

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

**In Coordination with:
United States Fish and Wildlife Service
Colorado Attorney General's Office
Colorado Department of Natural Resources
Colorado Department of Public Health and Environment**

**Draft Damage Assessment and Restoration Plan/
Environmental Assessment
for the West Creek Oil Spill, Gateway, Colorado**

Grand Junction Field Office
McInnis Canyons National Conservation Area
Dominguez-Escalante National Conservation Area
2815 H Road
Grand Junction, Colorado 81506

DOI-BLM-CO-N030-2016-0019-EA



November 1, 2017

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Suggested Citation

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Abbreviations and Acronyms

BLM	United States Bureau of Land Management
CFR	Code of Federal Regulations
CAGO	Colorado Attorney General's Office
CDNR	Colorado Department of Natural Resources
CDPHE	Colorado Department of Public Health and Environment
CWA	Clean Water Act
DARP	Damage Assessment and Restoration Plan
DOI	U.S. Department of the Interior
EA	Environmental Assessment
EIS	Environmental Impact Statement
EPA	U.S. Environmental Protection Agency
ESA	Endangered Species Act
FONSI	Finding of No Significant Impact
HEA	Habitat Equivalency Analysis
MBTA	Migratory Bird Treaty Act
NCP	National Contingency Plan
NEPA	National Environmental Policy Act
NRDAR	Natural Resource Damage Assessment and Restoration
OPA	Oil Pollution Act
PRP	Potentially Responsible Party
RP	Restoration Plan
DARP/EA	Damage Assessment and Restoration Plan / Environmental Assessment
Site	Site of gasoline and diesel spill
USC	United States Code
USFWS	United States Fish and Wildlife Service

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CHAPTER 1 – INTRODUCTION

1.1 IDENTIFYING INFORMATION

BACKGROUND: This Draft Damage Assessment and Restoration Plan/Environmental Assessment (Draft DARP/EA) has been prepared by the federal and state Natural Resource Trustees for the West Creek Oil Spill to 1) evaluate alternatives to restore, replace, rehabilitate, or acquire the equivalent natural resources and human uses that were injured or lost as a result of the West Creek oil spill, and 2) analyze the potential impacts of the following proposed restoration or human use projects (project 1 and 3) to the human environment¹:

1. Stile installation and improved human access to West Creek;
2. Removal and treatment of tamarisk and secondary invasive species within approximately 44 acres of riparian habitat along the Dolores River; and
3. Side-channel restoration along the Dolores River to provide nursery habitat for sensitive fish species.

The proposed restoration and human use projects are meant to compensate for injuries to natural resources and natural resource services resulting from a spill of diesel and gasoline into West Creek by returning the injured natural resources and natural resource services to their baseline condition and compensating for associated interim losses. Natural resources, as defined by the Oil Pollution Act (OPA) of 1990, include land, fish, wildlife, water sources, and other such resources belonging to, managed by, held in trust by, appertaining to, or otherwise controlled by the United States, any state or local government or Indian tribe, or any foreign government. Proposed restoration and human use projects would be completed pursuant to OPA, which provides Trustees authority to restore, rehabilitate, replace, or acquire the equivalent of injured resources.

CASEFILE/PROJECT NUMBER optional: DOI-BLM-CO-N030-2016-0019-EA West Creek Spill Restoration

PROJECT NAME: West Creek Oil Spill Damage Assessment and Restoration Plan / Environmental Assessment

PLANNING UNIT: Grand Junction Field Office – BLM, Colorado and Moab Field Office - BLM, Utah

1.2 PROJECT LOCATION AND LEGAL DESCRIPTION

LEGAL DESCRIPTION:

¹ “Human environment” shall be interpreted comprehensively to include the natural and physical environment and the relationship of people with that environment (40 CFR 1508.14)

Stile location: 6th P.M. T. 015 S. R. 103 W. SENE Section 21, 6th P.M. T. 015 S. R. 103 W. SENE Section 16

Site 1: New Mexico Meridian T. 049 N. R. 018 W. SENW Section 28

Site 2: New Mexico Meridian T. 050 N. R. 018 W. NWNW Section 30

Site 3 (Rock Berm Site): T.024 S. R. 026) E. Section 05

1.3 PURPOSE AND NEED

This Draft Damage Assessment and Restoration Plan and Draft Environmental Assessment for the West Creek Oil Spill is intended to inform the public about the natural resource injuries caused by the January 25, 2013, spill of gasoline and diesel and potential restoration projects that could compensate for those injuries. This document is part of a natural resource damage assessment and restoration being performed pursuant to the Oil Pollution Act of 1990 (OPA) (33 USC §§ 2701, et seq.), by the U.S. Department of the Interior (DOI), represented by the Bureau of Land Management (BLM) and the U.S. Fish and Wildlife Service (USFWS), and the state of Colorado, through the Colorado Attorney General’s Office (CAGO), Colorado Department of Natural Resources (CDNR), and Colorado Department of Public Health and Environment (CDPHE), collectively known as the trustees. OPA regulations provide that if an incident affects the interests of multiple trustees, the trustees should act jointly to ensure that full restoration is achieved without double recovery of damages. For joint assessments, trustees must designate one or more lead administrative trustee(s) to act as coordinators. The BLM represents the Trustees as the federal lead administrative trustee.

This Draft DARP includes several restoration projects to be undertaken in the vicinity of the spill site (Site) along West Creek and Dolores River and associated habitats, such as river banks. This plan also serves as an EA under the National Environmental Policy Act (NEPA) (42 USC §§ 4320, et seq.). This document addresses the potential impact of the Trustees’ proposed restoration actions on the quality of the physical, biological, and cultural environment. The purpose of this Draft DARP/EA is to compensate (in the form of natural resource restoration) for injuries to natural resources and natural resource services resulting from the spill of diesel and gasoline (also referred to as oil² in this document) by returning the injured natural resources and natural resource services to their “baseline” condition (i.e., the condition that would have occurred but for the spill) and compensating for associated interim losses.

1.3.1 Summary of Spill History and Resulting Public Losses

The oil spill occurred on January 25, 2013, in West Creek eight miles east of Gateway, Mesa County, Colorado (Figure 1). A Groendyke Transport, Inc. truck was transporting gasoline and diesel fuel; approximately 6,000 gallons of gasoline and 2,000 gallons of diesel entered West Creek due to the spill. Groendyke’s operations are based in Oklahoma. The company transports

² “Oil” means oil of any kind or in any form, including, but not limited to, petroleum, fuel oil, sludge, oil refuse, and oil mixed with wastes other than dredged spoil. However, the term does not include petroleum, including crude oil or any fraction thereof, that is specifically listed or designated as a hazardous substance under 42 U.S.C. 9601(14)(A) through (F), as defined in section 1001(23) of OPA (33 U.S.C. 2701(23)).

gasoline, diesel fuel, and paving-grade asphalt. The spill of oil-related substances into West Creek and subsequent response activities resulted in approximately two acres of injury to aquatic and riparian habitat. Diesel fuel and gasoline concentrations in surface water of West Creek were potentially sufficient to cause adverse effects in aquatic biota, and some direct impacts, such as fish mortality, were documented. Resources of concern in this sensitive watershed, with its ecologically important fauna, include water, fish, resident wildlife, including migratory birds, and habitats that support fish and wildlife.

In addition to the loss to natural resources, there have been losses to the recreational uses of West Creek due to impacts to the recreational fishery, consisting primarily of trout species.



Figure 1. Location of diesel and gasoline spill into West Creek along Colorado Highway 141.

1.3.2 Restoration Goals

The purpose of the Natural Resource Damage Assessment and Restoration (NRDAR) process is to compensate the public for its loss of natural resource services caused by the release of oil or other hazardous substances into West Creek. Services in this case are the ecosystem services, including human uses, such as recreation, provided by the affected areas that were impaired due to contamination from the gasoline and diesel spill.

The goals of restoration include the following:

- Offset lost services due to diesel and gasoline spill contamination;
- Increase the quality and/or quantity of riparian and aquatic habitat in the vicinity of spill-affected areas to a level sufficient to meet the restoration requirements of the NRDAR;
- Increase the quality and quantity of riparian and aquatic habitat for fish, aquatic biota and migratory birds occurring in the vicinity of the spill-affected area; and
- Enhance the quality and/or quantity of recreational uses, such as river fishing, to benefit one or more human uses in the vicinity of the spill-affected area.

1.3.3 Need for Restoration

The proposed restoration actions are needed to restore natural resources equivalent to those injured by a discharge of oil-related substances to fish, aquatic resources, migratory birds and recreational resources in West Creek. Based on recommendations set forth in this Draft DARP/EA and input from the public, the Trustees will select the preferred restoration alternative.

1.4 PUBLIC PARTICIPATION

1.4.1 Public Scoping:

The primary mechanism used by the BLM to invite public involvement in the public scoping process was posting this project on the BLM ePlanning NEPA website on August 17, 2016.

1.4.2 Internal Scoping:

Descriptions of restoration projects considered for alternative development were distributed among federal and state stakeholders, including the Grand Junction and Moab Interdisciplinary Team (IDT) and discussed at IDT meetings. Potential projects and potential environmental, social, or cultural issues were discussed as part of regularly scheduled coordination calls throughout 2016 and into early 2017. On September 8 and 9, 2016, Grand Junction IDT members and staff from DOI and the State of Colorado visited potential restoration sites along West Creek and Dolores River near the town of Gateway. The Moab IDT was engaged to provide input on the proposed river restoration project in Utah in August 2016. During the IDT

meetings and other stakeholder discussions, a preliminary list of environmental issues (impact topics) was developed.

1.4.3 Issues Identified:

During the internal scoping period the Trustees identified the following impact topics that guided the development of alternatives in Chapter 3, and the scope and content of the environmental consequences analysis for the Preferred Alternative found in Chapter 6.

Impact Topic: Physical Resources

Sub-topic: Impacts to Water Resources

Stream restoration, which includes sediment and soil disturbance activities, as well as other disturbances, as part of the Proposed Action has the potential to directly and cumulatively impact water quality (e.g., increased turbidity) at the restoration sites and downstream. Because of these issues, impacts to water resources were identified as an important environmental issue.

Sub-topic: Impacts to Floodplains (Moab Field Office)

Stream restoration, which includes changes to floodplain channels, as well as other disturbances, as part of the Proposed Action has the potential to directly and cumulatively impact floodplain resources (e.g., improved functioning) at the restoration sites. Because of these issues, impacts to floodplain resources were identified as an important environmental issue.

Impact Topic: Biological Resources

Sub-topic: Restoration Impacts to Aquatic and Upland Biota

Dolores River restoration activities have the potential to cause temporary adverse effects to aquatic and terrestrial biota, such as sensitive fish species and migratory birds. The potential impact of restoration activities, including side-channel restoration and tamarisk removal, along restoration reaches of the Dolores River were identified as an important environmental issue.

Sub-topic: Impacts to Wetland/ Riparian Resources (Moab Field Office)

Stream restoration and associated disturbances, as part of the Proposed Action, has the potential to directly and cumulatively impact wetland and riparian resources (e.g., improved conditions) at the restoration sites. Because of these issues, impacts to wetland and riparian resources were identified as an important environmental issue.

Sub-topic: Impacts to Rangeland Health Standards (Moab Field Office)

Stream restoration and associated disturbances, as part of the Proposed Action has the potential to directly and cumulatively impact rangeland health standards (e.g., improved functioning) at

the restoration sites. Because of these issues, impacts to rangeland health standards were identified as an important environmental issue.

Impact Topic: Heritage Resources and Human Environment

Sub-topic: Dolores River Habitat Restoration Impacts to Cultural, Historical, Visual and Native American Religious Values

Dolores River restoration activities have the potential to cause permanent or temporary adverse effects to heritage resources/values and visual resources. The potential impact of restoration activities, including side-channel restoration and vegetation management, to cultural, historical, visual, and Native American religious values along restoration reaches of the Dolores River were identified as an important issue.

Impact Topic: Land Resources

Sub-topic: Restoration Project Impacts to Recreation, Special Designations, Wild and Scenic rivers, and Range Management

Dolores River and West Creek restoration activities have the potential to cause permanent or temporary effects to recreation, special designations, Wild and Scenic Rivers, and range management. The potential impacts of proposed activities, including side-channel restoration, stile installation, and vegetation management, to land resources and their uses at and in the vicinity of restoration areas were identified as an important issue.

1.4.3.1 Issues not Analyzed: Issues that were considered but not analyzed, including a reason for the decision to not analyze, are listed in Chapter 6.1.1

1.4.4 Public Comment Period:

This Draft DARP/EA provides the public with information on the estimated natural resource injuries resulting from the spill of oil at the Site, the Trustees' restoration goals, and preferred restoration alternatives that would provide the public fair and adequate compensation for the injuries. In accordance with NEPA and the OPA regulations, this Draft DARP/EA is being made available for review and comment by the public for a period of 30 days. The Trustees seek comments on the Proposed Action presented in this Draft DARP/EA.

Comments may be submitted by any of the following methods:

In writing to:

Laura Archuleta
U.S. Fish and Wildlife Service
Colorado Field Office
46525 Highway 114
Saguache, CO 81149

By email to: laura_archuleta@fws.gov

Document available online at: <https://www.fws.gov/mountain-prairie/contaminants/westCreek.php>

1.5 DECISION TO BE MADE

The Trustees will decide whether to approve the proposed restoration and human use projects along West Creek and Dolores River based on the analysis contained in this EA and comments from the public. The EA portion of this document describes the potential alternatives considered (Chapter 3), the affected environment as it currently exists (Chapter 6), the probable consequences on the human environment that may result from the implementation of the Proposed Action (Chapter 6), and the potential cumulative impacts from the Proposed Action (also Chapter 6). The Trustees may choose to: a) authorize the projects as proposed, b) authorize the projects with modifications/mitigation, c) authorize an alternative to the proposed actions, or d) not implement the projects at this time.

CHAPTER 2 – NATURAL RESOURCE DAMAGE ASSESSMENT AND RESTORATION

2.1 ENVIRONMENT AFFECTED BY THE SPILL

The following sections provide an overview of the physical, biological, archeological/cultural, and recreational environment affected by the spill of oil into West Creek, Colorado. Additional detail about West Creek and natural resources can be found in Powell and Trammell (2002). Chapter 6 (Affected Environment and Environmental Consequences) provides additional and related information about the area where restoration projects are proposed.

2.1.1 Physical Environment

On January 25, 2013, a Groendyke Transport tanker traveling in the southwesterly direction along Colorado State Highway 141 rolled over a 50-foot steep embankment at mile marker 120. The tanker rolled into West Creek where it released 6,000 gallons of gasoline, and 2,000 gallons of diesel product into the creek. The tanker exploded and lit both the truck and released product on fire. The fire eventually travelled approximately three-quarters of a mile downstream from the incident location. In an attempt to absorb and control the oil product in the creek, the fire department placed sorbent booms one mile and two miles downstream of the accident (Figure 2; U.S. EPA POLREP #3, 2013). In the following days through February 11, 2013, site clean-up efforts occurred to remove the product from the stream, remove debris from the crash site, and wash the rock wall and riparian vegetation. Monitoring efforts included both stream water and sediment sampling, and fish kill documentation. Oil was visible along approximately 3.4 miles of West Creek, including surface water and geological and biological substrates (ie. rocks, woody debris, and plants).



A fish
of oil
brown
Long-
West
the oil
still

Figure 2. Boom deployed in West Creek to limit gasoline and diesel downstream movement (A); response crews working to address gasoline and diesel contamination (B).

2.1.2 Biological Environment

kill was reported following the spill products into West Creek. Mortality estimates included approximately 1,200 trout and 8,200 mottled sculpin. term monitoring of Creek suggests that spill had, and may continue to have,

sublethal impacts to fish as a result of continued exposure to low oil-associated contaminants (Sam Duggan personal communication). Laboratory experiments confirm that low-level exposure of fish and benthic macroinvertebrates to oil-associated contaminants can have population level impacts, as well as more subtle effects on behavior (Duggan et al. 2017). Estimated injuries to West Creek fish and benthic macroinvertebrates (as surrogates for the in-stream aquatic habitat) were a component of the Trustees' claim for damages.

2.1.3 Archeological and Cultural Resources

To the Trustees' knowledge, no archeological and cultural resources were impacted by oil spill into West Creek. Remarkable values of West Creek include scenic, wildlife, geological, and vegetation, although unlike its receiving water, Dolores River, no archeological or cultural resources have been designated (BLM 2015).

2.1.4 Recreational Services

West Creek is a good-quality, active fishery for recreational trout fisherman (Powell and Trammell 2002). According to historical records, it is common for a competent catch-and-release fly fisher to return 15 to 20 trout to the creek in a day's fishing (Powell and Trammell 2002). Direct impacts to aquatic macroinvertebrates and fish within the spill-affected reach were documented, resulting in fewer catchable fish, at least over the short-term. Estimated recreational fishing losses were a component of the Trustees' claim for damages.

The BLM manages a picnic area adjacent to West Creek approximately six miles northeast of the town of Gateway on Highway 141. The picnic area provides stream access and recreational facilities, including picnic tables, fire grates for cooking, and a public bathroom. To the Trustees' knowledge, recreational opportunities (besides fishing) at the BLM picnic area or other places along West Creek and Highway 14 were not impacted by the spill, because of the time of year it occurred (winter), and therefore were not included as a component of the claim for damages.

2.2 INJURY QUANTIFICATION AND RESTORATION PLANNING

The goal of injury assessment is to determine the nature, extent and severity of injuries to natural resources, thus providing the technical basis for evaluating and properly scaling potential restoration actions to compensate for resource injuries. The OPA NRDAR regulations define injury as "an observable or measurable adverse change in a natural resource or impairment of a natural resource service." An impairment or loss of recreational use of the natural resources is a compensable "value" as defined by the OPA NRDAR regulations, as well.

For each of the injury categories evaluated following the spill and discussed in this Draft DARP/EA, the Trustees selected assessment procedures based on (1) the range of procedures available under section 990.27(b) of the OPA regulations; (2) the time and cost necessary to implement the procedures, and considering whether the additional cost of more complex procedures were related to the expected increase in the quantity and/or quality of the information to be acquired; (3) the potential nature, degree, and spatial and temporal extent of the injury; (4)

potential restoration actions for the injury; (5) the relevance and adequacy of information generated by the procedures to meet information requirements of planning appropriate restoration actions; and (6) input from scientific experts.

2.2.1 Quantification of Damages

Injury assessment for biological resources and recreational use focused on determining both the magnitude of the injury (e.g., number of fish killed or days of lost recreational opportunity) and the time to full recovery. This produced an estimate of the initial and interim (from the time of injury until full recovery) losses resulting from the oil spill.

The Trustees' task is to determine the scale of restoration actions that adequately compensate the public for the injuries resulting from the spill. For fish and wildlife habitat, the Trustees used habitat equivalency analysis (HEA), an evaluation method to assess the interim losses and the expected service benefits of proposed restoration projects. HEA offers the ability to account for differences in ecosystem services, the potential improvements from any Environmental Protection Agency or other response agency's remedial actions or other projects to restore baseline, the different benefits of compensatory restoration projects, and the time it takes to restore to baseline. For human recreational losses, the Trustees used a valuation approach, estimating the number of lost user-days for recreational fishing, and then calculating the lost value, in dollars, of that lost use.

2.2.2 Restoration Project Selection Criteria

The Trustees considered several restoration alternatives to compensate the public for spill-related injuries. Each restoration alternative has been evaluated using the regulatory factors and additional criteria described below. This process resulted in the Trustees' selection of a Proposed Action, consisting of three restoration projects, for this Draft DARP/EA. All alternatives, including the no action, proposed, and considered but eliminated, are discussed in subsequent sections below.

In accordance with Section 990.53(a)(2) of the OPA NRDAR regulations only those alternatives considered technically feasible and in accordance with applicable laws, regulations, or permits were carried forward for further evaluation.

Section 990.54(a) of the OPA regulations list the following factors which the trustees used to evaluate the alternatives put forth in this Draft DARP/EA:

- (1) The cost to carry out the alternative;
- (2) The extent to which each alternative is expected to meet the trustees' goals and objectives in returning the injured natural resources and services to baseline and/or compensating for interim losses;
- (3) The likelihood of success of each alternative;
- (4) The extent to which each alternative will prevent future injury as a result of the incident, and avoid collateral injury as a result of implementing the alternative;

- (5) The extent to which each alternative benefits more than one natural resource and/or service; and
- (6) The effect of each alternative on public health and safety.

In addition to these regulatory factors, the Trustees considered the following criteria when evaluating restoration alternatives, to the extent information on them could be obtained.

- A. **Cost-Effectiveness.** If multiple proposed projects deliver an equivalent amount and type of benefits, the Trustees seek the least costly approach. This closely aligns with factor (1) above.
- B. **Relationship to Injured Resources and/or Services (nexus).** Projects that restore, rehabilitate, replace, enhance, or acquire the equivalent of the same or similar resources or services injured by the spill are preferred to projects that benefit other comparable resources or services; this includes consideration of the proximity of the restoration project to the location of the injured resources.
- C. **Time to Provide Benefits.** A proposed project that provides benefits to the target resource or public sooner is preferred over a project that would provide those benefits later.
- D. **Duration of Benefits.** The Trustees consider the expected duration of benefits from the proposed project. Long-term benefits are preferred.
- E. **Multiple Resource and Service Benefits.** The Trustees consider the extent to which the proposed project benefits more than one natural resource or resource service. This is measured in terms of the quantity and quality of natural resource services expected to result from the project. This closely aligns with factor (5) above.
- F. **Maintenance and Oversight of Project.** The Trustees consider the opportunities to protect an implemented project and resulting benefits over time through conservation easements, land acquisition, or other types of resource dedication. Long-term protection is preferable.
- G. **Opportunities for Collaboration.** The Trustees consider the possibility of matching funds, in-kind services, volunteer assistance, and coordination with other ongoing or proposed projects. External funding and support services that reduce costs or extend benefits are preferable. Funds, however, shall not be used to offset the costs of ongoing mitigation projects required pursuant to state or federal law.
- H. **Non-Duplication.** Projects should not duplicate other efforts already ongoing at the same location.

2.2.3 Injury Quantification and Development of Restoration Alternatives

This section describes the nature, extent, and severity of injuries to natural resources and human recreational uses resulting from the spill, as well as potential restoration alternatives that may compensate for these injuries. This section is divided into two resource categories, 1) Aquatic and riparian habitat (for fish and wildlife supported by riparian habitat) and 2) Recreational Use.

2.2.3.1 Aquatic and Riparian Habitat

To streamline the assessment process, the adverse effects quantified in benthic macroinvertebrates and fish were used to approximate the lost ecological services that would have been provided by other resources within the spill-affected area, including plants and wildlife that constitute upper trophic levels such as amphibians, reptiles, birds, and mammals (i.e., indirect assessment endpoints). Since oil spilled into West Creek may have had impacts not assessed by the Trustees, this approach provides a conservative estimate of potential injury within the affected stream reach. This general approach has been used in previous NRDAR cases where a representative resource has been used to quantify potential injury to several resources. Additional rationale for this approach is provided in Munns et al. (2009).

According to estimates from the state of Colorado, at least 1,200 brown trout and 8,200 mottled sculpin were killed as a result of the spill into West Creek. Other species of fish were likely killed or sustained lethal impacts, although such direct injuries were not quantified. For restoration planning purposes, the Trustees concluded that it was not practical to develop and implement restoration projects for each of the injured fish species. Trout stocking of West Creek ceased in 1973, and trout populations appear to remain stable despite cessation of stocking (because there are no major stressors to the fishery). In addition, brown trout numbers per mile downstream of the spill site are not indicative of a spill-impacted population (Duggan et al. 2017). Therefore, the Trustees determined that stocking of additional trout in West Creek would not provide significant natural resource benefits.

To determine the fish population after the spill occurred, the Trustees used data from a downstream site (reference 5A transect mentioned in Powell and Trammell 2002) to calculate fish injury for stream segment one, and an upstream site not impacted by the spill. In other words, the upstream site was used to characterize baseline conditions (ie. but for the spill of oil). The Trustees calculated the total fish/acre for all fish species combined among the upstream and impacted reaches within West Creek.

To determine impacts of the spill to benthic macroinvertebrates, the Trustees compared pre-spill benthic macroinvertebrate community health data with the impacted stream reach. Sample analysis demonstrated a significant reduction of benthic macroinvertebrate total abundance at the spill site, as well as a potentially spill-associated decrease in total abundance downstream of the spill site.

The Trustees used the average of fish and benthic macroinvertebrates estimated service losses to generate an overall habitat level service loss. Service losses were assumed to have begun in 2013 (after the spill) and ended in 2019, assuming six years were needed until aquatic resources had fully recovered. The assessment area included two segments of West Creek totaling 4,766 linear feet, or approximately 1.9 acres. Data from an existing stream restoration project within the

geographic region were used to generate an estimate of restoration project costs that could be associated with an appropriately-scaled (for size and type of restoration) project. Ecological restoration costs for implementation of the hypothetical project were estimated at \$32,734. In addition to implementation costs, other restoration cost categories include planning, implementation, oversight, corrective action, and monitoring. Restoration funds are to be used for stream restoration in the vicinity of the impacted area or areas that have an ecological nexus to West Creek and its supported biota, including fish, benthic macroinvertebrates, and wildlife.

2.2.3.2 Recreational Use

Because direct impacts to the aquatic community within the spill-affected reach were documented, resulting in fewer catchable fish, the Trustees estimated recreational fishing losses as a component of the Trustees' claim for damages. Pre-existing literature on recreational fishing values was examined. These values were multiplied by the number of potential lost fishing trips to estimate the total lost value for recreational damages. The Trustees' estimate of recreational fishing losses in West Creek amounted to \$13,519. Restoration funds are to be used for enhancing recreational uses or experiences, such as recreational fishing or improving access to the stream, within the riparian corridor of West Creek.

2.3 DAMAGE ASSESSMENT COORDINATION

As a designated Trustee, each state and federal agency is authorized to act on behalf of the public under state and/or federal law to assess and recover natural resource damages and to plan and implement actions to restore, rehabilitate, replace, or acquire the equivalent of the affected natural resources injured as a result of a discharge of oil.

2.3.1 Coordination among the Trustees

Federal regulations implementing OPA provide that where an oil spill affects the interests of multiple trustees, they should act jointly to ensure that full restoration is achieved without double recovery (15 CFR § 990.14(a)). The Trustees in this matter have worked together closely in a shared effort to fully assess the nature and extent of injuries to natural resources and plan appropriate actions to restore the injured resources. At the beginning of the NRDAR, the Trustees designated BLM as the Lead Administrative Trustee to act as coordinator pursuant to 15 CFR § 990.14(a)(1).

2.3.2 Coordination with Response Agencies

Pursuant to 15 CFR § 990.14(b), the Trustees coordinated with state and federal response agencies on activities conducted concurrently with response operations and in a manner consistent with the NCP.

2.3.3 Coordination with the Responsible Party

The OPA NRDAR regulations provide in pertinent part that trustees must invite the responsible party to participate in the NRDA (15 CFR § 990.14(c)); however, the regulations give trustees broad discretion to determine the nature and extent of participation. The regulations also encourage trustees to enter into binding agreements with responsible parties to facilitate their interactions, resolve disputes related to the assessment, and promote cost-effectiveness.

2.3.4 Coordination with the Public

The Trustees seek the public's input on this Draft DARP/EA. Public review of the Draft DARP/EA beginning November 1, 2017 for 30 days and will include a press release. Public coordination is an integral component of the restoration planning process because public input helps inform the Trustees' decisions regarding the selection of appropriate restoration. It is also required pursuant to Section 1006(c)(5) of OPA (33 USC § 2706(c)(5)). Public comments received in response to this draft DARP/EA will be made available in the Administrative Record (described below). The Trustees will respond to comments received from the public and the Trustee's responses to public comments will be placed into the Final DARP/EA.

The administrative record contains the official documents pertaining to the Site NRDA. The administrative record for the NRDA case is housed at the USFWS, Saguache Field Office, 46525 Highway 114, Saguache, CO 81149.

2.4 COMPLIANCE WITH ENVIRONMENTAL LAWS, REGULATIONS, AND POLICIES

2.4.1 Major Federal Laws

The Oil Pollution Act, National Environmental Policy Act, Clean Water Act, and Endangered Species Act and federal regulations implementing these laws are the major federal laws and regulations guiding the development of this Draft DARP/EA for restoration of injured resources and services resulting from the West Creek oil spill. However, there are other federal and state laws, regulations or policies that may be pertinent to this Draft DARP/EA and/or to implementation of the specific restoration actions proposed herein. Other potentially relevant laws, regulations, and policies are set forth below in Chapter 2.4.2.

2.4.1.1 Oil Pollution Act

OPA, Title 33 USC § 2701 et seq. (OPA), establishes a liability regime for oil spills into navigable waters or adjacent shorelines that injure or are likely to injure natural resources and/or the services that those resources provide to the ecosystem or humans. Pursuant to OPA, federal and state agencies and Indian tribes may act as trustees on behalf of the public to assess the injuries, scale restoration to compensate for those injuries, and implement restoration. This Draft DARP/EA has been prepared jointly by the USFWS, BLM, and the state of Colorado, through the CAGO, CDNR, and CDPHE. As described above, each of these agencies is a designated

trustee for natural resources injured by the spill. Assessments are intended to provide the basis for restoring, replacing, rehabilitating, and/or acquiring the equivalent of injured natural resources and services. OPA authorizes trustees to assess damages for injured natural resources under their trusteeship. OPA further instructs the designated trustees to develop and implement a plan for the restoration, rehabilitation, replacement, or acquisition of the equivalent of the injured natural resources under their trusteeship.

The regulations for natural resource damage assessments under OPA are found at 15 CFR Part 990. These regulations provide trustees with guidelines on processes and methodologies for carrying out an NRDA, including guidelines for conducting assessments cooperatively with the responsible party. While the decision whether or not to follow the NRDA regulations is left to the discretion of the trustees, OPA provides that if the trustees conduct the NRDA in accordance with the regulations, their determination or assessment of damages to natural resources will have the force and effect of a rebuttable presumption in an administrative or judicial proceeding under OPA (33 USC. § 2706(e)(2)).

2.4.1.2 National Environmental Policy Act

Congress enacted the National Environmental Policy Act (NEPA; 42 U.S.C. § 4321 et seq.) in 1969 to establish a national policy for the protection of the environment. NEPA applies to federal agency actions that affect the human environment. Federal agencies are obligated to comply with NEPA regulations adopted by the Council on Environmental Quality (CEQ). NEPA requires that an EA be prepared in order to determine whether the proposed restoration actions will have a significant effect on the quality of the human environment. If an impact is considered significant, then an environmental impact statement (EIS) is prepared. If the impact is considered not significant, then a finding of no significant impact (FONSI) is issued.

Compliance: The Trustees have integrated an analysis of the environmental consequences of the Proposed Action into this Draft DARP/EA to comply with NEPA and CEQ processes and requirements. This integrated process allows the Trustees to meet the public involvement requirements of NEPA and OPA concurrently. Based on the analysis described in this document, the Trustees do not believe an EIS will be required for any projects within the scope of the Proposed Action.

2.4.1.3 Clean Water Act (including Colorado Water Quality Control Act)

The Clean Water Act (33 U.S.C. § 1251, et seq.) and the Colorado Water Quality Control Act (25-8-101, et seq., C.R.S.) are the principal laws governing pollution control and water quality of the Nation's waterways. Section 404 of the Clean Water Act authorizes a permit program for the beneficial uses of dredged or fill material in navigable waters. The U.S. Army Corps of Engineers (USACE) administers the program. The Water Quality Control Division within the Colorado Department of Public Health and Environment administers the permit program required for the discharge of dredged or fill material into any state water (§ 25-8-501, C.R.S.)

Compliance: Coordination with the USACE would be completed pursuant to Section 404 of this Act before any site specific restoration action under this proposed plan could be undertaken. All

joint federal/state permits would be obtained prior to the start of any site specific construction activities. All construction activity will be done in compliance with Section 404 of the law.

2.4.1.4 Endangered Species Act

The federal Endangered Species Act (16 U.S.C. § 1531, et seq., 50 C.F.R. Parts 17, 222, 224) directs all federal agencies to conserve endangered and threatened species and their habitats and encourages such agencies to utilize their authority to further these purposes. Under the Act, NOAA National Marine Fisheries Service and U.S. Fish and Wildlife Service publish lists of endangered and threatened species. Section 7 of the Act requires that federal agencies consult with these two agencies to minimize the effects of federal actions on endangered and threatened species.

Compliance: The Trustees would conduct necessary Section 7 consultations with U.S. Fish and Wildlife Service prior to implementation of proposed restoration projects along the Dolores River.

2.4.2 Other Federal and State Laws, Regulations, and Policies

2.4.2.1 Clean Air Act

The Clean Air Act (42 U.S.C. § 7401, et seq.) directs the Environmental Protection Agency to set limits on air emissions to ensure basic protection of health and the environment. The fundamental goal is the nationwide attainment and maintenance of the National Ambient Air Quality Standards (NAAQS). Primary NAAQS are designed to protect human health. Secondary NAAQS are designed to protect the public welfare (for example, to prevent damage to soils, crops, vegetation, water, visibility and property).

Compliance: All construction activity would be done with conventional equipment in compliance with all local ordinances and NAAQS.

2.4.2.2 Fish and Wildlife Conservation Act

The Fish and Wildlife Conservation Act of 1980 (16 U.S.C. § 2901 and 50 C.F.R. § 83) provides for protection and management of non-game fish and wildlife and their habitats.

Compliance: The intent of NRDA restoration is to restore, replace, enhance, and/or acquire equivalent natural resources (fish, wildlife, and their supporting habitats) and resource services as were injured by releases of hazardous substances. The Trustees believe the restoration activities described in the Draft DARP/EA will enhance habitats and fish and wildlife, thereby benefiting natural resources.

2.4.2.3 Fish and Wildlife Coordination Act

The Fish and Wildlife Coordination Act (16 U.S.C. § 661, et seq.) states that wildlife conservation shall receive equal consideration with other features of water-resource

development. The Act requires federal permitting and licensing agencies to consult with NOAA/NMFS, USFWS, and state wildlife agencies before permitting any activity that in any way modifies any body of water to minimize the adverse impacts of such actions on fish and wildlife resources and habitat.

Compliance: BLM and USFWS are joint federal natural resource trustees who have worked cooperatively and in cooperation and consultation with the state of Colorado on evaluating various restoration alternatives, including their potential impacts, and in identifying the Proposed Action.

2.4.2.4 Migratory Bird Treaty Act

The Migratory Bird Treaty Act (16 U.S.C. § 715, et seq.) provides for the protection of migratory birds. The Act does not specifically protect the habitat of these birds but may be used to consider time of year restrictions for activities on restoration sites where it is likely migratory birds may be nesting and/or to stipulate maintenance schedules that would avoid the nesting seasons of migratory birds.

Compliance: Consultation with the USFWS constitutes compliance with this Act. If planned restoration activities under this plan are deemed to adversely impact migratory birds, appropriate measures will be implemented to avoid impacts.

2.4.2.5 Preservation of Historic and Archeological Data Act

The purpose of the Preservation of Historic and Archeological Data Act of 1974, as amended, (16 U.S.C. § 469, et seq.) is to provide for the preservation of historic American sites, buildings, objects and antiquities of national significance, and for other purposes by specifically providing for the preservation of historical of archeological data which might otherwise be lost or destroyed.

Compliance: In the area proposed restoration activities could occur, the Trustees do not expect any restoration project to have an interaction with historic sites, buildings, objects and antiques of national significance. However, coordination with the Colorado Office of Archeology and Historic Preservation would occur to ensure that specific restoration actions under this plan avoid impacting any such data.

2.4.2.6 Executive Order 11990 Protection of Wetlands

Executive Order 11990 (40 C.F.R. § 6392 (a) and Appendix A) requires federal agencies to avoid the adverse impacts associated with the destruction or loss of wetlands, to avoid new construction in wetlands if alternatives exist, and to develop mitigation measures if adverse impacts are unavoidable.

Compliance: The Proposed Action includes restoration activities (tamarisk management) that have the potential to affect existing wetlands along Dolores River. However, no long-term, significant adverse impacts to wetlands are associated with the Proposed Action.

2.4.2.7 Executive Order 12962 Recreational Fisheries

Executive Order 12962 requires that federal agencies, to the extent permitted by law and where practicable, and in cooperation with states and tribes, improve the quantity, function, sustainable productivity, and distribution of the Nation’s aquatic resources for increased recreational fishing opportunities.

Compliance: The restoration activities that would occur under the Proposed Action do not attempt to directly improve recreational fisheries, but the actions do attempt to enhance recreational fishing opportunities along West Creek.

2.4.2.8 Executive Order 13112 Invasive Species

The purpose of Executive Order 13112 is to prevent the introduction of invasive species and provide for their control, and to minimize the economic, ecological, and human health impacts that invasive species cause.

Compliance: The Proposed Action includes activities for management of invasive species. Surveys for invasive species and actions to control them, should they be present on managed restoration areas, would be performed.

2.4.2.9 Colorado Solid Waste Disposal Sites and Facilities Act

The purpose of the Colorado Solid Waste Disposal Sites and Facilities Act (§§ 30-20-101, et. seq., C.R.S.) is to ensure the proper disposal of solid waste in a manner that is protective of public health and the environment.

Compliance: The Proposed Action includes action for the management or disposal of solid waste materials.

2.4.2.10 Colorado Noxious Weed Act

The purpose of the Colorado Noxious Weed Act (§ 35-5.5-101, et. seq., C.R.S.) is to ensure that all lands of Colorado are protected by and subject to the jurisdiction of local government in the management of undesirable plants that constitute a threat to the continued economic and environmental value of the lands of the state.

Compliance: The Proposed Action includes activities for management of invasive species. Surveys for invasive species and actions to control them, should they be present on managed restoration areas, would be performed.

2.4.2.11 Nongame, Endangered, or Threatened Species Conservation Act

The purpose of the Colorado Nongame, Endangered, or Threatened Species Conservation Act (§§ 33-2-101, et. seq., C.R.S.) is to manage all nongame wildlife and to protect species or subspecies of wildlife that are deemed threatened or endangered.

Compliance: The Trustees will consult Colorado Parks and Wildlife prior to implementation of proposed restoration to ensure Colorado endangered and threatened species are not negatively impacted.

CHAPTER 3 – ENVIRONMENTAL ASSESSMENT

3.1 PROPOSED ACTION AND OTHER ALTERNATIVES

3.1.1 Introduction

The purpose of this chapter is to provide information on the Proposed Action and No Action alternative. Alternatives considered but not analyzed in detail are also briefly discussed. An evaluation of the No Action and Proposed Action against the restoration project selection criteria is provided in Table 2.

3.1.2 Alternatives Analyzed in Detail

3.1.2.1 Alternative A – No Action Alternative

Under the No Action alternative, no restoration, rehabilitation, replacement, or acquisition actions would occur. If the No Action alternative is selected, there would be no restoration or replacement of the lost resources or their services and the public would not be compensated for past injuries from releases from the Site. The No Action Alternative would not meet the Restoration Project Selection Criteria.

The No Action alternative is considered in this Draft DARP/EA, including as a basis for comparison of the impacts of the other alternatives to the status quo. The Trustees found that the No Action alternative would not meet the purpose and need for restoration under either this Draft DARP/EA or the responsibilities of the Trustees under OPA, including as defined by NRDA processes under OPA.

3.1.2.2 Alternative B – Proposed Action

The Proposed Action includes three restoration projects, and characteristics of each are described below.

As stated previously, the Trustees determined that stocking of additional trout in West Creek would not provide significant natural resource benefits, and restoration opportunities were determined to be infeasible along West Creek (see Section 3.1.3). Therefore, the Trustees identified two projects downstream of West Creek, along the Dolores River, that would provide

similar ecological benefits as if one or more projects could be completed along West Creek. Project 2 will improve ecological services of the riparian corridor. Project 3 will improve in-stream habitat for native fish.

3.1.2.2.1 Project 1: Enhanced access to West Creek

The primary component of this project involves stile, a type of fence ladder, installation to improve fisherman access to West Creek. Figure 3 depicts the two sites where fence stiles will be installed. BLM would maintain the stiles to ensure fisherman can safely use them. This project has been proposed to offset lost recreational use of West Creek as a result of the spill.



Figure 3. Stile locations (blue symbols) in proximity to spill location and BLM picnic area. Type of fence stile that may be used to enhance fisherman access to West Creek shown in upper left inset.

3.1.2.2.2 Project 2: Management of Tamarisk and other Invasive Species

The encroachment of exotic and invasive plant species into riparian habitats has resulted in the alteration of ecosystem services and habitat quality throughout the southwestern U.S., including in riparian habitats of the Dolores River. Changes such as altered hydrology, biogeochemical

changes, loss of habitat structure, reduced wildlife forage, and reduced wildlife productivity have reduced habitat values and diminished ecosystem services.

Under this project of the Proposed Action, the Trustees would pursue removal and treatment of tamarisk, also known as salt cedar, and secondary invasive species (Russian knapweed and white top) within approximately 44 acres of riparian habitat along the Dolores River on privately-owned tracts (Figure 4). The project is located along the Dolores River northwest of the town of Gateway as well as areas south near the confluence with Roc Creek. Thick stands of tamarisk have encroached into riparian areas along the Dolores River and are either outcompeting or have replaced native vegetation, including cottonwood, willow, and privet species (Figure 5). The purpose of this project is to enhance riparian habitat along the Dolores River through active removal of standing tamarisk through mechanical treatments and hand crews and subsequent treatment of re-sprouts using chemical treatment. Mechanical removal will involve mastication of standing tamarisk using a mulching head and hand crews using chainsaws. Root structure will be left in the ground and re-sprouts treated 12-18 months after mulching. The Trustees would seed treated areas with native grasses, forbs, and shrubs (Table 1) following removal and treatment of non-native undesired plant species.

Table 1. Approved list of native plants in seed mix.

Common Name	Scientific Name
Western yarrow	<i>Achillea millefolium</i>
Indian ricegrass	<i>Achnatherum hymenoides</i>
Basin big sagebrush	<i>Artemisia tridentata</i>
Fourwing saltbush	<i>Atriplex canescens</i>
Rocky Mountain bee plant	<i>Cleome serrulata</i>
Inland Saltgrass	<i>Distichlis spicata</i>
Bottlebrush squirreltail	<i>Elymus elymoides</i>
Thickspike wheatgrass	<i>Elymus lanceolatus</i>
Slender wheatgrass	<i>Elymus trachycaulus</i>
Utah sweetvech	<i>Hedysarum utahensis</i>
Annual sunflower	<i>Helianthus annuus</i>
Scarlet gilia	<i>Ipomopsis aggregata</i>
Lewis flax	<i>Linum lewisii</i>
Blue flax	<i>Linum perenne</i>
Pale evening primrose	<i>Oenothera pallida</i>
Western wheatgrass	<i>Pascopyron smithii</i>
Palmer penstemon	<i>Penstemon palmeri</i>
Skunkbrush	<i>Rhus trilobata</i>
Scarlet globemallow	<i>Sphaeralcea coccinea</i>
Gooseberryleaf globemallow	<i>Sphaeralcea grossularifolia</i>
Alkali sacaton	<i>Sporobolus airoides</i>
Sand dropseed	<i>Sporobolus cryptandrus</i>



Figure 4. Parcels (in red) identified for tamarisk removal, management of other invasive, non-native plants, and restoration of native plants (Project 2).

This project is part of a larger area-wide effort being conducted by the Dolores River Restoration Partnership in collaboration with private landowners and other stakeholders to restore over 200 acres of riparian habitat along the Dolores River. The area-wide effort is designed to improve wildlife habitat, enhance human access to river-side campsites, and/or reduce fuel loads near key infrastructure. A diverse riparian plant community will also benefit three sensitive warm-water fish species—the bluehead sucker (*Catostomus discobolus yarrow*), flannelmouth sucker (*Catostomus latipinni*), and roundtail chub (*Gila robusta*)—by improving backwater habitat as well as the input of key nutrients that support the aquatic food webs.

Project 2 has the goal of improving the health of the riparian habitat in the Dolores River Basin, which is something the Trustees attempted to do along West Creek, but unfortunately could not identify feasible projects. Funds for this project in the amount of \$32,750 are being provided by the DOI's Office of Restoration and Damage Assessment Restoration Catalyst Fund. Although the source of funding for this project is different from funding sources being used to support stile installation and river restoration (described in Section 3.1.2.2.3), the Trustees are including this project as part of this plan because the project is an important piece of the larger restoration effort to enhance riparian habitat within the Dolores River Basin, which includes West Creek.

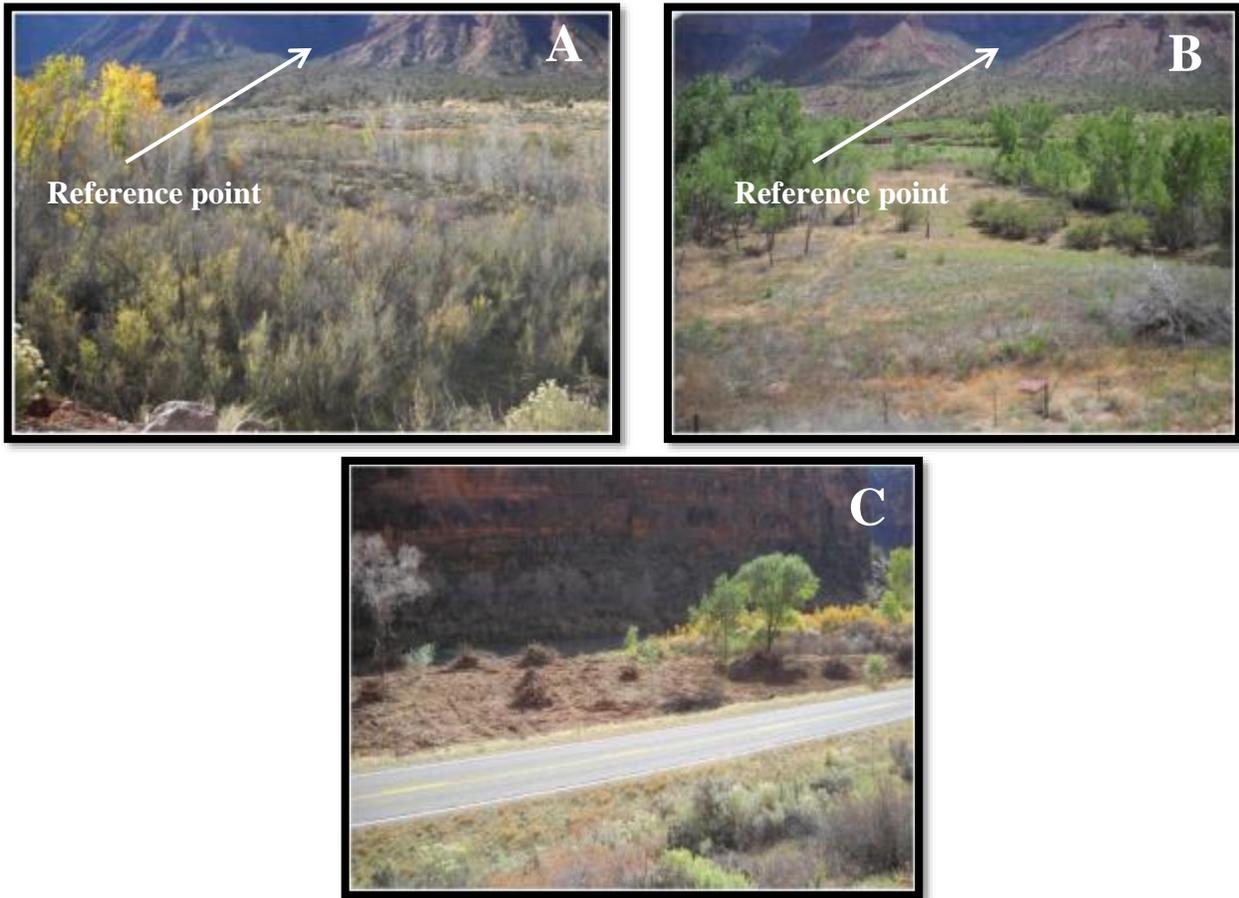


Figure 5. Site along Dolores River dominated by tamarisk (overstory) and Russian knapweed (understory) (A); after tamarisk removal, broadcast seeding of native plants, and weed treatments (B); piles of tamarisk slash following cutting near the bank of the Dolores River (C).

3.1.2.2.3 Project 3: Fish and Riverine Habitat Restoration along the Dolores River

The proposed fish habitat restoration projects in Colorado and Utah are designed to diversify in- and near-channel habitats to provide appropriate rearing habitats for young-of-year and juvenile fish, particularly roundtail chub, flannelmouth sucker, and bluehead sucker. The riverine habitat improvement project in Utah aims to restore floodplain connectivity to enhance existing wetland and riparian habitat. Habitats for young-of-year and juvenile fish are considered to be limiting factors for recruitment of roundtail chub, flannelmouth sucker, and bluehead sucker into adult populations. These three large-bodied desert fish species are adapted to unstable, diverse, heterogeneous channel habitats; however, confinement of much of the lower Dolores River below McPhee Dam, through flow alteration, tamarisk invasion, and subsequent geomorphic change, has homogenized much of the in-channel habitat. Historically, the Dolores River has

seen large flood discharges in the spring, with a high discharge of 17,000 cfs measured in the 1970's. In the 1980's, McPhee Dam was constructed upstream in the watershed, significantly reducing peak flood flows.

As a result of the new flow regime, there is a need to explore proactive measures to encourage native fish recruitment in the Dolores River. Because flows no longer exceed historic bankfull elevations, historic floodplains are converting to upland terrace habitat. Flows that have the sufficient velocity to significantly modify river channel morphology (and create heterogeneity) are infrequent or inadequate to create the dynamic environment necessary for all life stages of native fish. The projects proposed in this plan are designed to be supported by the current diversity of river flows, and recognize the channel morphology that reflects both unaltered flows from the San Miguel River (i.e., a stream without a major dam) and significantly altered flows below McPhee Dam in the Dolores River.

Fish habitat improvement projects on the Dolores River will occur in Colorado in two locations. The middle (referred to as Site 2 at river mile 144) and southern location (referred to as Site 1 at river mile 130) are located south (upstream) of Gateway Colorado (Figure 6). All proposed work will be conducted on the left bank of the river during periods of low flow (fall, winter, or early spring prior to runoff). River surveys were conducted at proposed fish restoration locations in 2016 and 2017. Cross-section and longitudinal profile surveys were used to estimate stream features, the amount of material to be removed, and the approximate range of flows that will engage the new habitat. Young of the year fish surveys were conducted in August 2017 to document juvenile fish occupation of existing habitat.

The northern most riverine habitat restoration site is in Utah (referred to as Site 3 at river mile 160). Riverine habitat restoration will include the removal of a gravel/cobble berm to restore floodplain connectivity to the Dolores River at the current bankfull discharge. The gravel/cobble berm at Site 3 is an artificial barrier constructed long ago to channelize and confine the Dolores River. The barrier impairs the stream's ability to manage flooding and reduces riparian/wetland production in the floodplain. Restoring the riparian/wetland corridor at Site 3 increases rare and unique values and functions in the Dolores River, such as nutrient cycling, water cycling, plant and animal production and hydrologic connectivity.

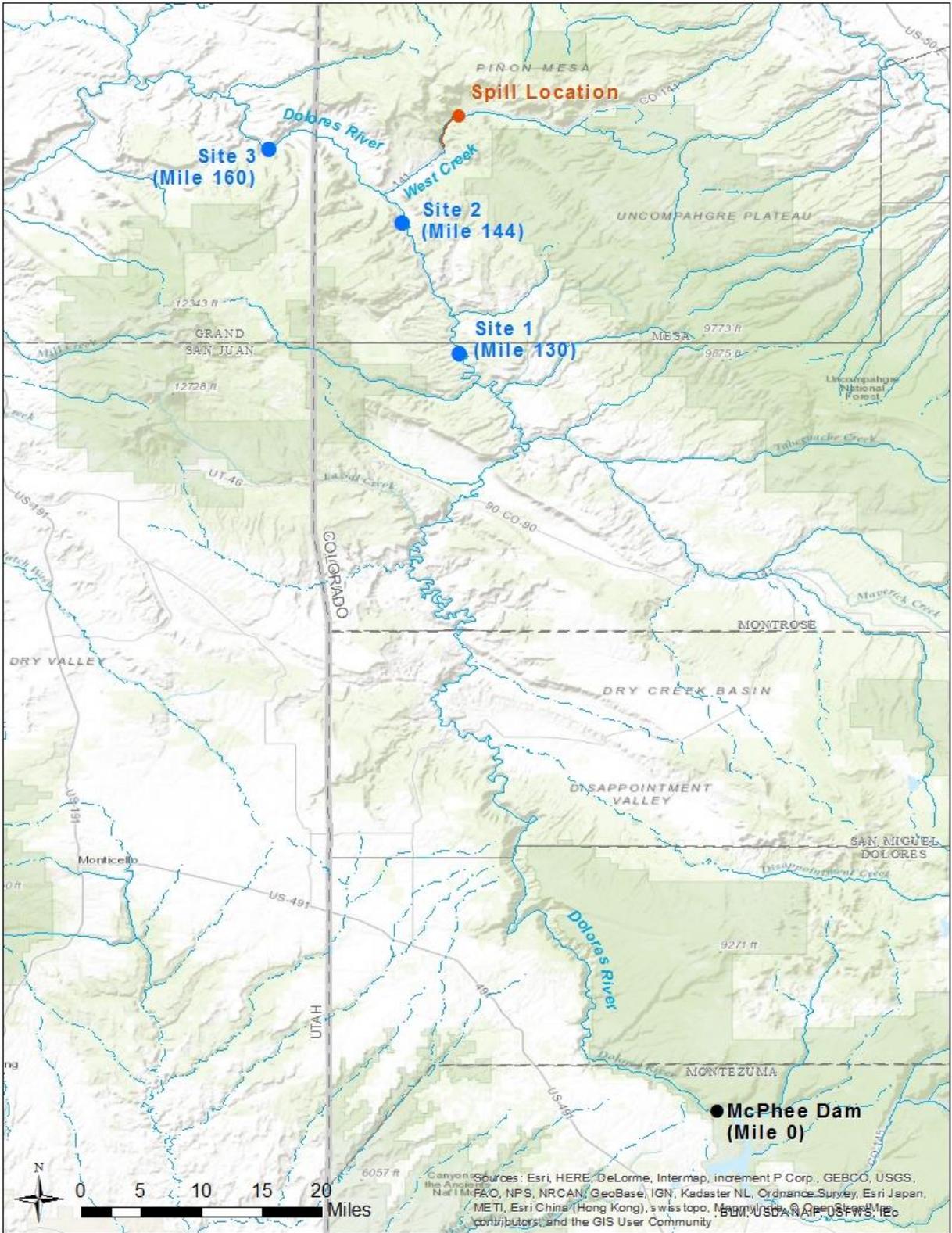


Figure 6. Fish habitat restoration sites along the Dolores River. Sites 1 and 2 are in Colorado; Site 3 is the most downstream location and is in Utah. The spill location is in Mesa County, Colorado.

Features Common to Project 3

- Access to the excavation sites will be from Highway 141 or county roads. Traffic control will be utilized during loading and unloading.
- The transport vehicle will be parked in roadside pull-offs. The excavation equipment will travel off the road shoulder and operate within previously completed tamarisk removal projects or existing disturbed areas, if possible.
- The excavation work will be completed using a tire or tracked hoe or excavator. Excavated material will be placed on the abandoned terrace and spread out to a maximum depth of three inches.

Description of Upstream Section – Colorado (Site 1 at river mile 130)

At Site 1 (Figure 7), excavation of material will occur to create backwater for Dolores River native fish. Backwaters are defined as areas that are open to the channel at one end (usually the downstream end of a cutoff meander or oxbow). They are important aquatic habitat for young-of-year and juvenile fish characterized by slow currents, shallow water and silt substrates.

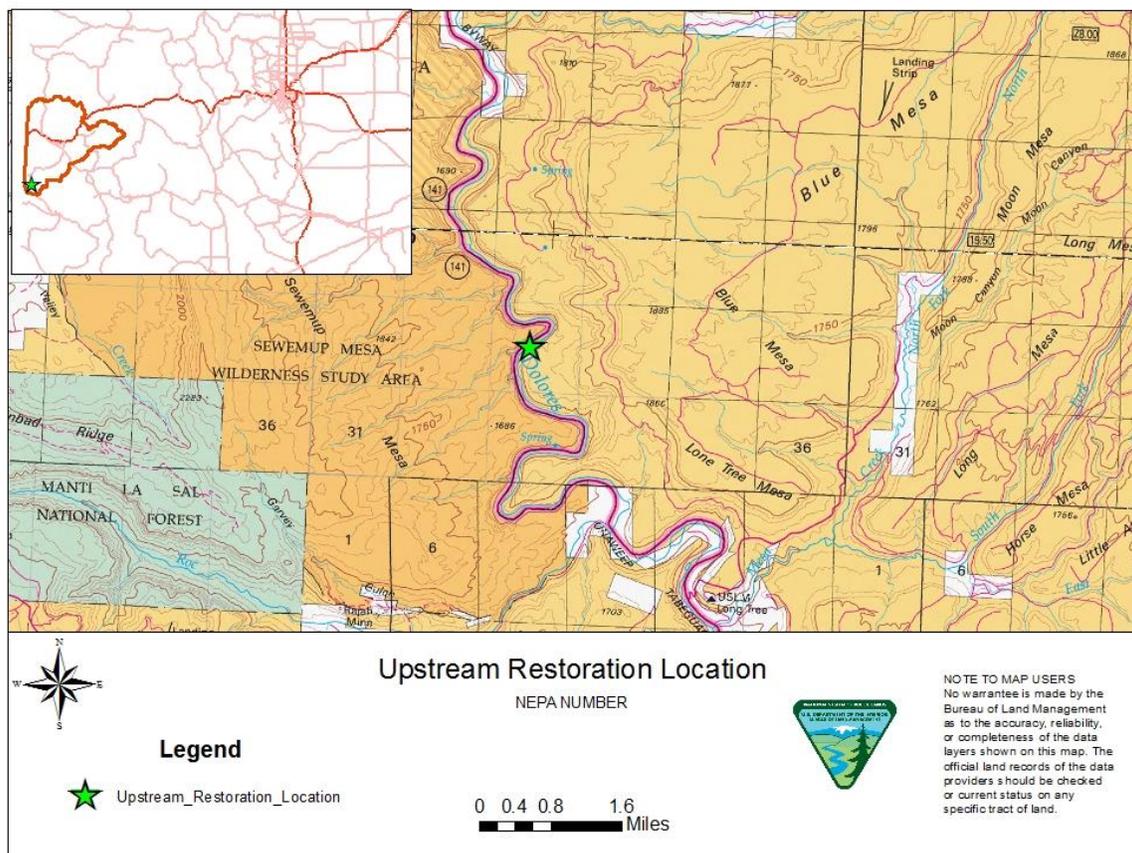


Figure 7. Upstream fish habitat restoration at Site 1 (green star) located along the Dolores River in Colorado.

To ensure backwater habitat self-maintenance, bank cover will be created by placing dead elm trees from a previous tamarisk removal project at the upstream end of the feature. The trees will be anchored into the left bank of the river. A 12-inch trench will be excavated into the bank and the trees will be placed with alternating trunk and canopy orientation to the trench with approximately 50 percent of the tree in the bank and 50 percent in the Dolores River. Material from a gravel berm site in Utah (Site 3) will be deposited above and below the trees to add stability. If material from the gravel berm site is not large enough, a local gravel pit will be used to obtain the needed material. The estimated volume of material that will be removed from Site 1 is 4,500 cubic feet. The area that will be covered when the excavated material is spread will be 0.41 acres (Figure 8). Ground disturbance by construction activity will be seeded with a native plant mix (see Table 1).



Figure 8. Aerial image of the proposed backwater habitat restoration site along the Dolores River (Site 1). Black shading denotes the access area, white area is excavation areas, and brown area is where the excavated material will be deposited.

Description of Downstream Section – Colorado (Site 2 at river mile 144)

Site 2 (river mile 144) includes two types of restoration activities, backwater creation and side-channel habitat enhancement (Figure 9). As defined earlier, backwater habitat is open on the

downstream end to the main channel, allowing water to pool into the feature at a range of flows. Side-channel habitat includes an upstream and downstream hydraulic connection to the main channel. Both habitat types add complexity to the Dolores River, particularly by creating quiet water or slack water with vegetative cover, where similar complexity is otherwise rare in the Dolores River due to changes in the flow regime post McPhee Dam. Both habitat types offer relatively shallow depths compared to the main channel and function as refugia for young-of-year and juvenile fish. These also represent habitats adult fish typically avoid, providing an area of safe refuge from predation.

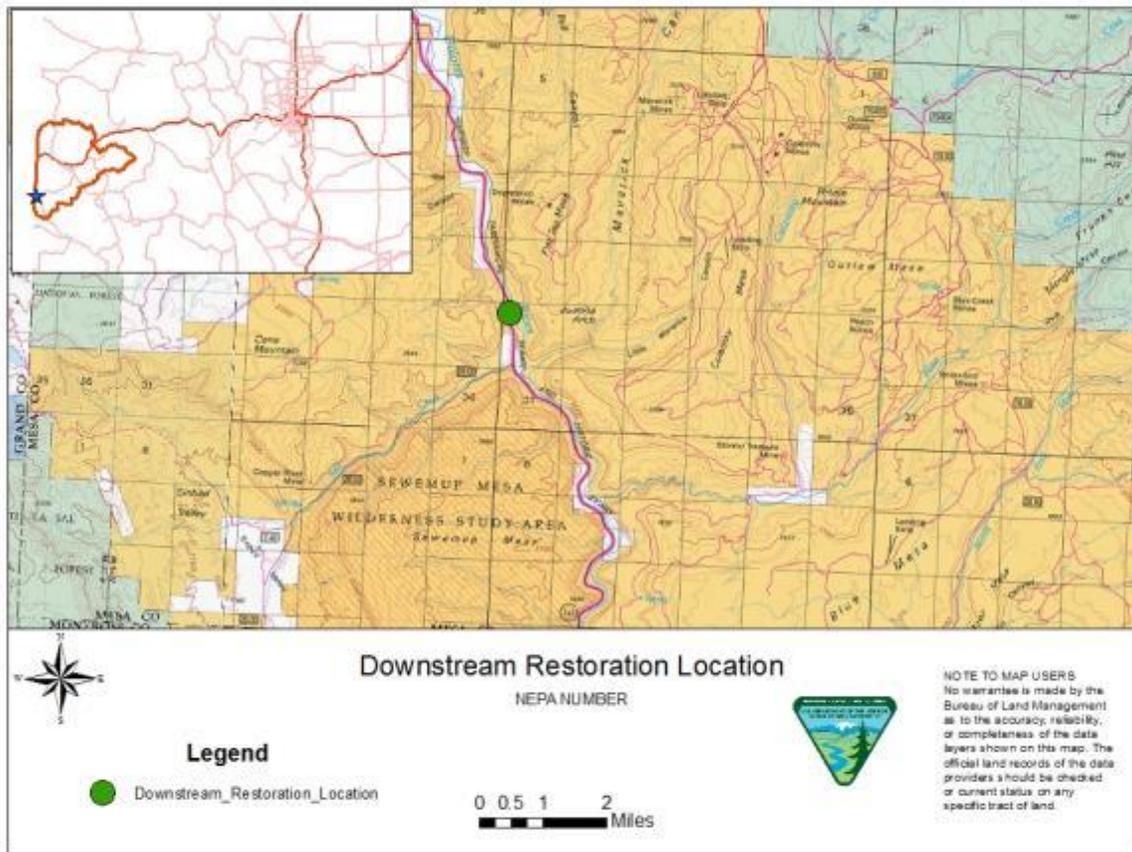


Figure 9. Site 2 (green circle) located along the Dolores River in Colorado.

At Site 2, a side-channel will be manipulated by enhancing the downstream backwater eddy and manipulating flow as it passes over a riffle on the upstream end (2a). Additionally at Site 2, a backwater channel feature will be created (2b).

Site 2a (Figure 10) includes an area of the river where flows below bankfull discharge and above low flows engage a side-channel on the left bank of the river. The side-channel is approximately 635 feet long measured down the thalweg (deepest point of the channel). There is a riffle in the main channel at the upstream end of the side-channel, and the downstream end of the side-channel empties into a pool. Construction includes excavating material at the downstream end of

the side-channel and increasing the height of the riffle which will allow more frequent flows to engage the side-channel. This will allow lower flows to engage the side channel and keep water in the downstream pool.

The approximate volume of material to be removed is 1,200 cubic feet. When this material is spread on the terrace, approximately 0.11 acres will be covered up.

Riffle habitat at the upstream end of the side-channel will be aggraded (increased in elevation) by placing large rocks at the top of the riffle. This material will be transported from the rock berm site in Utah (Site 3) or purchased from local gravel pits. Riffle height will be raised to a river flow that will engage the side-channel and maintain the backwater feature during periods critical for the survival and nourishment of juvenile fish.

Restoration activities at Site 2b (backwater habitat site), located at the upstream end of Site 2, include excavation of bank material along an existing run and pool feature that will reconnect backwater to the historic high flow channel. Excavated material will be placed on the abandoned terrace. The approximate volume of material to be removed is 6,000 cubic feet. When the material is spread across the terrace, it will cover 0.55 acres. Water should occupy the backwater feature during all river flow conditions.



Figure 10. Sites 2a and 2b where both side-channel and backwater habitat will be restored. Black shading indicates access areas, white shading indicates excavation areas, green is riffle enhancement, and brown shading indicates where excavated material will be deposited.

Description of the Utah Section (Site 3 at river mile 160)

The Dolores River flows through Utah for about 24 miles before joining the Colorado River near Dewey Bridge. Most of the river corridor in Utah is a narrow canyon with thin bands of riparian vegetation along the river. Interspersed throughout the canyon in Utah are alluvial fans, or wide bottom areas, associated with mouths of tributaries such as Beaver Creek, Granite Creek, etc. There is only one noticeable area with historic overflow channel features, located near the Utah-Colorado state line, mainly in Township 24 South, Range 26 East, Section 5.

There is an opportunity to restore another overflow channel upstream of the state line at Site 3. An overflow channel of the Dolores River was blocked with an extensive gravel berm by a farmer trying to protect his hay fields (Figure 11). This berm may have been constructed in the 1940s or 1950s and has persisted over the years. There is evidence of shallow ground water in historic floodplain, demonstrated by a small perennial wetland located just upstream of the hay field. Historically, the Dolores River would convey large flood discharges in the spring, with a high discharge of 17,000 cfs measured in the 1970's. In the 1980's, McPhee Dam was constructed upstream in the watershed, significantly reducing historical peak flood flows. There is little evidence this historic floodplain has been inundated during high flows since McPhee Dam was constructed.



Figure 11. Gravel berm blocking high flows from historic overflow floodplain.

As part of the proposed project, the Trustees will complete a topographic survey of the site to ensure that natural topography will allow water movement through the site and that overbank flows rejoin the river on the downstream end. Using elevation data from surveys, a construction

plan will be designed to minimize surface disturbance and to remove only a portion of the gravel berm necessary to allow overbank flooding (estimated to be approximately 100' x 50' x 8', or 1,500 cubic yards).

The Trustees anticipate that using an excavator to create a breach near the center of the berm would restore floodplain connectivity and permit periodic inundation of an historic overflow channel and wetland habitat in portions of the floodplain (see Figure 12). This effort would likely require only two to three days of work with the excavator and a small crew of three to four people.



Figure 12. Aerial photo of the proposed riverine restoration in Utah along the Dolores River (Site 3). The gravel berm is marked with a red line. The green polygon shows the potential wetland area. The orange polygon shows existing wetland habitat disconnected from the river due to the berm. The blue dashed line represents the approximate overflow channel to be restored. The blue oval represents a temporary staging area to stockpile material.

3.1.2.2.4 Best Management Practices (BMPs) for the Proposed Action

The following list of BMPs is a non-exhaustive list of potential BMPs that may be used for restoration activities in riparian areas. Additional appropriate BMPs may be implemented as recommended by regulatory staff and project partners. For projects occurring on BLM land, BMPs and SOPs listed in Appendix H of the Grand Junction Resource Management plan will be adopted and implemented, where appropriate and feasible.

1. Water Quality BMPs

- Restricting heavy equipment use to periods of low flow and the minimum time needed to achieve restoration objectives;
- Requiring the use of low-ground pressure tracked and/or wheeled vehicles to avoid rutting soils;
- Flagging authorized restoration areas to prevent impacts outside of designated areas;
- Restricting equipment access to designated corridors;
- Monitoring of vegetation regrowth to prevent excessive erosion in restored areas; and
- Implementation of corrective actions in areas identified as experiencing excessive erosion by installation of straw bale barriers, straw wattles, or approved methods.
- Heavy equipment will be pressure washed and/or steam cleaned before the start of the project and inspected daily for leaks. Leaking equipment will not be used in or near surface water. Equipment will be refueled at least 100 feet from surface water.
- Appropriate spill clean-up materials such as booms and absorbent pads will be available on-site at all times during construction.

2. Invasive Species Management BMPs

- Use of a certified applicator;
- Use of herbicides approved for use within wetlands; and
- Deployment of straw wattles to trap sediment.

3. Revegetation BMPs

- Where planting is required, use native plants from local sources.

4. Reptiles and Amphibian BMPs

- Avoid suitable habitat during all construction activities and do not permanently alter hydrology of the area. Avoid eliminating connectivity between suitable ponds.
- Use silt fencing to prevent sedimentation or erosion of the project site into ponds.

5. Migratory Bird BMPs

- Any ground-disturbing activities or vegetation treatments would be performed before migratory birds begin nesting or after all young have fledged to avoid incidental take.
- If activities must be scheduled to start during the migratory bird breeding season, appropriate steps would be taken to prevent migratory birds from establishing nests in the potential impact area. These steps could include covering equipment and structures and use of various excluders (e.g., noise).

- A site-specific survey for nesting birds would be performed starting at least two weeks prior to groundbreaking activities or vegetation treatments if activities need to be scheduled during the migratory bird breeding season.
- If nesting birds are found during the survey, appropriate spatial buffers would be established around nests. Vegetation treatments or ground-disturbing activities within the buffer areas would be postponed until the birds have left the nest. Confirmation that all young have fledged would be made by a qualified biologist.

6. Noise BMPs

- Limit construction activities to the hours between sunrise and sunset.
- Limit idling vehicles to the maximum extent practicable

Table 2. Evaluation of alternatives using restoration project selection criteria.

Restoration Criteria	Alternative 1: No Action	Alternative 2: Proposed Action
Cost-Effectiveness	The benefit to cost ratio of the No Action alternative is assumed to be lower than if the Trustees were to pursue restoration under the Proposed Action; however, the Proposed Action attempts to address interim losses of natural resource services, whereas the No Action alternative does not.	The Trustees anticipate favorable benefit to cost ratios given the success of similar types of projects in other parts of the Dolores River Basin. The Trustees and their partners have completed initial assessment of river habitat in an effort to reduce uncertainty in restoration outcomes and optimize benefits relative to cost.
Consistency with the Trustees Restoration Goals and Objectives	The No Action alternative would not provide for restoration, replacement, enhancement or acquisition of injured natural resources, making this alternative inconsistent with Trustee restoration goals.	This alternative is consistent with Trustee restoration goals listed in Section 1.3.2. This alternative has a moderate to high certainty of meeting specific restoration objectives listed in the monitoring framework (Chapter 4).
Likelihood of Success	The No Action alternative has a low likelihood of success, which is determined by meeting restoration goals and objectives.	The Proposed Action is likely to improve fisherman access to West Creek and reduce tamarisk and other non-native species presence in the Dolores River riparian corridor. The likelihood of providing self-sustaining side-channel habitat for native fish is moderate to high.
Prevents Future Injury/Avoids Collateral Injury	The No Action alternative would not cause further injury, but will also provide no benefit to offset interim losses. This alternative allows for continuing loss of plant diversity in the Dolores River riparian corridor and lack of side-channel habitat for juvenile fish.	This alternative will not cause significant injury in target restoration areas and associated fish and wildlife.
Multiple Resource Benefits	The No Action alternative would provide for multiple resource benefits; however, recovery rates of riparian and fish habitat would be less than if Trustees pursued active restoration activities included in the Proposed Actions. Fisherman access would remain the same.	The Proposed Action includes activities that will achieve minor to moderate benefits for humans, the physical environment, and fish and wildlife and their supporting habitats.

Table 2 Continued.

<i>Restoration Criteria</i>	Alternative 1: No Action	Alternative 2: Proposed Action
Nexus to Injured Resources	The No Action alternative would not provide for restoration, replacement, enhancement or acquisition of resources that were injured from the spill of oil at and downstream of the crash site.	This alternative will focus on improving riparian habitat and increasing the ecological productivity of those habitats and the biological resources within and adjacent to the Dolores River. User access to West Creek will be enhanced. Projects are focused on restoring and compensating for impacts similar to the Site-related natural resource injuries and losses.
Maintenance and Oversight	The No Action alternative does not require maintenance and oversight by the Trustees since the proposed projects would not be implemented. The project may be implemented with other funds at a later time, but the Trustees would have no maintenance requirements or oversight role.	The Proposed Action would require periodic maintenance at varying levels for all three projects. Maintenance for the stiles would be minimal and likely overseen by BLM. Maintenance for the other two projects (tamarisk and other invasive plants species management; Dolores River restoration) would be more intensive within the first one to two years and less so in subsequent years; oversight would be provided by a Trustee agency, project partner or contractor.
Public Health and Safety	Any potential public health and safety issues or concerns that exist under current and future natural resource management activities and recreation management would likely remain the same.	Restoration activities and long-term management would not pose elevated risk to workers and any other people accessing restoration areas. Periodic maintenance of stiles would be completed to reduce risk of injury to individuals attempting to access West Creek.
Time to Provide Benefits	The time to provide natural resource benefits under the No Action alternative is greater than if the Trustees were to pursue restoration under the Proposed Action. Under the No Action alternative, natural recovery would be relied upon to improve ecological services in area of interest.	The time to provide natural resource and recreational benefits under this alternative is relatively short to moderate when taking into consideration the complexity of the work and supporting science.

Table 2 Continued.

<i>Restoration Criteria</i>	Alternative 1: No Action	Alternative 2: Proposed Action
Duration of Benefits	The duration of benefits under the No Action alternative is unknown. Restoration action to improve recreational access to West Creek or Dolores River habitat conditions would not occur under this alternative.	Natural resource restoration and recreational enhancement activities, monitoring, corrective actions, and adaptive management along West Creek and Dolores River will ensure long-term benefits are being provided. The Trustees are not aware of any proposed or future plan for development or other anthropogenic impacts to the proposed restoration sites.
Opportunities for Collaboration	The No Action alternative would not allow for opportunities for collaboration.	The Proposed Action provides opportunities for collaboration among Trustees, non-governmental organizations, state and federal programs, and private citizens. Significant financial and personnel contributions from partner agencies and organizations are likely.
Non-Duplication	The No Action alternative does not result in restoration or recreation enhancement.	The Proposed Action does not result in duplicative activities in the areas of interest. Tamarisk and invasive plant management and river restoration has not occurred in the proposed restoration areas.

3.1.3 Alternatives Considered but not Analyzed in Detail

The inability of the Trustees to identify a feasible and appropriate habitat restoration project along West Creek (described below) ultimately led to the development of restoration projects 2 and 3 described in Chapter 3.1.2.2.2. and 3.1.2.2.3.

Stocking trout in West Creek: The Trustees considered stocking trout in West Creek as a mechanism of addressing the fill kill. The trout population in West Creek was not significantly impacted, despite the fish kill of many individuals, and the ecosystem is self-sustaining; therefore, fish stocking is not necessary or adequate to respond to the injuries from the spill.

This project does not meet factor 2 identified in Section 990.54(a) of the OPA regulations, which requires the Trustees to evaluate whether the project meets their goals and objectives in returning the injured natural resources and service to baseline and/or compensating for interim losses. None of the Trustee's restoration goals (see Section 1.3.2) would be met by implementing a project solely focused on stocking trout in West Creek.

Land acquisition and conservation easements along West Creek: The Trustees considered acquiring and managing streamside habitat along West Creek, primarily for the purpose of ensuring long-term fish and wildlife benefits, but also to provide access to fisherman. Acquired lands would either be owned and managed by the BLM, or purchased by the BLM and transferred to a third-party for long-term ownership and management. No willing sellers were identified during the restoration scoping process.

The project is not feasible for reasons stated above. Therefore, the project could not be carried forward for consideration as a viable restoration alternative.

Habitat Improvement Adjacent to West Creek: The West Creek Trustee Council intended to work with the USFWS Partners for Fish and Wildlife (Partners) Program and a private landowner to restore or enhance approximately 21 acres of West Creek riparian habitat upstream of the spill site. This project sought to improve habitat quality by enhancing native vegetation through plantings and invasive species removal and by installing livestock exclusion fencing and off-site drinking water features for livestock. While Partners staff had made significant progress solidifying a partnership, the landowner ultimately decided not to participate in this restoration effort.

The project became infeasible for reasons state above and received no additional consideration. Therefore, the project could not be carried forward for consideration as a viable restoration alternative.

3.1.4 Plan Conformance Review

PLAN CONFORMANCE REVIEW: The Proposed Action is subject to and has been reviewed for conformance with the following plan (43 CFR 1610.5, BLM 1617.3):

Name of Plan: Grand Junction Resource Management Plan; amended by the Northwest Colorado Greater Sage-grouse Approved Resource Management Plan Amendment, approved August 15, 2015.

Date Approved: August, 2015

Decision Number/Page: 9, 13, 28-30

Decision Language:

WTR-GOAL-01:

Protect, preserve, and enhance watershed functions in the capture, retention, and release of water in quantity, quality, and time to meet ecosystem and human needs.

WTR-OBJ-05:

Characterize, monitor, maintain, and/or restore surface/groundwater quality and quantity to sustain designated beneficial uses in cooperation with other federal, local, and state agencies and private entities.

WTR-MA-13:

Monitor morphology and channel stability of streams with concerns identified through land health or proper functioning condition assessments or inventories, or streams that could be impacted, to determine appropriate management action. Improve dysfunctional streams caused by unnatural factors. Modify management practices (e.g., grazing systems, recreational uses) and/or stream restoration techniques (e.g., native planting, fencing, energy dissipation structures, bank protection, and drainage structures) as appropriate to address causal factors.

SSS-GOAL-1:

Manage special status species habitats to provide for their conservation and restoration as part of an ecologically healthy system.

SSS-FSH-OBJ-01:

Maintain or improve the quality of listed (threatened or endangered) fish and sensitive fish habitat by managing public land activities to support species recovery and the benefit of those species.

SSS-FSH-MA-01:

Identify limiting habitat factors based on site characteristics and habitat capabilities using channel type and geology classifications (e.g., Rosgen). Upon identification of limiting factors, prioritize and implement proven river, stream, lake, and riparian practices (e.g., in-channel habitat structures to create pools, riparian plantings) or by changing management of other program activities (e.g., changing livestock grazing season use) to achieve desired future condition.

SSS-FSH-AU-01:

STIPULATION TL-1: Salmonid and Native, Non-Salmonid Fishes. Prohibit in channel stream work in all occupied streams during fish spawning, egg incubation, and fry emerging seasons. Fish spawning, egg incubation, and fry emerging seasons vary by elevation and temperatures; however the following intervals generally apply in Colorado:

- Cutthroat trout (various subspecies): May 1-September 1
- Rainbow trout: March 1-June 15
- Brown trout: October 1-May 1
- Brook trout: August 15-May 1
- Sculpin: May 1-July 31
- Bluehead sucker: May 1-July 15
- Flannelmouth sucker: April 1-July 1
- Roundtail chub: May 15-July 15
- Speckled dace: May 1-August 31
- Mountain whitefish: October 1-November 30

Name of Plan: Moab Field Office Resource Management Plan.

Date Approved: October, 2008

Decision Number/Page:

RIP-1/ page 99

Decision Language:

Manage riparian resources for PFC, which is described as the presence of adequate vegetation, landforms, or large woody debris, in accordance with the Utah Standards for Public Rangeland Health and Guidelines for Recreation Management for BLM lands in Utah and with the Grazing Guidelines for Grazing Management

Decision Number/Page:

SOL-WAT-17/ page 103

Decision Language:

Maintain and/ or restore overall watershed health and reduce erosion, stream sedimentation and salinization of water.

3.1.5 Standards for Public Land Health

In January 1997, the Colorado State Office of the BLM approved the Standards for Public Land Health and amended all RMPs in the State. Standards describe the conditions needed to sustain public land health and apply to all uses of public lands.

Standard 1: Upland soils exhibit infiltration and permeability rates that are appropriate to soil type, climate, land form, and geologic processes.

Standard 2: Riparian systems associated with both running and standing water function properly and have the ability to recover from major disturbance such as fire, severe grazing, or 100-year floods.

Standard 3: Healthy, productive plant and animal communities of native and other desirable species are maintained at viable population levels commensurate with the species and habitat's potential.

Standard 4: Special status, threatened and endangered species (federal and state), and other plants and animals officially designated by the BLM, and their habitats are maintained or enhanced by sustaining healthy, native plant and animal communities.

Standard 5: The water quality of all water bodies, including ground water where applicable, located on or influenced by BLM lands will achieve or exceed the Water Quality Standards established by the State of Colorado.

Because standards exist for each of these five categories, a finding must be made for each of them in an environmental analysis. These findings are located in Chapter 6 of this document.

CHAPTER 4 – MONITORING PLAN

Under the Proposed Action, project specific monitoring approaches and frameworks (shown below) may be used to evaluate the long-term success of the tamarisk management and Dolores River restoration projects. Each monitoring framework includes project specific monitoring parameters appropriate to the restoration action, guidelines for implementing corrective actions, and a schedule for the frequency and duration of monitoring.

The performance and functioning of restoration projects may be affected by various causative factors, both natural and anthropogenic. Restoration projects have been planned and designed, and will be implemented to be self-sustaining over time to the greatest extent feasible. However, after implementation, some active management or maintenance activities may be necessary to ensure the long-term sustainability of enhanced or restored habitats. Restoration projects proposed under the Proposed Action will rely on an adaptive management approach that involves the analysis of monitoring results to identify potential problems on restored areas, and the evaluation of those results to identify and implement measures appropriate to rectify those problems, within the constraints of available funding and personnel. Such actions may include, but are not limited to, mechanized earth work or supplemental plantings in areas that are not meeting vegetative success criteria. Activities considered for adaptive management would be those that fall within the range of restoration activities and potential environmental consequences considered in this Draft DARP/EA

4.1 Monitoring Approach for Tamarisk Removal and Management

The ultimate goal of the proposed tamarisk removal project is to facilitate restoration or replacements of tamarisk by native, desirable species. Promoting native re-establishment can provide important benefits, including site stabilization, erosion control, enhancing desirable wildlife habitat, potential use for forage, and enhanced aesthetics (CSU 2010). Ensuring that progress towards the project goals is being met can be accomplished only through effective monitoring and maintenance.

The following information is a summary of the types of monitoring approaches that may be used at locations where tamarisk is removed and replaced with native species.

Rapid Monitoring

- Purpose: Site inventories conducted on an annual basis on actively treated sites to inform ongoing implementation/maintenance efforts, and help individual land managers track progress/success towards restoration goals. Photo Point Monitoring and Progress Reporting Monitoring (both discussed below) are typically incorporated into Rapid Monitoring when requested by the land manager. A rapid monitoring protocol (2013) developed by the Tamarisk Coalition may be employed where applicable and feasible.
- Where: Formally conducted on select BLM and privately-owned sites
- When: As needed, but conducted no less than once annually
- Who: Typically Conservation Corps/interns or BLM Field Offices

- Data collected: As part of a site survey, 1) size/acreage of remaining weed infestations; 2) survival rate/success of seeding and planting efforts; and 3) Progress Reporting data collection and Photo Point data collection.

Photo Point Monitoring

- Purpose: Visually track progress/success towards meeting land manager restoration goals
- Where: Occurring on select BLM sites currently, as part of Rapid Monitoring efforts; also occurring on other select land manager sites
- When: Annually or as needed
- Who: Rapid Monitoring crew, or individual land managers
- Data Collected: Repeat photo points (typically minimum of 3 per site) taken from the exact same location each time. Typically includes at least one ‘overview’ photo of entire site, plus several photos on site of representative treatment areas

Other Forms of Informal Site Monitoring (e.g. Walkabouts, ‘Look-sees’)

- Purpose: Typically conducted on select sites slated to collect necessary specific implementation data, or other information useful for individual land managers to track their own restoration goals.
- Where: Various individual land manager sites, as needed
- When: Typically annually
- Who: Typically DRRP Implementation Subcommittee members and/or land managers
- Data collected: Specific implementation data, or other information used to track progress towards meeting restoration goals. May involve surveying entire site, or only portion of site

Active and passive revegetation following invasive, non-native plant management actions will generally following the Dolores River Restoration Partnership revegetation guidance (DRRP 2016)

4.2 Monitoring Framework for Dolores River Backwater, Side-Channel and Riverine Habitat Restoration

Overview of Monitoring Steps: Baseline measurements were collected in 2016 and 2017 to inform the designs of the specific restoration projects proposed in Utah and Colorado. Baseline measurements will also be used as a basis for comparison after implementation. For the fish habitat sites in Colorado, project partners will document fish presence and/or abundance and document baseline habitat conditions (stream morphology surveys). Monitoring of larval and/or juvenile fish will consist of using seine or drift net capture techniques in backwater areas. Sampling efficiency and effectiveness will be assessed, but findings may only show presence/absence of certain species occupying these habitats. At the Utah site, shallow piezometers will monitor changes in groundwater elevations, vegetation transects will monitor changes in plant communities, and stream channel sections will monitor changes in overflow channel geometrics. Finally, permanent photographic points at all sites will document all activities and the natural response of restoration activities over time.

During implementation, project partners will be present to ensure that all features are constructed according to design. An as-built report will be prepared and shared with Trustees. To determine effectiveness, project partners will monitor presence and/or abundance of juvenile fish at the restoration sites, and assess how the new fish habitat features are functioning within the restoration area relative to baseline conditions (i.e., pre-implementation). Monitoring will commence at years, 1, 3, and 5 following construction, and then as desired after year 5. Project partners will use established and reliable monitoring techniques and a before-after control-impact monitoring design to help assess restoration effectiveness.

Monitoring objectives and measures, and a basic framework and corrective action plan guiding the monitoring program, are provided in Tables 3, 4, and 5.

Restoration Description: This restoration project provides backwater and side-channel nursery habitat for Dolores River fish, including sensitive fish species such as roundtail chub, flannelmouth sucker, and bluehead sucker. It also restores a hydrologic connection to an existing floodplain due to anthropogenic modifications.

Goals: Colorado sites — Increase backwater and side-channel habitat for Dolores River fish, with the overall goal of providing juvenile fish refugia from predators and swift current at two sites along the Dolores River. Utah site — Restore floodplain connectivity at bankfull discharge to improve riparian functions and providing juvenile fish refugia from predators and swift current at the downstream end of the overflow channel.

Objectives:

1. Increase self-sustaining, stable and fish-accessible backwater and/or side-channel habitat as described in project-specific restoration designs no later than 3 years post-implementation. Improve channel connectivity to backwater and side-channel habitats.
2. Demonstrate presence of juvenile sensitive fish species using backwater and/or side-channel habitat at all three sites no later than 3 years post-implementation.

Table 3. Flow hypotheses, native fish habitat objectives, and measurable indicators that will assist in determining whether native fish objectives and hydrology are self-sustaining. Flow Condition' indicators focus on critical periods of baseflow and high flows when the river channel is interacting with its floodplain, and where hydraulic stressors will most likely affect habitat.

Flow Condition	Habitat Objective	Measurable Benchmark
<p>Baseflow Late summer thru winter periods of low flow; hydrologic limit on habitat</p>	<p>Young-of-year (YOY) and juvenile habitat improvements; structure and connectivity with main channel</p>	<p>Photo points under baseflow conditions to document connectivity; sampling of backwaters during late-summer for YOY and juvenile fish to determine presence of native fish; greater wetted perimeter under baseflow conditions.</p>
<p>Habitat Maintenance Flow 2000 - 3400 cfs for 7+ days (bankfull flows)</p>	<p>Maintain pattern and profile appropriate for the reach</p>	<p>Monitor changes in cross-section and profile dimensions; assess channel aggradation or degradation/ entrenchment through repeat cross sections and longitudinal profiles; assess plan-view changes and stability of constructed bars, bankfull benches, or structural enhancements. Document vegetative colonization on constructed or bare features.</p>
	<p>Backwater/ Channel Connectivity</p>	<p>Use staff gage and cross section information to determine discharge and stage height whereby side channels (inflow/outflow as applicable) are connected.</p>
<p>Habitat maintenance Flow Peak flows of >3400 cfs at a frequency of ~7-10 years</p>	<p>Maintain in- and near-stream habitat diversity (pool scour; backwaters; secondary channels)</p>	<p>Assess habitat complexity at project sites. Assess cross section and longitudinal changes through habitat sites, including side channel. Document with photo points, aerials, and cross section surveys.</p>
	<p>Floodplain exchange and robust riparian vegetative community</p>	<p>Monitor riparian vegetation diversity and density; cottonwood germination and recruitment (NOTE - Riparian monitoring will be an important indicator of whether large flows are providing the exchange benefits to instream resources).</p>

Table 4. Summary table of fishery measures intended to allow detection of trends in the health of the native fish species in the Dolores River.

Native Species	Baseline Assessment	Fishery Measure	YES (+)	NO (-)	Trend Analysis (moving in a positive or negative direction)
RTC		Fishery abundance (quantifiable metric where possible - fish/mi CPUE; lbs/ac)	_____	_____	_____
FMS			_____	_____	_____
BHS			_____	_____	_____
RTC		Young of year or larval fish present			
FMS					
BHS					
RTC		Expanded distribution of young of year larval fish in project areas			
FMS					
BHS					
RTC		Age class structure – presence of multiple age classes of fish, including juveniles and adults			
FMS					
BHS					
HYDROLOGIC NOTES		Describe conditions of flow that are relevant to the data summary			
TEMPERATURE NOTES		Describe thermal conditions that are relevant to the data summary			
GEOMORPHIC NOTES		Describe geomorphic conditions relevant to data summary (e.g., flash flood; debris flow event affecting sample...)			

RTC - Roundtail Chub
 FMS - Flannelmouth Sucker
 BHS - Bluehead Sucker

Table 5. Proposed monitoring framework and corrective action plan for Dolores River restoration projects in Utah and Colorado.

Monitoring Category	Monitoring Timeframe ³		
	Pre-Construction/Baseline Monitoring	Construction/Implementation Monitoring	Post-Construction/Effectiveness Monitoring ⁴
Performance Monitoring: Evaluate effectiveness of the project in meeting the established restoration objectives and assist in determining the need for corrective actions.	Parameters for all objectives: <ul style="list-style-type: none"> • Area or linear feet of accessible suitable habitat for juvenile fish (Colorado sites) • Presence and/or abundance of juvenile fish at restoration sites (Colorado sites) • An evaluation of flow hypotheses that will engage proposed habitat (all sites) • Groundwater data collection (Utah site) • Extent of existing wetlands (Utah site) • Photo points of the restoration sites (all sites) 	Parameters for all objectives: <ul style="list-style-type: none"> • Area or linear feet of accessible suitable habitat for juvenile fish (Colorado sites) • Photo points of the restoration sites (all sites) 	Parameters for all objectives: <ul style="list-style-type: none"> • Area or linear feet of accessible suitable habitat for juvenile fish: Year 3, 5 (Colorado sites) • Habitat/condition assessment, document flow conditions, soil/bank stability (all sites) • Presence, abundance and/or age class of fish at the restoration sites in years 1, 3, and 5 (Colorado sites) • Changes in shallow groundwater that support riparian/wetland function (Utah site). • Extent of existing wetlands (Utah site) • Photo points in years 1, 3, and 5 (all sites)

³ The parameters listed under the different monitoring timeframes are intended to include those parameters that are relevant to that specific monitoring category. For example, parameters that will help evaluate whether the project is meeting the established restoration objectives and assist in determining the need for corrective actions are listed under “performance monitoring.”

⁴ Actual timing/frequency of monitoring actions may be adjusted by stakeholders and are dependent on funding, environmental variables, and availability of trained personnel.

Table 5 Continued.

Monitoring Category	Monitoring Timeframe ⁵		
	Pre-Construction/Baseline Monitoring	Construction/Implementation Monitoring	Post-Construction/Effectiveness Monitoring ⁶
Performance Monitoring: Evaluate effectiveness of the project in meeting the established restoration objectives and assist in determining the need for corrective actions.	Timing/Frequency: At least once before restoration action begins	Timing/Frequency: During, or immediately following construction/implementation.	Timing/Frequency: Specified above.
	Location: Proposed fish habitat and riverine restoration sites.	Location: Fish habitat and riverine restoration sites	Location: Fish habitat and riverine restoration sites
Corrective Action Plan			
Potential Trigger		Corrective Action	
Fish habitat features fail to engage the Dolores River channel during targeted flows.		Evaluate and document deficiencies. Return to the site with equipment, if necessary, to reconstruct features in accordance with design intent.	
Disturbed areas undergo significant erosion due to high flows.		Assess erosion. Prepare and implement a best management plan to reduce or eliminate erosion.	
An increase or spread of non-native, noxious weeds in disturbed areas.		Coordinate treatment and/or removal.	

⁵ The parameters listed under the different monitoring timeframes are intended to include those parameters that are relevant to that specific monitoring category. For example, parameters that will help evaluate whether the project is meeting the established restoration objectives and assist in determining the need for corrective actions are listed under “performance monitoring.”

⁶ Actual timing/frequency of monitoring actions may be adjusted by stakeholders and are dependent on funding, environmental variables, and availability of trained personnel.

CHAPTER 5 – TIMELINE AND BUDGET

The Trustees intend to complete the remaining restoration planning activities by end of calendar year 2017, however project timelines are influenced by weather, staff availability, and unforeseen circumstances. Restoration implementation has been proposed to begin in late 2017, assuming all planning and environmental compliance has been completed and contracts/agreements awarded. A tentative timeline for additional restoration planning, implementation, and monitoring is provided below in figure 13. A budget for the restoration projects is also provided below in Table 6.

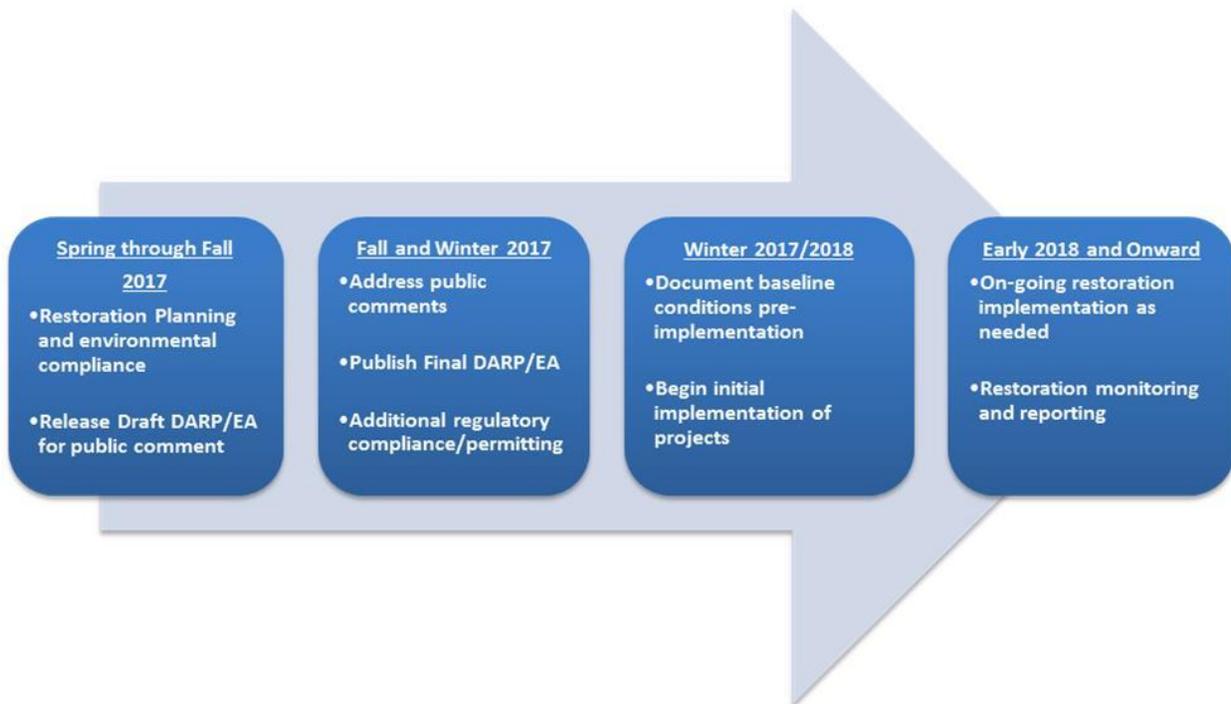


Figure 13. Tentative restoration planning, implementation, and monitoring timeline for the West Creek Oil Spill Restoration Plan.

Table 6. Budget for restoration implementation, monitoring, and oversight/administration.

Restoration Project or Category	Trustee Settlement Funds	Potential Partner Match
Fisherman Access – Stile Installation	\$3,500	NA
Tamarisk Management	\$32,750 ^a	USFWS staff time
Dolores River In-Stream/Riparian Habitat Restoration	\$50,000	\$145,000
Restoration Monitoring	\$24,000	Potential matching funds from state of Colorado or BLM
Oversight and Administration	\$10,750	NA
TOTAL (Available Settlement amount for projects/monitoring)	\$88,250	> \$145,000

^a Funds provided by the DOI Restoration Catalyst Fund; not included in settlement total.

CHAPTER 6 – AFFECTED ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES

6.1 INTRODUCTION

This section provides a description of the human and natural environmental resources that could be affected by the Proposed Action and presents comparative analyses of the direct, indirect and cumulative effects on the affected environment stemming from the implementation of the actions under the No Action and Proposed Action.

This EA draws upon information compiled in the Grand Junction Resource Area RMP (BLM 2015).

NEPA requires that the Trustees evaluate the potential impacts of their proposed actions. This includes evaluation of what would happen if the Trustees did nothing further, referred to as the “No Action Alternative”. This section sets out the potential impacts of both the No Action Alternative and the Proposed Action alternative evaluated and proposed in Chapter 3 as meeting the Trustees’ Restoration Goals and Evaluation Criteria. The analysis presented here considers the range of potential environmental consequences that may be anticipated to occur as a result of implementation of activities within the scope of the Proposed Action.

The following definitions will be used to characterize the nature of the various impacts evaluated in this Draft DARP/EA:

- *Short-term or long-term impacts.* These characteristics are determined on a case-by-case basis and do not refer to any rigid time period. In general, short-term impacts are those that would occur only with respect to a particular activity or for a finite period. Long-term impacts are those that are more likely to be persistent and chronic.
- *Direct or indirect impacts.* A direct impact is caused by a proposed action and occurs contemporaneously at or near the location of the action. An indirect impact is caused by a proposed action and might occur later in time or be farther removed in distance but still be a reasonably foreseeable outcome of the action. For example, a direct impact of erosion on a stream might include sediment-laden waters in the vicinity of the action, whereas an indirect impact of the same erosion might lead to lack of spawning and result in lowered reproduction rates of indigenous fish downstream.
- *Minor, moderate, or major impacts.* These relative terms are used to characterize the magnitude of an impact. Minor impacts are generally those that might be perceptible but, in their context, are not amenable to measurement because of their relatively minor character. Moderate impacts are those that are more perceptible and, typically, more amenable to quantification or measurement. Major impacts are those that, in their context and due to their intensity (severity), have the potential to meet the thresholds for significance set forth in CEQ regulations (40 CFR 1508.27) and, thus, warrant heightened attention and examination for potential means for mitigation to fulfill the requirements of NEPA.

- *Adverse or beneficial impacts.* An adverse impact is one having adverse, unfavorable, or undesirable outcomes on the man-made or natural environment. A beneficial impact is one having positive outcomes on the man-made or natural environment. A single act might result in adverse impacts on one environmental resource and beneficial impacts on another resource
- *Cumulative impacts.* CEQ regulations implementing NEPA define cumulative impacts as the “impacts on the environment which result from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (Federal or non-Federal) or person undertakes such other actions.” (40 CFR 1508.7) Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time within a geographic area.

6.1.1 Components Not Affected or Not Analyzed in this Document

The following components, identified as not being present, affected, or analyzed are not brought forward for additional analysis in this Draft DARP/EA:

- Project 1 of the Proposed Action: Enhanced Access to West Creek – This action has been determined to not have effects on physical resources and heritage resources and the human environment, and specific biological and land resources. Potential impacts to vegetation, invasive species, and recreation are carried forward for additional analysis.
- Project 2 of the Proposed Action: Management of Tamarisk and other Invasive Species – This action has been analyzed by the USFWS and it was determined that the project is covered by categorical exclusion 516 DM 8.5B (3)⁷. No additional analysis under NEPA is required.
- Air and Climate – These activities are not expected to produce air pollutants at levels to exceed state air quality standards. There are no class I airsheds in the vicinity.
- Geology/Mineral Resources – Most of the sites on the Dolores River are either located on, or immediately upstream of Gold Placer Claims that are active with recreational prospecting clubs. Since they are recreational (instead of operating under a Notice or Plan of Operation), there is no conflict with the 1872 Mining Law. Signs should be displayed or erected noting that the area is under rehabilitation and the area should not be disturbed. Also, maps showing exactly where this operation is occurring should be sent to the claim holders so that the prospectors’ clubs can disseminate the information to their members to not disturb the work.
- Forestry – No forest resources are present within the project areas. No woodland product sales occur within the project areas.
- Paleontological – Work is to be completed in the active drainage. The nearest fossil-bearing geological unit is approximately one mile distant from either river. Therefore, no impacts to paleontological resources are anticipated.
- Tribal & Native American Religious Concerns – No traditional cultural properties, unique natural resources, or properties of a type previously identified as being of interest

⁷ This categorical exclusion is for “the construction of new, or the addition of, small structures or improvements, including structures and improvements for the restoration of wetland, riparian, instream, or native habitats, which result in no or only minor changes in the use of the affected local area.”

to local tribes, were identified during the cultural resources inventory of the project area. No additional Native American Indian consultation was conducted for the proposed project. The project would not alter or limit any access if there were traditional uses or sites that are not known to the agency. The Ute Indian Tribe of the Uintah and Ouray Reservation and the Ute Mountain Ute Tribe were notified of the spill in February 2013 and asked if they had any concerns or comments. None were received by the BLM at this time. No potential adverse effects are anticipated at Site 3 in Utah.

- Social/Economic – No social or economic impacts are expected from this project because of the small scale and remote location. There are no minority or low income populations within the immediate project area.
- Transportation and Access – The Proposed Action would not change access to or across public lands.
- The project area is outside of special designations except for the Dolores River Riparian ACEC, containing the values of fish, wildlife, scenic, riparian habitat and plants.
- Wilderness and Wilderness Characteristics – There are no lands with wilderness characteristics or designated wilderness in the proposed project area.
- Range Management – Cattle grazing would not be impacted during periods of proposed activities.
- Wild Horse and Burros – Wild horse and burro are not present within the proposed restoration areas.
- Land Tenure, ROW, Other Uses – A review of the Master Title Plats and LR2000 Database indicates the following land use authorizations and land tenure adjustment actions in the project area:

SERIAL NO.	FACILITY/ACTION	HOLDER
COC-30590	Highway 141 ROW	CDOT
COC-026622	Highway 141 ROW	CDOT
COC-017364	Highway 141 ROW	CDOT
COC-090820	Highway 141 ROW	CDOT
COC-12348 & 12348B	buried/overhead telephone line ROW	Nucla/Naturita Telephone Co.
COC-40194	overhead power line ROW	Grand Valley Power
COC-28631	withdrawal - power site classification 108, SO 7/22/1925	
COC-58936	fee acquisition of 221 acres, Land and Water Conservation Fund	

The Proposed Action would not affect land tenure. As long as the BLM notifies and coordinates with the ROW holders, the project should not conflict with existing ROWs.

- Fire and Fuels – The proposed action does not pose any impacts to Fire or Fuels Management.
- Farmlands, Prime and Unique – There are no designated Prime and Unique Farmlands located within the Grand Junction Field Office.

Table 7. Potentially impacted resources for sites 1 and 2 of Project 3: Fish and Riverine Habitat Restoration. Completed by BLM - Grand Junction Field Office.

Resources	Not Present On Location	No Impact	Potentially Impacted	Mitigation Necessary/ Design Features?	BLM Evaluator Initial & Date	Comments
PHYSICAL RESOURCES						
Air and Climate	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	KEH8/9/16	
Water (surface & subsurface, floodplains)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	KEH8/9/16	
Soils	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	KEH8/9/16	
Geological/Mineral Resources	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	EE 07/26/16	
BIOLOGICAL RESOURCES						
Special Status Plants	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	ARL 8/1/16	Need plant surveys to ensure rare plants are not impacted at restoration sites
Special Status Wildlife	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	HLP 7/21/17	Design features included in proposed action
Migratory Birds	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	HLP 7/21/17	Design features included in proposed action
Other Important Wildlife Habitat	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	HLP 7/21/17	
Vegetation	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	JRD 8/9/16	
Forestry	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
Invasive, Non-native Species	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	MT 7/25/16	No impact from ladders. Fish habitat sites rolled into Dolores project weed treatments as necessary.
Wetlands/Riparian Zones	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	ARL 7/19/17	
HERITAGE RESOURCES AND HUMAN ENV.						
Cultural or Historical	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	ALR 7/25/16	Needs survey, please let me know when field visits are happening.
Paleontological	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	EE 07/18/16	

Table 7 Continued.

Resources	Not Present On Location	No Impact	Potentially Impacted	Mitigation Necessary/ Design Features?	BLM Evaluator Initial & Date	Comments
Tribal& American Indian Religious Concerns	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	ALR 7/25/16	Needs survey, please let me know when field visits are happening.
Visual Resources	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	AW 8/3/16	River restoration sites are along a Scenic Byway. Sites 2, 3, and 4 could be visible.
Social/Economic	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	CS 8/2/16	
Transportation and Access	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	AW 8/3/16	
Wastes, Hazardous or Solid	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	AEK 8/19/16	Design features suggested as noted.
LAND RESOURCES						
Recreation	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	AW 8/3/16	Project is within the Dolores River RMA managed for scenic touring. Need to know what level of change will occur.
Special Designations (ACEC, SMAs, WSR)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	DB 07/28/16	
Wilderness & Wilderness Characteristics	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	DB 07/18/16	
Range Management	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	JRD 8/9/16	
Wild Horse and Burros	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
Land Tenure, ROW, Other Uses	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	RBL 8/9/16	BLM should notify ROW holders.
Fire/Fuels	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	JP 8/1/16	

Table 8. Potentially impacted resources for site 3 of Project 3: Fish and Riverine Habitat Restoration. Completed by BLM - Moab Field Office.

Resources	Not Present	Present but No Impact	Present with Potential for Impact	Comments
PHYSICAL RESOURCES				
Air Quality/Greenhouse Gas Emissions	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	The proposed berm removal does not generate enough emissions to require analysis in EA.
Water Resources/Quality and Floodplains	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Positive impacts to floodplains and water resources
Soils	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Minor impacts to soils
Geological/Mineral Resources	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
BIOLOGICAL RESOURCES				
Special Status Plants	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	No special status plants present
Special Status Fish and Wildlife/Utah BLM Sensitive Species	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Will avoid nesting season; beneficial for "3 species"; no T&E species impacted; no detailed analysis needed
Other Fish and Wildlife/Migratory Birds	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Will avoid nesting season; therefore nesting birds will not be impacted and non-nesting birds anticipated to avoid during construction; no further analysis needed
Vegetation	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Minor vegetation removal
Forestry/Woodlands	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Removal of berm will not likely impact forestry to a degree that would require further analysis.
Invasive, Non-native Species (E.O. 13112)	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	There is existing disturbance at the site and removal of the portion of the berm is not likely to add to the disturbance. The re-connection of the river to the side channel should help in revegetation.
Visual Resources	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Project will enhance visual resources along the Dolores River
Wetlands/Riparian Zones	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Positive impacts to riparian vegetation by reconnecting overflow channel
HERITAGE RESOURCES AND HUMAN ENV.				
Cultural or Historical	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Need cultural inventory and determination of eligibility and effect
Paleontological	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Work takes place in area not expected to contain fossils. Stop work if fossils found and contact BLM paleontologist.
Environmental Justice	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	No environmental justice populations identified in planning area.
Native American Religious Concerns	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	No adverse effect determination.
Socioeconomics	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Minimal impact relative to planning area economy.
Wastes, Hazardous or Solid	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	

Table 8 Continued.

LAND RESOURCES				
Recreation	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Will not affect recreation use
Areas of Critical Environmental Concern	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	2008 RMP
Wild and Scenic Rivers	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Project will enhance qualities of the suitable Wild and Scenic River segment
BLM Natural Areas	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	2008 RMP
Wilderness & Wilderness Characteristics	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	2008 RMP
Range Management/Range Health Standards	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Will help the riparian habitat with removal of rock berm
Land Tenure, ROW, Other Uses	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Subject to valid existing rights.
Livestock Grazing	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	No impact to cattle grazing
Fire/Fuels	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Fuels projects in the area will benefit from berm removal and re-connection of the river. Removal of berm will not impact fire/fuels to a degree that requires further detailed analysis.

6.2 PHYSICAL RESOURCES

As stated in Section 6.1.1, the discussion below is focused on potential impacts of a) Enhanced Access to West Creek (Project 1) to vegetation, non-native species, and recreation along West Creek, and b) Fish Habitat Restoration along the Dolores River (Project 3) to several resource and use categories.

6.2.1 Soils (includes a finding on Standard 1)

Current Conditions:

Soils of the Dolores River Corridor are comprised primarily of fluvents. Soils in the area are commonly deep, well drained, and are found on the floodplain, terraces, and fans associated with the Dolores River (BLM 1990). Historically, these soils were subject to periodic flooding, but less so since irrigation, transbasin diversions, and domestic and industrial uses have reduced flows. The hazard of water erosion due to flooding is slight to high. The soil unit is important wildlife habitat and suitable for livestock grazing under a well-managed grazing system. Outside of the floodplain in higher elevations, much of the remainder of the Dolores River Corridor is rock outcrop.

Finding for Public Land Health Standard 1 for Upland Soils:

Public Land Health Standard 1 states that upland soils should exhibit infiltration and permeability rates that are appropriate to soil type, climate, land form, and geologic processes. A Land Health Assessment (LHA) was conducted in 2011. The existing soils in the project area meet this standard. There are no signs of erosion above what is appropriate for the soil types present in the area, and no signs of active erosion.

Alternative A – No Action:

The No Action Alternative would not result in any direct or indirect soils impacts since no restoration actions would be undertaken.

Finding for Public Land Health Standard 1 for Upland Soils:

Under the No Action Alternative, changes to LHS 1 is not expected due to no action being implemented.

Alternative B – Proposed Action:

River restoration activities adjacent to and in the Dolores River would result in some localized disturbance of soils and sediments during ground-disturbing/earth-moving restoration actions. BMPs and standard operating procedures (SOPs), as described in Appendix H of the BLM Grand Junction Field Office RMP, would be implemented where appropriate to minimize soil and sediment transport from restoration project areas, including monitoring of erosion in restored river features and implementation of corrective actions in areas identified as experiencing excessive erosion by installation of appropriate structures. Immediate and future post-construction cross section surveys will be completed and used in future years to determine erosion status. There is uncertainty about the long-term direct impacts to sediment at Dolores River restoration sites because the constructed backwater features at these sites may or may not mitigate sediment scour during storm or flooding events and reduce instream transport of sediment into downstream areas. Construction of the proposed Dolores River backwater feature at the downstream section of the Dolores River in Colorado (Site 2) would result in approximately 6,000 cubic feet of soil being excavated, covering approximately 0.55 acres. Within the same restoration reach, approximately 1,200 cubic feet of soil would be removed for the side-channel restoration project and placed within a 0.11 acre footprint adjacent to the river. For the construction of the proposed backwater feature at the upstream section of Dolores River in Colorado (Site 1), the estimated volume of material that will be removed is 4,500 cubic feet. The area that will be covered when the excavated material is spread will be approximately 0.41 acres. Much of the excavated material from all of the Dolores River projects is anticipated to be composed primarily of sand and gravel. This material will be placed on terraces at elevations expected to exceed high flow scenarios.

Fish habitat restoration activities as proposed in this Draft DARP/PEA have potential to provide a variety of ecosystem benefits, primarily consisting of direct and indirect benefits to fish. The Trustees anticipate localized, temporary and minor impacts to soils/sediments during periods of construction and management. Therefore, implementation of Dolores River fish habitat projects would be expected to result in short-term impacts that would be direct, minor and adverse, whereas long-term impacts are expected to be both direct and indirect, minor to moderate and beneficial in nature (see Section 6.1 for definitions).

Finding for Public Land Health Standard 1 for Upland Soils:

Land Health Standard 1 should continue to be met under the Proposed Action. The activities planned should not impact a large enough area to result in wide spread soil degradation. Since the activities are within the riparian area, recovery of the disturbed area should occur within a short time frame minimizing erosion. Soil compaction from equipment should be minimized as a result of equipment type and access locations.

6.2.2 Water (includes a finding on Standard 5)

Current conditions

Flows in the Dolores River vary seasonably, with high flows resulting following spring snowmelt in the head-water of the Dolores and San Miguel Rivers and in the La Sal Mountains of Utah. Localized peak flows occur intermittently during July, August, and September following thunderstorms. Flow reductions have resulted from diversions, various human uses, and construction and operation of the McPhee Dam. In an average snowpack year, flows range from about 800 to 2,000 cubic feet per second (cfs). Minimum flow rates were established following construction of McPhee Dam, with flows ranging from 20 cfs (in dry years) to 78 cfs (in wet years).

Water quality in the Dolores River varies with location and flow rate. Total dissolved solids concentrations increase further downstream, with significant contributions coming from localized sources and groundwater discharge from the Paradox salt anticline (BLM 1990). Turbidity and water discoloration in the Dolores River increases proportionally with flow rate.

West Creek is a snowmelt fed west- and south-flowing fourth-order tributary to the Dolores River which is a major tributary to the Colorado River. West Creek flows through the southwest end of Unaweep Canyon, a large drainage feature of the Uncompahgre uplift, also known as the Uncompahgre Plateau (Cater 1955; Lohman 1961; Oesleby 1978; Sinnock 1981; Cole and Young 1983). West Creek is adjacent to the Unaweep Seep Area, a unique spring-fed ecosystem that is identified as an Area of Critical Environmental Concern. Stream gradient, streambed morphology, and fish habitat are largely controlled by the location and extent of valley fill and areas where West Creek cuts through exposed bedrock. West Creek extends in Unaweep Canyon from the drainage divide, southwestward to Gateway, Colorado. Public access to West Creek is available along Unaweep-Tabeguache Scenic and Historic Byway (Highway 141), including the West Creek picnic area managed by the BLM. Approximately 4.93 miles of West Creek is situated within BLM-managed lands primarily for the purpose of recreation.

West Creek is categorized as a B3 stream according to the Rosgen classification scheme (Rosgen 1996). A B3 stream is described as moderately entrenched with channel bed morphology dominated by cobble materials and characterized by rapids with irregularly spaced scour pools and a sinuosity of greater than 1.2. Classification data for the permanent reference reach of West Creek is contained in Powell and Trammell (2002). Discharge in West Creek is highly variable and directly proportional to snow melt that provide surface runoff as well as groundwater recharge to the spring that feed base flows during low water periods. Wintertime minimum flows are less than 20 cubic feet per second (cfs), whereas late spring peak flows exceed 200 cfs.

Water quality in West Creek is considered to be moderate. West Creek water contains certain nutrients and dissolved solids that are possibly derived from livestock and other farm wastes that enhance organic production and runoff from the adjacent highway. A unique feature of West Creek is the coating of its rocky substrate by a mixture of precipitated calcium carbonate in association with clay and organic matter.

Finding for Public Land Health Standard 5 for Water Quality:

Public Land Health Standard 5 requires that the water quality of all water bodies, including ground water where applicable, located on or influenced by BLM lands would achieve or exceed the Water Quality Standards established by the State of Colorado. A Land Health Assessment

(LHA) was conducted in 2011. Hydrologic indicators evaluated indicated there are no widespread hydrologic function concerns. The Dolores River is currently listed on the State of Colorado's 303(d) list indicating there are some water quality concerns, including exceedances of standards for E.coli, temperature, and iron.

Alternative A – No Action:

The No Action Alternative would not result in any hydrology or water quality impacts since no restoration actions would be undertaken.

Finding for Public Land Health Standard 5 for Water Quality:

LHS 5 is should continue to be met under the No Action Alternative as no activities would occur.

Alternative B – Proposed Action:

Fish habitat restoration activities, where backwater and side-channel habitat along the edge of three sections of the Dolores River would be enhanced or created, will temporarily affect ambient water quality, such as increased turbidity, adjacent to and downstream of proposed restoration reaches. Implementation of Dolores River fish habitat projects is expected to result in temporary and minor impacts to hydrology processes during periods of construction and management from the use of various types of construction equipment.

No impacts to hydrology or water quality are expected to occur as a result of installing fence stiles near West Creek. Even after access to West Creek is improved, recreation pressure is likely to remain low resulting in negligible to minimal impacts to West Creek, including water resources.

During hydrological restoration activities, BMPs, as described in this document, would be utilized to ensure that any temporary negative impacts to hydrology and water quality are minimized. The impacts of this alternative on water quality are expected to be short-term, direct, minor and adverse.

Finding for Public Land Health Standard 5 for Water Quality:

Under the Proposed Action LHS 5 should continue to be met. During construction, the Dolores River may have short term increases in sediment and turbidity, but these increases should not cause any exceedances of water quality standards. In addition, the proposed activities are not expected to cause any further exceedance of water quality standards.

6.3 BIOLOGICAL RESOURCES

6.3.1 Invasive, Non-native Species

Current Conditions:

Management activities to control or eliminate invasive, non-native plants and revegetate floodplain and upland habitat with native plants are key components of a collective effort being led by federal, state, regional, and local partners to restore the Dolores River's riparian corridor. The primary invasive woody species occurring along the Dolores River near the project areas are

tamarisk (*Tamarix* spp.; also known as salt cedar), Russian olive (*Elaeagnus angustifolia*), and Siberian elm (*Ulmus pumila*). The main herbaceous weeds are Russian knapweed (*Rhaponticum repens*), kochia (*Kochia scoparia*), Russian thistle (*Salsola tragus*) and whitetop (*Cardaria draba*). Tamarisk is a woody species of primary concern, covering approximately 2,350 acres along the Dolores River as of 2008 (Tamarisk Coalition 2008). The economic impact of this infestation along the Dolores River amounts to approximately \$2,500,000 at a cost of \$1,050 per acre treated. Recruitment of native species, such as coyote willow (*Salix exigua*), big sage (*Artemisia tridentata*), New Mexico privet (*Forestiera neomexicana*), alkali pepper weed (*Lepidium crenatum*), suaeda (*Suaeda Forssk*), greasewood (*Sarcobatus vermiculatus*), inland saltgrass (*Distichlis spicata*), three-leaf sumac (*Rhus trilobata*), alkali sacaton (*Sporobolus airoides*), rabbit brush (*Ericameria nauseosa*), Fremont cottonwood (*Populus fremontii*), and sand dropseed (*Sporobolus cryptandrus*), among others, following treatment of invasive species is a goal at restoration sites.

Relatively few isolated occurrences of invasive plants and aquatic nuisance species have been documented for West Creek. The riparian corridor for this creek is generally intact and not under threat from invasive, non-native species.

Alternative A – No Action:

The No Action Alternative would not result in any impacts to invasive, non-native species because no restoration actions would be undertaken. Recent and on-going socio-economic and ecological impacts due to existing invasive, non-native species are likely to continue.

Alternative B – Proposed Action:

Proposed fish habitat restoration activities along the Dolores River would restore or enhance small areas of riparian habitat that have been impacted by invasion of tamarisk and other non-native woody and herbaceous species. Construction activities such as clearing and earth-moving to create side-channel and backwater habitats would directly impact plant communities in those areas. However, following construction activities, vegetation would be restored by planting with species native to the Dolores River Corridor, followed by management activities to reduce potential occurrence of invasive plant species. Areas would be monitored after construction to identify and correct erosion that threatens revegetation. Construction activities in restoration areas would follow applicable BMPs and SOPs developed by the BLM to minimize introduction of invasive species and other adverse impacts; revegetation activities would follow guidance from the Dolores River Restoration Partnership (DRRP 2016). Activities to restore or improve habitat conditions could also potentially result in localized removal of existing trees and understory plants as well as loss of vegetation due to flooding or desiccation resulting from the modified river morphology within restoration reaches. Impacts to invasive, non-native vegetation in existing habitats would be long-term, direct, and major, although ecological benefits from restoring limited areas of vegetation with native species are expected to be minor to moderate, long-term, and both direct and indirect.

6.3.2 Threatened, Endangered and Sensitive Species (includes a finding on Standard 4)

Current conditions:

Below is a summary of threatened, endangered, and sensitive species, including migratory birds of conservation concern, potentially occurring within the proposed restoration project areas along and in the vicinity of Dolores River. The Information, Planning, and Consultation System provided by the U.S. Fish and Wildlife Service was used to generate the list. There are no federally designated critical habitats listed within proposed restoration areas.

No federally listed plants are known to occur in the project area. Numerous BLM sensitive plant species occur along Highway 141: Dolores River skeleton plant (*Lygodesmia doloresensis*), Horseshoe milkvetch (*Astragalus equisolensis*), Fisher milkvetch (*Astragalus piscator*), Osterhout's ctyptantha (*Cryptantha osterhoutii*), and San Rafael milkvetch (*Astragalus rafaensis*). The rare stream orchid, Giant helleborine (*Epipactus gigantea*) also occurs along the Dolores River and West Creek.

Riparian habitats of Dolores River and West Creek have been identified as important habitat for southwestern willow flycatcher (*Empidonax traillii extimus*) and yellow-billed cuckoo (*Coccyzus americanus*), although there are no recent records of either of these species occurring at specific restoration sites. Southwestern willow flycatcher is a federally endangered migratory bird that is protected across its entire range, including southeastern Utah and southwestern Colorado. The western distinct population of yellow-billed cuckoo is federally threatened and protected in its entire range in southeastern Utah and southwestern Colorado.

Table 9. List of federally protected species potentially occurring at or in the vicinity of the restoration projects sites in Utah and Colorado. Data from U.S. Fish and Wildlife Service Information, Planning, and Conservation System (<http://ecos.fws.gov/ipac>) generated on May 11, 2017. Key: E – Federally Endangered, T – Federally Threatened.

Common Name	Scientific Name	Status
Bonytail chub	<i>Gila elegans</i>	E
California condor	<i>Gymnogyps californianus</i>	E
Colorado pikeminnow	<i>Ptychocheilus Lucius</i>	E
Greenback cutthroat trout	<i>Oncorhynchus clarki stomias</i>	T
Gunnison sage grouse	<i>Centrocercus minimus</i>	T
Humpback chub	<i>Gila cypha</i>	E
Jones cycladenia	<i>Cycladenia humilis var. jonesii</i>	T
Mexican spotted owl	<i>Strix occidentalis lucida</i>	T
Navajo sedge	<i>Carex specuicola</i>	T
North American wolverine	<i>Gulo gulo luscus</i>	T (proposed)
Razorback sucker	<i>Xyrauchen texanus</i>	E
Southwestern willow flycatcher	<i>Empidonax traillii extimus</i>	E
Yellow-billed cuckoo	<i>Coccyzus americanus</i>	T

Table 10. List of migratory Birds of Conservation Concern potentially occurring at or in the vicinity of the proposed project areas. Data generated from Information for Planning and Conservation (<https://ecos.fws.gov/ipac/>) on May 11, 2017

Common Name	Scientific Name	Seasonal Occurrence
Bald eagle	<i>Haliaeetus leucocephalus</i>	Year-round
Bendires' thrasher	<i>Toxostoma bendirei</i>	Breeding
Balck rosy finch	<i>Leucosticte atrata</i>	Year-round
Brewer's sparrow	<i>Spizella breweri</i>	Breeding
Burrowing owl	<i>Athene cucularia</i>	Breeding
Calliope hummingbird	<i>Stellula callipe</i>	Migrating
Cassin's finch	<i>Carpodacus cassinii</i>	Year-round
Ferruginous hawk	<i>Buteo regalis</i>	Year-round
Flammulated owl	<i>Otus flammeolus</i>	Breeding
Golden eagle	<i>Aquila chrysaetos</i>	Year-round
Gray vireo	<i>Vireo vicinior</i>	Breeding
Juniper titmouse	<i>Baeolophus ridgwayi</i>	Year-round
Lewis's woodpecker	<i>Melanerpes lewis</i>	Year-round
Loggerhead shrike	<i>Lanius ludovicianus</i>	Year-round
Long-billed curlew	<i>Numenius americanus</i>	Breeding
Lucy's warbler	<i>Vermivora luciae</i>	Breeding
Olive-sided flycatcher	<i>Contopus cooperi</i>	Breeding
Peregrine falcon	<i>Falco peregrinus</i>	Breeding
Pinyon Jay	<i>Gymnorhinus cyanocephalus</i>	Year-round
Prairie falcon	<i>Falco mexicanus</i>	Year-round
Rufous hummingbird	<i>Selasphorus rufus</i>	Migrating
Sage thrasher	<i>Oreoscoptes montanus</i>	Migrating
Short-eared owl	<i>Asio flammeus</i>	Wintering

Table 10 Continued.

Common Name	Scientific Name	Seasonal Occurrence
Swainson's hawk	<i>Buteo swainsoni</i>	Breeding
Virginia's warbler	<i>Vermivora virginiae</i>	Breeding
Western grebe	<i>Aechmophorus occidentalis</i>	Breeding
Williamson's sapsucker	<i>Sphyrapicus thyroideus</i>	Breeding
Willow flycatcher	<i>Empidonax traillii</i>	Breeding

Finding for Public Land Health Standard 4 for Threatened and Endangered Species:

The proposed project area along West Creek is meeting Land Health Standard 4. While Site 1 and Site 3 along the Dolores River have not been assessed for Land Health, Site 2 has been assessed. Site 2 is not meeting Land Health Standard 4 due to the abundance of weedy species, and the corresponding reduction in the native plant community. A similar pattern would be expected at Site 1. The GJFO Land Health Assessments do not cover the Utah portion of the proposed project.

Alternative A – No Action:

The No Action Alternative would not result in any impacts to threatened, endangered and sensitive species since no restoration actions would be undertaken.

Finding for Public Land Health Standard 4 for Threatened and Endangered Species:

The No Action alternative would have no effect on the Land Health, as no work would occur along the Dolores River.

Alternative B – Proposed Action:

As demonstrated above, many federally protected species have the potential to be present within or in the vicinity of the proposed restoration areas; however, currently the proposed restoration sites are not occupied by federally threatened or endangered species and there is no critical habitat within the action area. A survey completed on June 2, 2017, did not result in any rare plant detections.

A review of Colorado BLM and Colorado Natural Heritage Program (CNHP) records found that no rare plant species are known to occur in the three project areas along the Dolores River. While the giant helleborine (*Epipactis gigantean*) has been documented near Site 1, and the horseshoe milkvetch was recorded near Site 2, both occurrences were on the west side of Highway 141, and would not be impacted by the proposed action. Site 3, in Utah, is not covered by GJFO BLM and CNHP records, thus a records review could not be completed for that site, and impacts to rare plants are unknown. The giant helleborine occurs in multiple spots along West Creek. No impacts to the orchid are anticipated, as the locations of the proposed fence stiles are not near any recorded orchid occurrence.

On-site surveys will be completed prior to project implementation activities and additional reviews and documentation may need to be completed to confirm that impacts to federally protected species and migratory birds are not likely. Construction along the Dolores River will occur during the non-breeding season to eliminate direct impacts to breeding wildlife. Areas identified for restoration activities will be surveyed by trained biologists for special status species and who will identify methods or practices that can be used to avoid inadvertently impacting special status species. These activities, in addition to using BMPs, will ensure that proposed actions will have no effect on special status species or that such effects are mitigated consistent with federal and state laws. In the unforeseen event that special status species are impacted, the Trustees anticipate only minor, temporary, both direct and indirect, and adverse impacts to occur within proposed restoration areas, primarily resulting from actions involved in moving soil, creating side-channel features and subsequently increasing river turbidity, revegetating disturbed areas, and managing invasive plants. Long-term, direct and indirect, moderate, and beneficial impacts, primarily for native fish, would also be expected from the improved river habitat features and riparian habitat.

Finding for Public Land Health Standard 4 for Threatened and Endangered Species:

The proposed action could lead to an increase in understory weedy species (knapweed, whitetop, or other species) if equipment is not cleaned adequately. If the proposed action is properly implemented, the removal of tamarisk and other weedy species, and the alteration of river morphology are expected to improve the project's area ability to meet Standard 4.

6.3.3 Vegetation (includes a finding on Standard 3)

Current conditions:

Dolores River Corridor habitat consists of four vegetative types: Montane, foothills, Upper Sonoran, and Desert salt shrub. Interspersed among these communities is a diverse riparian plant community, particular along the Dolores River. Because of its richness and diversity, riparian habitat along the Dolores River supports distinctive local plant and animal populations. A healthy riparian corridor is supported by numerous native species, including coyote willow (*Salix exigua*), big sage (*Artemisia tridentata*), New Mexico privet (*Forestiera neomexicana*), alkali pepper weed (*Lepidium crenatum*), suaeda (*Suaeda Forssk*), greasewood (*Sarcobatus vermiculatus*), inland saltgrass (*Distichlis spicata*), three-leaf sumac (*Rhus trilobata*), alkali sacaton (*Sporobolus airoides*), rabbit brush (*Ericameria nauseosa*), Fremont cottonwood (*Populus fremontii*), and sand dropseed (*Sporobolus cryptandrus*), among others species. In its current condition, large areas of Dolores River riparian habitat is overrun with invasive woody species herbaceous weeds (see Chapter 6.3.1).

The riparian corridor of West Creek contains plant species typically found in mid-elevation, semi-arid mountains of western Colorado and eastern Utah. Riparian vegetation along West Creek in areas adjacent to proposed stiles is robust and relatively non-disturbed, except for minor impacts from users accessing the stream for recreation, primarily fishing. Riparian species include willow (*Salix* spp.), alder, cerro hawthorn (*Crataegus erythropoda*), cottonwood, chokecherry (*Prunus virginiana*), red osier dogwood (*Cornus sericea*), juniper, Gambel oak (*Quercus gambelii*), skunkbush (*Rhus trilobata*), various grasses and sedges, poison oak

(*Toxicodendron diversilobum*), cattails, lupine, bindweed, thistle, among other woody and herbaceous species. Upland areas, including valley walls, contain mountain mahogany (*Cercocarpus ledifolius*), pinyon pine (*Pinus edulis*), blanket flower, yucca, milkvetch, claret cup cactus (*Echinocereus triglochidiatus*), and ephedra (Powell and Trammell 2002, Appendix H).

Finding on Public Land Health Standard 3 for plant communities:

The proposed action could lead to an increase in understory weedy species (knapweed and whitetop) if equipment is not cleaned to ensure weed seed from one project area is not being spread to other areas. If the proposed action is properly implemented the removal of tamarisk and other weedy species, and the restoration of stream function is expected to improve the project's area ability to meet Standard 3.

Alternative A – No Action:

The No Action Alternative would not result in any impacts to vegetation since no restoration actions would be undertaken.

Finding on Public Land Health Standard 3 for plant communities:

The project areas would remain in the state described above under the No Action alternative.

Alternative B – Proposed Action:

Construction activities along the Dolores River, including upland areas needed to access river restoration sites, will result in some vegetation clearing and trampling and earth- moving to create side-channels and backwater habitats and recontour areas. Once construction is completed, vegetation would be restored by planting and/or seeding with native species, followed by management activities to reduce potential re-occurrence of invasive plant species. Any intentional actions to remove invasive species would have the potential to impact interrelated native vegetation in the treated areas. Application of herbicides could impact native vegetation as well as invasive vegetation. If herbicide application was used for invasive plant management, BMPs, such as use of a certified applicator and herbicides approved for use within proximity to aquatic and riparian habitats, would be employed. In general, the Trustees intend to follow SOPs and BMPs described in Appendix H of the Grand Junction Resource Management Plan (BLM 2015). Areas would be monitored after construction to identify and correct erosion or other stressors that threatens revegetation. Efforts will be made to minimize impacts to existing native trees and herbaceous plants. Impacts to vegetation in existing habitats would be short-term, direct, minor to moderate, and adverse. However, long-term, direct and indirect, minor to moderate and beneficial impacts are anticipated following post-construction reclamation/restoration activities.

Enhanced access to West Creek through installation of stiles is anticipated to cause short-term and long-term, direct, minor, and adverse impacts to vegetation as a result of trampling and other disturbance to vegetation adjacent and in proximity to West Creek. Most noticeable direct impacts will occur as a result of increased foot traffic on trails and potential development of new foot trails by recreational users.

Finding on Public Land Health Standard 3 for plant communities:

Under the proposed action reseeding disturbed areas adjacent to the Dolores River should result in these areas to meet Land Health Standards by removing invasive species. The seeding efforts will improve the upland vegetation by using native grasses, forbs and shrubs to replace weedy species such as Russian knapweed, kochia, whitetop and cheatgrass

6.3.4 Wetlands & Riparian Zones (includes a finding on Standard 2)

Current conditions:

The riparian corridor of West Creek and Dolores River contains plant species typically found in mid-elevation, semi-arid mountains of western Colorado and eastern Utah. Riparian vegetation along West Creek in areas adjacent to proposed stiles is robust and relatively non-disturbed, except for minor impacts from users accessing the stream for recreation, primarily fishing. Additional information about the riparian corridor and associated vegetation is described in Section 6.3.3.

Finding on Public Land Health Standard 2 for Riparian Systems:

A Proper Functioning Condition (PFC) assessment has not been completed for Site 1. Site 3, located in Utah, has a current condition rating of Proper Functioning Condition based on assessments conducted by BLM Moab Field Office staff. Site 2 has been assessed, and has been determined to meet Land Health Standard 2. Vegetation primarily consists of tamarisk, willows, grasses, primrose, with a trace of Baltic rush, sedges, boxelder, and cottonwoods. The riparian zone on each side of the creek is approximately 25 feet wide. Once tamarisk is removed, willows would be expected to colonize the banks.

West Creek is meeting Standard 2. PFC assessments indicate the riparian zone is populated by: coyote willow, skunkbush, sumac, redozer dogwood, cottonwoods (Rio Grande and narrowleaf), box elder, alder, ponderosa pine, and a few elms (in the upper terrace), reed grass, equisetum, orchard grass, and goldenrod.

Alternative A – No Action:

The No Action Alternative would not result in any impacts to wetlands and riparian zones since no restoration actions would be undertaken.

Finding on Public Land Health Standard 2 for Riparian Systems:

No changes to the area's ability to meet Standard 2 would be expected under this alternative, as the proposed action would not occur.

Alternative B – Proposed Action:

See Section 6.3.3 for a description of potential impacts to riparian zone vegetation. In general, the Trustees intend to follow SOPs and BMPs described in Appendix H of the Grand Junction Resource Management Plan (2015) to ensure no significant impacts occur to riparian and wetland habitat.

Finding on Public Land Health Standard 2 for Riparian Systems:

Installation of stiles on West Creek could increase use of the creek by fishermen, and lead to more foot traffic along the creek banks. However, the increase in use is not expected to be great enough to result in bank shearing or the loss of bank stabilizing vegetation. West Creek is very brushy, with continuous canopy coverage, and should not be at risk from a small increase in angler's use.

The three proposed restoration sites along the Dolores River are not expected to negatively impact the area's ability to meet Standard 2. Over time, the projects would be expected to result in a more available localized flood plain, and should increase riparian species in the project areas. If BMPs were not implemented, the proposed project could lead to an increase in weedy understory species such as knapweed and whitetop.

6.3.5 Wildlife (includes fish, aquatic and terrestrial) (includes a finding on Standard 3)

Current conditions:

The Dolores River Corridor provides habitat for a wide diversity of small and large mammals, migratory and resident birds, and aquatic fish and wildlife. Desert bighorn sheep (*Ovis canadensis nelson*) were reintroduced into Dolores River Canyon following an agreement signed in 1986 between BLM and Colorado Division of Wildlife authorizing the action. Other medium to large mammals, such as mountain lion (*Puma concolor*), gray fox (*Urocyon cinereoargenteus*), kit fox (*Vulpes macrotis*), bobcat (*Lynx rufus*), and coyote (*Canis latrans*), can be found in the Dolores River Corridor. Smaller mammals include beaver (*Castor canadensis*), muskrat (*Ondatra zibethicus*), badger (*Taxidea taxus*), and short-tailed weasel (*Mustela ermine*). Upland gamebirds include chukar partridge (*Alectoris chukar*) and mourning dove (*Zenaida macroura*), as well as the occasional Merriam's wild turkey (*Meleagris gallopavo merriami*) primarily in the upper portion of the Dolores River. Nongame birds include birds of conservation concern (Chapter 6.3.2) and numerous non-sensitive migratory bird species. Although popular sport fish, rainbow (*Oncorhynchus mykiss*) and brown trout (*Salmo trutta*), are present in upper portions of the Dolores River, downstream sections near Gateway are occupied primarily by less popular sport fish and nongame fish, such as roundtail chub, speckled dace (*Rhinichthys osculus*), bluehead sucker, channel catfish (*Ictalurus punctatus*), common carp (*Cyprinus carpio*), sand shiner (*Notropis stramineus*), yellow bullhead (*Ameiurus natalis*), black bullhead (*Ameiurus melas*), and flannelmouth sucker. There are relatively little data concerning distribution and abundance of amphibians and reptiles, although species such as tiger salamander (*Ambystoma tigrinum*), western spadefoot toad (*Spea hammondi*), canyon treefrog (*Hyla arenicolor*), red-spotted toad (*Bufo punctatus*), collared lizard (*Crotaphytus collaris*), plateau striped whiptail (*Aspidoscelis velox*), western rattlesnake (*Crotalus oreganus*), bullsnake (*Pituophis catenifer sayi*), longnose snake (*Rhinocheilus lecontei*), western skink (*Plestiodon skiltonianus*), and western whiptail (*Cnemidophorus tigris*) are among the species comprising the Dolores River Corridor list.

Populations of roundtail chub, flannelmouth sucker, and bluehead sucker in the Dolores River between McPhee Dam and the San Miguel River confluence have been declining since the early 1990s. Dewatering, habitat fragmentation, re-timing of native flows, and threats from introduced

predatory sportfish are cited most frequently as causes for the regional declines observed in fishery data. The 'Rangewide Conservation Agreement and Strategy for Roundtail Chub , Bluehead Sucker, and Flannelmouth Sucker' (3-Species Agreement) was developed to provide a framework for the long-term conservation of the three species throughout their ranges through a collaborative and cooperative effort amongst resource agencies in Wyoming, Utah, Colorado, New Mexico, Nevada and Arizona. The 3-Species Agreement, given the current status and threats to these fisheries, emphasizes protection and enhancement measures for all three species rather than simply maintenance of existing stocks of fish. The goal of the signatory agencies to the 3-Species Agreement, including the State of Colorado, is to establish a program that combines data collection, research, and information sharing with community-based, voluntary efforts that can diminish threats and improve populations of all three species. If successful, listing of these species under the ESA would not be warranted and would protect existing and potentially new uses of water.

West Creek suffers from little anthropogenic disturbance, as no environmental parameters that have been examined show any indication of potential degradation that might lead to significant reduction of trout populations. Trout species in West Creek include brook (*Salvelinus fontinalis*), brown, rainbow, and hybrid Colorado cutthroat (*Oncorhynchus clarkii*) x rainbow. Other fish in the stream include the native species of mottled sculpin and speckled dace. The combined trout population has been estimated at least 125 trout per acre, with trout averaging less than 8 inches in length (Powell and Trammell 2002).

Finding on Public Land Health Standard 3 for Animal Communities:

The proposed project area along West Creek is meeting Land Health Standard 3. While Site 1 and Site 3 along the Dolores River have not been assessed for Land Health, Site 2 has been assessed. Site 2 is not meeting Land Health Standard 3 due to the abundance of weedy species, and the corresponding reduction in the native plant community. A similar pattern would be expected at Site 1. The GJFO Land Health Assessments do not cover the Utah portion of the proposed project (Site 3 is in Utah).

Alternative A – No Action:

The No Action Alternative would not result in any impacts to fish and wildlife resources since no restoration actions would be undertaken. Any historical, current, and future impacts to fish would not be addressed through restoration activities.

Finding on Public Land Health Standard 3 for Animal Communities:

Under the no action alternative no changes to Land Health Standard 3 would be expected as no work would be conducted.

Alternative B – Proposed Action:

Fish habitat restoration projects along the Dolores River are anticipated to have temporary and minor adverse impacts to fish, other aquatic biota, and terrestrial wildlife during construction. Increased turbidity and sedimentation from excavation could potentially cause gill-smothering that may adversely affect individual fish and other aquatic biota at or in the vicinity of restoration sites, as well as cause temporary changes in animal behavior. Fish, however, are generally mobile and would be able to avoid direct impacts from construction activities. Short-term and

minor impacts to resident birds and other wildlife during construction activities, such as disturbance due to construction noise, are possible. Direct mortality to wildlife is not anticipated since animals are mobile and generally avoid human activities. Where applicable and feasible, BMPs and SOPs, to minimize impacts to fish and wildlife, will be used to the maximum extent practicable. Use of seasonal restrictions during restoration activities would also occur where applicable to avoid impacts to species during sensitive life stages (e.g., spawning, occupancy of larval habitat, breeding birds). Therefore, short-term, direct and indirect, minor, adverse impacts would be expected during construction activities. Long-term, direct and indirect, minor to moderate, beneficial impacts to Dolores River fish would be expected from the enhanced river habitat.

Installation of fence stiles adjacent to West Creek and enhanced human access is anticipated to have minor, direct and indirect, and long-term adverse impacts to fish and wildlife species occurring in and near West Creek. Impacts are primarily due to increased disturbance as a result of increased human use.

Finding on Public Land Health Standard 3 for Animal Communities:

The proposed action could lead to an increase in understory weedy species (knapweed and whitetop) if equipment was not cleaned to ensure weed seed from one project area was not spread to other areas. However, over the long-term the proposed action is expected to remove tamarisk and other weedy species, and enhance river morphology, which is expected to improve the project's area ability to meet Standard 3 for fish and wildlife species.

6.4 HERITAGE RESOURCES AND HUMAN ENVIRONMENT

6.4.1 Cultural or Historical Resources

Current conditions:

Grand Junction Field Office, Colorado: A records search of the general project area, and a Class III inventory of the Area of Potential Effect (APE), as defined in the National Historic Preservation Act (NHPA), was completed by the BLM Grand Junction Field Office archaeologist and two archaeological technicians (Long 2017). Conditions of the existing cultural environment are incorporated by this reference but the following briefly summarizes cultural resources in the APE. One linear site (an historic telephone line (5ME21031 and 5ME21031.1) and two historic isolated finds (5ME21957 and 5ME21958) were found in the surveyed areas. While the entire linear resource, the historic Nucla-Naturita Telephone Company Unawep Line (5ME21030), is eligible to the National Register of Historic Places (NRHP) under criteria A and D, the segment of the Unawep line present in the project area (5ME21031.1) is a non-supporting segment. The project inventory and evaluation is in compliance with the NHPA, the Colorado State Protocol Agreement, and other federal law, regulation, policy, and guidelines regarding cultural resources.

Moab Field Office, Utah: A report titled Dolores River Hydrologic Connectivity/Fisheries Habitat Project was completed for this project in August 2017 and one archaeological site, a historic gravel berm (42GR5446) was recorded and evaluated for eligibility to the NRHP. The site

does not meet the criteria for eligibility and was determined not to be eligible for the NRHP through consultation with the Utah State Historic Preservation Office. Therefore the BLM makes a determination that the project to remove a portion of the gravel berm to reconnect the river with its historic floodplain will have no adverse effect to historic properties in the Moab Field Office.

Alternative A – No Action:

The No Action Alternative would not result in any impacts to cultural resources since no restoration actions would be undertaken.

Alternative B – Proposed Action:

Under the Proposed Action alternative there will be no impacts to historic properties (cultural resources eligible under the NRHP), because no historic properties are present in the Colorado or Utah project areas. Since no historic properties are present in the project area, there will be no impacts to significant cultural resources under this alternative.

The gravel berm at Site 3 does not meet the criteria for eligibility and was determined not to be eligible for the NRHP, therefore the BLM makes a determination that the project to remove a portion of the gravel berm to reconnect the river with its historic floodplain will have no adverse effect to historic properties.

6.4.2 Visual Resources

Current conditions:

The Dolores River has remarkable scenic values, largely as a result of its geologic, cultural, paleontological, archaeological, and water resources, which ultimately draw visitors to drive or hike scenic roads or trails, or raft, kayak, or fish the river. Areas in the vicinity of the proposed West Creek and Dolores River projects fall under Class I, II, and III designations⁸. Proposed restoration sites in the Dolores River Corridor remain largely natural in appearance due to the area's topography and scenic integrity. Few facilities currently exist, but trailheads and other interpretive exhibits may be developed over time. Two of three sections along the Dolores River proposed for habitat restoration have received partial or complete treatment for tamarisk and other non-native invasive plants management. Sections of riparian habitat that have not been treated contain dense stands of tamarisk and coverage by other non-native invasive plants. Instream river conditions within restoration reaches are typical among other sections of the river in their proximity.

Alternative A – No Action:

⁸ Class I Objective: To preserve the existing character of the landscape. The level of change to the characteristic landscape should be very low and must not attract attention.

Class II Objective: To retain the existing character of the landscape. The level of change to the characteristic landscape should be low.

Class III Objective: To partially retain the existing character of the landscape. The level of change to the characteristic landscape should be moderate.

The No Action Alternative would not result in any impacts to visual resources since no restoration actions would be undertaken.

Alternative B – Proposed Action:

The proposed restoration projects will ensure that visual impacts are minimized during construction activities in the short term (5 years) and visual resource management objectives in the project area are not adversely impacted in the long-term. Operations at night time will not be performed; therefore, no impacts to dark night skies are anticipated. Direct and long-term adverse impacts to visual resources are not anticipated because no new facilities or roads will be installed. All disturbed areas, including access roads, as a result of stream restoration activities will be reclaimed to the original contour or a contour that blends with the surrounding topography containing an improved native vegetation assemblage. Short-term, direct, and minor impacts to visual resources are anticipated within the restoration project footprints as a result of construction equipment being present within the riparian corridor and being visible to boaters and other passers-by.

6.4.3 Wastes, Hazardous or Solid

Current conditions:

There are no known sources of hazardous or solid wastes within proposed restoration project areas.

Alternative A – No Action:

The No Action Alternative would not pose any risk of solid or hazardous waste spills into the environment since no restoration activities would occur.

Alternative B – Proposed Action:

The proposed restoration projects at Sites 1 – 3 along the Dolores River will require use of heavy equipment and other machinery, such as chainsaws. Such equipment contains gasoline or diesel and other fluids, such as motor oil, which have the potential to contaminate the environment if spilled. Areas for refueling equipment will be located no less than 200 feet from the river edge, when practicable and feasible. A spill kit will be located on-site during periods of equipment use.

6.5 LAND RESOURCES

6.5.1 Recreation

Current conditions:

The Dolores River Corridor supports a diversity of recreational opportunities, automobile/motorized scenic touring, mountain biking, day hiking, float boating (canoes, kayaks, rafts), and environmental learning. Recreational opportunities in proximity to the proposed West Creek and Dolores River projects primarily include fishing, automobile/motorized scenic touring, day hiking, float boating, and environmental learning. The majority of visitors use the scenic byway (Highway 141) to explore the river corridor, with a smaller percentage of visitors

floating the river or using the trails. Recreational use is highest during the spring, summer, and fall months. The proposed action is within the Dolores River Special Recreation Management Area. The recreation area is managed to support the activities listed above along with opportunities for visitors to experience the area's wildlife, scenery, views, aesthetics, and culture.

Alternative A – No Action:

The No Action Alternative would not result in any impacts to recreation since no restoration actions would be undertaken.

Alternative B – Proposed Action:

Stile installation at two points adjacent to West Creek would increase recreational access for fishing, hiking, and environmental learning. Human use at and in the vicinity of the BLM picnic site adjacent to West Creek may increase as a result of enhancing access to the creek. Impacts of stile installation to recreation would be direct, minor to moderate, beneficial, and long-term.

Dolores River side-channel and backwater restoration projects are expected to have minor to negligible impacts to recreation. There are no trails in the proposed project footprints, and boaters using the Dolores River will not have impeded access as they navigate downstream. Since none of the restoration sites overlap river access points, there would be no limitation of river boaters accessing the river. Impacts to recreation along the Dolores River are expected to be direct and indirect, adverse, and short-term.

6.5.2 Special Designations (ACECs, SMAs etc.)

Current conditions:

The project areas are outside of special designations except for the Dolores River Riparian Area of Critical Environmental Concern (ACEC), containing the values of fish, wildlife, scenic, riparian habitat and plants, the Unaweep-Tabeguache Byway (Colorado State Highway 141), and Unaweep Seep Area (adjacent to West Creek). One of the goals of the Dolores River Riparian ACEC (7,400 acres in total) is to protect habitat for sensitive fish, including flannelmouth and bluehead sucker. The Dolores River Riparian ACEC also has a goal of protecting and maintaining unique ecological values for unique and sensitive plants and animals, including riparian obligate bird species. Several management actions are included in the Dolores River Riparian ACEC including, but not limited to, allowing for vegetation treatment that does not negatively impact the identified relevant and important values and allowing for camping in designated sites (BLM 2015).

Alternative A – No Action:

The No Action Alternative would not result in any impacts to special designations since no restoration actions would be undertaken.

Alternative B – Proposed Action:

The proposed fish habitat restoration projects are compatible with goals of the Dolores River Riparian ACEC and will have minor, beneficial, direct and indirect, and long-term impacts in the project areas along the Dolores River. Construction, plant management, and other activities

associated with the restoration projects will not have impacts to special designations, but may have minor, short-term, direct and indirect, and adverse impacts to ecological and socio-cultural values of the project areas. The proposed restoration project will not have any impacts to the Unaweep-Tabeguache Byway or the Unaweep Seep Area ACEC except for those impacts described in Visual Resources (Section 6.4.3).

6.5.3 Wild and Scenic Rivers

Current conditions:

A total 32.01 miles of the Dolores River within the Grand Junction Field Office's area of management have been determined to be eligible for inclusion in the National Wild and Scenic River System (BLM 2015, Appendix C; Figure 14). Of the 32.01 eligible miles, only a portion of the Dolores River in Colorado has been determined suitable for designation into the National Wild and Scenic Rivers System (BLM 2015, Appendix C). Outstanding resource values within eligible areas include scenic, recreational, geologic, paleontological, and fishery. The suitable segment has been described as "from point on the river closest to the southern boundary of the Sewemup Mesa Wilderness Study Area to the BLM-private land boundary in Section 24, T50NR19W, New Mexico P.M. a distance of approximately 10.38 miles" (BLM 2015, Appendix C). The entire stretch of the Dolores River in Utah has been determined to be suitable for inclusion in the National Wild and Scenic River System (BLM 2004). No segments of West Creek have been determined to be suitable for inclusion in the National Wild and Scenic Rivers System, although West Creek does contain outstandingly remarkable scenic, geologic, wildlife, and vegetative values.

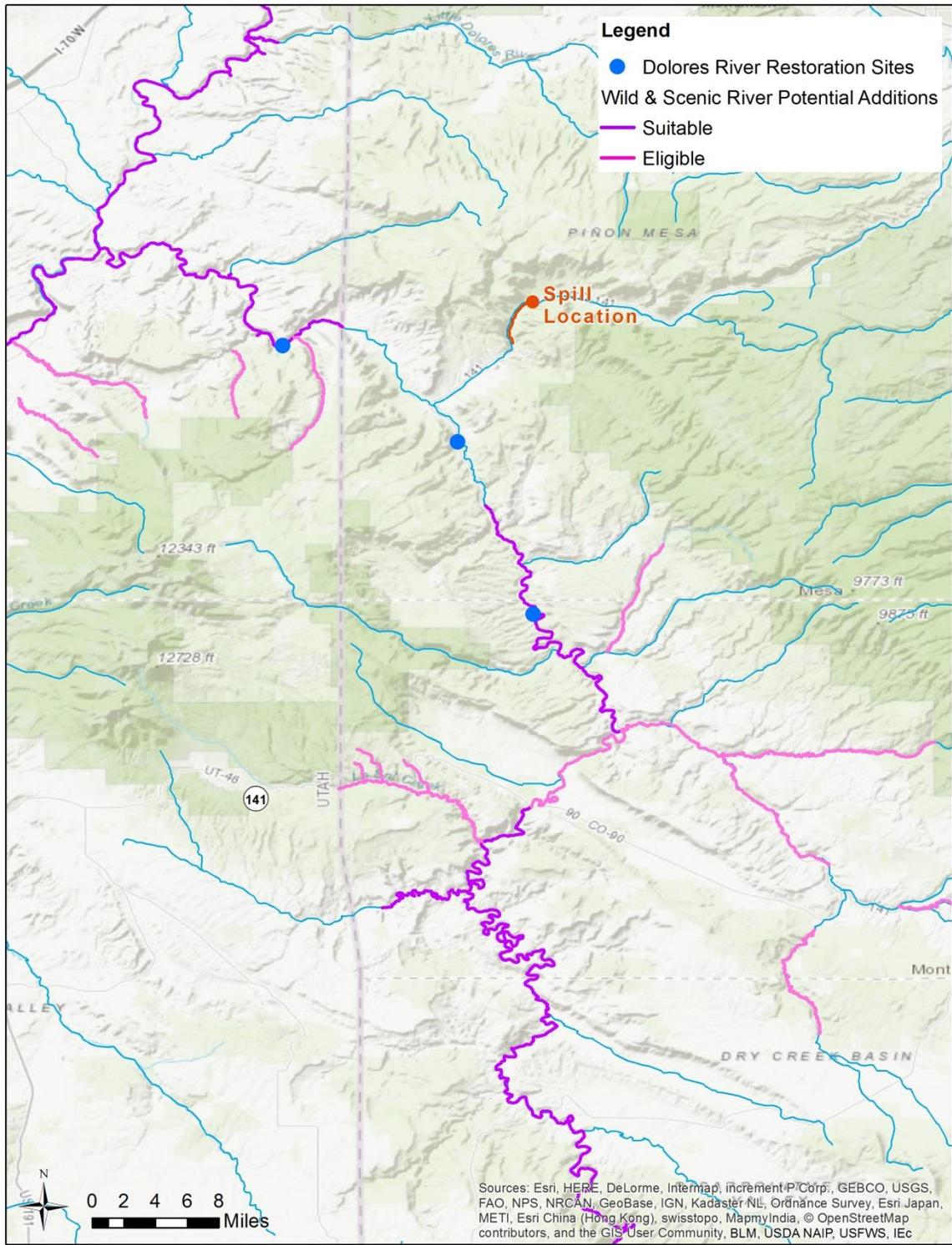


Figure 14. Suitable and eligible river segments of the Dolores River for consideration into the National Wild and Scenic River System.

Alternative A – No Action:

The No Action Alternative would not result in any impacts to Wild and Scenic Rivers since no restoration actions would be undertaken.

Alternative B – Proposed Action:

Proposed restoration Site 1 along the Dolores River is located within a ¼ mile stream corridor buffer designated as suitable for inclusion under the Wild and Scenic Rivers Act. The proposed fish habitat restoration project (Site 3) along the Utah section of the Dolores River is located within a ¼ mile stream corridor buffer designated as suitable for inclusion under the Wild and Scenic Rivers Act. The proposed restoration projects aim to protect and enhance fish habitat and should fully protect the river's values. The proposed projects will have minor, beneficial, direct and indirect, and long-term impacts to sections along the Dolores River designated as Wild and/or Scenic.

6.6 Cumulative Effects

Past, Present, Reasonably Foreseeable Actions

NEPA requires federal agencies to consider the cumulative effects of proposals under their review. Cumulative effects are defined in the Council on Environmental Quality (CEQ) regulations 40 CFR §1508.7 as "...the impact on the environment that results from the incremental impact of the action when added to other past, present, and reasonably foreseeable actions regardless of what agency...or person undertakes such other actions." The CEQ states that the "cumulative effects analyses should be conducted on the scale of human communities, landscapes, watersheds, or airsheds" using the concept of "project impact zone" or more simply put, the area that might be affected by the proposed action. Cumulative effects are discussed in Section 6.6. The area that may be affected by this project includes the 5th code watershed that contains the project area. To assess past, present and reasonably foreseeable actions that may occur within the affected area a review of GJFO NEPA log and our field office GIS data was completed. The following list includes all past, present and reasonably foreseeable actions known to the BLM that may occur within the affected area:

Past Actions:

Riparian invasive weeds treatment – 2008 to 2015

Present Actions:

Placer Mining – On going

Reasonably Foreseeable Actions

Designated Campground Development – 2018 to 2025

Cumulative Effects Analysis

The cumulative effects analysis of the Proposed Action in this Draft DARP/PEA is commensurate with the nature and the degree of direct and indirect effects anticipated from implementation of projects 1 and 3 of the proposed restoration. For the purpose of this analysis, the cumulative impact spatial boundary includes all project areas and areas in close proximity to construction locations, includes roads and other areas of ingress/egress. The Proposed Action

includes three restoration projects, encompassing relatively small sets of activities intended to enhance habitats and improve recreation access along West Creek and Dolores River in order to compensate the public for past injuries and losses to trust resources and services. The Proposed Action is anticipated to result in predominantly minor to moderate beneficial impacts to those same resources and services, to help return injured natural resources to baseline conditions, and to compensate for interim losses.

Implementing the projects as proposed and analyzed in this Draft DARP/PEA would have no major adverse impacts on West Creek and Dolores River habitats, on adjacent lands and waterways, or on the natural resources within each. As described above, proposed projects may result in minor, short term adverse impacts and both short- and long-term beneficial impacts. When considered with other past, present, and reasonably foreseeable future actions within the vicinity of the project areas, the Proposed Action is not anticipated to have adverse cumulative impacts. Direct and indirect adverse impacts, as discussed previously, are likely to be short-term and, with the exception of periodic activities for invasive species management, to occur only during periods of active construction activities along the Dolores River. Periods of active construction will be short (less than 2 weeks), but individually and cumulatively, would result in only short-term impacts.

The resources or services that may be temporarily impacted during construction activities include soils and sediments (direct disturbance), water quality (from temporary increases in turbidity), and noise (during construction). Some short-term, minor impacts to fish, wildlife, and vegetation in the project areas could occur, but impacts to these and other resources would be minimized by the use of BMPs. Consequently, the minor and short-term impacts of restoration and habitat enhancement activities on soils and sediments, water quality, and noise have a low potential to result in cumulative significant impacts to these resources.

The Proposed Action is not expected to result in significant cumulative impacts on the human environment since it alone, or in combination with other current and future activities (described previously) in the vicinity, would not change the larger current hydrological patterns of discharge, recreational use, economic activity or land-use along West Creek and Dolores River. Future activities within the scope of the Proposed Action will enhance Dolores River riparian and in-stream habitat that exists naturally in the area.

The Proposed Action is not being undertaken as part of any current comprehensive plan that is providing for the restoration of these habitats in the Dolores River Watershed. However, other agencies and organizations are pursuing potential and similar restoration actions, including non-native, invasive plant management and riparian habitat restoration, along the Dolores River. The cumulative impacts of these actions are expected to be minor to moderate, long-term, direct and indirect, and beneficial. Moreover, because the various restoration actions are not expected to be executed concurrently, the minor adverse impacts described for projects developed as part of this restoration plan and those expected to result from similar restoration projects are not anticipated to result in adverse cumulative impacts.

Other activities along Dolores River and West Creek that may be undertaken by other entities, private and public, vary widely. These may include activities on private parcels, such as cattle

grazing, maintenance of utilities, development of housing on nearby uplands, and/or agriculture practices on adjacent uplands. These categories of activity would be expected to result in short- and long-term adverse impacts within the vicinity of the proposed project areas. Maintenance of public utilities in easements within state or federally-owned lands will not be impeded as a result of the Proposed Action. State or federal agencies, such as BLM, may undertake wildlife management activities on parcels under their control throughout sections of West Creek or Dolores River. This may include restoration activities similar to those proposed under Draft DARP/EA and others such as road maintenance or recreation area management. These activities would result in both short- and long-term adverse and beneficial impacts.

Outside of the Proposed Action, it is difficult to predict or foresee exactly what, when and where other actions may be undertaken by other entities within proposed restoration project areas that could combine with future restoration actions under this plan to produce cumulative impacts. The potential for cumulative impacts in combination with other actions would be evaluated by the Trustees on a case-by-case base, but cumulative impacts outside of those discussed in this section are unlikely due to the remoteness of the proposed restoration areas and relatively low human use of these areas.

Potential Climate Influence

The Dolores River is recognized by BLM and the general public as a nationally-significant, unique resource capable of providing desirable, widely-valued recreation opportunities. In 1975, approximately 94 miles of the Dolores River downstream from the Bradfield Bridge received Wild and Scenic River designation. Factors influencing flows of the Dolores River are among the most significant stressors to the ecological and recreational values of the system. Because climate influences hydrology, which plays a major role in shaping the condition and function of riverine ecosystems, the Trustees used the U.S. Geological Survey National Climate Change Viewer (accessed May 23, 2017) to project changes in climate and water balance for Mesa County, Colorado.

Seasonal maximum and minimum air temperatures in the county are anticipated to increase approximately 5 - 7° F between the period of 2050 – 2074 when compared to historical reference (1981 – 2010) (Alder and Hostetler 2013). Seasonal averages of precipitation between the period of 2050 - 2074 are anticipated to be within historical variation; however, there is considerable uncertainty associated with these projections. Contrary to this uncertainty, there is relative agreement in projections that summer precipitation will decrease on average by 2 mm/month under the most aggressive emissions scenario in which GHGs continue to rise unchecked through the end of the century (RCP8.5). Significant changes in snow water equivalent are anticipated to occur primarily during the months of December through May by the last quarter of this century under the two simulated emissions scenarios (Figure 15). Runoff patterns are projected to shift significantly by the last quarter of the century, with peak runoff occurring approximately two months earlier than the historical average from 1981 – 2010 (data not shown). Another significant change projected is a significant decrease in soil water storage during the months of April through August occurring as early as 2050 under both emissions scenarios (Figure 16). The Trustees intend to take this information into consideration throughout restoration planning, implementation, and monitoring phases and adjust course of action where feasible and practicable.

Evapotranspiration rates for tamarisk are higher than native riparian species, and tamarisk has the potential to reduce stream flows and desiccate soils under dense tamarisk stands. In light of these impacts, restoration actions to minimize impacts of tamarisk in riparian zones, like those proposed in this Draft DARP/EA, can help enhance resiliency of desert riparian ecosystems like the Dolores River. Other feasible actions may include habitat management activities that support a high diversity of grassland and rangeland species since high plant diversity potentially increases resiliency in response to climate change. Genetically diverse populations of plant species may also increase the potential for species to adapt to climate and its impacts on both biotic and abiotic variables, thereby enhancing ecosystem resiliency.

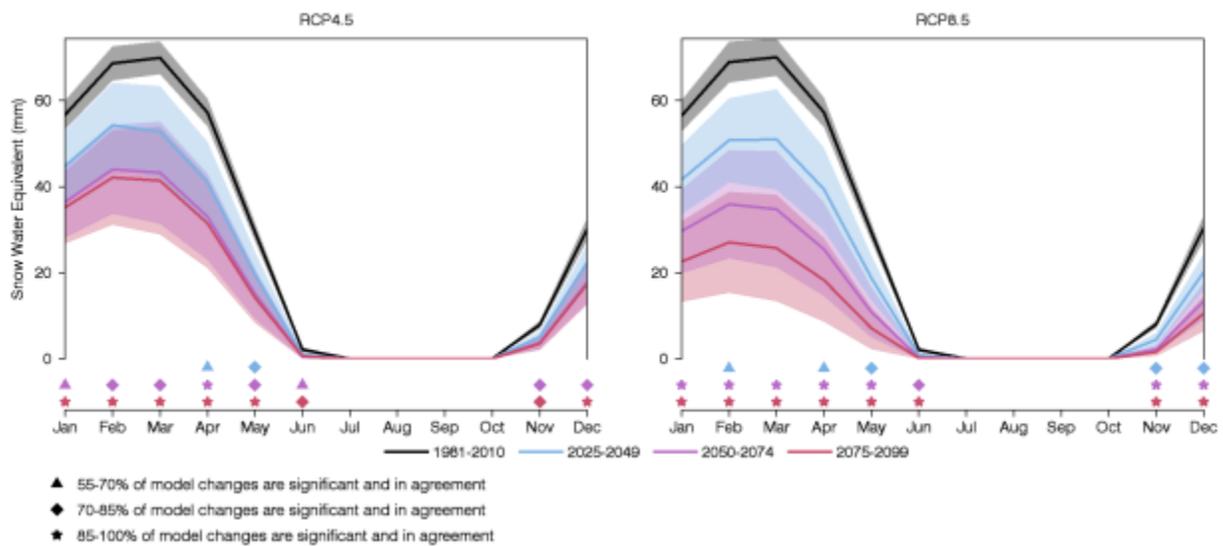


Figure 15. Monthly averages of snow water equivalent for Mesa County for four time periods for the RCP4.5 (left) and RCP8.5 (right) simulations. The average of 30 CMIP5 models is indicated by the solid lines and their standard deviations are indicated by the respective shaded envelopes. Triangle, diamond and square symbols indicate the percent of models that simulate future minus present changes that are of the same sign and significant. A two-sided Students t-test is used to establish significance. (See http://www.usgs.gov/climate_landuse/clu_rd/apps/nccv_documentation_v1.pdf for information about the tutorial and emissions scenarios)

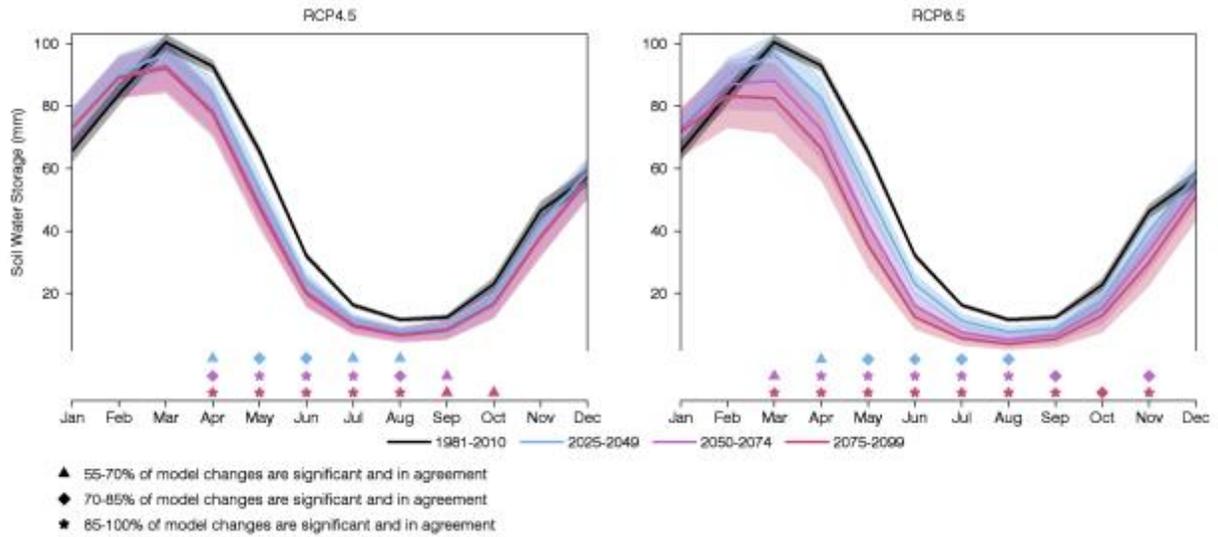


Figure 16. Figure X. Monthly averages of soil water storage for Mesa County for four time periods for the RCP4.5 (left) and RCP8.5 (right) simulations. The average of 30 CMIP5 models is indicated by the solid lines and their standard deviations are indicated by the respective shaded envelopes. Triangle, diamond and square symbols indicate the percent of models that simulate future minus present changes that are of the same sign and significant. A two-sided Students t-test is used to establish significance.

CHAPTER 7 - CONSULTATION AND COORDINATION

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Ute Mountain Ute Tribe, Towaoc CO.

Tamarisk Coalition

Dolores River Restoration Partnership

Grand Valley Trout Unlimited

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