatchers (*Empidonax traillii extimus*), each federally listed as threatened or endangered. The Paria River/Colorado River confluence on the Glen Canyon National Recreation Area is proposed as critical habitat for the razorback sucker. California condors, Federally considered to be part of an experimental, non-essential population (Section 10J) also roam the area.

Plants

Welsh's milkweed, listed as threatened, occurs within areas of dune sand in the Paria Canyon, Coyote Buttes, and on the north and east sides of the Paria Plateau within the wilderness. The recovery plan for this plant states that trampling is considered a threat. In the canyons, the plant does not occur within the hiking/camping corridor. This species is not found along the riverbank or on the terraces that would be treated under the proposed action.

Fish Species

The Paria River is home to small populations of speckled dace (*Rhinichthys osculus*), bluehead mountain sucker (*Pantosteus delphinus*), and flannelmouth sucker (*Catostomus latipinnis*), all of which are native fish. These species, along with humpback chub and razorback sucker are either restricted to or are most common on National Park Service administered portions of the Paria River near its confluence with the Colorado River. It is unlikely these species exist in the treatment area.

California Condors

Recently released along the Vermilion cliffs, California condors have been seen in Coyote Buttes and above the canyons. These birds were released as part of a reintroduction program, and are considered to be an experimental, non-essential population under the Endangered Species Act.

Southwest Willow Flycatchers

The southwestern willow flycatcher is a neotropical migrant that breeds across much of North America. The southwestern willow flycatcher's breeding range includes southern California, Arizona, New Mexico, western Texas, southwestern Colorado, southern portions of Nevada and Utah, and extreme northwestern Mexico. During the breeding season, the species occurs in riparian habitats where dense growth of willow, baccharis, arrowweed, and tamarisk occur.

All of the riparian habitats on the Arizona Strip have been evaluated to determine the extent and condition of habitat for southwestern willow flycatchers. The criteria used to evaluate these areas are based on published descriptions of habitat characteristics, and habitat classification and mapping guidelines provided in the Southwestern Willow Flycatcher Action Plan. Eleven patches of suitable willow flycatcher habitat have been identified on the Strip, nine in the Virgin River drainage and two in Kanab Creek. Flycatcher surveys have been conducted on all federal lands within these areas. All habitat patches, except on private land have been surveyed.

Following an extensive habitat assessment of the treatment unit in the Paria River in 1995, biologists concluded that there was no suitable breeding habitat for southwestern willow flycatchers in the project area. This conclusion was based on the frequency of scouring flood events, which periodically remove vegetation from the steep-walled canyon. Very few areas within the canyon are wide enough to provide sufficient floodplain area to support the dense stands of woody vegetation necessary for southwestern willow flycatcher habitat. Those isolated point bars that where cottonwoods and/or tamarisk have gained a foothold are not wide enough and lack the dense understory typical of flycatcher nesting sites. The arid nature of the canyon, the high frequency of scouring floods, and sparse understory layer make it unlikely that the habitat within the canyon will reach suitability within the near future. The habitat assessment was repeated in 2003 and 2004 with the same results. Several side canyons of the Paria River include over-mature cottonwood gallery forests, including Wrath and Bush Head. However, the understory is too sparse and open to be suitable for southwestern willow flycatchers. This habitat is not likely to become suitable without large scale disturbance.

The best habitat in the Paria drainage appears to be on lands administered by the Glen Canyon

Recreation Area (GCRA) near the mouth of the Paria where it joins the Colorado River in the vicinity of Lees Ferry. This habitat consists primarily of tamarisk up to 15 feet tall. The Lee's Ferry site is considered by biologists to be potential southwestern willow flycatcher habitat. Occurrence surveys were conducted at the Lee's Ferry site in 1995 and 1999-2003. Only one migrant southwestern willow flycatcher in 2001 was detected during these surveys.

Mexican Spotted Owl

Potential breeding habitat for Mexican spotted owls in Paria Canyon generally consists of steep-walled canyons. However, unlike the narrow, shaded slot canyons where owls have been found at nearby Zion National Park, the canyon habitat in Paria is wide with high solar exposure. Cool microsites are limited in availability, though ledges are abundant. A prey base for Mexican spotted owls appears to be present.

Surveys for Mexican spotted owls have previously been conducted in the treatment unit at Paria Canyon. No owls were detected. However, some of the previous surveys were not done in accordance with established protocols. This is because Paria Canyon is a narrow slot canyon 38 miles long, accessible only by foot. The trip requires at least four days to backpack from one end to the other. Conducting owl surveys along the way adds additional days. In some cases it simply was not possible to complete four visits to these locations due to time constraints. Surveys also deviated from the protocol by employing continuous calling routes within the narrow, linear canyon, a practice discouraged by the protocol. Survey results were as follows:

2004: One survey conducted over three nights was conducted in 2004. Continuous calling routes done from mile 7.5-12.25 (state line to Big Spring), mile 17.5-20.5 (Judd Hollow to Wrather Canyon and also about $\frac{3}{4}$ miles up Wrather Canyon), and mile 25-26.5 (Last Reliable Spring to Bush Head Canyon). No responses from any owl species.

2003: Four surveys each at Wrather Canyon (mile 20.5) and The Hole (mile 19) were done according to accepted protocols. Two surveys each at mile 22.5, mile 23, mile 24.5, and mile 25. One survey at Fourth Creek above mile 15. One continuous survey from mile 16.5 to Bush Head at mile 26.5. No responses from any owl species.

1992: Four surveys each at four call stations were done according to accepted protocols, apparently the same ones near The Hole as 1991. No responses from any owl species.

1991: Four visits in the vicinity of The Hole (mile 19), two done from four calling stations at the top from the rim and two by hiking up from Lee's Ferry. Surveys done by SCWA and were done according to accepted protocols. Two great horned owls responded.

Bald Eagles

Bald eagles may occasionally travel through the project area, although there are no recent records of observations with the treatment unit.

Other Special Status Species

Other sensitive species that may be in the area are Marble Canyon kangaroo rats (*Dipodomys microps leucotis*), ferruginous hawks (*Buteo regalis*), loggerhead shrikes (*Lanius ludovicianus*), and chuckwallas (*Sauromalus obesus obesus*).

3.4.9 Visual Resources

The project area is in a Class I Visual Resource Management area. The objective for Class I areas is to preserve the existing character of the landscape. The level of change to the characteristic landscape should be very low and must not attract attention.

3.4.10 Water Quality (drinking or ground)

Water in the Paria River and Buckskin Gulch feeds into the Colorado River near Lee's Ferry, and then runs through the Grand Canyon into Lake Mead, where it is impounded behind Hoover Dam. Water from the Paria may eventually be used for agriculture, commercial, or culinary purposes by residents of Nevada, California, and Mexico. River flows are normally low (less than 100 cfs) although there are seasonally frequent flood events carrying large amounts of debris and sediment.

3.4.11 Wild & Scenic Rivers

The Paria River was determined to be eligible for inclusion in the Wild and Scenic Rivers System because it meets the definition of a free-flowing stream from above the Utah-Arizona State line to the Glen Canyon National Recreation Area.

Based on the suitability determination in the Arizona Strip RMP, the Arizona portion of the Paria, and four miles in Utah immediately north of the state line is suitable for inclusion into the Wild and Scenic Rivers System. The Paria River was classified as Wild, being free of impoundments, generally inaccessible except by trail, with primitive shorelines, and with unpolluted waters.

The Arizona Strip RMP concluded that the river has several outstandingly remarkable values: scenic, recreational, riparian vegetation, fish and wildlife habitat, cultural resources, and geologic. The outstandingly remarkable fish habitat value only exists on the National Park Service portion of the river near the confluence of the Paria River with the Colorado River. Riparian vegetation is an outstandingly remarkable value for the BLM portion, and riparian vegetation is habitat for a wide variety of fish and wildlife. These habitat values are inextricably related to the fish and wildlife species that use this habitat.

3.4.12 Wilderness

The wilderness, designated in 1984, extends north four miles into Utah along the Paria River and west nine miles along Buckskin Gulch, a tributary of the Paria. The wilderness also includes the Coyote Buttes area on the Paria Plateau. The wilderness is managed in accordance with the Paria Canyon-Vermillion Cliff Wilderness Management Plan.

The goals of wilderness management are stated on page 3 of the plan, and are summarized here:

- ~ The first and dominant goal is to provide for the long term protection and preservation of the area's wilderness character under a principle of non-degradation
- ~ The second goal is to manage for use and enjoyment of visitors in a manner that will leave the area unimpaired for future use and enjoyment as wilderness
- ~ The third goal is to manage the area using the minimum tool, equipment, or structure
- ~ Management will seek to preserve spontaneity of use and as much freedom from regulation as possible

The plan is clear that the wilderness resource will be dominant in all management decisions where a choice must be made between preservation of wilderness character and visitor use

The wilderness is classified as Recreation Opportunity Class (ROC) I, the most pristine class. Areas classified as ROC Class I are essentially an unmodified environment that contain ecosystems that are healthy and natural processes operate essentially free of human-induced control. They have few visitor impacts, typically consisting of minor, permanent disturbance of soils and vegetation in camp areas and along popular hiking routes, and have subtle disturbances that do not dominate the landscape. Impacts from other resource users are rare to nonexistent, temporary, and unnoticeable, so that the area provides outstanding opportunities for solitude and isolation from other users. Encounters with other visitors are rare in the off-season and occasional during peak periods of use.

3.4.13 Wildlife

The area in Arizona is managed in accordance with the Paria/Kanab Creek Habitat Management Plan (1983), a cooperative document between the BLM and the Arizona Game and Fish Department. Wildlife in the Utah portion is managed by BLM and the Utah Division of Wildlife Resources.

Wildlife, particularly bighorn sheep (*Ovis canadensis*) and mule deer (*Odocoileus hemionus*), contribute to outstanding values of the area. Although these species come down to the river where possible to drink, they do not spend time in the treatment unit due to the high human visitation and lack of escape routes from predators.

Peregrine Falcons

Peregrines occupy ledges on the canyon walls and can frequently be heard calling or seen hunting and roaming above the canyon. Peregrines were recently removed from the list of threatened and endangered species due in part to their healthy populations in the Grand Canyon area. Although they will prey on mammals, peregrines focus on bird species for food. Peregrines breed in the late winter and spring, and the birds in the canyon appear to have become somewhat accustomed to the presence of humans along the river.

Neo-tropical Migrants

A number of neo-tropical migratory birds use Paria Canyon during various times of the year. They may forage in and around the streamside vegetation, and some may nest or breed there.

Other Species

Many other species of invertebrates, reptiles, birds, and mammals live all or part of the year in the study area. For further information refer to the Paria-Kanab Creek Habitat Management Plan.

4.0 ENVIRONMENTAL IMPACTS

4.1 Introduction

This section analyzes the impact of the proposed action and alternatives on the following resource issues:

Air Quality

- Burning material may affect the Class I Airshed
- Burning material may affect visitors

Cultural

- Cutting and removing vegetation may affect cultural resources
- Burning vegetation may affect cultural resources

Hazardous Materials

- Transportation and use of herbicide
- Transportation and use of fuel for burning

Invasive, Non-native Species

- Potential for introduction/establishment of invasive, non-native species

Monument Objects

- Treatment may affect Monument Objects

Recreation

- Treatment operations may impair visitor experience (solitude)
- Burning material may affect visitors – safety
- Removal of non-native vegetation may change visitor experience/opportunity
- Some visitors may choose not to visit during the project, and this may impact permit revenue, which is used to fund Paria Special Management Area employees.

Riparian

- Impact of herbicide on non-target species
- Impact of treatment on native riparian ecosystem

Special Status Species

- Potential for removal of vegetation to affect special status species or their habitat

Visual Resources

- Visual resources may be impaired during the project and for a substantial period of time following completion.

Water Quality (drinking or ground)

- Transportation and use of herbicide
- Transportation and use of fuel for burning
- Non-native vegetation water use

Wild & Scenic River

- Treatment may affect Wild and Scenic River qualities

Wilderness

- Treatment may affect appearance of naturalness
- Treatment may temporarily affect solitude (during project)
- Treatment may affect primitive recreation opportunities
- Minimum tool

Wildlife

- Treatment operations may affect peregrine falcon populations
- Treatment operations may affect bighorn sheep
- Removal of non-native vegetation may affect wildlife populations

4.2 Direct/Indirect Impacts

Under the proposed action, over a period of several years, groups of up to ten BLM personnel, contractors, and/or volunteers would enter the Paria Canyon/Buckskin Gulch and remove tamarisk and Russian olive shrubs and trees, paint the cut stems with Garlon 3a or Garlon 4, and pile and burn most of the material below the annual average high water mark. Small amounts of vegetation debris would be scattered about the area.

There would be a direct impact on riparian vegetation in the area from the removal of the non-natives. There would be a direct impact to visitors from the presence of crews working in the area, and a change in the appearance of the vegetation on the terraces. During pile burning there would be an impact on visitors from an increase in smoke in the canyon. Small amounts of ash would be swept away by flooding.

There would be an indirect impact on riparian vegetation and wildlife from the reduction of nonnative vegetation. Native vegetation would face reduced competition for light, space, and water due to the removal of nonnative species. Native wildlife populations would respond to a return of the native vegetation.

The impacts of the proposed action and alternatives on specific resources are discussed in detail below.

4.2.1 Alternative A – Proposed Action

4.2.1.1 Air Quality

Burning small piles (maximum ten feet in diameter, four feet high) of vegetation would produce small amounts of smoke that would drift through the canyon and dissipate within two to 24 hours post-burn. The smoke would not cause substantial degradation to the Class I airshed. Visitors in the canyon during burn periods would notice smoke, but would not suffer adverse health impacts due to the low volume and short duration of exposure.

4.2.1.2 Cultural

Removal of nonnative shrubs and trees by cutting and applying herbicide would have little or no impact on cultural resources. The removal of these plants could expose surface artifacts currently concealed by dense vegetation. No impacts to cultural resources are anticipated from the pile burning since this activity would occur below the average annual high water mark. Project personnel would receive training in cultural resources, allowing them to avoid potential impacts.

4.2.1.3 Hazardous Materials

Properly transported, stored, and used, the herbicides and fuel for pile burning would be released in volumes that would not impact other resources. Herbicide applicators would be trained and certified at the State and/or Federal level to avoid spills and take appropriate action should a spill occur.

Care would be taken to minimize contact with soil and native plants. Garlon 3a would be used to treat trees that are close to the water in order to minimize impacts to aquatic species. Garlon 4 would be used to treat trees farther away from the edge of water or saturated soil.

4.2.1.4 Invasive, Non-native Species

Non-native species targeted for treatment would be reduced substantially in the project area. As a result of the removal of non-native vegetation, opportunities would be created for the establishment of non-native/noxious weed species. Project personnel would be trained to reduce the introduction of non-natives into the project area. The treatment areas would be monitored for the return of target species, or the establishment of new non-native/noxious species. Follow-up removal treatments would occur that would prevent the establishment of non-native/noxious plants.

4.2.1.5 Monument Objects

The geologic structure, stratigraphy and erosional processes within the monument would remain intact. There could be a slight increase in rates of bank erosion in areas where large amounts of tamarisk now exist. Recruitment of native species would help to reduce these rates.

There would be no impact on archaeological resources of Archaic and Ancestral Puebloan origin and on historic resources, such as ranch structures and corrals, fences, water tanks, mines, and historic routes, except that removal of non-native vegetation has the potential to expose resources currently hidden by dense vegetation to the public.

The proposed action would help restore native vegetation and wildlife, essential parts of the ecological processes, by reducing competition from non-natives species.

4.2.1.6 Recreation

Visitors frequently camp on the terraces in areas that have been cleared of vegetation. Their campsites are more or less concealed by vegetation and on many terraces this includes tamarisk and Russian Olive. Removal of these invasives would open the visual site distance and expose some campsites to hikers along the river. As native vegetation filled in the areas currently occupied by tamarisk, this impact would be gradually reduced.

Immediately post-treatment, visitors would see treated areas that were reduced in vegetation, with cut stems visible. It is possible that visitors could be impaled by cut stems if they fell onto them.

After burning occurred, there would be soot and ash along the river that would remain until the next high water/flood event occurred.

Visitors would benefit from the information and education program developed by BLM regarding the project and river ecology. Although many visitors would remain oblivious to the fact that tamarisk and Russian olive are non-native species, and the visible evidence of the treatment project would disappear after a few years, they would benefit from a recreational experience traveling along through an ecosystem containing few exotic species.

There would be a reduction in the sense of solitude during periods of treatment activity. By limiting project personnel group size to a level identical to visitor group size limits, and by reducing visitor permits, this impact would be minor and temporary.

Some visitors may choose not to visit the canyon during treatment activity. Since all overnight permits must be obtained in advance, visitors would be made aware of any treatment activities in advance and could decide at that time whether or not to purchase a permit. While a reduction in visitor numbers would have a corresponding reduction in revenue, it is anticipated that the drop in revenue would be small enough that it would not impact operations that use fee revenues.

Visitors to the canyon during periods of burning would see project personnel burning piles along the river, and could see and smell smoke. Project personnel would be trained professionals who would ensure public safety. Smoke amounts and durations are not anticipated to be sufficient to create respiratory problems or other concerns.

4.2.1.7 Riparian

The proposed action would help restore native vegetation and wildlife, essential parts of the

ecological processes, by reducing competition from non-natives species and restoring the native species composition. Removal of non-natives would also reduce fire risk due to the removal of tamarisk. Cut stump application of herbicide is a fairly target-specific treatment, and is not anticipated to have unintentional impacts on nearby native plants.

4.2.1.8 Special Status Species

According to information provided by the U.S. Fish and Wildlife Service, Paria Canyon provides habitat for bald eagles, humpback chub, razorback sucker, Mexican spotted owls, and southwestern willow flycatchers, each federally listed as endangered. The Paria River/Colorado River confluence on the Glen Canyon National Recreation Area is proposed as critical habitat for the razorback sucker. California condors may also occur in the area. Welsh's milkweed, listed as threatened, occurs within areas of dune sand in the Paria Canyon, Coyote Buttes, and on the north and east sides of the Paria Plateau within the wilderness.

Indirectly and cumulatively, Garlon 3a has little if any potential to accumulate in aquatic organisms and is practically nontoxic to fish, invertebrates and mammals. Garlon 4 is not harmful to terrestrial species, and would not be used near aquatic environments due to its potential effects on aquatic species. The selective herbicide application methods used under this alternative would minimize any potential effects, which overall would be short-term and negligible.

Plants

Welsh's milkweed is not found along the riverbank or on the terraces that would be treated under the proposed action, and would not be affected by the proposed action.

Fish Species

The small populations of speckled dace, bluehead mountain sucker, and flannelmouth sucker are either restricted to or are most common on National Park Service administered portions of the Paria River near its confluence with the Colorado River. There would be no impact on these species due to the large distance separating them from the treatment.

California Condors

Occasionally, during the late fall and winter months, California condors will scavenge below the project area along the river corridor, and in some side canyon areas. They also may perch or roost for the night. Crews would adhere to the attached Condor Conservation Measures. With these measure in place, there would be no impact to the experimental, non-essential population.

Southwest Willow Flycatchers

Southwestern willow flycatchers have not been documented in the project area, however potential nesting and breeding habitat exist near the project area. Assessments were done to identify potential SW willow flycatcher habitats, and there are no such areas within the treatment area. There would be no effect on this species from the proposed action.

Mexican Spotted Owl

Mexican spotted owls have not been documented in the project area, however potential nesting and breeding habitat may exist within the project area. Assessments were done to identify owl occurrence, but none were found. The nature of the treatment is such that even if Mexican spotted owls were in the project area, there would be no effect on the species.

Bald Eagles

Bald eagles may occasionally travel through the project area, although there are no recent records of observations with the treatment unit. While it is possible that bald eagles may traverse the project area, it is unlikely that they would remain on site. The nature of the treatment is such that even if bald eagles were on site, there would be no impact on the population.

Other Special Status Species

Other sensitive species that may be in the area are Marble Canyon kangaroo rats, ferruginous hawks, loggerhead shrikes, and chuckwallas. None of these species would be affected by the proposed action.

The project would not adversely affect habitat considered critical for any listed species. The proposal would have no effect on any listed species.

4.2.1.9 Visual Resources

Immediately post-treatment, visitors would see treated areas that were sparse in vegetation, with cut stems visible. In some areas tree skeletons would remain for several years. After burning occurred, there would be soot and ash along the river that would remain until the next high water/flood event occurred. Re-growth of native vegetation would mitigate the long-term effects of tamarisk and Russian olive removal on visual resources.

4.2.1.10 Water Quality (drinking or ground)

If herbicide or fuel were spilled in or near water, there would be potential to affect water quality, thus these chemicals would be transported in leak-proof and spill-proof containers. Only herbicides that are certified for safe use near water would be used in the vicinity of the stream. Triclopyr, which is not intended for use near water, would only be used on upper terraces, far from water sources and applied in a very selective manner so that it would not come into contact with water or soils. Impacts to surface and groundwater quality are not anticipated under this alternative.

During flood events the river carries high volumes of debris and sediment. The amount of debris and ash created by the proposal is negligible in comparison to the base river load.

4.2.1.11 Wild & Scenic River

The river has several outstandingly remarkable values: recreational, riparian vegetation, fish and wildlife habitat, cultural resources, scenic and geologic. Impacts to these resources are addressed in

the sections pertinent to each.

The proposed action would not affect the Wild & Scenic River qualities that make the Paria River suitable for designation by Congress. The proposed action is consistent with acceptable management activities for Wild sections.

4.2.1.12 Wilderness

Areas where non-natives were cut would retain evidence of human activity for a period up to several years, until native vegetation became reestablished. Evidence of pile burning would remain until flood waters scoured the sites. During periods of treatment activity, there would be an increased management presence in the canyon, reducing naturalness and solitude for brief periods.

The use of hand tools for cutting, hand sprayers for herbicide application, and the use of drip torches are consistent with minimum tool guidelines for wilderness.

4.2.1.13 Wildlife

The proposal would not affect game species such as bighorn sheep or mule deer because the treatment would occur in areas that are infrequently used by these species.

Peregrine falcons primarily prey on other birds and there would be a slight temporary disruption of the habitat that some bird species use for cover, foraging, and nesting. In the long term the vegetative composition of the treatment area would tend to have more natives and fewer non-natives, and this could provide an increase in the populations of peregrine prey.

Peregrines in the canyon are somewhat accustomed to the presence of humans and the presence of project personnel would have a negligible impact on this species, especially in the fall.

During the treatment period a substantial amount of native vegetation would remain unaffected and this would provide suitable habitat for wildlife, including neo-tropical migratory birds.

4.2.1.14 Monitoring

BLM would monitor the vegetation of treated areas to determine treatment effectiveness. Photo-monitoring plots and monitoring transects would be set up prior to removal and revisited annually in the Fall. Data collection at transects would include depth to groundwater, soil chemistry, soil texture, bank stability, and characterization of vegetation presence, type, and abundance. Follow-up treatments would occur in areas where non-natives reestablished.

4.2.2. Alternative B: No Action

Under the No Action Alternative BLM would continue to manage the Paria Wilderness under existing plans and policies.

BLM personnel would continue to hand cut and/or pull small tamarisk plants from the soil on an

occasional basis, though no comprehensive non-native species control would occur. Hand cutting would generally occur in and around terrace campsites where individual plants were encroaching on campsites and access trails. BLM would continue to monitor vegetation conditions in the canyons.

4.2.2.1 Air Quality

There would be no effect on air quality from the No Action Alternative, since there would be no burning of piled vegetation.

4.2.2.2 Cultural

The No Action alternative could have an impact on cultural resources. Surface artifacts currently concealed by dense vegetation would remain concealed, but root action from the plants would continue to displace subsurface features and artifacts. In addition branches would continue to rub up against rock art and creating potential adverse impacts

Due to the remote location of the treatment unit, it is unlikely that Native Americans harvest the tamarisk in the treatment unit. The abundance of the plant outside the treatment unit provides numerous opportunities for harvest.

4.2.2.3 Hazardous Materials

No hazardous materials would be used under the No Action Alternative.

4.2.2.4 Invasive, Non-native Species

Non-native species targeted for treatment would continue to increase, and would continue to disperse throughout the Paria riparian corridor.

4.2.2.5 Monument Objects

The geologic structure, stratigraphy and erosional processes within the monument would remain intact under the No Action Alternative. There would be no impact on archaeological resources of Archaic and Ancestral Puebloan origin and on historic resources, such as ranch structures and corrals, fences, water tanks, mines, and historic routes. Under the No Action alternative, monument objects such as soils, native vegetation and wildlife, would continue to be impacted by competition and changes in habitat associated with non-native riparian tree species.

4.2.2.6 Recreation

Recreation would not be impacted by the No Action Alternative, however continued encroachment by tamarisk and Russian olive would reduce the quality of recreation experiences in the area.

4.2.2.7 Riparian

The No Action Alternative would affect riparian areas by enabling the continued establishment and

expansion of non-native species. Native vegetation would continue to decrease due to competition and increased fire risks associated with continued establishment of tamarisk and Russian olive.

4.2.2.8 Special Status Species

Special Status Species such as SW willow flycatcher and California condors would not be affected by the No Action Alternative. Water use by non-natives may increase with the expansion and growth of these species and could reduce stream flow to the extent that aquatic Special Status species become affected.

4.2.2.9 Water Quality (drinking or ground)

No herbicide would be used and no pile burning would occur under the No Action Alternative, therefore there would be no impact on water quality.

Non-native vegetation such as tamarisk and Russian olive would continue to uptake large quantities of water, effectively depressing stream flow and groundwater resources.

4.2.2.10 Visual Resources

Existing conditions would continue under the No Action Alternative, with a high probability that tamarisk and Russian olive would continue to aggressively expand and occupy sites that are now occupied by native vegetation.

4.2.2.11 Wild & Scenic River

The river has several outstandingly remarkable values: recreational, riparian vegetation, fish and wildlife habitat, cultural resources, scenic and geologic. Impacts to these resources are addressed in the sections pertinent to each. The No Action Alternative would not affect the Wild & Scenic River qualities that make the Paria River suitable for designation by Congress.

4.2.2.12 Wilderness

The No Action Alternative would not affect wilderness.

4.2.2.13 Wildlife

The No Action Alternative could indirectly affect wildlife through the continued expansion and establishment of untreated invasive species that alter the natural riparian habitat structure.

4.3 Cumulative Impact Analysis

4.3.1 Past and Present Actions

Tamarisk and Russian olive have been successfully removed in nearby areas downstream of the proposed project area. Approximately 90 tributaries of the Colorado River were treated in the Grand Canyon, and a 10-acre area was treated at Lee's Ferry, at the confluence of the Paria and Colorado

Rivers. Removal of tamarisk and Russian olive is still ongoing in Grand Canyon tributaries. The proposed action would contribute to further eradication of tamarisk and Russian olive in the vicinity of these other projects, and would potentially bolster the success of these projects due to the eradication of seed sources dispersing into these areas from the proposed project area.

4.3.2 Reasonably Foreseeable Action Scenario (RFAS)

The following RFAS identifies reasonably foreseeable future actions that would cumulatively affect the same resources in the cumulative impact area as the proposed action and alternatives.

Incremental removals of tamarisk in the Paria River may occur at some point in the future. Monitoring data would be used to quantify the success of natural establishment of native vegetation following removal. Monitoring data pre- and post-treatment would include characterization of bank attributes such as salinity, soil texture, erosion, and depth to groundwater as well as revegetation success of native (and exotic) species. This information would help to establish whether natural reestablishment of native species could be successful following tamarisk removal, or whether active replanting would be necessary to restore treated areas. The information gathered during this project would help to determine the most appropriate strategy to use for larger-scale removals of dense, well established patches of non-natives in this area so that environmental impacts would be minimized. This information would be used to guide future removals of non-native vegetation in the Paria River.

4.3.3 Cumulative Impacts

Past and present tamarisk removal efforts on the Colorado mainstem at Lee's Ferry and in the tributaries of the Grand Canyon are not expected to contribute to impacts associated with the proposed action alternative since these projects are located in different geographic areas. The proposed action would contribute to the impacts of a RFAS that included removing large, dense stands of tamarisk in the lower Paria River.

4.3.3.1 Air Quality

The proposed action would not contribute to cumulative impacts on air quality given an RFAS of extensive removal of tamarisk in the lower Paria River, since smoke produced by either project would occur several years apart.

4.3.3.2 Cultural Resources

The proposed action may uncover cultural resources that were formerly masked by invasive vegetation. The cumulative impact of this, given the RFAS would be to increase the spatial extent of uncovered cultural resources.

4.3.3.3 Hazardous Materials

The hazardous materials used in the proposed action are expected to be handled in a manner that would minimize contact with soils and non-target species.

4.3.3.4 Invasive, Non-native Species

The proposed action in combination with the RFAS would increase the extent of tamarisk and Russian olive eradication in the Paria drainage by removing presently established species and seed sources that would facilitate the success of both projects. Conversely, the proposed action and RFAS would cumulatively increase the extent to which new non-native species could become established following removal. Post-removal monitoring conducted under the proposed action would provide data regarding the potential for invasive species to become established in areas disturbed by removal of tamarisk and Russian olive. This information would be used to assess the risk of other non-natives becoming established under the RFAS so that impacts of the RFAS could be minimized.

4.3.3.5 National Monument Objects

Under the alternatives and RFAS, national monument objects including the geologic structure, archaeological objects, and native biota would not be adversely affected. The proposed action may have slight effects on bank erosion, and thus the geologic structure of the river. Under the RFAS, the potential for bank erosion could potentially be significant. Monitoring of bank erosion following tamarisk removal and revegetation in the proposed action would provide data that would guide the planning process so that floodplain configuration would be minimally impacted. Under the proposed action, there would be no impact on archaeological resources of Archaic and Ancestral Puebloan origin and on historic resources, such as ranch structures and corrals, fences, water tanks, mines, and historic routes, thus there would be no cumulative impacts caused by this alternative.

4.3.3.6 Recreation

Under the proposed action, recreation may be impacted primarily through a reduced feeling of solitude associated with the presence of management personnel and treatment activities, and reduction in privacy of campsites with removal of trees. In conjunction with the RFAS, these impacts would be extended over a longer period of time and over a larger spatial extent.

4.3.3.7 Riparian

Under the proposed action, riparian areas would be restored to their natural state through removal of non-native species. Impacts of removal techniques used in the proposed action are expected to minimally impact surrounding native vegetation and soil. Monitoring conducted under the proposed action would enable an assessment of revegetation potential under different removal treatment scenarios at a small scale, and would inform planning for the RFAS.

4.3.3.8 Special Status Species

The proposed action is not expected to impact special status species and thus would not contribute to the effects on these species under the RFAS.

Comment [c2]: This may need further discussion, but waiting until the effects of the proposed action are complete.

4.3.3.9 Visual Resources

Visual resources would be cumulatively impacted by the proposed action and the RFAS. The spatial

extent of removal of non-native species would be increased. Revegetation is expected to mitigate these effects under the proposed action, and the success of revegetation techniques would be monitored and used to inform a mitigation plan under the RFAS.

4.3.3.10 Water Quality (drinking or ground)

There would probably be no cumulative impacts of the proposed action and the RFAS on water quality due to herbicide and drip torch fuel transport because these projects would occur years apart and because impacts are not expected to occur based on the proposed action.

4.3.3.11 Wild & Scenic Rivers

The proposed action and RFAS would have cumulative impacts on resources pertinent to Wild and Scenic River designation. Impacts to these resources are addressed in the sections pertinent to each.

4.3.3.12 Wilderness

The proposed action and RFAS would increase the spatial extent of areas modified by humans in the short term, but would collectively return the natural wilderness character in the long term.

4.3.3.13 Wildlife

The proposed action is not expected to impact special status species and thus would not contribute to the effects on these species under the RFAS.

5.0 CONSULTATION AND COORDINATION

5.1 Introduction

The issue identification section of Chapter 1 identifies those issues analyzed in detail in Chapter 4. The issues were identified through the public and agency involvement process described in sections 5.2 and 5.3 below.

5.2 Persons, Groups, and Agencies Consulted

Arizona Game and Fish Department, Region II, Flagstaff
Grand Canyon Trust
US Fish and Wildlife Service
Grand Canyon National Park

5.3 List of Preparers

BLM:

NAME	TITLE	RESPONSIBLE FOR THE FOLLOWING SECTION(S) OF THIS DOCUMENT
Tim Duck	Fuels Program Manager, Arizona Strip BLM	Project Lead, Proposed Action development
Gloria Benson	Native American Coordinator, Arizona Strip BLM	Native American Concerns
Tom Folks	Wilderness Team Lead, Arizona Strip BLM	Wilderness, Wild & Scenic Rivers, Recreation, Visual Resources
Laurie Ford	Lands & Realty Team Lead, Arizona Strip BLM	Lands & Realty
Michael Herder	Wildlife Team Lead, Arizona Strip BLM	Wildlife, Special Status Species
John Herron	Cultural Resource Specialist, Arizona Strip BLM	Cultural Resources
Lee Hughes	Ecologist, Arizona Strip BLM	Vegetation, Special Status Plants
Ray Klein	Park Ranger, Grand Canyon – Parashant National Monument	Law Enforcement
Linda Price	Vermilion Cliffs National Monument Manager, Arizona Strip BLM	National Monument
Bob Sandberg	Range Team Lead, Arizona Strip BLM	Range, Vegetation
Richard Spotts	Planning & Environmental Coordinator, Arizona Strip BLM	Planning & Environmental Coordination
Ron Wadsworth	Law Enforcement Ranger, Arizona Strip BLM	Law Enforcement
LD Walker	Noxious Weed Specialist, Arizona Strip BLM	Non-native Plants, Herbicide Application
David Kiel	Wilderness Specialist, Arizona Strip BLM	Recreation, Wilderness
Robert Smith	Watershed Coordinator, Arizona Strip BLM	Watershed, Hazardous Materials
Dennis Pope	, Kanab BLM	Range, Wildlife
Tom Christensen	, Kanab BLM	Planning & Environmental Coordination
Lisa Church	Wildlife Biologist, Kanab BLM	Wildlife

Non-BLM Preparers

NAME	TITLE	RESPONSIBLE FOR THE FOLLOWING SECTION(S) OF THIS DOCUMENT
Ethan Aumack	Grand Canyon Trust	Proposed Action
Christine Albano	Grand Canyon Trust	Proposed Action

APPENDIX A: Interdisciplinary Team Analysis Record Checklist

ASDO NEPA DOCUMENT ROUTING SHEET

NEPA Document Number: **AZ-120-2007-0021**

Project Title: **Paria/Buckskin Tamarisk and Russian Olive Eradication**

Project Lead: **Tim Duck**

Date that any scoping meeting was conducted:

Date that concurrent, electronic distribution for review was initiated: 6/29/07

Deadline for receipt of responses: 7/20/07

ID Team/Required Reviewers will be determined at scoping meeting or as a default the following:

Gloria Benson, Native American Coordinator
Tom Folks, Recreation/Wilderness/VRM
Laurie Ford, Lands/Realty/Minerals
Michael Herder, Wildlife/ T&E
John Herron, Cultural
Lee Hughes, Special Status Plants
Ray Klein, GCPNM Supervisory Ranger
Linda Price, S&G
Bob Sandberg, Range/Vegetation
Richard Spotts, Environmental Coordinator
Ron Wadsworth, Supervisory Law Enforcement
LD Walker, Weed Coordinator
Relevant Manager VCNM, and/or ASFO

Required Recipients of electronic distribution E-mails only (not reminders):

Andi Rogers (E-mail address: arogers@azgfd.gov)
Rick Miller (E-mail address: rmiller@azgfd.gov)
LeAnn Skrzynski (E-mail address: kptenv@color-country.net)

(Ms. Rogers and Mr. Miller are Arizona Game and Fish Department (AGFD) habitat specialists. Ms. Skrzynski is Environmental Program Director for the Kaibab Paiute Tribe (KPT). They may review and/or forward on ASDO NEPA documents to other employees. If a Project Lead receives comments from any AGFD employee on their draft NEPA document, they should include them in the complete set/administrative record and share them with Michael Herder as the ASDO Wildlife Team Lead. Mr. Herder will then recommend how these comments should be addressed. If a Project Lead receives comments from any KPT employee, they should include them in the complete set/administrative record and share them with Gloria Benson as the ASDO Native American Coordinator. Ms. Benson will then recommend how these comments should be addressed.)

Discretionary Reviewers:

(insert names and titles of any additional reviewers recommended by Project Lead, Manager(s), Environmental Coordinator, or from scoping meetings)

INTERDISCIPLINARY TEAM ANALYSIS RECORD CHECKLISTNEPA Document Number: **AZ-120-2007-0021**Project Title: **Paria/Buckskin Tamarisk and Russian Olive Eradication**Project Lead: **Tim Duck**

File/Serial Number: NA

DETERMINATION OF STAFF: (Choose one of the following abbreviated options for the left column)

NP = not present in the area impacted by the proposed or alternative actions

NI = present, but not affected to a degree that detailed analysis is required

PI = present with potential for significant impact analyzed in detail in the EA; or identified in a DNA as requiring further analysis NC = (DNAs only) actions and impacts not changed from those disclosed in the existing NEPA documents cited in Section C of the DNA form.

Determination	Resource	Rationale for Determination*	Signature	Date
CRITICAL ELEMENTS				
PI	Air Quality	Pile burning may affect Class I airshed and visitors		
NP	Areas of Critical Environmental Concern	There are no designated ACECs in the project area.		
PI	Cultural Resources	Surface disturbing activities have the potential to affect cultural resources		
NI	Environmental Justice	No disproportionately high or adverse health or environmental impacts would affect low income or minority populations as a result of implementation of the Proposed Action.		
NP	Farmlands (Prime or Unique)	Not present within wilderness area		
NI	Floodplains	Executive Order 11988, Floodplain Management, requires an examination of impact to floodplains. Executive Order 11988 requires all Federal agencies to avoid construction in the 100-year floodplain unless no other practical alternative exists. This project does not propose any construction, and there would be either no impacts or negligible impacts to floodplains. Therefore, this topic was eliminated.		
PI	Invasive, Non-native Species	Implementation of the Proposed Action would lessen the potential for the establishment or spread of invasive, non-native species.		
NP	Native American Religious Concerns	No Native American religious concerns have been identified.		

NP	Threatened, Endangered or Candidate Plant Species	No listed species in project area.		
NI	Threatened, Endangered or Candidate Animal Species	Species may be present but would not be affected		
Determination	Resource	Rationale for Determination*	Signature	Date
PI	Waste (hazardous or solid)	Use of herbicides and drip-torch fuel in wilderness		
PI	Water Quality (drinking/ground)	Use of herbicides and drip-torch fuel near aquatic systems. Burning piles below high water level		
PI	Wetlands/Riparian Zones	Proposed action is to treat riparian vegetation to remove non-natives plants		
PI	Wild and Scenic Rivers	The Paria is suitable for inclusion as a Wild and Scenic River.		
PI	Wilderness	Vermilion Cliffs – Paria River Wilderness Area		
OTHER RESOURCES / CONCERNS**				
NI	Rangeland Health Standards and Guidelines	Proposal would not preclude attainment of S&Gs, proposal is consistent with S&Gs		
NP	Livestock Grazing	No livestock grazing on the treatment unit		
NP	Woodland / Forestry	No forestry within the wilderness		
PI	Vegetation including Special Status Plant species other than FWS candidate or listed species	Project is to treat vegetation to eradicate non-natives		
NI	Fish and Wildlife Including Special Status Species other than FWS candidate or listed species	Migratory birds and other wildlife in the project area, although impacts anticipated to be negligible		
NI	Soils	Proposal to eradicate non-native vegetation could increase soil erosion in the short term		
PI	Recreation	Highly managed recreation area. Activities have the potential to disrupt visitation		
PI	Visual Resources	Removal of non-natives would affect visual qualities of area		
NP	Geology / Mineral Resources/Energy Production	Wilderness		

NP	Paleontology	No paleontological resource identified		
PI	Lands / Access	Wilderness		
NI	Fuels / Fire Management	Proposal to eradicate non-native vegetation would reduce hazardous fuels		
NP	Socio-economics	No impacts anticipated		
NP	Wild Horses and Burros	No wild horses or burros in treatment area		
NP	Wilderness characteristics	Area is currently designated wilderness (not WSA)		

FINAL REVIEW:

Reviewer Title	Signature	Date	Comments
NEPA / Environmental Coordinator			
Authorized Officer			

California Condor Conservation Measures
Applying to Actions Authorized, Funded or Carried Out
By the BLM Arizona Strip Field Office

Conservation measures are based on the following assumptions:

1. Condors may be found anywhere on the Arizona Strip.
 2. The experimental non-essential designation (10(j)) for California condors established the need for different conservation measures within the 10(j) area.
 3. In keeping with the intent of the Implementation Agreement for releasing California condors in Arizona, some conservation measures do not apply to the general public, including permit holders, within the 10(j) area. Conservation measures in Section A apply to projects implemented by authorized or permitted members of the public within the 10(j) area. Most of these are optional for the public.
 4. Conservation measures in Section B apply to projects constructed or implemented by BLM (employees of the Field Office or contractors) within the 10(j) area and to all projects, regardless of proponent, outside the 10(j) area on the Arizona Strip.
 5. All fire related activities, even if interagency, are conducted by BLM.
 6. Aviation related activities are limited here to those either conducted by or authorized by BLM. Private and commercial aviation operations not specifically authorized or permitted by BLM are not subject to these conservation measures.
-

Section A. Conservation Measures for Projects Constructed or Implemented
by Authorized or Permitted Members of the Public Within the 10(j) Area

CC1A. Immediately prior to the start of a permitted project, BLM will contact personnel monitoring California condor locations and movements on the Arizona Strip to determine the locations and status of condors in or near the project area.

CC2A. BLM will request that permit holders notify the BLM wildlife team lead or condor biologist if California condors visit the worksite while permitted activities are underway. BLM may request that project activities be modified, relocated, or delayed where adverse affects to condors may result. Compliance with such requests is optional.

CC3A. Where condor nesting activity is known within 0.5 miles of permitted or authorized activities that include operation of heavy machinery, BLM may request that the operator not use the equipment during the active nesting season (February 1- November 30) as long as the nest is viable. Compliance with such requests is optional.

CC4A. Where condors occur within 1.0 mile of permitted or authorized activities that include blasting, BLM may request that blasting be postponed until the condors leave the area or are hazed away by personnel permitted to haze condors. Where condor nesting activity is known within 1.0 mile of the project area, BLM will request blasting activity be delayed until after the active nesting season (February 1- November 30) as long as the nest is viable. These dates may be modified based on the most current information regarding condor nesting. Compliance with such requests is optional.

Section B. Conservation Measures for Projects Constructed or Implemented
by BLM Employees or Contractors Within the 10(j) Area

AND

For All BLM-Authorized Actions, Regardless of Proponent,
Outside the 10(j) Area on the Arizona Strip

CC1B. Immediately prior to the start of a permitted project, BLM will contact personnel monitoring California condor locations and movement on the Arizona Strip to determine the locations and status of condors in or near the project area.

CC2B. Where California condors visit a worksite while activities are underway, the on-site supervisor will notify the BLM wildlife team lead or condor biologist. Project workers and supervisors will be instructed to avoid interaction with condors. Project activities will be modified, relocated, or delayed if those activities could have adverse affects on condors. Operations will cease until the bird leaves on its own or until techniques are employed by permitted personnel which results in the individual condor leaving the area.

CC3B. Where condor nesting activity is known within 0.5 miles of activities that include

operation of heavy machinery, BLM will direct the operator to cease equipment use during the active nesting season (February 1- November 30) as long as the nest is viable. Where feasible and consistent with NEPA, BLM may relocate operations to a site greater than 0.5 miles from the condor nest site.

CC4B. Where condors occur within 1.0 miles of activities that include blasting, BLM will require that blasting be postponed until the condors leave the area or are hazed away by personnel permitted to haze condors. Where condor nesting activity is known within 1.0 miles of the project area, BLM would cease blasting during the active nesting season (February 1- November 30) as long as the nest is viable. These dates may be modified based on the most current information regarding condor nesting.

CC5B. The project site will be cleaned up at the end of each day the work is being conducted (e.g., trash removed, scrap materials picked up) to minimize the likelihood of condors visiting the site. BLM staff will conduct a site visit to the area to ensure adequate clean-up measures are taken.

CC6B. To prevent water contamination and potential poisoning of condors, a vehicle fluid-leakage and spill plan will be developed and implemented for each project. It will include provisions for immediate clean-up of any hazardous substance, and will define how each hazardous substance will be treated in case of leakage or spill. BLM will use the first plan that is developed for a specific project as a template for a fluid-leakage and spill plan that would apply to each construction project. The plan will be reviewed by the BLM condor lead biologist to ensure condors are adequately addressed.

CC7B. Use of non-lead ammunition is strongly encouraged for activities involving the discharge of firearms.

For any operations using aircraft:

CC7B. Aircraft use along the Vermilion Cliffs, Paria Plateau, or any sites where condors are actively breeding or roosting will be minimized to the extent possible. Known active nest sites will be avoided.

CC8B. The BLM condor biologist or Wildlife Program Lead will contact the Peregrine Fund, as appropriate, immediately before operations involving aviation begin to check on possible locations of condors in the subject area.

CC9B. All BLM-authorized aviation personnel will be provided literature and/or instructed regarding condor concerns prior to conducting aerial operations.

CC10B. Aircraft will maintain and maximize safe flying separation distances from condors in the air or on the ground unless safety concerns override this restriction. If airborne condors approach aircraft, aircraft will give up airspace to the extent possible, as long as this action does not jeopardize safety. Aircraft will keep a minimum of 0.25 miles away from condors located on the ground.

For herbicide or other pesticide application:

CC11B. BLM will implement the protective measures for California condors that are contained in the March 2004 "Recommended Protection Measures for Pesticide Applications in The Southwest Region of the U.S. Fish and Wildlife Service."

Conservation Measures For Fire Operations:

CC12B. The Resource Advisor will contact the Peregrine Fund daily (at 520-606-5155 or 520-380-4667) to check on locations of condors during fire suppression or fuels treatment activities involving aviation. This information will be communicated to the Incident Commander and aviation personnel.

CC13B. Any presence of condors in the general area of an active fire will be reported immediately to the Resource Advisor, who will in turn advise the BLM condor biologist, as appropriate. The BLM condor biologist or the AZ Strip F.O wildlife team lead will be the primary contacts with the U.S. Fish and Wildlife Service and the Peregrine Fund when such contacts are needed regarding condor concerns.

CC14B. Fire dispatch will immediately notify the Peregrine Fund at either (208) 362-3811 or (928) 355-2270 whenever a fire or other event on the Paria Plateau is reported which may conceivably threaten the condor holding pens and facilities atop the Vermilion Cliffs.

CC15B. If condors arrive at any area of human activity associated with fire suppression or fuels treatment projects (wildland fire use, prescribed fire, vegetation treatments), the birds will be avoided. The assigned Resource Advisor or a qualified wildlife biologist approved by BLM will be notified, and only permitted personnel will haze the birds from the area.

CC16B. All District BLM fire personnel, including helicopter pilots, will be provided literature or instructed regarding condor concerns. Normally this will be done by the BLM condor biologist when the fire crews first come on and are trained on various subjects, including desert tortoise concerns. If additional pilots come on during the summer, fire dispatch will notify the BLM condor biologist (435 688-3224) so that they can also be briefed.

CC17B. All helicopter dip tanks containing water will be covered when not in use or personnel will be stationed nearby until a cover is in place.

CC18B. If any fire retardant chemicals must be used in areas where condors are in the vicinity, the application area will be surveyed and any contaminated carcasses will be removed as soon as practical to prevent them from becoming condor food sources.

CC19B. Smoke from prescribed fire projects will be prevented from negatively affecting condor holding pens and breeding, nesting, and chick rearing sites. A proposed prescribed fire will not be initiated, or an existing fire use event will be modified or terminated, in order to prevent or stop significant amounts of smoke, or smoke that will remain in place for an extended period of time, or chronic smoke events, from occurring in area(s) where condors are held or attempting to breed, nest, or rear chicks.

CC20B. BLM will adhere to the air quality standards set by the Arizona Department of Environmental Quality.

CC21B. All camp areas will be kept free from trash.

SRP Stipulations for Hunting Guides

Use of non-lead ammunition is strongly encouraged for activities that involve use of firearms.

**FINDING OF NO SIGNIFICANT IMPACT
AND
DECISION RECORD**

**Environmental Assessment AZ-120-2007-0021
PARIA/BUCKSKIN TAMARISK AND RUSSIAN OLIVE ERADICATION
August 2007**

Vermilion Cliffs National Monument/Arizona Strip District

Bureau of Land Management
345 East Riverside Drive
St. George, Utah 84790
435-688-3200

Kanab Resource Area/Cedar City District

Bureau of Land Management
318 North First East
Kanab, Utah 84741

This unsigned FONSI and the attached EA-AZ-120-2007-0021 for the Paria/Buckskin Tamarisk and Russian Olive Eradication are available for public review and comment for 30 days ending on September 10, 2007.

The decision to approve or deny the Paria/Buckskin Tamarisk And Russian Olive Eradication, and if appropriate a signed FONSI with rationale, will be released after consideration of public comments and completion of the EA.

FONSI: Based on the analysis of potential environmental impacts contained in the attached environmental assessment (EA-AZ-120-2007-0021), I have determined that the proposed action will not have a significant effect on the human environment and an environmental impact statement is therefore not required.

DECISION: It is my decision to implement the Paria/Buckskin Tamarisk and Russian Olive Eradication, as described in the Proposed Action of EA-AZ-120-2007-0021, BLM would use contractors, volunteers, and/or agency personnel to cut tamarisk and Russian olive along a 20-mile stretch of the Paria River from the wilderness boundary in Utah to the confluence with Wrather Canyon in Arizona, and along a one mile section of Buckskin Gulch upstream from the confluence with the Paria River. One of the following methods would be used to remove tamarisk and Russian olive, depending on the age of individual stems, the density of stands, and the degree of intermingling with native vegetation.

Hand-pulling: Personnel could hand pull smaller shrubs and stems from the ground. Hand tools, including picks, pulaskis, and shovels may be used to loosen the soil surrounding the larger plants and then the entire root system would be removed.

Basal-bark: This treatment would primarily be used on immature trees under one year in age and up to 3m tall. BLM, volunteers, or private contractor employees, certified in herbicide application by the States of Utah and Arizona, would apply Garlon 3a (near water) or Garlon 4 (away from water on terraces) using hand-applicators to the base of the tree at manufacturer-recommended rates.

Cut-stump: This treatment would primarily be used on mature stems. Shrubs and trees along the banks and on the terraces would be cut or lopped at or near ground level and herbicide would be applied within a few minutes of cutting. Crews would use hand saws and loppers; no mechanized equipment such as chainsaws would be used. BLM, volunteers, or private contractor employees, certified in herbicide application by the States of Utah and Arizona, would apply Garlon 3a or Garlon 4 (depending on distance from the water) using hand-applicators to the cut stems at manufacturer-recommended rates.

Cut material would be scattered in those areas where only small amounts of material were treated. In areas of heavier concentrations, cut material would be cut into smaller pieces to facilitate handling. The cut material would be piled along the banks of the Paria River (above high water mark). The piles would be moved to below the high water mark immediately prior to burning, and burned in accordance with an approved pile burn plan. Piles would be kept small, less than ten feet in diameter and less than four feet tall.

Piled material would be allowed to cure as necessary to allow consumption by burning. Piles would be ignited using handheld devices such as drip torches. Piles would be allowed to burn out, and then mopped up. Residual vegetation would be scattered or re-piled and burned as necessary. It is anticipated that piles would be burned within one month after the material was cut, although they could remain in place for up to six months. Piles would be burned as soon as practical to reduce the availability of firewood for visitors, and to minimize the likelihood of flooding sweeping the piles downstream.

Crews would hike in carrying camping gear, supplies, and tools. Crew size would be restricted to ten in accordance with party size restrictions for the public. Crews would camp at existing sites in the canyon, remaining for one to six nights. Project personnel would conduct all activities in accordance with existing wilderness area policies, utilizing a *Leave No Trace* approach.

Treatment activities would be scheduled for early spring and late fall to avoid peak visitor use. However, because of the time required for the cut tamarisk to cure, burning of cut vegetation would likely take place during peak spring visitation. Visitor permits could be reduced by the number of project personnel in accordance with visitor use limits established for the area. The project is anticipated to begin in the fall of 2007. Removals would occur intermittently over a period of up to five years. Crews would enter the area as needed over the next ten years to re-treat tamarisk and Russian olive that were missed during the initial treatment, or where resprouting occurs. Monitoring would occur in the fall, throughout the duration of the project.

Prior to implementation, the area to be treated would be inventoried for cultural and biological resources by qualified individuals. Areas containing cultural resources eligible for inclusion on the National Register would be avoided.

Prior to implementation, BLM would apply for herbicide use permits from the states of Utah and Arizona. Personnel would comply with all of the terms and conditions of the permits.

Prior to implementation of burning, BLM would apply for smoke permits from the states of Utah and Arizona. Personnel would comply with all of the terms and conditions of the permits.

BLM would develop an information/education program that would include signs at the trailheads and brochures/handouts to be included in permit packages for registered visitors.

Information on the project would be presented on the BLM website with clear language explaining the tamarisk removal project, why it is occurring, and when it would be conducted. No permits would be issued without the participants having full knowledge of what to expect in the Paria Canyon and/or Buckskin Gulch.

Staff at the Paria Contact Station, the Kanab Field Office, and the Grand Staircase-Escalante National Monument Visitor Center would be briefed on the project specifics and be given educational handouts to dispense to the general public.

Project personnel would receive a briefing on the goals and objectives of the treatment, to include information on sensitive cultural and biological resources in the area. The briefing would include information on employee and visitor safety.

Treatment areas would be monitored on a yearly basis to evaluate the success of removal treatments, and for colonization of native and non-native vegetation. This would be done primarily through the use of pre-established photo-monitoring plots and transects distributed throughout the study area. Re-sprouts of treated tamarisk would be re-treated, and newly colonized non-native species would be removed. Monitoring would occur for a minimum of 15 years, but would likely continue beyond that time frame.

I have determined that authorizing this treatment is in the public interest. This decision is contingent upon meeting all stipulations and monitoring requirements listed below.

Stipulations: Only use handtools (shovels, pulaskis, rakes, handsaws, loppers) to treat the units.

Application of herbicide will be conducted in accordance with an approved Pesticide Use Proposal Permit.

All burn activities will be conducted in accordance with an approved burn plan. No burning will occur without a smoke permit from the Arizona Department of Environmental Quality or the Utah Department of Environmental Quality (as appropriate).

Monitoring: BLM will implement pre-project herbaceous vegetation monitoring to establish baseline grass/forb conditions and post-burn monitoring to evaluate treatment effectiveness (objectives). BLM will monitor the treatment unit for the presence of non-native, invasive noxious weeds. BLM would conduct post-treatment monitoring of treatment effects.

Comment [DK1]: What does this mean? I think we need to be more specific. Can I conduct this monitoring during annual recreational impact monitoring trips each fall? Or does it require a subject matter expert?

RATIONALE: The decision to authorize the treatment has been made in consideration of the environmental impacts of the proposed action. The action is in conformance with the Arizona Strip Resource Management Plan and Kanab Management Framework Plan.

It also is consistent with the Paria Wilderness Management Plan. The proposal is not inconsistent with the Proclamation for the Vermilion Cliffs National Monument (2000), which is silent on the issue of prescribed burning, but does direct the BLM and NPS to manage the Monument to protect Monument objects.

The No Action Alternative was not selected because it would not protect National Monument objects, wilderness character, and important ecological and social resources.

Potential adverse impacts on wilderness character (solitude and naturalness) were resolved through mitigation and monitoring stipulations (above). Concerns regarding wildlife habitat were addressed in the project design and through mitigation stipulations. This NEPA action was posted on the Arizona BLM website and the Utah Environmental Notification Bulletin Board, and a Notice of Availability was sent out for a 30-day public comment/review period.

Rex Smart

Date

Manager
Kanab Field Office

DRAFT

Linda Price

Date

DRAFT

Manager
Vermilion Cliffs National Monument

DRAFT

DRAFT

