National Park Service
U.S. Department of the Interior

Arches National Park
Utah

FINDING OF NO SIGNIFICANT IMPACT
Salt Wash Rehabilitation Project

Recommended:

Kate Cannon 12/12/17

Katé Cannon
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Date

Approved:

ACTING 12/21/17

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Date

INTRODUCTION

In compliance with the National Environmental Policy Act (NEPA), the National Park Service (NPS) prepared an Environmental Assessment (EA) to examine the environmental impacts associated with the proposed project to rehabilitate Salt Wash, Salt Valley Wash, and Winter Camp Wash in Arches National Park. The project is needed to reduce the flooding, sediment deposition, and closure of the Wolfe Ranch/Delicate Arch Viewpoint road by improving the conveyance of water and sediment in the three washes.

The statements and conclusions reached in this finding of no significant impact (FONSI) are based on documentation and analysis provided in the EA and associated decision file. To the extent necessary, relevant sections of the EA are incorporated by reference below.

SELECTED ALTERNATIVE AND RATIONALE FOR THE DECISION

Based on the analysis presented in the EA, NPS selected Alternative 2 – Reduction of Flooding and Road Closures through Wash Excavation (the NPS preferred alternative).

The selected alternative will improve the conveyance of water and sediment through Salt Wash, Salt Valley Wash, and Winter Camp Wash through the removal of tamarisk (*Tamarix chinensis*), mechanical excavation of the wash channels, and the exposure of buried culverts. Up to 115 acres of tamarisk (both above and belowground biomass) will be removed using an excavator with a grapple attachment. Wash channels will be scooped out with an excavator and re-contoured to establish a sufficient gradient to support flow velocities that will carry water and sediment downstream. Culverts will be flushed out using a water truck with a hose attachment. Sediment removed from the wash channels and buried culverts will be deposited on site in areas pre-selected and cleared by cultural and natural resource staff. These deposits will have short-term silt-fencing installed around the edges and/or erosion mats or soil stabilization polymers applied to limit erosion, and will be seeded with a native plant mix appropriate for the area. Tamarisk shrubs, once removed, will be chipped on-site (but outside recommended wilderness) and the chippings will be hauled out of the park to a landfill. Areas disturbed by tamarisk removal, channel contouring, and sediment deposition will be regularly treated by exotic plant management teams to ensure the efficacy of exotic vegetation removal and the successful establishment of native vegetation communities. In addition, the project will implement a number of resource protection measures to minimize the degree and/or severity of adverse effects on air quality; cultural resources; soundscapes; vegetation and soils; visitor use and experience and public health and safety; and water quality.

RATIONALE

Alternative 2 was selected because it best meets the project purpose to:

- Reduce the flooding, sediment deposition and closure of the Wolfe Ranch/Delicate Arch Viewpoint road.
- Improve the conveyance of water and sediment through Salt Wash, Salt Valley Wash, and Winter Camp Wash.

MITIGATION MEASURES

Refer to Appendix A for a complete list of all mitigation measures that will be implemented for the selected alternative.

PUBLIC INVOLVEMENT/AGENCY CONSULTATION

The EA was available for public review and comment during a 30-day period, from October 17, 2017 through November 16, 2017. Nine public comment letters were received. Substantive comments centered on the purpose and need, impacts to wetlands, native vegetation, and wildlife, proposed new alternatives not considered in the EA, or suggested new mitigations to consider. Substantive comments are addressed in the Errata and Response to Public Comments.

In accordance with §106 of the National Historic Preservation Act the NPS initiated consultation with the Utah State Historic Preservation Office (UT SHPO) and traditionally associated tribes on May 12, 2017. Of the nine tribes contacted, the Hopi Tribe and the Navajo Nation responded to the initiation of consultation with the following comments.

- Hopi Tribe: The Hopi Cultural Preservation Office (HCPO) requested copies of the draft EA, cultural resources inventory report, and any proposed treatment plans for prehistoric cultural sites that will be adversely affected by project activities for review and comment. The HCPO further added that if any cultural features or deposits are encountered during project activities, these activities must be discontinued in the immediate area of the remains, and the SHPO must be consulted to evaluate their nature and significance, and if any Native American human remains or funerary objects are discovered during construction they shall be immediately reported as required by law.

- Navajo Nation: The Navajo Nation Heritage and Historic Preservation Department (NNHHPD) supported the project description to remove non-native species and restore the hydraulic patterns and sediment transport in order to protect park resources, like the Salt Wash and associated drainage channel's natural flow of storm-water runoff and sediment deposition. The NNHHPD requested to be notified in accordance with 36 CFR 800 as a consulting party and per the Native American Graves Protection and Repatriation Act if the proposed project inadvertently discovers Traditional Cultural Properties such as habitation sites, plant gathering areas, human remains or objects of cultural patrimony

On October 23, 2017, the NPS provided UT SHPO and traditionally associated tribes with a copy of the EA and cultural resources inventory report seeking a "no adverse effect" determination on historic properties for the actions proposed under the selected alternative.

Concurrence with the agency's determination of effect was received from the UT SHPO in a letter dated November 8, 2017 (Case No. M17-1766), from the Hopi Tribe in a letter from the HCPO dated October 31, 2017, and from the Southern Ute Indian Tribe in a letter submitted via email from the Southern Ute Cultural Department (SUCD) dated November 22, 2017. The SUCD further expressed concern that once the road is improved and the flooding has been reduced, visitor traffic may increase and possibly damage a nearby petroglyph panel and Delicate Arch, which are of cultural significance. No other responses or comments were received from traditionally associated tribes.

FINDING OF NO SIGNIFICANT IMPACT

CEQ regulations at 40 CFR Section 1508.27 identify ten criteria for determining whether the Selected Action will have a significant effect on the human environment. The NPS reviewed each of these criteria given the environmental impacts described in the EA and determined there will be no significant direct, indirect, or cumulative impacts under any of the criteria.

The following impacts were dismissed in the EA because they were found to have no potential for significant adverse impacts: air quality, aquatic species, biological soil crusts, cultural resources, environmental justice, Indian Trust Resources and sacred sites, migratory bird species, threatened and endangered species, wetlands, and wildlife and wildlife habitat.

As described in the EA, the selected alternative has the potential for beneficial or adverse impacts on hydrologic and geomorphologic processes and floodplains, vegetation, visitor experience, and wilderness; however, no potential for significant adverse impacts was identified.

Hydrologic and geomorphologic processes and floodplains will be beneficially impacted by the selected alternative by improving the natural flow of water and sediment through establishment of a sufficient downstream gradient, using mechanical excavation. Additionally, there will be beneficial impacts from improving the conveyance of water and sediment under the road, preserving floodplain values and decreasing potential flooding hazards, and by removing the cover of tamarisk and the sediment trapped by tamarisk shrubs, allowing a wider channel to develop. Salt Valley Wash, Salt Wash, and Winter Camp Wash will have sediment removed from 2,200 linear feet, 4,900 linear feet, and 2,250 linear feet down gradient along the wash channels, respectively. Re-channelized wash cross sections will be 30 to 90 feet wide and between one and three feet deep. How long the beneficial impacts will last is unknown, but a monitoring program will be established and monitoring data will help the Park determine whether hydrologic processes are moving toward or away from the desired conditions.

The selected alternative will directly and adversely impact up to 7% of the native riparian shrub and herbaceous vegetation cover and up to 2.2% of the greasewood and <1% saltbush shrubland cover in Arches. However, the majority of impacts will be to native plant species with extensive rhizomatous root systems (such as common reed, coyote willow, and desert saltgrass); these impacts will be short-term, as rhizomatous plants will rebound quickly from disturbance as long as some roots and stems or parts of stands are left intact. Other native species may not rebound as easily; therefore, mitigations will be imposed to minimize impacts to native plants by defining access routes and temporarily fencing or flagging pockets of native plants for machinery to avoid. Therefore, it is anticipated that much less than 7% of the total cover of native riparian shrub and herbaceous vegetation in the Park will be adversely impacted over the long term. The selected alternative will additionally result in up to 115 acres of permanent adverse impacts to non-native vegetation, specifically tamarisk, in the form of complete removal of above and belowground biomass. This represents 36% of the total acreage of tamarisk mapped in the Park. This will have beneficial impacts to native vegetation, hydrologic processes, wildlife habitat, and the natural quality of wilderness. Soil disturbances from construction activities and movement of wash sediment to deposit sites may favor the establishment of non-native species adapted to disturbances. Mitigation measures listed in Appendix A will be implemented to ensure the efficacy of the exotic vegetation removal and the successful establishment of native vegetation communities.

Visitor experience will be directly, adversely impacted by the sights and sounds of construction activities, but these impacts will be localized to the Delicate Arch parking area and some areas along the trail. Construction activities will occur in the winter, in part, to coincide with the period of lowest park visitation. Adverse impacts will last only the duration of construction activities, to occur over two to three winters (three to six months of work each winter). There will be long-term beneficial impacts to visitor experience due to decreased flooding-induced road closures and visitor strandings expected as a result of project activities, and from improving the reliability of access to Delicate Arch Viewpoint, the only ADA-accessible viewpoint of Delicate Arch. Mitigation measures listed in Appendix A will be implemented to minimize the adverse impacts to visitor experience resulting from the selected alternative.

Three of the five qualities of wilderness will be adversely impacted by the selected alternative (*untrammeled, undeveloped,* and *opportunities for solitude or primitive and unconfined recreation*). The sights and sounds of construction activities will degrade the *opportunities for solitude or primitive and unconfined recreation* quality of wilderness. These impacts will cease upon the completion of project activities. Manipulation of the wash channels and removal of tamarisk by mechanical excavation will temporarily degrade the *untrammeled* quality of wilderness, until the traces of project activities have been obscured by the natural processes of water and sediment transport and the revegetation of the project area. The use of motorized machinery is a prohibited use in wilderness and will adversely impact the *undeveloped* quality of wilderness. These impacts will cease upon the completion of project activities. NPS Management Policies 2006 (section 6.3.5 Minimum Requirement) provide additional guidance on Section 4(c) of the Wilderness Act by stating that "only those actions that preserve wilderness character and/or have localized, short-term adverse impacts will be acceptable" and "administrative use of motorized equipment or mechanical transport will be authorized only if determined by the superintendent to be the minimum requirement needed by management to achieve the purposes of the area, including the preservation of wilderness character and values, in accordance with the Wilderness Act." Per this guidance, the NPS completed a Minimum Requirements Decision Guide (MRDG), analysis. The described use of motorized equipment, including all mitigation actions intended to avoid significant resource impacts or conflicts with visitor use, has been determined to be the minimum tool necessary to achieve restoration of the natural hydrologic and geomorphologic processes of the three washes. Based on the analysis in the MRDG, it is necessary to take action in wilderness to preserve the *natural* quality of wilderness. The *natural* quality of wilderness will be beneficially impacted by the selected alternative through the removal of up to 115 acres of an invasive, non-native plant species and the reestablishment of natural hydrologic processes. Utilization of less obtrusive and non-prohibited tools, will not achieve the desired restoration of the *natural* quality of wilderness. There will be minimal impacts to the *other features of value* quality of wilderness, as cultural resources in the area will be avoided where known to occur and through implementing the mitigation measures for cultural resources listed in Appendix A.

The project will not result in the loss or destruction of significant scientific, cultural, or historical resources, nor any significant impacts on public health, public safety, or unique characteristics of the region. No highly uncertain or controversial impacts, unique or unknown risks, significant cumulative effects, or elements of precedence were identified. Implementation of the NPS selected alternative will not adversely affect any threatened or endangered species or violate any federal, state, or local environmental protection law.

CONCLUSION

As described above, the selected alternative does not constitute an action meeting the criteria that normally requires preparation of an environmental impact statement (EIS). The selected alternative will not have a significant effect on the human environment in accordance with Section 102(2)(c) of NEPA.

Based on the foregoing, it has been determined that an EIS is not required for this project and, thus, will not be prepared.

APPENDIX A: MITIGATION MEASURES

The following mitigation measures will minimize the degree and/or extent of adverse impacts and will be implemented during the project.

AIR QUALITY

- **Fugitive dust generated by construction activities on roadways will be controlled by spraying water on the roads, if necessary.**
- **Inspection will be used to confirm equipment has properly functioning mufflers.**

CULTURAL RESOURCES

- **All project personnel will be informed of the procedures to follow in the event of post-review and inadvertent discoveries, as well as the penalties for intentionally damaging historic properties or illegally collecting archeological resources.**
- **Procedures will be established for notifying and updating the archeological monitor on the schedule of ground disturbing activities.**
- **Project personnel will coordinate with the archeological monitor to develop and implement resource protection procedures, including installation of temporary barriers. The archeological monitor will be present during installation of temporary barriers and will periodically inspect to ensure that barriers are effective and that resources are not being impacted.**
- **Archeological monitoring through periodic and regular inspections by a professionally qualified archeologist will be conducted during all ground disturbing activities within the project area.**
- **If any previously unidentified cultural resources are discovered during construction activities, the procedures outlined in the Archeological Monitoring and Inadvertent Discovery Plan (Baker 2017) prepared for this undertaking will be followed.**

SOUNDSCAPES

- **To reduce noise, chippers and grapple models with low noise ratings or noise dampening treatments will be selected and all efforts will be made to use chippers and grapple models with lower maximum noise levels.**
- **To reduce noise (and visual) impacts at sensitive visitor or wildlife locations, chipping operations will be timed to lessen impacts as much as possible (using available data to optimize days of the week, times of day, and continuous vs. non-continuous chipping operations).**
- **To minimize sights and sounds of project activities on visitors within wilderness, wood chipping activities will be located out of view from the Delicate Arch trail, as determined by the Viewshed Analysis (see Appendix A in the EA).**
- **Reduced power operation, equipment models known to produce lower noise levels, and equipment of only the necessary size and power to do the job effectively (not oversized) will be used.**
- **Operation that minimizes the need for rearward motion and operating backup alarms will be used.**

- Quieter backup alarms that meet regulatory requirements, e.g. manually adjustable, ambient-sensitive, or broadband alarms will be used; or no alarm if an observer directs the vehicle's rearward motion (Reid et al. 2013).

VEGETATION AND SOILS

- Repeated post-treatment of exotic vegetation species to ensure efficacy of exotic vegetation removal. Methods may include the use of loppers, hand saws, chain saws, and National Park Service approved herbicides. All exotic vegetation treatments would be covered by the Park's existing *Exotic Plant Management Plan* (NPS 2009).
- Restoration actions at sediment deposit sites to mitigate soil erosion and establish native perennial vegetation, such as the application of soil stabilization products (i.e. silt fencing, erosion mats, and/or soil stabilization polymers) and planting of native seeds.
- Vehicles and tools must be cleaned thoroughly before entering the Park to avoid the possibility of bringing exotic plant seed or material into the park.
- Loads of tamarisk debris or wood chips will be covered when leaving the project area, in order to minimize spread of windblown seeds from noxious weeds known to occur in the project area.
- Access routes to tamarisk removal and sediment deposition sites will be chosen and flagged to minimize impacts to native species and soils and confine construction activities as much as possible.
- On-site monitoring by a professionally qualified environmental monitor will be conducted during key phases of construction activities (including the onsets of tamarisk removal, when re-channelization is proceeding downstream, and the onsets of sediment deposition) to help minimize impacts to natural resources and deal with unforeseen situations. This work may include flagging areas or patches of native vegetation to avoid, marking access routes, and salvaging native plants for revegetation efforts.
- The chipping area will be raked clean of all chips and other plant debris and will be treated by exotic vegetation management teams post-construction activities.

VISITOR USE AND EXPERIENCE, PUBLIC HEALTH AND SAFETY

- Signs, alerts, press releases, and notifications will be issued to inform visitors prior to and throughout the duration of construction activities.
- Construction zones will be identified (i.e. flagging, fencing, etc.) to prevent visitors from entering unknowingly.
- Construction materials staging will be restricted to areas that will neither impede vehicle traffic of visitors, contractors, or park staff.

WATER QUALITY

- To minimize possible petrochemical leaks from construction equipment, the contractor would have a spill plan, regularly monitor and check construction equipment to identify, and repair any leaks.
- A fuel/lubricant spill absorption kit will be in place to address potential land and water spills and leaks.

- All fueling and oil servicing will be done in designated staging areas, at least 100 feet from a wash, and best management practices will be implemented to ensure no pollutants enter the washes.
- Sediment removal from the wash channels will involve the clean excavation method of scooping sediment out of the wash channels to minimize sediment discharge and erosion.
- Standard erosion control measures will be used such as silt fences, sand bags, wattles, and/or soil contouring to minimize any potential soil erosion and minimize debris accumulation in the washes.

WILDLIFE (INCLUDING NESTING RAPTORS AND MIGRATORY BIRDS)

- Time-of-year restrictions will be imposed from April 1 to August 31 for federally and state-listed, and migratory birds.
- Time-of-year restrictions will be imposed from January 1 to August 31 for nesting raptors only within the project area that is a half mile from the located nest (see Figure 10 in the EA).
- Systematic surveys will be conducted by resource management staff for nesting migratory bird species.
- A professionally qualified wildlife monitor will be required for all channel excavation work that will occur in perennial reaches of Salt Wash and/or will result in the destruction of a beaver dam to minimize adverse impacts to beavers and other wildlife.

ERRATA AND RESPONSE TO PUBLIC COMMENTS
Salt Wash Rehabilitation Project
Environmental Assessment

Arches National Park
November 2017

The following Errata and response to public comments together with the Findings of No Significant Impact (FONSI) and the Environmental Assessment (EA) describe the final decision of the National Park Service for the Salt Wash Rehabilitation Project.

ERRATA

These Errata are to be attached to the Salt Wash Rehabilitation Project EA dated October 2017 and are intended to correct or clarify statements in the EA other than typographical and minor editorial errors and to address substantive comments on these documents received during the public review period.

Project Summary
Page i, paragraph 3, line 4 – text here and throughout the EA (23 instances) has been changed from "geologic" to "geomorphologic" to correct a misuse of the word.

Chapter 1: Issues and Impact Topics Retained for Detailed Analysis
Page 8, paragraph 2, lines 4-6 – text has been revised
Current text
"The proposed action has the potential to restore hydrologic and geomorphological processes and affect non-native wetland vegetation."
Revised text
"The proposed action has the potential to restore hydrologic and geomorphological processes and affect native and non-native vegetation."

Chapter 1: Issues Dismissed from Detailed Analysis
Page 11, paragraph 2, lines 11-12 – text has been revised
Current text
"Identification of cultural resources and assessment of project effects is required by the provisions contained within the NHPA and the National Park Service is currently consulting with the Utah State Historic Preservation Office (SHPO) and associated American Indian Tribes."
Revised text
"Identification of cultural resources and assessment of project effects is required by the provisions contained within the NHPA and the National Park Service has consulted with the Utah State Historic Preservation Office (SHPO) and traditionally associated Native American tribes."

Page 11, paragraph 4 – text has been revised
Current text
"Additional cultural resources survey is ongoing at other project areas as those areas are identified for project staging, sediment deposition and contouring, or any other type of activity having the potential to impact properties eligible for listing on the National Register. Any

cultural resources identified will be documented and evaluated for historical and/or traditional religious and cultural significance in consultation with the Utah SHPO and associated American Indian Tribes. Any effects to identified properties will be avoided through modification of project activities or the inclusion of conditions to avoid such effects. No additional cultural resources survey was conducted in the greater area of the Salt Wash, Salt Valley Wash, and Winter Camp Wash drainage channels where tamarisk removal is proposed. The density of tamarisk in these areas precludes effective inventory methodology by restricting pedestrian access and ground surface visibility. Furthermore, the potential for undisturbed cultural material to occur within this area of active floodplain is low, although redeposited material may be present. To avoid or minimize effects to previously undocumented cultural resources, mitigation measures will include archeological monitoring during ground disturbing activities within the Salt Wash, Salt Valley Wash, and Winter Camp Wash drainage channels. The proposed action is, therefore, not expected to adversely affect archeological resources within the project area. Consultation with the Utah SHPO and associate American Indian Tribes concerning the adequacy of identification efforts and mitigation measures for this resource is ongoing."

Revised text

"Additional cultural resources inventory was completed for the area of potential effects (APE) (Baker and Knudson 2017) as those areas were identified for project staging, sediment deposition and contouring, or any other type of activity having the potential to impact properties eligible for listing on the National Register. Cultural resources identified in the APE were documented and evaluated for historical and/or traditional religious and cultural significance in consultation with the Utah SHPO and associated Native American tribes. Any effects to identified properties will be avoided through modification of project activities or the inclusion of conditions to avoid such effects. The potential for undisturbed cultural material to occur within this area of active floodplain is low, although redeposited material may be present. To avoid or minimize effects to previously undocumented cultural resources, mitigation measures will include archeological monitoring during ground disturbing activities within the Salt Wash, Salt Valley Wash, and Winter Camp Wash drainage channels in accordance with the Archeological Monitoring and Inadvertent Discovery Plan prepared for this undertaking (Baker 2017). The proposed action is, therefore, not expected to adversely affect archeological resources within the project area."

Page 12, paragraph 2 – text has been revised

Current text

"The proposed action is expected to have little to no impact on ethnographic resources. The presence of ethnographically significant plants has been identified within the project area (Stoffle et al. 2016), which may be immediately disturbed by the proposed action, but will experience a long-term beneficial effect by reestablishing conditions conducive to native vegetation populations."

Revised text

"The proposed action is expected to have little to no impact on ethnographic resources. The presence of ethnographically significant plant and mineral resources and culturally important viewscapes have been identified within the project area (Stoffle et al. 2016), which may be immediately disturbed by the proposed action, but will experience a long-term beneficial effect by reestablishing conditions conducive to natural processes and native vegetation populations."

Page 12, paragraph 3 – text has been revised

Current text

"Consultation with the associated American Indian Tribes concerning the degree of potential impacts and mitigation measures for this resource is ongoing."
Revised text
"Consultation with the Utah SHPO and traditionally associated Native American tribes concerning the degree of potential impacts and mitigation measures for this undertaking resulted in concurrence with the agency's determination of 'No Adverse Effect" and the adequacy of mitigation measures to avoid, minimize, or mitigate impacts to known and previously unidentified cultural resources."

Page 12, paragraph 4 – deleted text that read: "If new information about ethnographic resources, Tribal concerns, or other subsequent issues is identified as a result of this consultation, the NPS may reconsider this determination."

Page 13, paragraph 1 – text has been revised
Current text
"The proposed action is expected to have no impact on Indian trust resources and Indian sacred sites. There are no Indian Trust resources located in the project area, and the lands comprising the national park are not held in trust by the Secretary of the Interior for the benefit of Indians due to their status as Indians. The agency has not been informed of the existence of any Indian sacred sites in the project area. Consultation with traditionally associated Tribes to determine the presence of such sites is ongoing. If new information about Indian sacred sites, Tribal concerns, or other subsequent issues are identified as a result of this consultation, the NPS may reconsider this determination."
Revised text
"The proposed action is expected to have no impact on Indian trust resources and Indian sacred sites. There are no Indian Trust resources located in the project area, and the lands comprising the national park are not held in trust by the Secretary of the Interior for the benefit of Indians due to their status as Indians. Consultation with traditionally associated Tribes provided no further information on the existence of any Indian sacred sites in the project area."

Pages 14-15: NATIVE VEGETATION - combined Native Vegetation as an impact topic dismissed with Non-native Vegetation as an impact topic retained for detailed analysis because of issues encountered with splitting out the two types of vegetation when analyzing impacts. Impact analyses for Native Vegetation were moved and combined with those for Non-native Vegetation, which already included some impact analyses (including cumulative impacts) for native vegetation. All text from Chapter 1, pages 14-15, under Native Vegetation has been moved to Chapter 3, pages 33-37, under Vegetation, as detailed below:

Page 14, paragraph 1 – text has been moved to page 35 above paragraph 2 (new paragraph 1) (second paragraph under Vegetation – Affected Environment)
Page 14, paragraph 2, lines 1-4 – the following text has been deleted because it was redundant with text already in the combined Vegetation section (pages 34-38): "The 2009 vegetation map of Arches (Coles et al. 2009) classifies 115 acres of the 160 total project area acres as tamarisk-dominated. Twenty-five acres are mapped as greasewood shrublands, 14 acres as non-native, annual herbaceous vegetation, and the remaining 6 acres as saltbush shrublands."
Page 14, paragraph 2, lines 4-5 – text has been moved to page 36 (new page 37), under Vegetation – Alternative 2 – Proposed Action, new paragraph 1, lines 1-2 and the following prepositional phrase has been added: "Under alternative 2,."
Page 14, paragraph 2, lines 5-16 – text has been moved to page 36 (new page 37), under Vegetation – Alternative 2 – Proposed Action, new paragraph 1, lines 6-23 and revised:

Current text
"As a percentage of park native vegetation community cover, project activities have the potential to directly or indirectly, adversely impact up to 2.2% of greasewood shrublands in the Park and <1% of saltbush shrublands in the Park. Additionally, small patches of mesic, native vegetation are mosaicked with tamarisk shrublands as narrow bands adjacent to perennial water courses. Up to 12 acres of the 115 acres mapped as tamarisk may be dominated by coyote willow, common reed, Baltic rush, softstem bulrush, cattails, saltgrass, and/or alkali muhly. Channel contouring and tamarisk removal have the potential to directly and adversely impact up to 7% of the native, riparian shrub and herbaceous vegetation cover in the Park. The impacts to many of the native species with extensive rhizomatous root systems (such common reed, coyote willow, and desert saltgrass) would be short-term, as they will rebound quickly from disturbance as long as parts of stands are left undisturbed and some roots and stems are left intact."
Revised text
"As a percentage of park native vegetation community cover, project activities have the potential to directly or indirectly, adversely impact up to 2.2% of greasewood shrublands in the Park and <1% of saltbush shrublands in the Park. Additionally, small patches of mesic, native vegetation are mosaicked with tamarisk shrublands as narrow bands adjacent to perennial water courses. Up to 12 acres of the 115 acres mapped as tamarisk may be dominated by coyote willow, common reed, Baltic rush, softstem bulrush, cattails, saltgrass, and/or alkali muhly. Channel contouring and tamarisk removal have the potential to directly and adversely impact up to 7% of the native, riparian shrub and herbaceous vegetation cover in the Park. However, the majority of impacts would be to native plant species with extensive rhizomatous root systems (such common reed, coyote willow, and desert saltgrass); these impacts would be short-term, as rhizomatous plants will rebound quickly from disturbance as long as parts of stands are left undisturbed and some roots and stems are left intact. Other native plant species may not rebound as easily; therefore, mitigations would be imposed to minimize impacts to native plants by defining access routes and temporarily fencing or flagging pockets of native plants for machinery to avoid. Therefore, it is anticipated that much fewer than 7% of the total cover of native riparian shrub and herbaceous vegetation in the Park would be adversely impacted over the long term."
Page 14, paragraph 2, lines 16-20 – text has been moved to page 37, after paragraph 2 as a new paragraph 4 under Vegetation – Alternative 2 – Proposed Action
Page 14, paragraph 3, lines 1-2 – text has been moved to page 37, after paragraph 1, as new paragraph 3, lines 1-2, under Vegetation – Alternative 2 – Proposed Action
Page 14, paragraph 3, lines 2-6 – the following text has been moved to page 37, paragraph 2, as new paragraph 3, line 6, replacing the current text:
Current text
"Sand-loving native species such as dropseed (*Sporobolus* sp.), sand sage (*Artemisia filifolia*) and four-wing saltbush (*Atriplex canescens*) could benefit from the addition of the sediment to the deposit sites."
Revised text
"Strategically depositing sediment over weedy sites could benefit native vegetation by burying the existing exotics and providing a favorable substrate for sand-loving native plants such as sand sage (*Artemisia filifolia*), sand dropseed (*Sporobolus cryptandrus*), ricegrass (*Achnatherum hymenoides*), globemallow (*Sphaeralcea* sp.) and evening primrose (*Oenothera* sp.)."
Page 15, paragraph 1, lines 2-5 – text has been deleted because it was redundant
Page 15, paragraph 2, lines 1-4 – text has been moved to page 37, after paragraph 2 as a new paragraph 4 under Vegetation – Alternative 2 – Proposed Action

Page 15, paragraph 2, lines 4-7 – the following text has been deleted because it was redundant with text already in the combined Vegetation section (pages 33-37) and the dismissal language no longer applied: : "Impacts to individual native plants would occur in the short term, but overall native plant populations would benefit over the long term from the proposed project. For these above reasons, native vegetation has been dismissed from detailed analysis."

Chapter 2: Alternative 2

Page 22 (new page 20), paragraph 3 – text has been revised

Current text

"Sediment deposit sites would include erosion control mitigations, such as silt fencing. Silt fencing would be used to minimize aeolian (wind driven) erosion and help stabilize sediment so new vegetation can establish. Silt fencing, or any other erosion control methods, would not be permanent installations in wilderness, and would be removed once vegetation is established or by the end of the five year project."

Revised text

"Sediment deposit sites would include erosion control mitigations, such as silt fencing, erosion mats, and/or soil stabilization polymers. These measures would be used to minimize aeolian (wind driven) erosion and help stabilize sediment so new vegetation can establish. Silt fencing and/or erosion mats would not be permanent installations in wilderness, and would be removed once vegetation is established or by the end of the five year project."

Chapter 2: Alternatives and Alternative Elements Considered but Dismissed

Page 27 (new pages 25-26) – Added the following alternatives based on comments received from the public:

1. Remove Tamarisk using a Controlled Burn and Perform Wash Excavation and all other Project Activities in One Season of Work

- A controlled burn of tamarisk does not meet the purpose and need of the plan because it leaves root systems intact which will inhibit the excavation and re-contouring of the wash channels. Tamarisk is fire-adapted and recovers more quickly than native species after a burn because it sprouts vigorously from the root crown; therefore, burning tamarisk would be an ineffective means of tamarisk treatment over the long term. Additionally, it would be difficult to contain the impacts of a controlled burn on native vegetation in the project area, which is interwoven with tamarisk thickets. Controlled burns of wildland areas involve the additional impact of fire line construction. The selected alternative and grapple excavation of tamarisk will allow for more targeted treatment of tamarisk and would have fewer incidental, adverse impacts on native vegetation than a controlled burn is likely to have.

2. Partial Removal of Tamarisk and Perform Wash Excavation and all other Project Activities in One Season of Work

- A partial removal of tamarisk leaves the wash banks stabilized and does not meet the purpose and need of the plan in that it does not facilitate the excavation and re-contouring of the three washes to improve the flow of water and sediment. An additional benefit of the project is that it meets other stated park goals; it is supported by NPS Management Policies 2006 (section 4.1.5., Restoration of Natural Systems), which states that parks will reestablish natural processes that have been impacted by "...human disturbances including the introduction of exotic species;... changes to hydrologic patterns and sediment transport; the accelerations of erosion and sedimentation; and the disruption of natural processes" and by Executive Order 13112,

February 3, 1999, which directs all agencies in the Executive Branch to: "take steps to prevent the introduction of invasive species, detect and respond rapidly to and control populations of such species, and provide for restoration of native species and habitat." Partial tamarisk removal does not meet these goals.

Chapter 2: Mitigation Measures
Pages 28-29 (new pages 27-29) – Reorganized text on these pages using the following subheadings: Air Quality, Cultural Resources, Soundscapes, Vegetation and Soils, Visitor Use & Experience and Public Health & Safety, Water Quality and Wildlife. Revised and added mitigation measures as detailed below:

1. Added the following mitigation measures for Cultural Resources as outlined in the completed Archeological Monitoring and Inadvertent Discovery Plan (Baker 2017):
   - All project personnel will be informed of the procedures to follow in the event of post-review and inadvertent discoveries, as well as the penalties for intentionally damaging historic properties or illegally collecting archeological resources.
   - Procedures will be established for notifying and updating the archeological monitor on the schedule of ground disturbing activities.
   - Project personnel will coordinate with the archeological monitor to develop and implement resource protection procedures, including installation of temporary barriers. The archeological monitor will be present during installation of temporary barriers and will periodically inspect to ensure that barriers are effective and that resources are not being impacted.
   - Revised the following mitigation:
     Current text
     "On-site monitoring by a professionally qualified archeological monitor during all ground- disturbing activities within the Salt Wash drainage channels."
     Revised text
     "Archeological monitoring through periodic and regular inspections by a professionally qualified archeologist will be conducted during all ground disturbing activities within the project area."
   - Revised the following mitigation:
     Current text
     "If any previously unidentified cultural resources are discovered during construction, all work will stop in the immediate vicinity until the resources can be identified, documented, and evaluated. If resources eligible for listing in the National Register of Historic Places are discovered and project components cannot be altered or rerouted, then appropriate mitigation strategies will be prepared in consultation with the appropriate state and tribal entities."
     Revised text
     "If any previously unidentified cultural resources are discovered during construction activities, the procedures outlined in the Archeological Monitoring and Inadvertent Discovery Plan (Baker 2017) prepared for this undertaking will be followed."

2. Revised the following mitigation measures for Vegetation and Soils based on comments received from the public:
   - Revised the following mitigation:
     Current text

"Restoration actions at sediment deposit sites to mitigate soil erosion and establish native perennial vegetation, such as the application of soil stabilization products (i.e. silt fencing) and planting of native seeds."
Revised text
"Restoration actions at sediment deposit sites to mitigate soil erosion and establish native perennial vegetation, such as the application of soil stabilization products (i.e. silt fencing, erosion mats, and/or soil stabilization polymers) and planting of native seeds."

- Revised the following mitigation:
  Current text
  "Access routes to tamarisk removal and sediment deposition sites will be chosen to minimize impacts to native species and soils as much as possible."
  Revised text
  "Access routes to tamarisk removal and sediment deposition sites will be chosen and flagged to minimize impacts to native species and soils and confine construction activities as much as possible."
- Revised the following mitigation:
  Current text
  "On-site monitoring by a professionally qualified environmental monitor during key phases of construction activities (including the onsets of tamarisk removal, re-channelization, and sediment deposition) to help minimize impacts to natural resources. This work may include flagging areas or patches of native vegetation to avoid, marking access routes, and salvaging native plants for revegetation efforts."
  Revised text
  "On-site monitoring by a professionally qualified environmental monitor will be conducted during key phases of construction activities (including the onsets of tamarisk removal, when re-channelization is proceeding downstream, and the onsets of sediment deposition) to help minimize impacts to natural resources and deal with unforeseen situations. This work may include flagging areas or patches of native vegetation to avoid, marking access routes, and salvaging native plants for revegetation efforts.
- Deleted the following mitigation because it was impractical: "The chipper will be oriented so chips are blown directly into a covered/ enclosed truck (this eliminates need for loading, reduces exotic seed dispersal, and may reduce noise from chipper output)."
  Replaced it with the following mitigation: "The chipping area will be raked clean of all chips and other plant debris and will be treated by exotic vegetation management teams post-construction activities."

3. Added the following mitigation measures for Visitor Use and Experience and Public Health and Safety based on comments received from the public and as standard safety measures outlined in other Environmental Assessments:
   - Signs, alerts, press releases, and notifications will be issued to inform visitors prior to and throughout the duration of construction activities.
   - Construction zones will be identified to (i.e. flagging, fencing, etc.) prevent visitors from entering unknowingly.

- Construction materials staging will be restricted to areas that will neither impede vehicle traffic of visitors, contractors, or park staff.

4. Added the following mitigation measures for Water Quality based on consultation with Army Corps of Engineers and as standard safety measures outlined in other Environmental Assessments:
   - A fuel/lubricant spill absorption kit will be in place to address potential land and water spills and leaks.
   - All fueling and oil servicing will be done in designated staging areas, at least 100 feet from a wash, and best management practices will be implemented to ensure no pollutants enter the washes.
   - Sediment removal from the wash channels will involve the clean excavation method of scooping sediment out of the wash channels to minimize sediment discharge and erosion.

5. Added the following mitigation measure for Wildlife based on comments received from the public:
   - A professionally qualified wildlife monitor will be required for all channel excavation work that will occur in perennial reaches of Salt Wash and/or will result in the destruction of a beaver dam to minimize adverse impacts to beavers and other wildlife.

Chapter 3: Affected Environment and Environmental Consequences
Page 33, paragraph 3, lines 10-11 and page 36, paragraph 2, lines 3-4 – the following text has been deleted because it was redundant: "and the typical geologic process of sediment being moved downstream (erosion) does not occur."

Page 34, heading for impact topic "Non-native Vegetation"– heading has been changed to "Vegetation" to cover a detailed impact analysis relevant to both native and non-native vegetation.

Page 35, paragraph 1 – paragraph has been moved to below paragraph 2 as a new paragraph 4 under Vegetation – Alternative 2 – Proposed Action, lines 1-3

Page 35, paragraph 2, lines 1-4 – the following text has been added to the start of paragraph 2: "Approximately 80% of the project area is dominated by exotic or non-native vegetation, according to the 2009 vegetation map of Arches (Coles et al. 2009). 115 acres are mapped and classified as tamarisk shrublands and 14 acres are mapped and classified as non-native, annual herbaceous vegetation."

Page 35, paragraph 2, lines 3-8 – text (starting and ending with the words "tamarisk") has been moved to same paragraph, lines 10-14

Page 35, paragraph 2, lines 11-14 – the following text has been deleted, "Later vegetation mapping efforts mapped 115 acres of the project area as tamarisk shrublands (Coles et al. 2009), which represents.." and the following text has been moved to page 36, paragraph 4, lines 1-3: "36% of the total acreage of tamarisk mapped Parkwide (excluding tamarisk found along the Colorado River on the Park boundary)."

Page 35, paragraph 2, lines 14-18 – text (starting with "Currently") has been moved to below paragraph 2 as a new paragraph 4 under Vegetation – Alternative 2 – Proposed Action, lines 3-7

Page 35, paragraph 5 – text has been moved to page 35, bottom of paragraph 2, lines 14-23

Page 36, paragraph 2 (new paragraph 3), lines 1-3, under Alternative 1 – No Action – the following text has been added: "Under Alternative 1, incidental removal of or disturbances to native vegetation would not occur. Native vegetation would continue to be out-competed by non-native species across much of the project area."

Page 36, above paragraph 4 – the following text has been added to new page 37, paragraph 1, under Alternative 2 – Proposed Action, lines 2-6: "Across the project area, twenty-five acres are mapped as greasewood shrublands and 6 acres are mapped as saltbush shrublands (Coles et al. 2009). These shrublands are outside of the tamarisk removal area but some portion of them will be impacted as a result of accessibility constraints (heavy machinery gaining access from the road to tamarisk-dominated areas)."

Page 36, paragraph 4, lines 1-2, under Alternative 2 – Proposed Action – the following text has been deleted because it was redundant: "1/3 of the estimated tamarisk in the Park."

Page 36, paragraph 5 – entire paragraph, starting with the text, "Eliminating tamarisk and their roots," has been deleted because it was redundant.

Page 37, paragraph 2 (new paragraph 3) – text has been revised:
Current text
"Soil disturbing activities often favor non-native vegetation that is adapted to disturbance. The channel reconstruction project will disturb soils and vegetation in areas where the seed bank likely includes a high proportion of exotic species. The potential to spread non-native seed is high, particularly to the proposed sediment deposit sites. Sediment deposit sites were intentionally selected in areas currently degraded and dominated by weedy or non-native plant species, to lessen these impacts. Sand-loving native species such as dropseed (*Sporobolus* sp.), sand sage (*Artemisia filifolia*) and four-wing saltbush (*Atriplex canescens*) could benefit from the addition of the sediment to the deposit sites. Park vegetation management teams will work to mitigate adverse impacts by repeatedly treating exotic vegetation to ensure the efficacy of the exotic vegetation removal and the successful establishment of native vegetation communities."
Revised text
"Activities associated with channel contouring and sediment deposition would negatively affect the plants that are directly driven over and buried by these deposits. Soil disturbing activities often favor non-native vegetation that is adapted to disturbance. The channel reconstruction project will disturb soils and vegetation in areas where the seed bank likely includes a high proportion of exotic species. The potential to spread non-native seed is high, particularly to the proposed sediment deposit sites. Sediment deposit sites were intentionally selected in areas currently degraded and dominated by weedy or non-native plant species, to lessen these impacts. Strategically depositing sediment over weedy sites could benefit native vegetation by burying the existing exotics and providing a favorable substrate for sand-loving native plants such as sand sage (*Artemisia filifolia*), sand dropseed (*Sporobolus cryptandrus*), ricegrass (*Achnatherum hymenoides*), globemallow (*Sphaeralcea* sp.) and evening primrose (*Oenothera* sp.). Park vegetation management teams will work to mitigate adverse impacts by repeatedly treating exotic vegetation to ensure the efficacy of the exotic vegetation removal and the successful establishment of native vegetation communities."

Page 37, paragraph 3 (new page 38, paragraph 2), lines 8-11 – the following text has been added: "Mitigation measures would be imposed to protect stands of native vegetation from construction activities as much as possible. Additionally, reseeding and revegetation efforts, where feasible, would aid in the restoration of native plant communities across the project area."

Page 46 (new page 47), paragraph 4 – the following text has been added twice: "and/or erosion mats."

Chapter 6: References
Page 51 – the following references have been added as list items 3 and 4:
Baker, Thann
2017 Archeological Inventory and Inadvertent Discovery Plan for the Salt Wash Rehabilitation Project (PEPC 70534) in Arches National Park, Grand County, Utah. In *Cultural Resources Inventory for the Salt Wash Rehabilitation Project, Arches National Park, Grand County, Utah* by Thann Baker and Clay Knudson, pp. C-1 – C-11. National Park Service, Southeast Utah Group, Moab.

Baker, Thann and Clay Knudson
2017 Cultural Resources Inventory for the Salt Wash Rehabilitation Project, Arches National Park, Grand County, Utah. National Park Service, Southeast Utah Group, Moab.

RESPONSE TO PUBLIC COMMENTS

The EA was released for public review from October 17, 2017 through November 16, 2017. In response to the EA, nine public comment letters were received. All comments will be maintained in the project decision file.

Response to public comments addresses substantive comments that were received during the public review period. Some comments addressed issues already adequately covered in the EA or expressed support for the NPS preferred alternative or were out of the project scope. No comments warranted development of an additional alternative or reconsideration of alternatives that were considered but dismissed. Therefore, the alternatives remain as described in the EA, and no changes were made in the assessment of environmental consequences, other than minor corrections to sentences in response to review comments, as presented in the Errata.

The public comments and responses are summarized as follows:

PURPOSE AND NEED

COMMENT: Commenters stated that they don't believe the preferred alternative will satisfy the purpose and need for action over the long-term, that redesigning the washes will not resolve issues of sediment aggradation, and that sediment aggradation will work its way upstream to the road crossing and the flooding issues will repeat.

RESPONSE: NPS stated on page 34 of the EA that the beneficial effects of the proposed action would last for an unknown duration and that the long-term success of the project may be complicated by future uncertainties, especially when factoring in the effects of climate change. Project activities are necessary to meet the immediate need for action and any future actions, if

necessary, will be informed by monitoring data and will be subject to the appropriate compliance. The NPS will implement a monitoring program with the selection of the preferred alternative, as outlined on page 25 of the EA, following completion of project activities. The critical and necessary data gathered from monitoring activities will be used by NPS to inform future management decisions for the area.

PROPOSED ACTION

COMMENT: A commenter stated that NPS fails to consider a reasonable range of alternatives because only two alternatives are analyzed, that a decision has already been made, and that the alternatives considered but dismissed are not fully described alternatives.

RESPONSE: As described in the NPS NEPA Handbook, CEQ's 40 Most Asked Questions Concerning NEPA Regulations (Question 1a), and the Department of the Interior's NEPA Regulations (43 CFR 46.420(c)), the term "range of alternatives" refers to the set of all reasonable alternatives analyzed in detail, as well as other alternatives considered but eliminated from detailed analysis. With this in mind, NPS considered a total of four different alternatives. The "Alternatives Considered but Dismissed" section of Chapter 2 explains why three of these alternatives were not carried forward. Also, as noted in the NPS NEPA Handbook, there are no regulatory requirements to consider a minimum number of alternatives in an EA or to do more than briefly discuss the reasons for eliminating alternatives.

COMMENT: A commenter stated that NPS improperly dismissed Wetlands as an impact topic from detailed analysis.

RESPONSE: NPS stands by its analysis of impact topics dismissed from detailed analysis and feel we adequately explained impacts on wetlands and why they were dismissed from detailed analysis. NPS reviewed the considerations to apply when deciding whether or not to retain an impact topic for detailed analysis, as noted in the NEPA Handbook (pg. 51), and does not feel that the selected alternative would result in significant impacts to wetland resources. NPS does not feel that the environmental impacts associated with the disturbances to wetlands resulting from project activities are of critical importance to Park wetland resources; project activities are occurring in a mostly degraded wetlands area, overwhelmingly dominated by exotic, invasive plant species and a partially man-made wetlands area where the roadway and tamarisk shrubs have acted as a dam and caused water to artificially pool where it otherwise would not. NPS consulted with wetland ecologists at the NPS Water Resources Division who concurred with the adequacy of the wetlands impact analysis because the proposed action (Salt Wash Rehabilitation Project) is designed to restore degraded wetland, stream, riparian, and other aquatic habitats according to the NPS Director's Order 77-1; Procedural Manual #77-1: Wetland Protection Section 4.2.1.9. Therefore, the project is exempt from having to complete a Wetland Statement of Findings or any other requirements for compliance with DO #77-1.

ALTERNATIVES CONSIDERED BUT DISMISSED

COMMENT: New Alternative Proposed - A commenter asked why NPS didn't consider removing the tamarisk using a controlled burn and then performing wash excavation and all other project activities in one season of work.

RESPONSE: A controlled burn of tamarisk does not meet the purpose and need of the plan because it leaves root systems intact which will inhibit the excavation and re-contouring of the wash channels. Tamarisk is fire-adapted and recovers more quickly than native species after a burn because it sprouts vigorously from the root crown; therefore, burning tamarisk would be

an ineffective means of tamarisk treatment over the long term. Additionally, it would be difficult to contain the impacts of a controlled burn on native vegetation in the project area, which is interwoven with tamarisk thickets. Controlled burns of wildland areas involve the additional impact of fire line construction. The selected alternative and grapple excavation of tamarisk will allow for more targeted treatment of tamarisk and would have fewer incidental, adverse impacts on native vegetation than a controlled burn is likely to have.

COMMENT: New Alternative Proposed - A commenter asked why NPS didn't consider a partial removal of tamarisk and performing wash excavation and all other project activities in one season of work.

RESPONSE: A partial removal of tamarisk, which as the commenter noted, leaves the wash banks stabilized and does not meet the project purpose and need of the plan in that it does not facilitate the excavation and re-contouring of the three washes to improve the flow of water and sediment. An additional benefit of the project is that it meets other stated park goals; it is supported by NPS Management Policies 2006 (section 4.1.5., Restoration of Natural Systems), which states that parks will reestablish natural processes that have been impacted by "...human disturbances including the introduction of exotic species;... changes to hydrologic patterns and sediment transport; the accelerations of erosion and sedimentation; and the disruption of natural processes" and by Executive Order 13112, February 3, 1999, which directs all agencies in the Executive Branch to: "take steps to prevent the introduction of invasive species, detect and respond rapidly to and control populations of such species, and provide for restoration of native species and habitat." Partial tamarisk removal does not meet these goals.

COMMENT: New Alternative Proposed - A commenter asked why NPS didn't consider elevating the road with bridges over the three wash crossings.

RESPONSE: As stated on page 5 of the Salt Wash Rehabilitation EA, the selected alternative addresses the immediate need for a management strategy that satisfies the purpose and need for action and an alternative such as elevating the road with bridges would not meet the immediate need for action. Additionally, elevating the road and constructing bridges would not satisfy the other component of the purpose and need, which is to improve the conveyance of water and sediment within the three wash channels. Tamarisk would not be removed under this new alternative and would continue to trap sediment and wash channels would not be excavated, worsening sediment aggradation and further degrading the hydrologic and geomorphologic processes. The NPS will implement a monitoring program with the selection of the preferred alternative, as outlined on page 25 of the EA, following completion of project activities. The critical and necessary data gathered from monitoring activities will be used by NPS to inform future management decisions for the area, if necessary.

MITIGATION MEASURES

COMMENT: A commenter proposed that NPS add a mitigation or best management practice to alert visitors about project activities with interpretative signs and postings on our website.

RESPONSE: NPS added the following mitigation measure: "Signs, alerts, press releases, and notifications will be issued to inform visitors prior to and throughout the duration of construction activities."

COMMENT: A commenter proposed that NPS add a mitigation to have an environmental inspector on the ground when channel excavation work is proceeding to deal with unforeseen situations and minimize impacts to native vegetation.

RESPONSE: NPS amended the current mitigation to read, "On-site monitoring by a professionally qualified environmental monitor during key phases of construction activities (including the onsets of tamarisk removal, when re-channelization is proceeding downstream, and the onsets of sediment deposition) to help minimize impacts to natural resources and deal with unforeseen situations. This work may include flagging areas or patches of native vegetation to avoid, marking access routes, and salvaging native plants for revegetation efforts."

COMMENT: A commenter proposed that NPS add mitigation measures detailing how to proceed with channel excavation work when encountering a beaver dam.

RESPONSE: NPS added the following mitigation measure:

- "A professionally qualified wildlife monitor will be required for all channel excavation work that will occur in perennial reaches of Salt Wash and/or will result in the destruction of a beaver dam to minimize adverse impacts to beavers and other wildlife."

COMMENT: A commenter expressed concern that once the road is improved and the flooding has been reduced, visitor traffic may increase and possibly damage a nearby petroglyph panel and Delicate Arch, which are of cultural significance.

RESPONSE: The purpose of the Salt Wash Rehabilitation Project is to reduce the frequency of flooding-induced closures of the Wolfe Ranch/Delicate Arch Viewpoint Road by improving the conveyance of water and sediment. Expected results of the proposed action are improvements to visitor safety and to the reliability of access to Delicate Arch Viewpoint. The project does not include any actions to make road improvements for the purpose of accommodating increased visitor traffic. The existing footprint of the road and associated parking areas will remain unchanged. Therefore, NPS does not believe visitor traffic will increase as a result of the proposed action to a point where it will have a negative impact on nearby sites of cultural significance, which NPS is mandated to preserve unimpaired for future generations (54 U.S.C. 100101).

Non-Impairment Determination

By enacting the NPS Organic Act of 1916 (Organic Act), Congress directed the U.S. Department of the Interior and the National Park Service (NPS) to manage units "to conserve the scenery, natural and historic objects, and wild life in the System units and to provide for the enjoyment of the scenery, natural and historic objects, and wild life in such manner and by such means as will leave them unimpaired for the enjoyment of future generations" (54 U.S.C. 100101). NPS *Management Policies 2006*, Section 1.4.4, explains the prohibition on impairment of park resources and values:

"While Congress has given the Service the management discretion to allow impacts within parks, that discretion is limited by the statutory requirement (generally enforceable by the federal courts) that the Park Service must leave park resources and values unimpaired unless a particular law directly and specifically provides otherwise. This, the cornerstone of the Organic Act, establishes the primary responsibility of the National Park Service. It ensures that park resources and values will continue to exist in a condition that will allow the American people to have present and future opportunities for enjoyment of them."

An action constitutes impairment when its impacts "harm the integrity of park resources or values, including the opportunities that otherwise will be present for the enjoyment of those resources or values" (NPS 2006, Section 1.4.5). To determine impairment, the NPS must evaluate the "particular resources and values that will be affected; the severity, duration, and timing of the impact; the direct and indirect effects of the impact; and the cumulative effects of the impact in question and other impacts." An impact on any park resource or value may constitute impairment, but an impact would be more likely to constitute impairment to the extent that it affects a resource or value whose conservation is:

- necessary to fulfill specific purposes identified in the establishing legislation or proclamation of the park;
- key to the natural or cultural integrity of the park or to opportunities for enjoyment of the park; or
- identified in the park's general management plan or other relevant NPS planning documents as being of significance (NPS 2006, Section 1.4.5).

Fundamental resources and values for Arches National Park are identified in the enabling legislation for the park, the Foundation Document, and the General Management Plan. Based on a review of these documents, the fundamental resources and values for Arches National Park come from the park's geologic wonders, clean air and scenic vistas, natural ecosystems, cultural and historic features, collaborative conservation, science, and scholarship, and providing for the benefit, enjoyment, education, and inspiration of this and future generations. Resources that were carried forward for detailed analysis in the EA are considered necessary to fulfill specific purposes identified in the establishing legislation or proclamation of the park; are key to the natural or cultural integrity of the park; and/or are identified as a goal in relevant NPS planning documents and include: hydrologic and geomorphologic processes; vegetation; and wilderness. Accordingly, a non-impairment determination is made for each of these resources. Non-impairment determinations are not necessary for human health and safety or visitor use and experience because impairment findings relate back to park resources and

values, and these impact topics are not generally considered park resources or values according to the Organic Act.

This non-impairment determination has been prepared for the selected alternative, as described in the Finding of No Significant Impact (FONSI) for the Salt Wash Rehabilitation Project Environmental Assessment (EA).

Hydrologic and Geomorphologic Processes

Hydrologic and geomorphologic processes in the broad alluvial fan where Salt Valley Wash, Salt Wash, and Winter Camp Wash converge have been altered from a more natural state to a degraded state due to the human activities in the area, specifically the construction of the paved road and culverts and the introduction and spread of exotic tamarisk shrubs. The combination of the sediment accumulation at and below the three wash crossings with the road coupled with the establishment of tamarisk, has resulted in the slowing of normal storm water runoff flows, the blocking of normal sediment transport, and the complete loss of a favorable downstream gradient. In addition, all 15 culverts that have been installed at the three wash crossings between the 1960s and 2009 are silted in and rendered non-functional. The frequency and magnitude of over-road flow and sediment deposition events are increasing with time due to repeated deposition and floodplain aggradation, resulting in longer and more frequent road closures and deteriorating hydrologic and geomorphologic processes.

During project activities, which will occur in fall, winter, and early spring for up to 3 years, sediment could be introduced into the floodplain and stream channel and decreases in water quality or turbidity in the short term are possible; however, mitigations will be imposed to reduce adverse impacts, so it is expected that little or no sediments will move into the perennial stream channel from the construction areas. The removal of up to 115 acres of tamarisk (above and belowground biomass) and the mechanical excavation and re-contouring of the three wash channels will reestablish a steeper gradient, improving the conveyance of water and sediment under the road, allowing for the continued movement of sediment and water downstream during rainfall events, and reducing flooding-induced road closures and sediment deposition on the road. This will support geomorphologic processes, such as weathering of rocks and soils, and erosion of sediments downstream. Sediment removed from the wash channels will be retained on-site in elevated deposit sites away from the stream channel and on top of degraded areas dominated by weedy, annual vegetation. Mitigations such as silt fencing, erosion mats, or soil stabilization polymers will be used to limit erosion from the sediment deposit sites.

It is not expected that the selected alternative will adversely alter the hydrologic or geomorphologic processes of the three washes; rather project activities will help to restore these natural processes. These processes are an important natural component of the landscape, and support the ecological resiliency of the Park's ecosystems. Resiliency provides for a robust ecosystem that can recover more quickly from human and natural disturbances. As a result, the NPS has determined that the selected alternative will not result in an impairment of hydrologic or geomorphologic processes or floodplain functions.

Vegetation

Approximately 80% of the project area is dominated by exotic or non-native plant species, primarily tamarisk (*Tamarix chinensis*). Tamarisk will be targeted for removal as part of project activities, including both above and belowground biomass. The selected alternative will

result in short-term adverse impacts on native vegetation in the project area, which will be incidentally impacted during tamarisk removal and wash excavation activities. Native plant species documented in the area include: coyote willow (*Salix exigua*), common reed (*Phragmites australis*), Baltic rush (*Juncus arcticus*), cattails (*Typha latifolia*), alkali muhly (*Muhlenbergia asperifolia*), Soft-stem bulrush (*Scirpus validus*), desert saltgrass (*Distichlis spicata*), sand dropseed (*Sporobolus cryptandrus*), alkali sacaton (*Sporobolus airoides*), James' galletta (*Hilaria jamesii*), rubber rabbitbrush (*Chrysothamnus nauseosus*), Basin big sage (*Artemisia tridenta ssp. tridentata*), saltbush (*Atriplex canescens*), greasewood (*Sarcobatus vermiculatus*is), Torrey's seepweed (*Suaeda torreyana var. torreyana*) and Iodine bush (*Allenrolfia occidentalis*). Up to 12 acres of the 115 acres mapped as tamarisk (the tamarisk removal area) may be dominated by native wetland plant species (listed above). Channel re-contouring and tamarisk removal have the potential to directly and adversely impact up to 7% (12 acres) of the native riparian shrub and herbaceous vegetation cover in the Park. However, the majority of impacts will be to native plant species with extensive rhizomatous root systems (such as common reed, coyote willow, and desert saltgrass); these impacts will be short-term, as rhizomatous plants will rebound quickly from disturbance as long as some roots and stems or parts of stands are left intact. Other native species may not rebound as easily; therefore, mitigations will be imposed to minimize impacts to native plants by defining access routes and temporarily fencing or flagging pockets of native plants for machinery to avoid. Therefore, it is anticipated that much less than 7% of the total cover of native riparian shrub and herbaceous vegetation in the Park will be adversely impacted over the long term. Across the project area, twenty-five acres are mapped as greasewood shrublands and 6 acres are mapped as saltbush shrublands (Coles et al. 2009). These shrublands are outside of the tamarisk removal area but some portion of them will be impacted as a result of accessibility constraints (heavy machinery gaining access from the road to tamarisk-dominated areas). As a percentage of Park native vegetation community cover, project activities have the potential to directly or indirectly adversely impact up to 2.2% of greasewood shrublands and <1% of saltbush shrublands in the Park. Soil disturbances from construction activities and movement of wash sediment to deposit sites may favor the establishment of non-native species adapted to disturbances; therefore, mitigations will be imposed to perform follow-up treatment of exotic species and reseeding of native species on sediment deposit sites post-construction activities.

The removal of up to 115 acres of tamarisk will have long-term, beneficial impacts on Park native vegetation, which is currently out-competed by tamarisk across most of the project area. Project activities will eliminate approximately 36% of all tamarisk mapped in the Park. Over the long term, the proposed action will greatly benefit native vegetation by reducing competition from this aggressive exotic species (tamarisk). Over time, this degraded riparian system should achieve higher diversity and cover of native plant species once tamarisk is removed.

The selected alternative will not result in impairment of vegetation because short-term adverse impacts to native plants will affect only a minor percentage of the critical riparian vegetation resources of the Park. On balance, the selected alternative will have a beneficial effect on native vegetation because removal of tamarisk and post-treatment of tamarisk re-sprouts and targeted exotic species on the sediment deposit sites will help facilitate native plant re-vegetation across the project area. Mitigation measures will be imposed to protect stands of native vegetation from construction activities as much as possible. Additionally, reseeding and revegetation efforts will aid in the restoration of native plant communities across the project area.

Wilderness

The total acreage for recommended wilderness in Arches National Park is 73,310 acres; over 96% of the park's total area. The majority of the project area is in recommended wilderness. The Park completed a Minimum Requirements Decision Guide (MRDG) to assist in decision-making and determine whether project activities are necessary and whether the methods used represent the minimum required action. Three of the five qualities of wilderness will be adversely impacted by the selected alternative (*untrammeled, undeveloped,* and *opportunities for solitude or primitive and unconfined recreation*). Manipulation of the wash channels and removal of tamarisk by mechanical excavation will temporarily degrade the *untrammeled* quality of wilderness because these activities are a manipulation or control of the natural processes in wilderness. The effects of this trammeling will last until the traces of project activities have been obscured by the natural processes of water and sediment transport and the revegetation of the project area. The use of motorized equipment and machinery will adversely impact the *undeveloped* quality of wilderness. Any activity that will not be required in wilderness to meet the purpose and need of the project will be conducted elsewhere (i.e. chipping operations). The impacts to the *undeveloped* quality of wilderness will cease upon the completion of project activities or after no more than five years (when silt fencing will be removed), whichever is less. The sights and sounds of construction activities will degrade the *opportunities for solitude or primitive and unconfined recreation* quality of wilderness. These impacts will cease upon the completion of project activities. Long-term impacts on visitors' wilderness experience will be enhanced by restored natural processes. The *natural* quality of wilderness will be beneficially impacted by the selected alternative through the removal of up to 115 acres of an invasive, non-native plant species, tamarisk, and the restoration of natural hydrologic and geomorphologic processes. There will be minimal impacts to the *other features of value* quality of wilderness, as cultural resources in the area will be avoided where known to occur and through implementing the mitigation measures for cultural resources listed in Appendix A.

Section 4(c) of The Wilderness Act states that: "...except as necessary to meet minimum requirements for the administration of the area for the purpose of this Act (including measures required in emergencies involving the health and safety of persons within the area), there shall be no temporary road, no use of motor vehicles, motorized equipment or motorboats, no landing of aircraft, no other form of mechanical transport, and no structure or installation within any such area." NPS Management Policies 2006 (section 6.3.5 Minimum Requirement) provides additional guidance on this section of the Wilderness Act by stating that "only those actions that preserve wilderness character and/or have localized, short-term adverse impacts will be acceptable" and "administrative use of motorized equipment or mechanical transport will be authorized only if determined by the superintendent to be the minimum requirement needed by management to achieve the purposes of the area, including the preservation of wilderness character and values, in accordance with the Wilderness Act." Per this guidance, the NPS completed a Minimum Requirements Decision Guide (MRDG), analysis. Based on the analysis in the MRDG, it is necessary to take action in wilderness to preserve the *natural* quality of wilderness. The described use of motorized equipment, including all mitigation actions intended to avoid significant resource impacts or conflicts with visitor use, has been determined to be the minimum tool necessary to achieve restoration of the natural hydrologic and geomorphologic processes of the three washes. Utilization of less obtrusive and non-prohibited tools, will not achieve the desired restoration of the *natural* quality of wilderness.

While the selected alternative will have adverse impacts on the *untrammeled* and *undeveloped* qualities of wilderness, the Park believes that the long term benefits of restoring these natural

processes in wilderness outweigh the short term negative impacts from the prohibited use of motorized, heavy equipment; on balance the net effect to wilderness will be beneficial. Therefore, the selected alternative will not impair the wilderness resources of the Park long-term.

Conclusion

In conclusion, as guided by this analysis, good science and scholarship, advice from subject matter experts and others who have relevant knowledge and experience, and the results of public involvement activities, it is the Superintendent's professional judgment that there will be no impairment of park resources and values from implementation of the selected alternative. The NPS has determined that implementation of the selected alternative will not constitute an impairment of the resources or values of Arches National Park. This conclusion is based on consideration of the park's purpose and significance, a thorough analysis of the environmental impacts described in the EA, comments provided by the public and others, and the professional judgment of the decision maker guided by the direction of NPS *Management Policies 2006*.

ARTHUR CARHART NATIONAL WILDERNESS TRAINING CENTER

MINIMUM REQUIREMENTS DECISION GUIDE WORKBOOK

"...except as necessary to meet minimum requirements for the administration of the area for the purpose of this Act..."

-- The Wilderness Act of 1964

Project Title: Arches National Park: Salt Wash Rehabilitation Project

MRDG Step 1: Determination

Determine if Administrative Action is Necessary

Description of the Situation

What is the situation that may prompt administrative action?

The National Park Service proposes to remove sediment from wash channels and remove non-native tamarisk shrubs (Tamarix sp.) within recommended wilderness in Arches National Park. The current paved Wolfe Ranch / Delicate Arch Viewpoint roadway, sediment deposition rates, and increase in non-native tamarisk within three washes have compromised the natural flow of storm-water runoff, resulting in frequent flooding . The road crosses the three washes over a distance of about 0.6 miles (1.0 kilometer); Salt Valley Wash to the west, Salt Wash in the center, and Winter Camp Wash to the east. All three washes are subject to periodic flooding and contribute to sediment transport. Both Salt Valley Wash and Winter Camp Wash are ephemeral drainages, flowing only in response to rainfall. Salt Wash, the largest of the three drainages, is perennial.

The confluence of the three drainages forms an elongated valley that is accumulating sediment.
Aerial imagery indicates that as recently as the 1970s, Salt Wash maintained a single- thread channel which meandered through the area of the road crossings and on through the downstream valley Currently, Salt Wash and its immediate tributaries form a braided system with shifting channels downstream from the crossing area and a single- thread channel no longer exists. This braided reach has become inundated with thick riparian vegetation dominated by non-native tamarisk shrubs (Tamarix sp.). The channel appears to regain a single-thread, meandering form about 660 yard (600 meter) downstream from the crossing area .

The combination of the sediment accumulation at and below the crossings coupled with the establishment of tamarisk has resulted in complete loss of a favorable downstream gradient, which leads to further sediment aggradation and deteriorating flow.

The wash valley has evolved into an unnatural state due to the paved road acting as a dam, and the invasive shrub tamarisk blocking normal sediment transport within the three washes. Flooding at the roadway crossing area results in traffic disruptions, road closures, and potential hazards to visitors. Culverts installed in the 1960s and in 2008 have been buried with sediment and are non-functional.

The proposed project occurs almost completely in recommended Wilderness. The wilderness boundary delineated by the Arches National Park November 1974 Wilderness Recommendation is 300 feet from the centerline of major roads (ie. Wolfe Ranch/Delicate Arch Viewpoint Road) and excludes the Wolfe Ranch parking area and area of high visitor concentration.

Options Outside of Wilderness

Can action be taken outside of wilderness that adequately addresses the situation?

☐ YES

☑ NO **EXPLAIN & COMPLETE STEP 1 OF THE MRDG**

Explain:

The proposed project to rehabilitate the three washes occurs almost completely in wilderness except for the 300 foot buffer from Wolfe Ranch/Delicate Arch Viewpoint road.

Proposed actions must occur within Wilderness to accomplish the purpose of the project: to reestablish a more natural flow to Salt Wash at its confluence with Salt Valley Wash and Winter Camp Wash. Actions taken outside Wilderness by themselves will not adequately address the situation.

Criteria for Determining Necessity

Is action necessary to meet any of the criteria below?

A. Valid Existing Rights or Special Provisions of Wilderness Legislation

*Is action necessary to satisfy valid existing rights or a special provision in wilderness legislation (the Wilderness Act of 1964 or subsequent wilderness laws) that **requires** action? Cite law and section.*

☐ YES ☑ NO

Explain:

No action is necessary to satisfy valid existing right or special provision of wilderness legislation.

B. Requirements of Other Legislation

Is action necessary to meet the requirements of other federal laws? Cite law and section.

☐ YES ☑ NO

Explain:

There are no requirements in existing federal laws that specifically require management action. However, Executive Orders have the effect of law in providing direction to federal agencies.

Executive Order 13112, February 3, 1999, directs all agencies in the Executive Branch to: prevent the introduction of invasive species, detect and respond rapidly to and control populations of such species, provide for restoration of native species and habitat, conduct research and develop technologies, promote public education, and directs agencies not to authorize, fund, carry out actions that are likely to cause or promote the introduction or spread of invasive species. It also directs the creation of a federal invasive species council, directs the development of a national Invasive Species Management Plan and Invasive Species information clearinghouse, and directs federal agencies to participate in the council and to implement the Invasive Species Management Plan.

In addition NPS *Management Policies* 2006 (section 4.1.5., Restoration of Natural Systems) states parks will reestablish natural processes that have been impacted by "...human disturbances including the introduction of exotic species;... changes to hydrologic patterns and sediment transport; the accelerations of erosion and sedimentation; and the disruption of natural processes." Along with (section 6.3.7 Natural Resources Management) "Management intervention should only be undertaken to the extent necessary to correct past mistakes, the impacts of human use, and influences

C. Wilderness Character

Is action necessary to preserve one or more of the five qualities of wilderness character?

UNTRAMMELED

☐ YES ☑ NO

Explain:

It is not necessary to take action to preserve this quality. The definition of the Untrammeled quality is the lack of manipulation or control of natural processes by humans, which if allowed to occur, would eventually affect wilderness character. This quality is typically preserved when no action is taken to control, hinder, or manipulate the natural functioning of the ecosystem.

Any proposed action to control non-native tamarisk and manipulate sediment in wash channels to re-establish natural flow would be a manipulation of the natural processes of wilderness, and a trammeling, even though the treatment may ultimately help restore natural conditions. The potential impacts of any proposed treatment methods will be addressed in the Step 2 alternatives.

UNDEVELOPED

☐ YES ☑ NO

Explain:

It is not necessary to take action to preserve this quality. Preserving this quality keeps areas free from "expanding settlement and growing mechanization" and "with the imprint of man's work substantially unnoticeable" and without structures, installations, temporary or permanent roads, or use of motorized equipment, mechanical transport, or landing or aircraft as required by the Wilderness Act.

The potential impacts of any proposed treatment methods will be addressed in the Step 2 alternatives.

NATURAL

☑ YES ☐ NO

Explain:

It is necessary to take action to preserve this quality. A wilderness area is to be "protected and managed so as to preserve its natural conditions" meaning that wilderness ecological systems are substantially free from the effects of modern civilization. To preserve this quality, and address the scenic and conservation public purposes of wilderness, it may be necessary to take action to correct unnatural conditions even if they were present at the time of designation. Any impacts resulting from the influence of modern civilization (such as the effects on natural stream flow from the road and non-native tamarisk) affect the Natural quality of wilderness character .

Specific proposals for actions and their impacts, will be addressed in Step 2.

SOLITUDE OR PRIMITIVE & UNCONFINED RECREATION

☐ YES ☑ NO

Explain:

It is not necessary to take action to preserve this quality. The Wilderness Act defines wilderness as having "outstanding opportunities for solitude or a primitive and unconfined type of recreation." This quality is about the *opportunity* for people to experience wilderness in terms of the visitor's sense of solitude, and their expectation for an undeveloped environment with minimal restrictions.

The potential impacts of any proposed treatment methods will be addressed in the Step 2 alternatives.

OTHER FEATURES OF VALUE

☐ YES ☑ NO

Explain:

It is not necessary to take action to preserve this quality. The Wilderness Act indicates that areas "may also contain ecological, geological, or other features of scientific, educational, scenic, or historical use" that reflect the character of a particular wilderness. Included in these features could be the presence of hydrologic and geologic process of stream flow but these are typically evaluated as part of the natural quality unless the specific process or feature is unique to the wilderness area. In this case, similar hydrologic processes exist in other places within the region and is not unique to this wilderness.
No Other Features of Value would be affected.

The potential impacts of any proposed treatment methods will be addressed in the Step 2 alternatives.

Step 1 Determination

Is administrative action necessary in wilderness?

Decision Criteria	Summary Responses
A. Existing Rights or Special Provisions	Action IS NOT necessary to meet this criterion.
B. Requirements of Other Legislation	Action IS NOT necessary to meet this criterion.
C. Wilderness Character	
Untrammeled	Action IS NOT necessary to meet this criterion.
Undeveloped	Action IS NOT necessary to meet this criterion.
Natural	Action IS necessary to meet this criterion.
Outstanding Opportunities	Action IS NOT necessary to meet this criterion.
Other Features of Value	Action IS NOT necessary to meet this criterion.

Is administrative action necessary in wilderness?

☑ YES

EXPLAIN & PROCEED TO STEP 2 OF THE MRDG

☐ NO

Explain:

Action is necessary within the Arches National Park Wilderness to preserve the natural quality of wilderness character. NPS *Management Policies* 2006 (section 4.1.5., Restoration of Natural Systems) states parks will reestablish natural processes that have been impacted by "...human disturbances including the introduction of exotic species;... changes to hydrologic patterns and sediment transport; the accelerations of erosion and sedimentation; and the disruption of natural processes." Action is necessary to reestablish more natural hydrologic processes within the three washes which have been impacted by human disturbances and actions outside of wilderness, in particular, the introduction of non-native vegetation and changes to hydrologic patterns from the construction of the road.

This proposal and alternatives will be considered in Step 2 of this analysis.

Project Title: Arches National Park: Salt Wash Rehabilitation Project

MRDG Step 2

Determine the Minimum Activity

Other Direction

Is there "special provisions" language in legislation (or other Congressional direction) that explicitly allows consideration of a use otherwise prohibited by Section 4(c)?

AND/OR

Has the issue been addressed in agency policy, management plans, species recovery plans, or agreements with other agencies or partners?

☑ YES

☐ NO

DESCRIBE OTHER DIRECTION

Describe Other Direction:

There is no special provision language in legislation or Congressional direction that explicitly allows consideration of a prohibited use for restoration of natural stream flow and management of exotic plant infestations in wilderness.

National Park Service and Park Policy provide guidance on activities in wilderness:
NPS *Management Policies* 2006 (section 4.1.5., Restoration of Natural Systems) which states parks will reestablish natural processes that have been impacted by "...human disturbances including the introduction of exotic species;... changes to hydrologic patterns and sediment transport; the accelerations of erosion and sedimentation; and the disruption of natural processes."

NPS *Management Policies* 2006 (section 6.3.7 Natural Resources Management) The principle of non-degradation will be applied to wilderness management, and each wilderness area's condition will be measured and assessed against its own unimpaired standard. Natural processes will be allowed, insofar as possible, to shape and control wilderness ecosystems. Management should seek to sustain the natural distribution, numbers, population composition, and interaction of indigenous species. Management intervention should only be undertaken to the extent necessary to correct past mistakes, the impacts of human use, and influences originating outside of wilderness boundaries.
NPS *Management Policies* 2006 (section 6.3.5 Wilderness Resource Management, Minimum Requirement) If a compromise of wilderness resources or character is unavoidable, only those actions that preserve wilderness character and/or have localized, short-term adverse impacts will be acceptable.

Arches National Park Backcountry Management Plan, 1988 (section V.B Management Activities, Resource Management, Monitoring, and Research) Some visitors maybe affected by ongoing resource management activities but efforts will I be taken to minimize these situations whenever possible. Work will be done during low use periods when feasible to do so.

Time Constraints

What, if any, are the time constraints that may affect the action?

The action will be completed over two years of construction (removal of tamarisk and excavation of the three wash channels) dependent on time-of-year restrictions and weather. Time-of-year restrictions for migratory birds and wildlife is from April 1 to August 31, and for nesting raptors from January 1 to August 31. Construction activities in the three washes would occur from September 1 up until April 1, as long as it is outside of the raptor nesting area buffer. In the raptor nesting area, construction would be allowed from September 1 to January 1. All construction activities would be during the day. No night construction or need for lighting, like flood lights, would be necessary.

Components of the Action

What are the discrete components or phases of the action?

Component X	*Example: Transportation of personnel to the project site*
Component 1	removal of tamarisk
Component 2	re-channeling of three washes
Component 3	placement of sediment in "sediment deposit sites"
Component 4	silt fencing
Component 5	seeding of sediment deposits
Component 6	monitoring
Component 7	
Component 8	
Component 9	

Proceed to the alternatives.

Refer to the MRDG Instructions regarding alternatives and the effects to each of the comparison criteria.

Project Title: Arches National Park: Salt Wash Rehabilitation Project

MRDG Step 2: Alternatives

Alternative 1: No Action-Continuation of current management practices

Description of the Alternative

What are the details of this alternative? When, where, and how will the action occur? What mitigation measures will be taken?

Under the no-action alternative, the natural flow of water and sediment would not be reestablished in the three washes. Aggradation of sediment in the washes and degradation of natural processes would continue. Non-native vegetation would remain within the washes .

Park staff would continue annual herbicide treatments of noxious weeds that occur on the roadsides and only high-priority non-native species will continue to be removed from the washes. "High-priority non-native species" are described in Section 2.4 of the 2009 Exotic Plant Management Plan, which outlines a "Decision-making Tool" with a set of five decision trees to guide exotic species management priorities. With limited resources available for managing exotic plants infestations, the Park uses this framework to decide priorities for exotic species treatments. Generally, tamarisk is not a high priority species because of its difficulty to remove, but depending on its site-specific impacts, it can be (as in the case of the three washes).

Component Activities

How will each of the components of the action be performed under this alternative?

Component of the Action		Activity for this Alternative
X	*Example: Transportation of personnel to the project site*	*Example: Personnel will travel by horseback*
1	removal of tamarisk	No action would be taken in wilderness. Annual herbicide treatments of noxious weeds on the roadsides may occur, possible removal of tamarisk
2	re-channeling of three washes	No action would be taken in wilderness.
3	placement of sediment in "sediment deposit sites"	No action would be taken in wilderness.
4	silt fencing	No action would be taken in wilderness.
5	seeding of sediment deposits	No action would be taken in wilderness.
6	monitoring	No action would be taken in wilderness.
7		
8		
9		

Wilderness Character

What is the effect of each component activity on the qualities of wilderness character? What mitigation measures will be taken?

UNTRAMMELED

Component Activity for this Alternative		Positive	Negative	No Effect
X	*Example: Personnel will travel by horseback*	☐	☐	☑
1	No action would be taken in wilderness. Annual herbicide treatments of noxious weeds on the ro	☑ Ch	☐ Ch	☐ Ch
2	No action would be taken in wilderness.	☑ Ch	☐ Ch	☐ Ch
3	No action would be taken in wilderness.	☑ Ch	☐ Ch	☐ Ch
4	No action would be taken in wilderness.	☑ Ch	☐ Ch	☐ Ch
5	No action would be taken in wilderness.	☑ Ch	☐ Ch	☐ Ch
6	No action would be taken in wilderness.	☐ Ch	☐ Ch	☑ Ch
7		☐ Ch	☐ Ch	☐ Ch
8		☐ Ch	☐ Ch	☐ Ch
9		☐ Ch	☐ Ch	☐ Ch
Totals		5	0	NE
Untrammeled Total Rating			**5**	

Explain:

The untrammeled wilderness character would not be impacted with no action. There would be no control of natural processes by humans.

UNDEVELOPED

Component Activity for this Alternative		Positive	Negative	No Effect
X	*Example: Personnel will travel by horseback*	☐	☐	☑
1	No action would be taken in wilderness. Annual herbicide treatments of noxious weeds on the r	☐ Ch	☐ Ch	☑ Ch
2	No action would be taken in wilderness.	☐ Ch	☐ Ch	☑ Ch
3	No action would be taken in wilderness.	☐ Ch	☐ Ch	☑ Ch
4	No action would be taken in wilderness.	☐ Ch	☐ Ch	☑ Ch
5	No action would be taken in wilderness.	☐ Ch	☐ Ch	☑ Ch
6	No action would be taken in wilderness.	☐ Ch	☐ Ch	☑ Ch
7		☐ Ch	☐ Ch	☐ Ch
8		☐ Ch	☐ Ch	☐ Ch
9		☐ Ch	☐ Ch	☐ Ch
Totals		0	0	NE
Undeveloped Total Rating			0	

Explain:

The undeveloped wilderness character would not be impacted with no action. No motorized/mechanized equipment would be used to re-establish the natural flow of the washes.

NATURAL

Component Activity for this Alternative		Positive	Negative	No Effect
X	*Example: Personnel will travel by horseback*	☐	☐	☑
1	No action would be taken in wilderness. Annual herbicide treatments of noxious weeds on the r	☐ Ch	☑ Ch	☐ Ch
2	No action would be taken in wilderness.	☐ Ch	☑ Ch	☐ Ch
3	No action would be taken in wilderness.	☐ Ch	☐ Ch	☑ Ch
4	No action would be taken in wilderness.	☐ Ch	☐ Ch	☑ Ch
5	No action would be taken in wilderness.	☐ Ch	☐ Ch	☑ Ch
6	No action would be taken in wilderness.	☐ Ch	☑ Ch	☐ Ch
7		☐ Ch	☐ Ch	☐ Ch
8		☐ Ch	☐ Ch	☐ Ch
9		☐ Ch	☐ Ch	☐ Ch
Totals				
Natural Total Rating		0	3	NE
			-3	

Explain:

If the action were to not occur the natural quality of wilderness character would continue to degrade over time.

SOLITUDE OR PRIMITIVE & UNCONFINED RECREATION

	Component Activity for this Alternative	Positive ☐	Negative ☐	No Effect ☑
X	*Example: Personnel will travel by horseback*			
1	No action would be taken in wilderness. Annual herbicide treatments of noxious weeds on the r			
2	No action would be taken in wilderness.			
3	No action would be taken in wilderness.			
4	No action would be taken in wilderness.			
5	No action would be taken in wilderness.			
6	No action would be taken in wilderness.			
7				
8				
9				
Totals		0	0	NE
Solitude or Primitive & Unconfined Recreation Total Rating			0	

Explain:

The solitude or primitive and unconfined recreation quality of wilderness character would not be impacted with no action. No motorized/mechanized equipment would be used or installations of silt fencing.

OTHER FEATURES OF VALUE

Component Activity for this Alternative		Positive	Negative	No Effect
X	*Example: Personnel will travel by horseback*	☐	☐	☑
1	No action would be taken in wilderness. Annual herbicide treatments of noxious weeds on the r	☐	☐	☑
2	No action would be taken in wilderness.	☐	☐	☑
3	No action would be taken in wilderness.	☐	☐	☑
4	No action would be taken in wilderness.	☐	☐	☑
5	No action would be taken in wilderness.	☐	☐	☑
6	No action would be taken in wilderness.	☐	☐	☑
7		☐	☐	☐
8		☐	☐	☐
9		☐	☐	☐
Totals		0	0	NE
Other Features of Value Total Rating			0	

Explain:

The other features of value quality of wilderness character would not be impacted with no action.

Summary Ratings for Alternative 1	
Wilderness Character	
Untrammeled	5
Undeveloped	0
Natural	-3
Solitude or Primitive & Unconfined Recreation	0
Other Features of Value	0
Wilderness Character Summary Rating	**2**

Project Title: Arches National Park: Salt Wash Rehabilitation Project

MRDG Step 2: Alternatives

Alternative 2: Rehabilitation of the Salt Wash, Salt Valley Wash and Winter Camp Wash

Description of the Alternative

What are the details of this alternative? When, where, and how will the action occur? What mitigation measures will be taken?

This alternative will restore the natural conveyance of water and sediment through Salt Valley Wash, Salt Wash and Winter Camp Wash. This will be accomplished by removal of non-native vegetation (mainly tamarisk) and mechanical excavation of wash channels. The proposed improvements to the channels would use the 1968 historic channel paths which are straighter than the current channels that turn just below the road. The linear or gently arcing channels will maintain a higher flow velocity minimizing sediment deposition. Removal of the tamarisk will allow a wider channel, with smaller meandering channels within the wide channel.

The project construction would last two years followed by three years of monitoring. Total project area is 160 acres. The construction part of the project would have two phases: removal of tamarisk followed by re-channeling the three washes. The Park would utilize an excavator with a specialized attachment (grappler) to remove tamarisk trees, including as much of the root system as possible. Once removal of tamarisk is completed, Park staff would excavate the three washes with heavy equipment including large front end loaders, road graders, and dump trucks to reestablish a proper gradient that supports the natural flow of water and sediment. Salt Valley Wash, Salt Wash, and Winter Camp Wash would have sediment removed from 2,200 linear feet, 4,900 linear feet, and 2,250 linear feet down gradient along the wash channels, respectively. Approximately 29,000 cubic yards of sediment would be removed and deposited within the project area of effect. Sediment would be placed at identified locations within the project area near the washes, referred to as "sediment deposit sites," that would complement the landscape with equipment used to remove sediment and not interfere with the regraded wash channels. This method would be used to minimize impacts from construction-related activities to visitors and wilderness character by decreasing the amount of time and equipment needed to complete the project.

Sediment deposit sites would include erosion control mitigations, such as silt fencing. Silt fencing or other erosion control methods would not be permanent installations in wilderness and would be removed by the end of the total five year project. Sediment deposits would be seeded with an upland, native seed mix to promote native plant revegetation.
No work would occur outside of the time constraints identified in Step 2.
If maintenance or re-excavation within the channels is necessary beyond the wilderness boundary or after five years, longer term solutions will be explored that address the issue and the proper NEPA and Wilderness compliance will be completed.

The wilderness character within the project area would be impacted by construction activities due to the prohibited use of mechanized equipment and physical manipulation within recommended wilderness. The use of mechanized equipment in wilderness will be limited to activities that directly support the restoration of hydrologic processes, sediment transport, and removal of invasive species. Any activity that would not be required in wilderness to meet the purpose and

Component Activities

How will each of the components of the action be performed under this alternative?

Component of the Action		Activity for this Alternative
X	*Example: Transportation of personnel to the project site*	*Example: Personnel will travel by horseback*
1	removal of tamarisk	excavator with a specialized attachment (grappler) to remove tamarisk trees, including as much of the root system as possible
2	re-channeling of three washes	heavy equipment including front end loaders, road graders, and dump trucks
3	placement of sediment in "sediment deposit sites"	same equipment used to remove the sediment from the washes
4	silt fencing	Silt fencing or other erosion control methods would not be permanent installations and removed by end of 5 years
5	seeding of sediment deposits	upland, native seed mix to promote native plant revegetation
6	monitoring	non-motorized
7		
8		
9		

Wilderness Character

What is the effect of each component activity on the qualities of wilderness character? What mitigation measures will be taken?

UNTRAMMELED

Component Activity for this Alternative		Positive	Negative	No Effect
X	*Example: Personnel will travel by horseback*	☐	☐	☑
1	excavator with a specialized attachment (grappler) to remove tamarisk trees, including as much	☐	☑	☐
2	heavy equipment including front end loaders, road graders, and dump trucks	☐	☑	☐
3	same equipment used to remove the sediment from the washes	☐	☑	☐
4	Silt fencing or other erosion control methods would not be permanent installations and removed	☐	☑	☐
5	upland, native seed mix to promote native plant revegetation	☐	☑	☐
6	non-motorized	☐	☑	☐
7		☐	☐	☑
8		☐	☐	☐
9		☐	☐	☐
Totals		☐	☐	☐
Untrammeled Total Rating		0	5	NE
			-5	

Explain:

The untrammeled wilderness character would be impacted. The untrammeled quality is impacted when there is manipulation or control of the natural processes in wilderness. Even though the proposed actions are intended to restore natural processes, the effects are trammeling. The effects of the actions are addressed for the Natural quality.

UNDEVELOPED

Component Activity for this Alternative		Positive	Negative	No Effect
X	*Example: Personnel will travel by horseback*	☐	☐	☑
1	excavator with a specialized attachment (grappler) to remove tamarisk trees, including as much	☐	☑	☐
2	heavy equipment including front end loaders, road graders, and dump trucks	☐	☑	☐
3	same equipment used to remove the sediment from the washes	☐	☑	☐
4	Silt fencing or other erosion control methods would not be permanent installations and removed	☐	☑	☐
5	upland, native seed mix to promote native plant revegetation	☐	☐	☑
6	non-motorized	☐	☐	☑
7		☐	☐	☐
8		☐	☐	☐
9		☐	☐	☐
Totals		0	4	NE
Undeveloped Total Rating			-4	

Explain:

The wilderness character within the project area would be impacted by construction activities due to the prohibited use of mechanized equipment and physical manipulation within recommended wilderness. The use of mechanized equipment in wilderness will be limited to activities that directly support the restoration of hydrologic processes, sediment transport, and removal of invasive species. Any activity that would not be required in wilderness to meet the purpose and need of the project would be conducted elsewhere.

All construction activities will be during the day. No night construction or need for lighting, like flood lights, would be necessary. Post-treatment of exotic vegetation species would occur to ensure efficacy of exotic vegetation removal. Methods may include the use of loppers, hand saws, chain saws, and National Park Service approved herbicides. All exotic vegetation treatments would be covered by the Park's existing exotic plant management plan (NPS 2009). Restoration actions will be implemented at sediment deposit sites to mitigate soil erosion and establish native perennial vegetation, such as the installation of silt fencing. These installations will be removed long term. The impacts to undeveloped wilderness quality would be short term, no longer than 5 years. The long term benefits of restoring the natural processes in the wilderness outweigh the short term negative impacts from the use of motorized, heavy equipment.

NATURAL

Component Activity for this Alternative		Positive	Negative	No Effect
X	*Example: Personnel will travel by horseback*	☐	☐	☑
1	excavator with a specialized attachment (grappler) to remove tamarisk trees, including as much	☑	☐	☐
2	heavy equipment including front end loaders, road graders, and dump trucks	☑	☐	☐
3	same equipment used to remove the sediment from the washes	☑	☐	☐
4	Silt fencing or other erosion control methods would not be permanent installations and removed	☑	☐	☐
5	upland, native seed mix to promote native plant revegetation	☑	☐	☐
6	non-motorized	☐	☐	☑
7		☐	☐	☐
8		☐	☐	☐
9		☐	☐	☐
Totals		5	0	NE
Natural Total Rating		**5**		

Explain:

This alternative is supported by NPS Management Policies 2006 (section 4.1.5., Restoration of Natural Systems). The proposed action would reestablish natural processes that have been impacted by human disturbances, in particular, the introduction of non-native vegetation, changes to hydrologic patterns from the construction of the road, and the disruption of natural processes. The long term benefits of restoring the natural processes in the wilderness outweigh the short term negative impacts from the use of heavy equipment and use of herbicides.

SOLITUDE OR PRIMITIVE & UNCONFINED RECREATION

Component Activity for this Alternative		Positive	Negative	No Effect
X	*Example: Personnel will travel by horseback*	☐	☐	☑
1	excavator with a specialized attachment (grappler) to remove tamarisk trees, including as much	☐	☑	☐
2	heavy equipment including front end loaders, road graders, and dump trucks	☐	☑	☐
3	same equipment used to remove the sediment from the washes	☐	☑	☐
4	Silt fencing or other erosion control methods would not be permanent installations and removed	☐	☐	☑
5	upland, native seed mix to promote native plant revegetation	☐	☐	☑
6	non-motorized	☐	☐	☑
7		☐	☐	☐
8		☐	☐	☐
9		☐	☐	☐
Totals		0	3	NE
Solitude or Primitive & Unconfined Recreation Total Rating			**-3**	

Explain:

The opportunity for solitude and unconfined recreation would be degraded with activities in the washes and staging areas during project activities. Noise and views of operations would be heard and seen by visitors in the adjacent wilderness. These views and sounds would be seen and heard on the trail to Delicate Arch, however, the exact impacts are unknown . The work area would be closed for safety.

The opportunities for solitude or primitive and unconfined recreation are already degraded near the Wolfe Ranch and Delicate Arch due to heavy visitation. Noise and views of traffic and people are common.

The actions will temporarily impact the opportunity for visitors to experience solitude and primitive recreation. The effect of the actions will allow for restoration of the natural processes resulting in positive impact to the Natural quality. Long term impact on the visitor's wilderness experience will be enhanced by restored natural processes.

OTHER FEATURES OF VALUE

Component Activity for this Alternative		Positive	Negative	No Effect
X	*Example: Personnel will travel by horseback*	☐	☐	☑
1	excavator with a specialized attachment (grappler) to remove tamarisk trees, including as much	☐	☐	☑
2	heavy equipment including front end loaders, road graders, and dump trucks	☐	☐	☑
3	same equipment used to remove the sediment from the washes	☐	☐	☑
4	Silt fencing or other erosion control methods would not be permanent installations and removed	☐	☐	☑
5	upland, native seed mix to promote native plant revegetation	☐	☐	☑
6	non-motorized	☐	☐	☑
7		☐	☐	☑
8		☐	☐	☐
9		☐	☐	☐
Totals		☐	☐	☐
Other Features of Value Total Rating		0	0	NE
			0	

Explain:

The hydrologic and geologic processes will be impacted by activities.

However, these are evaluated as part of the Natural quality unless the specific process or feature is unique to the wilderness area. In this case, similar hydrologic processes exist in other places within the region and is not unique to this wilderness.

Surveys prior to and monitoring during work for natural and cultural resources will occur. If sensitive resources are discovered, additional compliance will occur.

Summary Ratings for Alternative 2	
Wilderness Character	
Untrammeled	-5
Undeveloped	-4
Natural	5
Solitude or Primitive & Unconfined Recreation	-3
Other Features of Value	0
Wilderness Character Summary Rating	-7

Project Title: Arches National Park: Salt Wash Rehabilitation Project

MRDG Step 2: Alternatives Not Analyzed

Alternatives Not Analyzed

What alternatives were considered but not analyzed? Why were they not analyzed?

Rehabilitate Salt Wash utilizing non-prohibited and/or less impactful tools
This alternative would utilized all or some non-mechanized or motorized and/or less impactful tools (ex. elimination of motorized equipment for reestablishment of the wash channels and tamarisk removal). This would decrease the impacts to the undeveloped and solitude /primitive wilderness qualities. However, expert analysis suggests use of the proposed tools is necessary to successfully accomplish the overall purpose of restoring the natural flow to the channels. To accomplish the natural flow, the entire root system of the tamarisk needs to be removed. A motorized excavator is necessary to fully accomplish this. Lesser tools would not fully accomplish the need and purpose for taking action and could result in reoccurring longer term impacts to wilderness.

Rehabilitate the Washes outside of Wilderness
The recommended wilderness boundary is 300 feet from centerline of the Wolfe Ranch / Delicate Arch Viewpoint roadway. This alternative would utilize motorized equipment for reestablishment of the wash channels and tamarisk removal only within the 300 feet from the road of non-wilderness. No action would take place within wilderness. To accomplish the purpose and need to reestablish the natural flow to the wash channels, action would need to extend into wilderness. This alternative would not fully reestablish the natural flow in the washes and is anticipated to result in reoccurring longer term impacts to wilderness.

Transport Sediment from Excavated Washes out of the Project Area
This alternative would utilize motorized machinery for the reestablishment of the wash channels and tamarisk removal. The sediment removed from the wash channels would be transported out of the project area as opposed to the proposed sediment deposit sites within the project area. This alternative would increase the amount of time and equipment needed to complete the project resulting in greater impacts to wilderness character.

Remove Culverts and Return This Section of Delicate Arch Road to a Low Water Crossing
This alternative would conflict with the management strategies identified for Delicate Arch in the Park's General Management Plan that supports visitation to the area. In addition, prior to the 1994, the Wolfe Ranch/Delicate Arch road was a low water crossing, and flooding events and safety issues lead the Park to raise and pave the roadway. Reestablishing the road as a low water crossing would create a condition similar to that time period with flooding events and road closures. This alternative would not meet the purpose of reestablishment of a more natural flow to Salt Wash at its confluence with Salt Valley Wash and Winter Camp Wash.

Partial Rehabilitation of One or Two Washes
The three washes converge into the same alluvial fan south of the road. Partial rehabilitation would not meet the purpose of reestablishment of a more natural flow to Salt Wash at its confluence with Salt Valley Wash and Winter Camp Wash.

Relocate the Road below the Alluvial Fan and Install Bridges
This alternative would relocate the road to an area that is less affected by the wash drainages and alluvial fan. However, total relocation of the road is economically infeasible and would have too great of an environmental impact, such as permanent negative impacts to undisturbed areas managed as wilderness.

Project Title: Arches National Park: Salt Wash Rehabilitation Project

MRDG Step 2: Alternative Comparison

Alternative 1: No Action-Continuation of current management practices

Alternative 2: Rehabilitation of the Salt Wash, Salt Valley Wash and Winter Camp Wash

Alternative 3: #REF!

Alternative 4: #REF!

Wilderness Character	Alternative 1		Alternative 2		Alternative 3		Alternative 4	
	Positive	Negative	Positive	Negative	Positive	Negative	Positive	Negative
Untrammeled	5	0	0	5	#REF!	#REF!	#REF!	#REF!
Undeveloped	0	0	0	4	#REF!	#REF!	#REF!	#REF!
Natural	0	3	5	0	#REF!	#REF!	#REF!	#REF!
Solitude/Primitive/Unconfined	0	0	0	3	#REF!	#REF!	#REF!	#REF!
Other Features of Value	0	0	0	0	#REF!	#REF!	#REF!	#REF!
Totals	5	3	5	12	#REF!	#REF!	#REF!	#REF!
Wilderness Character Rating	**2**		**-7**		**#REF!**		**#REF!**	

Alternative 5: #REF!

Alternative 6: #REF!

Alternative 7: #REF!

Alternative 8: #REF!

Wilderness Character	Alternative 5		Alternative 6		Alternative 7		Alternative 8	
	Positive	Negative	Positive	Negative	Positive	Negative	Positive	Negative
Untrammeled	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!
Undeveloped	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!
Natural	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!
Solitude or Primitive & Unconfined Rec.	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!
Other Features of Value	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!
Totals	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!
Wilderness Character Rating	**#REF!**		**#REF!**		**#REF!**		**#REF!**	

Project Title: Arches National Park: Salt Wash Rehabilitation Project

MRDG Step 2: Determination

Refer to the MRDG Instructions before identifying the selected alternative and explaining the rationale for the selection.

Selected Alternative

- ☐ Alternative 1: No Action-Continuation of current management practices
- ☑ Alternative 2: Rehabilitation of the Salt Wash, Salt Valley Wash and Winter Camp Wash
- ☐ Alternative 3: #REF!
- ☐ Alternative 4: #REF!
- ☐ Alternative 5: #REF!
- ☐ Alternative 6: #REF!
- ☐ Alternative 7: #REF!
- ☐ Alternative 8: #REF!

Explain Rationale for Selection:

The purpose of this analysis is to determine whether rehabilitation of the Salt Wash is necessary in wilderness (Step 1) and if so, what methods represent the minimum required action (Step 2). The National Wilderness Steering Committee provides guidance that short-term impacts to wilderness qualities for long-term wilderness character enhancement such as the restoration of natural processes are possible. The intent is to reverse anthropogenic changes that, once accomplished is self sustaining. Users of wilderness may encounter restoration activities that would typically result in impacts to wilderness character lasting from one season up to several years. Upon completion, traces of the restoration activity would lessen, and the benefits and naturalness to wilderness character would be long-term. In addition Executive Order 13112, February 3, 1999, directs all agencies in the Executive Branch to prevent the introduction of invasive species and to detect and respond rapidly to and control populations of such species but does not specify actions for wilderness or for other public lands. National Park Service policy (NPS *Management Policies* 2006 section 4.1.5., Restoration of Natural Systems) states parks will reestablish natural processes that have been impacted by "...human disturbances including the introduction of exotic species;... changes to hydrologic patterns and sediment transport; the accelerations of erosion and sedimentation; and the disruption of natural processes."

Based on the analysis described in Step 1 it is necessary to take action to preserve the Natural quality. A wilderness area is to be "protected and managed so as to preserve its natural conditions" meaning that wilderness ecological systems are substantially free from the effects of modern civilization. To preserve this quality, and address the Scenic and Conservation public purposes of wilderness, it is necessary to take action to correct unnatural conditions.

If more space is needed, continue on the next page...

Explain Rationale for Selection, Continued:

Any impacts resulting from the influence of modern civilization (such as the effects on natural stream flow from the road and non-native tamarisk) affect both the Natural quality of wilderness character and the Scenic and Conservation public purposes.

The selected alternative is #2, rehabilitation of Salt Wash using the actions and mitigations described. This alternative best meets the purpose and need for action to preserve and restore the Natural quality of wilderness. NPS Management Policies 2006 (section 6.3.5 Minimum Requirement) states "only those actions that preserve wilderness character and/or have localized, short-term adverse impacts will be acceptable" and "administrative use of motorized equipment or mechanical transport will be authorized only if determined by the superintendent to be the minimum requirement needed by management to achieve the purposes of the area, including the preservation of wilderness character and values, in accordance with the Wilderness Act." The described use of motorized equipment , including all mitigation actions intended to avoid significant resource impacts or conflicts with visitor use, with alternative #2 has been determined to be the minimum tool necessary to achieve restoration of the natural hydrologic and geologic processes of the Salt Wash. This alternative allows for localized, short-term impacts which will have long-term benefits to natural quality.

Utilization of less obtrusive and non-prohibited tools , as identified in alternatives not analyzed, would not achieve the desired restoration of natural quality and could over the long term require additional impacts to wilderness qualities in order to maintain the natural processes of the Salt Wash.

No action would not meet the purpose and need to restore natural processes that have been impacted by human disturbances or to respond to and control populations on invasive species.

Describe Monitoring & Reporting Requirements:

Approvals

Which of the prohibited uses found in Section 4(c) of the Wilderness Act are approved in the selected alternative and for what quantity?

Prohibited Use	Quantity
☐ Mechanical Transport:	
☐ Motorized Equipment:	
☐ Motor Vehicles:	
☐ Motorboats:	
☐ Landing of Aircraft:	
☐ Temporary Roads:	
☐ Structures:	
☐ Installations:	

Record and report any authorizations of Wilderness Act Section 4(c) prohibited uses according to agency policies or guidance.

Refer to agency policies for the following review and decision authorities:

	Name	Position	Signature	Date
Prepared	Keri Nelson	Wilderness Coordinator	Keri Nelson	12/12/2017
Recommended	Scott BROWN	CHIEF RANGER (VRP)	ScottBrown	12/12/17
Recommended				
Approved	KATE CANNON	SUPERINTENDENT	Kate Cannon	12/12/17