National Park Service
U.S. Department of the Interior

Dinosaur National Monument
Colorado/Utah

Deerlodge Road Rehabilitation Project
Environmental Assessment

January 2013

Prepared for
Department of Interior National Park Service
Denver Service Center
12795 West Alameda Parkway
P.O. Box 25287
Denver CO 80225-0287
PMIS 59763

Deerlodge Road Rehabilitation

Environmental Assessment

Summary

The National Park Service (NPS), Dinosaur National Monument (Monument), in partnership with the Federal Highway Administration (FHWA) proposes to provide safer access and parking for private landowners, visitors, and employees by rehabilitating, restoring, and resurfacing about 12.7 miles of Deerlodge Road and stabilizing the Yampa riverbank where it has encroached on the roadway. Road improvements are needed to correct roadway deficiencies. The proposed road rehabilitation would improve the efficiency of park operations by correcting structural deficiencies and reducing maintenance requirements. The road rehabilitation would also improve visitor enjoyment and safety when traveling Deerlodge Road, while protecting the natural and cultural resources and the scenic quality of the Yampa River.

This Environmental Assessment (EA) evaluates two alternatives: a no-action alternative and a preferred alternative. Under the no-action alternative, Deerlodge Road would not be rehabilitated or improved. Dinosaur National Monument staff would continue road maintenance and minor repairs, as they have in the past. The road pavement and structural integrity would continue to deteriorate; drainage problems would persist; and bank erosion would continue, which could destroy portions of the road near milepost 9.5. The preferred alternative includes proposed resurfacing, restoring, reconstructing, bank stabilization measures, and installing new drainage measures needed to address the identified deficiencies along the 12.7-mile stretch of Deerlodge Road.

This EA has been prepared in compliance with the National Environmental Policy Act (NEPA) to provide the decision-making framework that 1) analyzes a reasonable range of alternatives to meet objectives of the proposed plan; 2) evaluates potential issues and impacts to the natural and cultural resources of Dinosaur National Monument; and 3) identifies specific and required mitigation measures that are designed to lessen the degree or extent of these impacts. Resource topics evaluated in detail include soils; vegetation; wildlife; special status species; water resources; visitor use and experience; and public health and safety. All other resource topics were dismissed because the project would result in negligible to less than minor effects.

This EA was prepared to evaluate potential environmental, socioeconomic, and cultural resource effects from the action alternatives to repair the road; and a no-action alternative that does not repair or improve the road. The EA was prepared in compliance with the National Environmental Policy Act (NEPA) of 1969 and implementing regulations, 40 CFR Parts 1500-1508, and NPS Director's Order (DO)-12 and Handbook, *Conservation Planning, Environmental Impact Analysis, and Decision-making.* The EA will determine whether significant impacts would occur as a result of the proposed project and if an Environmental Impact Statement (EIS) or Finding of No Significant Impact (FONSI) would be required. Compliance with the National Historic Preservation Act (NHPA), in accordance with the Advisory Council on Historic Preservation's regulations implementing Section 106 (36 CFR Part 800) has been completed in consultation with the tribes and the Colorado State Historic Preservation Office (SHPO). The NPS found that

the preferred alternative would have no adverse effect on historic properties and the SHPO has concurred with that determination in a letter dated December 24, 2012 (Appendix A). Public scoping was conducted to assist with the development of this document and comments were received and considered in the evaluation of effects.

Public Comment

If you wish to make a comment on this EA, please submit written suggestions, comments, and concerns regarding the proposed project online at the NPS Planning, Environment, and Public Comment (PEPC) website at: http://parkplanning.nps.gov/. Click on Colorado in the "Choose a State" pulldown menu, then click on the Dinosaur National Monument in the "Choose a Park" menu, then click on the "Install Rip Rap Protection on Deerlodge Road" or mail comments to Superintendent; Attn: Deerlodge Road Rehabilitation EA; Dinosaur National Monument; 4545 Highway 40, Dinosaur, CO 81610.

The EA will be available for public comments for 30 days; the comments are due by March 4, 2013. Before including your address, phone number, e-mail address, or other personal identifying information in your comments, you should be aware that your entire comment—including your personal identifying information—may be made publicly available at any time. While you can ask us in your comment to withhold your personal identifying information from public review, we cannot guarantee that we will be able to do so.

Table of Contents

Figures

Tables

Appendices

Acronyms and Abbreviations

ADA	American Disability Act
APE	Area of Potential Effect
BA	Biological Assessment
BMP	Best Management Practice
CEQ	Council of Environmental Quality
CFLHD	Central Federal Lands Highway Division
CWA	Clean Water Act
DO	Director's Order
EA	Environmental Assessment
EIS	Environmental Impact Statement
EO	Executive Order
ESA	Endangered Species Act
FHWA	Federal Highway Administration
FONSI	Finding of No Significant Impact
GHG	Greenhouse gas
GMP	General Management Plan
Monument	Dinosaur National Monument
NEPA	National Environmental Policy Act
NHPA	National Historic Preservation Act
NPS	National Park Service
NRCS	Natural Resources Conservation Service
NRHP	National Register of Historic Places
PEC	Primary Constituent Elements
PEPC	Planning, Environment, and Public Comment
Road	Deerlodge Road
ROW	Right-of-Way
SHPO	State Historic Preservation Office
NPDES	National Pollutant Discharge Elimination System
US EPA	United States Environmental Protection Agency
USFWS	United states U.S. Fish and Wildlife Services
yd^3	Cubic yards

ENVIRONMENTAL ASSESSMENT
DEERLODGE ROAD REHABILITATION
DINOSAUR NATIONAL MONUMENT

PURPOSE AND NEED

Introduction

Dinosaur National Monument (hereafter Monument) in cooperation with the Central Federal Lands Highway Division (CFLHD) of the Federal Highway Administration (FHWA), is proposing to rehabilitate, restore, and resurface 12.7 miles of Deerlodge Road (road) and to stabilize the Yampa riverbank where it has encroached on the roadway (Figure 1). Rehabilitation is needed because of the deteriorating road conditions and safety concerns.

Deerlodge Road is the only entrance to the eastern portion of the Monument, providing access to the public campground, ranger station, Yampa River boat launch site, BLM lands, and private lands. The Yampa River boat launch site is also the only way river users can access the Yampa River to float through the park, making it a popular launch site. In addition to the public facilities, the Monument interpretive staff uses the Deerlodge area to host numerous school groups for environmental education purposes.

This Environmental Assessment (EA) was prepared to evaluate potential environmental, socioeconomic, and cultural resource effects from the action alternative to rehabilitate the road and to stabilize the Yampa riverbank and the no-action alternative. The EA was prepared in compliance with the National Environmental Policy Act (NEPA) of 1969 and implementing regulations, 40 CFR Parts 1500–1508 and NPS Director's Order (DO) - 12 and Handbook, Conservation Planning, Environmental Impact Analysis, and Decision-making. The EA will determine whether significant impacts would occur as a result of the proposed project and if an environmental impact statement (EIS) or finding of no significant impact (FONSI) would be required.

Description of Dinosaur National Monument

The Monument was created by presidential proclamation on October 4, 1938 as an 80-acre Monument to preserve the extensive fossil deposits at dinosaur quarry. In 1951, the original 80-acre Monument was enlarged by presidential proclamation to administer lands for preservation of natural resources and public use. This addition contained the canyons and viewsheds of the Green and Yampa rivers. Additional land was added in 1960, enlarging the Monument and providing for new access roads. Currently, the Monument encompasses 211,141 acres.

Based on the 1951 and 1938 proclamations, the purpose of the Monument is to provide for protection and visitor enjoyment of the outstanding fossil resources and the scenic canyon areas of the Green and Yampa Rivers.

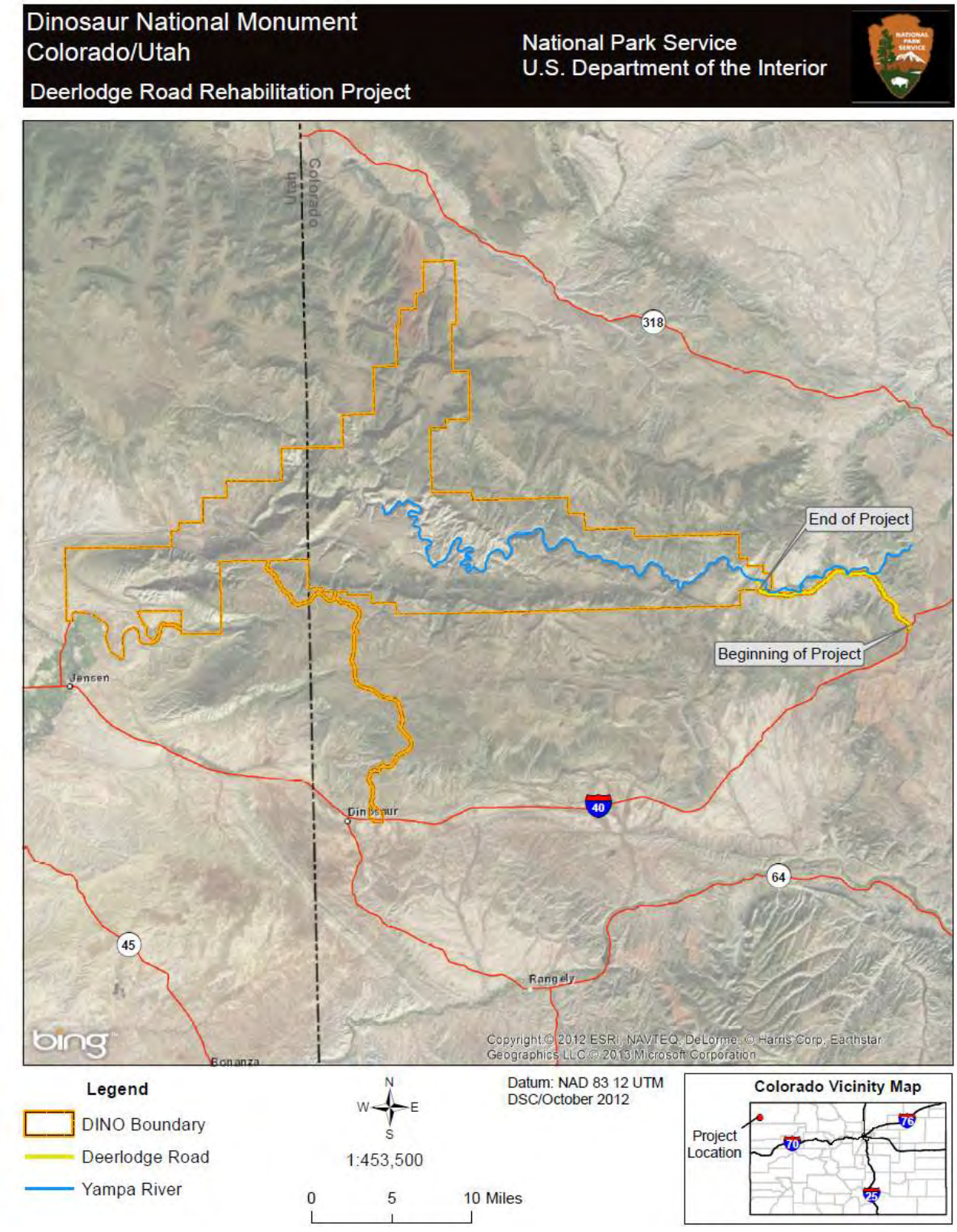


Figure 1. Project Area Location.

As stated in the Dinosaur National Monument Comprehensive Interpretive Plan (NPS 2003), the Monument is significant for the following reasons:

- The geologic record at the Monument is significant for the many rock layers exposed in a relatively small area. These 23 formations provide a scenic landscape for understanding the geologic history of the Colorado Plateau.
- The historic Douglass Quarry contains the most concentrated, diverse, and abundant collection of well-preserved Jurassic Period dinosaur bones in the world. Fossils from the Morrison Formation enable scientists to reconstruct the 150 million-year-old ecosystem in which the dinosaurs and their contemporaries lived.
- The Monument is the only NPS site established to preserve an *in situ* (fossil bones left in place) historic dinosaur quarry, and is known internationally for the continued discovery and scientific study of new fossil specimens.
- The Monument preserves a portion of the Uintah Basin, which is characterized by an impressive biological diversity that results from the interplay between geologic deposition, uplift, erosion, time, and biological communities.
- The Monument offers outstanding opportunities to experience solitude, natural quiet, dark night skies, and wild environments.
- The Monument reveals an 11,000-year record of continuous human occupation, cultural development, and exploration from Paleo-Indian culture to the present. The pristine and intact cultural resources provide excellent opportunities for research and education.
- Fur trappers, explorers, and early boaters on the Monument's wild rivers set the stage for white water boating–a unique, high quality, non-motorized boating experience. This history of human interaction with the Green River contributes to a better understanding of our relationship to this river system.
- The proposal to dam the Green River below Echo Park in the 1950s galvanized the nation's fledgling conservation organizations into a potent political power that defended the National Park idea.
- The Yampa River is the last natural-flowing river in the Colorado River System. As such, it provides necessary habitat for all native aquatic and riparian species remaining in the Upper Green River System, and has forestalled the extinction of four endangered fish species. Outstanding research opportunities exist within the Monument to compare the river and riparian systems of the Yampa River to the regulated flow regime of the Green River.

Project Purpose

The purpose of the proposed project is to provide safer access and parking for private landowners, visitors, and employees by rehabilitating about 12.7 miles of Deerlodge Road and stabilizing the Yampa riverbank where it has encroached on the roadway.

Road improvements are needed to correct roadway deficiencies. The objectives of the proposed project are to:

Improve the Efficiency of Park Operations

- Repair damaged and deteriorating road pavement, and address drainage, riverbank instabilities, and other structural features that require rehabilitation and restoration
- Reduce maintenance requirements and costs due to deficiencies in the road condition and prevent catastrophic failure that could lead to road or parking area closure

Provide for Visitor Enjoyment and Safety

- Improve the condition of the road to more safely accommodate traffic
- Reduce the risk of traffic accidents
- Efficiently implement rehabilitation work while minimizing visitor impacts

Protect Park Resources

- Maintain the scenic quality of the Yampa River and the road
- Protect park natural resources and values
- Protect park cultural resources

Background

Deerlodge Road extends east from Disappointment Draw Access Area to US 40, in the most eastern end of the Park with a portion of the road running along the south side of the Yampa River in Moffat County, Colorado. The road is the only entrance to the eastern portion of the Monument, providing access to the public campground, ranger station, Yampa River boat launch site, BLM lands, and private lands. In addition to the public facilities, the Monument interpretive staff uses the Deerlodge area to host numerous school groups for environmental education purposes. The average daily traffic using Deerlodge Road is less than 350 vehicles. Improvements to Deerlodge Road since construction in 1966 have included pavement overlays, maintenance, and realignment of a section of the road the Yampa River was encroaching in 2003.

The existing paved Deerlodge Road width is 20 feet with 9-foot travel lanes and 1-foot paved shoulders. The existing bench width is 40 feet. There are approximately 93 culverts that carry run-off under the roadway within the rehabilitation project limits; ten culverts were identified as having severe erosion at the downstream end of the culvert and would require erosion protection measures; two additional culverts would be replaced because they are damaged and causing distress to the asphalt roadway.

Project Need

The proposed project is being considered to address deficiencies in road conditions and safety concerns. Portions of the current pavement have exceeded their service life and have developed surface cracks, rutting, buckling, and unraveling of the pavement edge. The road distress may be caused by subgrade failures and drainage issues with culverts. These conditions are necessitating increased costs for road maintenance. Deerlodge Road is the only entrance to the eastern portion of the Monument, providing access to the public campground, ranger station, Yampa River boat launch site, BLM lands, and private lands. The Yampa River boat launch site is also the only way river users can access the Yampa River to float through the park, making it a popular launch

site. In addition to the public facilities, the Monument interpretive staff uses the Deerlodge area to host numerous school groups for environmental education purposes.

In 2003, the Monument attempted to stabilize the south bank of the Yampa River adjacent to Deerlodge Road by burying riprap in a trench between the roadway and the riverbank. However, in 2011, above-average snowmelt and runoff caused substantial bank erosion due to the migration of the Yampa River along Deerlodge Road, damaging the previous bank stabilization work. The Yampa River has encroached to within approximately 50 feet of the edge of the pavement in this Oxbow area (milepost 9.5). Another high flow year in the Yampa River could result in additional erosion and perhaps even threaten the road itself. The measures installed in 2003 are no longer providing adequate protection to the road. The riverbank needs to be stabilized before another large runoff occurs and additional bank erosion destroys the road in the project area.

Relationship to Other Planning Documents

Dinosaur National Monument General Management Plan

The General Management Plan (GMP) updated in 1986, guides management actions to protect natural and cultural resources; upgrade facilities, staffing, and services necessary to support recreational uses; to upgrade roads; to improve visitor opportunities to experience Monument resources; to protect, manage, and recover endangered species and their habitats where feasible in cooperation with other federal agencies, state agencies, and participating entities. The actions proposed in this EA for the Deerlodge Road are consistent with the GMP direction to upgrade roads, to improve visitor opportunities, and to protect and manage endangered species and their habitat.

NPS Management Policies 2006

NPS Management Policies 2006 provides guidance for management of all national park units. Road systems are addressed in section 9.2.1, which states "park roads will be well constructed, sensitive to natural and cultural resources, reflect the highest principles of park design, and enhance the visitor experience."

The actions proposed in this EA are consistent with the NPS Management Policies 2006 guidance that park roads are to enhance visitor experience by providing access to park facilities, resources, and recreational opportunities. Park roads are intended to provide access to areas of recreation while being sensitive to the natural and cultural resources in the area (section 9.2.1.1 NPS Management Policies 2006). Park roads provide access for the protection, use, and enjoyment of the resources that constitute the national park unit.

1984 Park Roads Standards

The 1984 NPS Park Roads Standards state that roads in national parks serve a distinctly different purpose from most other road and highway systems. Among all public resources, those of the national park system are distinguished by their unique natural, cultural, scenic, and recreational

qualities. Park roads are to be designed with extreme care and sensitivity to provide access for the protection, use, and enjoyment of the resources that constitute the national park system.

Director's Order–87A, Park Roads and Parkways

Director's Order–87A states that park roads are constructed only where necessary to provide access for the protection, use, and enjoyment of the natural, historical, cultural, and recreation resources that constitute our national park system. Park roads should enhance the visitor experience while providing safe and efficient accommodations and should serve essential management action needs. Park roads are designed with extreme care and sensitivity with respect to the terrain and environment through which they pass—they are laid lightly onto the land.

Impact Topics Retained for Further Analysis

In this section and the following "Impact Topics Dismissed from Further Analysis" section, the Park Service takes a "hard look" at all potential impacts by considering the direct, indirect, and cumulative effects of the proposed action on the environment, along with connected and cumulative actions. Impacts are described in terms of context and duration. The context or extent of the impact is described as localized, park wide, or regional. The duration of an impact is the time period for which the impacts are evident and are expressed in the short term or in the long term. A short-term impact would be temporary in duration and would be associated with roadway improvements, as well as the period of site restoration. Depending on the resource, impacts may last as long as construction takes place, or a single year or growing season, or longer. Impact duration for each resource is unique to that resource. Impact duration for each resource is presented in association with impact intensities in the following "Methodologies" section. The intensity and type of impact is described as negligible, minor, moderate, or major, and as beneficial or adverse. The Park Service equates "major" effects as "significant" effects. The identification of "major" effects would trigger the need for an EIS. Where the intensity of an impact could be described quantitatively, the numerical data are presented; however, most impact analyses are qualitative and use best professional judgment in making the assessment.

Impact topics for this project have been identified on the basis of federal laws, regulations, and orders, including the NPS 2006 Management Policies, and NPS knowledge of resources at the Monument, as well as the questions and comments brought forth during internal and external scoping. Impact topics that are carried forward for further analysis in this Environmental Assessment are those where the proposed action may have a measurable effect. The Park Service defines "measurable" impacts as moderate or greater effects. It equates "no measurable effects" as minor or less effects. The use of "no measurable effects" in this EA pertains to whether the Park Service dismisses an impact topic from further detailed evaluation in the EA. The reason the Park Service uses "no measurable effects" to determine whether impact topics are dismissed from further evaluation is to concentrate on the issues that are truly significant to the action in question, rather than amassing needless detail in accordance with Council on Environmental Quality (CEQ) regulations at 1500.1(b).

There were eight impact topics retained for further analysis. The impact topics along with the rationale for retaining each of these topics are listed below in Table 1.

Table 1. Impact Topics Retained for Further Analysis and Relevant Laws, Regulations, and Policies. Table continued on following page.

Impact Topic	Reason for Retaining Impact Topic	Relevant Laws, Regulations, and Policies
Soils	Rehabilitation of the road, bank stabilization, and drainage improvements would result in disturbance to soils.	NPS Management Policies 2006
Vegetation	Roadside vegetation disturbance and the introduction of invasive nonnative species are possible from ground-disturbing activities during road rehabilitation.	NPS Organic Act; NPS Management Policies 2006; Resource Management Guidelines (NPS-77); Federal Noxious Weed Control Act; Executive Order (EO) 13112; Invasive Species (1999)
Wildlife	Temporary disturbance and displacement of individual wildlife species and/or habitat are possible from ground-disturbing activities and human presence during road rehabilitation.	NPS-77; Migratory Bird Treaty Act, as amended; EO 13186; Lacey Act, as amended; NPS Management Policies 2006
Special Status Species	The bank stabilization *may affect, but is not likely to adversely affect* the Colorado pikeminnow, razorback sucker, bonytail chub, and humpback chub due to no young are known to occur within the project area even though installing riprap may create habitat for the invasive smallmouth bass, a known predator of the young and adults would likely avoid the project area due to noise disturbance.	Endangered Species Act, as amended; NPS-77; Migratory Bird Treaty Act, as amended; EO 13186; Lacey Act, as amended; NPS Management Policies 2006; National Environmental Policy Act
Water Resources and Floodplains	Temporary effects on water quality are possible during construction from erosion and introduction of sediment to river and drainages. Proposed drainage improvements are intended to have beneficial hydrologic effects.	Clean Water Act; Fish and Wildlife Coordination Act of 1934 (PL 85-624), as amended; EO 12088; EO 11988 ; NPS Management Policies 2006; NPS-77; Director's Order 77-2
Wetland	Bank stabilization would impact 0.52 acre of natural streambed within the Yampa River, a riverine wetland, as classified by Cowardin (1979).	Clean Water Act, EO 11990, NPS Management Policies 2006, Director's Order 77-1
Visitor Use and Experience	Traffic management for the road rehabilitation would impact visitor travel and the recreation experience during construction as a result of traffic delays, temporary short-term road closures, increased noise, and temporary changes in the scenic quality from construction equipment and disturbances. The proposed improvements would provide long-term benefits to the visitor experience.	NPS Management Policies 2006
Public Health and Safety	Deteriorating road conditions pose a safety risk to vehicle travel and potential for accidents. The proposed improvements are designed to improve road conditions and safety.	NPS Management Policies 2006; OMB Circular A-123; Federal Managers Financial Integrity Act of 1982 (31 USC 3512(d)); Government Performance and Results Act of 1993

Impact Topics Dismissed from Further Analysis

In this section of the EA, the Park Service provides an explanation as to why some impact topics are not evaluated in more detail. Impact topics were dismissed from further analysis if it was determined that the project did not have the potential to cause substantial change to these resources and values. In addition, impact topics were dismissed from further evaluation in this EA if:

- They do not exist in the analysis area, or
- They would not be affected by the proposal, or the likelihood of impacts are not reasonably expected, or
- Through the application of mitigation measures, there would be minor or less effects (i.e., no measurable effects) from the proposal, and there is little controversy on the subject or reasons to otherwise include the topic.

The regulatory context and baseline conditions relevant to each impact topic were analyzed in the process of determining if a topic should be retained or dismissed from further analysis. Because there would be no effects or no measurable effects, there would either be no contribution toward cumulative effects or the contribution would be low. The following provides an overview of impact topics that were considered, but ultimately dismissed along with the reasons for dismissing each topic from further analysis.

Geology

In accordance with NPS *Management Policies* 2006, the Park Service strives to preserve and protect geologic resources and features from adverse effects of human activity, while allowing natural processes to continue (NPS 2006). The project area geology is mapped as Cretaceous shale and sandstone, Tertiary sandstone and siltstone, Jurassic mudstone and sandstone, and Jurassic–Triassic sandstone (Green 1992). Proposed rehabilitation and improvements to the road under the preferred alternative would not impact geologic features. No blasting, rock scaling, or other operations are planned that would disturb rock formations or geologic processes. The no-action alternative would have no effect on geologic resources. Because impacts to geology from the preferred alternative and no-action alternative would be negligible, this topic was dismissed from detailed discussion in this EA.

Cultural Resources

Section 106 of the NHPA of 1966, as amended (16 USC 470, et seq.) and its implementing regulations under 36 CFR 800 require all federal agencies to consider the effects of federal actions on cultural properties eligible for or listed in the National Register. In order for an archeological site to be listed in the National Register, it must be associated with an important historic event, person(s), or that embodies distinctive characteristics or qualities of workmanship.

A review of the Colorado Cultural Resource On-line Database, COMPASS, and the Bureau of Land Management Little Snake Field Office archaeological site maps within one mile of the project area was conducted April 2, 2012 and April 9, 2012, respectively by Richard Boston

(NPS DSC Archeologist). The purpose of the record search was to determine the location of any known cultural resources that may be affected by the preferred alternative. Twenty five previously recorded archeological sites are known to occur within one mile of the current APE.

The project area was surveyed by Richard Boston, NPS, Archeologist (Cultural Resource Specialist) Denver Service Center (DSC), on April 11–12 and July 24–25 of 2012. One existing pre-historic site—5MF.485— and one historic site—5MF.XXXH—were re-located and re-plotted by the current survey. 5MF.485 needs testing to determine eligibility but this project will treat it as National Register Eligible; this site is outside the APE. The historic site and two rock pile features were identified outside the APE and are recommended as not register eligible. Because there are no cultural resources in the area of potential affect that would be impacted by the alternatives, this impact topic was dismissed from further discussion in this EA.

Cultural Landscapes

"In the broadest sense, a cultural landscape is a reflection of human adaptation and use of natural resources and is often expressed in the way land is organized and divided, patterns of settlement, land use, systems of circulation, and types of structures that are built. The character of a cultural landscape is defined both by physical materials, such as roads, buildings, walls, and vegetation, and by use reflecting cultural values and traditions (DO-28)." (NPS's Director's Order 28 *Cultural Resource Management Guideline*). These inventories are a computerized, evaluated inventory of all Cultural Landscapes in which NPS has or plans to acquire any legal interest. Cultural Landscapes must be documented then evaluated for significance and integrity and then may be nominated for listing on the National Register. No cultural landscapes have been documented in the project area; therefore, cultural landscapes was dismissed as an impact topic in this EA.

Historic Structures

Section 106 of the NHPA of 1966, as amended (16 USC 470, et seq.) and its implementing regulations under 36 CFR 800 require all federal agencies to consider effects of federal actions on historic properties, including historic structures, eligible for or listed in the National Register. In order for a structure to be listed in the National Register, it must be associated with an important historic event, person(s), or that embodies distinctive characteristics or qualities of workmanship. The term "historic structures" refers to both historic and prehistoric structures, which are defined as constructions that shelter any form of human habitation or activity. On January 3, 2001, the Quarry Visitor Center was designated as a National Historic Landmark because of its distinctive Mission 66 design and its structural relationship to the resource. The project area does not include the Quarry Visitor Center or any historic structures. Because there are no historic structures in the area of potential affect that would be impacted by the alternatives, thus this topic was dismissed from further discussion in this EA.

Paleontological Resources

The 2006 Management Policies states the paleontological resources (fossils), including both organic and mineralized remains in body or trace form, will be protected, preserved, and

managed for public education, interpretation, and scientific research. The Morrison Formation has produced the majority of dinosaur fossils found within the Monument. The paleontological resources occur in the Monument quarry, which is outside the project area. There are no known paleontological resources within the project area. Therefore, there would be no impacts to paleontological resources as a result of the alternatives and the topic was dismissed from further assessment.

Ethnographic Resources

Director's Order 28 (DO-28), *Cultural Resource Management*, defines ethnographic resources as any site, structure, object, landscape, or natural resource feature assigned traditional legendary, religious, subsistence, or other significance in the cultural system of an associated traditional group. According to DO-28 and Executive Order 13007, *Indian Sacred Sites*, the NPS should preserve and protect ethnographic resources. The proposed action would be designed to minimize any impacts to known cultural resources that could be identified as ethnographic resources. Tribal contacts were sent an informational letter on June 6, 2012 describing the proposed project and the Park Service's desire to hear their comments. No scoping comments were received from American Indian tribes as of the date of this EA. This EA will also be sent to each tribe for their review and comment. If subsequent issues or concerns are identified, appropriate consultations would be undertaken. Because it is unlikely that ethnographic resources would be affected by the proposed project, and because appropriate steps would be taken to protect any ethnographic resources that are inadvertently discovered, ethnographic resources was dismissed from further analysis.

Museum Collections

The Director's Order 24 *Museum Collections* states that NPS is required to consider the impacts on museum collections (historic artifacts, natural specimens, and archival and manuscript material), and provides further policy guidance, standards, and requirements for preserving, protecting, documenting, and providing access to, and use of, NPS museum collections. No museum collection items would be disturbed as a result of the proposed action. Therefore, museum collections were dismissed from further analysis.

Soundscapes

In accordance with the 2006 Management Policies for the NPS and Director's Order 47 *Sound Preservation and Noise Management*, an important component of the NPS's mission is the preservation of natural soundscapes associated with national park units (NPS 2006). Natural soundscapes exist in the absence of human-caused sound. The natural ambient soundscape is the combination of all the natural sounds that occur in park units, together with the physical capacity for transmitting natural sounds. The frequencies, magnitudes, and durations of human-caused sound considered acceptable varies among NPS units as well as potentially throughout each unit, being generally greater in developed areas and less in undeveloped areas.

Impacts to the soundscape could occur from mechanical equipment (e.g., dump trucks, motor grader) used for road rehabilitation. The no-action alternative would continue to impact

soundscapes from visitor and local traffic and mechanical equipment used for periodic maintenance. These impacts should be minor and temporary and should not exceed the typical levels of man-made noise present during visitor season or regular operations. Therefore, soundscapes was dismissed as an impact topic for further analysis.

Lightscapes

The 2006 Management Policies for the NPS states the NPS will strive to preserve natural ambient landscapes, which are natural resources and values that exist in the absence of human caused light (NPS 2006). NPS strives to limit the use of artificial outdoor lighting to the amount necessary for basic safety requirements. No outdoor lighting is proposed as part of road improvements and no night work would occur that would affect the night sky and the no-action alternative would have no impact on lightscapes. There should be no impacts to lightscape management; thus, this topic was dismissed from further analysis.

Prime and Unique Farmlands

The Farmland Protection Policy Act of 1981, as amended, requires federal agencies to consider adverse effects to prime and unique farmlands that would result in the conversion of these lands to non-agricultural uses. Prime or unique farmland is classified by the U.S. Department of Agriculture's Natural Resources Conservation Service (NRCS). Prime farmland is defined as land that has the best combination of physical and chemical properties for producing food, forage, fiber, and oil seed, and for other uses (e.g., pasture land, forest land, and crop land). Unique farmland is defined as land other than prime farmland that can produce high value and fiber crops, such as fruits, vegetables, and nuts. There are no prime and unique farmlands designated in the project area; thus this topic was dismissed from further analysis.

Air Quality and Climate Change

The Clean Air Act of 1963 (42 USC 7401 et seq.) was established to promote the public health and welfare by protecting and enhancing the nation's air quality. The act establishes specific programs that provide special protection for air resources- and air quality-related values associated with national park system units. Section 118 of the Clean Air Act requires a park system unit to meet all federal, state, and local air pollution standards. The Monument is a designated Class II air shed under the Clean Air Act, which allows moderate deterioration associated with moderate, well-controlled industrial and population growth. Earthwork and hauling material during construction would temporarily increase dust and vehicle emissions under the preferred alternative and would result in localized effects on air quality. Hydrocarbons, nitrogen oxide, and sulfur dioxide vehicle emissions would be rapidly dissipated; and visibility, deposition, and other air quality-related values are not expected to be appreciably impaired. These effects would be short-term, negligible, and adverse. Neither overall park air quality nor regional air quality would be more than negligibly affected by the short-term increase in emissions. The no-action alternative would have no effect on existing air quality.

Construction activities associated with implementation of the preferred alternative would contribute to increased greenhouse gas (GHG) emissions, but such emissions would be short-

term, ending with the cessation of construction. Any effects of construction-related GHG emissions on climate change would not be discernible at a regional scale, as it is not possible to meaningfully link the GHG emissions of such individual project actions to quantitative effects on regional or global climatic patterns. The preferred alternative would result in short-term negligible adverse effects to air quality during construction and it is not possible to meaningfully link the GHG emissions from the project to climate change. Because the preferred alternative would result in short-term negligible adverse effects and the no-action alternative would have no effect, air quality and climate change were dismissed from further analysis.

Indian Trust Resources

Secretarial Order 3175 mandates any anticipated impacts to Indian trust resources from proposed project or action by the Department of Interior agencies be explicitly addressed in environmental documents. The federal Indian trust responsibility is a legally enforceable fiduciary obligation on the part of the United States to protect tribal lands, assets, resources, and treaty rights, and it represents a duty to carry out the mandates of federal law with respect to American Indian and Alaska Native tribes. The Monument is a public holding and is not considered a Native American trust resource and does not have any designated Native American trust resources. Therefore, Indian Trust Resources was dismissed as an impact topic for further analysis.

Environmental Justice

Presidential Executive Order 12898, "General Actions to Address Environmental Justice in Minority Populations and Low-Income Populations" requires all federal agencies to incorporate environmental justice into their missions by identifying and addressing the disproportionately high and/or adverse human health or environmental effects of their programs and policies on minorities and low-income populations and communities.

According to the Environmental Protection Agency, environmental justice is the fair treatment and meaningful involvement of all people, regardless of race, color, national origin, or income, with respect to the development, implementation, and enforcement of environmental laws, regulations, and policies. Fair treatment means that no group of people, including a racial, ethnic, or socioeconomic group, should bear a disproportionate share of the negative environmental consequences resulting from industrial, municipal, and commercial operations or the execution of federal, state, local, and tribal programs and policies.

The goal of 'fair treatment' is not to shift risks among populations, but to identify potentially disproportionately high and adverse effects, and identify alternatives that may mitigate these impacts.

Dinosaur, Colorado and other nearby small communities contain both minority and low-income populations; however, environmental justice was dismissed as an impact topic for the following reasons:

- The park staff and planning team actively solicited public participation as part of the planning process and gave equal consideration to all input from persons regardless of age, race, income status, or other socioeconomic or demographic factors.
- Implementation of the preferred alternative would not result in any identifiable adverse human health effects. Therefore, there would be no direct or indirect adverse effects on any minority or low-income population.
- The impacts associated with implementation of the preferred alternative would not disproportionately affect any minority or low-income population or community.
- Implementation of the preferred alternative would not result in any identified effects that would be specific to any minority or low-income community.
- The economic impacts resulting from implementation of the preferred alternative may be short-term and adverse, but the long-term effects would be beneficial. In addition, the park staff and planning team do not anticipate that the impacts on the socioeconomic environment would alter the physical and social structure of nearby communities.

Wilderness

The 2006 Management Policies, Section 6 states, "The National Park Service will evaluate all lands it administers for their suitability for inclusion within the national wilderness preservation system. For those lands that possess wilderness characteristics, no action that would diminish their wilderness suitability will be taken until after Congress and the President have taken final action. The superintendent of each park containing wilderness will develop and maintain a wilderness management plan to guide the preservation, management, and use of the park's wilderness area, and ensure that wilderness is unimpaired for future use and enjoyment as wilderness." There are no lands designated as wilderness or proposed wilderness in or near the proposed action. Thus, wilderness was dismissed for further analysis.

Park Operations

Park operations include changes that may affect the current facilities or that may require a new level of maintenance or staffing. The no action alternative would have local, long-term, adverse impacts due to potential increases in road maintenance. Under the proposed action, road rehabilitation may reduce the potential level of staffing effort for future road maintenance, minor repairs, and asphalt patching and sealing. Additional demands may be placed on Monument staff during construction to coordinate traffic and construction activities. Construction activities would require temporary traffic delays, resulting in a disruption of normal traffic patterns, parking, and visitor activities. The preferred alternative would result in local, short-term, adverse effects on park operations during construction and local, long-term, beneficial impacts due to reduction in road maintenance. However, impacts to park operations would be less than minor; thus, park operations were dismissed from further analysis.

ALTERNATIVES

Introduction

This chapter describes the no-action alternative and the preferred alternative for rehabilitation of Deerlodge Road. The no-action alternative would result in no road rehabilitation and the continuation of present level management, maintenance, and operations. The preferred alternative was developed to address the purpose and need for the project to rehabilitate, restore, and resurface Deerlodge Road and to stabilize the Yampa riverbank, while providing safer public access and protecting and preserving park natural and cultural resources.

The preferred alternative represents the NPS preferred management action and defines the rationale for the action in terms of resource protection and management, visitor and operational use, cost, and other applicable factors. Other alternatives that were considered but eliminated from detailed analysis are discussed in this chapter. Also included in this chapter is a comparison of how well the alternatives meet the project objectives and a summary comparison of the environmental effects of each of the alternatives.

No-action alternative

This alternative provides a baseline for comparing and evaluating the impacts to the environment by the preferred alternative and the respective environmental consequences. Under the no-action alternative, Deerlodge Road would not be rehabilitated and NPS would respond to future needs and conditions without major actions or changes in the present course. The Monument staff would continue routine maintenance, minor repairs, and asphalt patching and sealing as needed. The road pavement and structural integrity would continue to deteriorate and the safety concerns associated with encroachment of the Yampa River on the roadway; failing pavement; and sharp drop-offs due to erosion around culverts would continue. No highway funds would be expended for rehabilitation, improvements, or bank stabilization; however, road maintenance costs would likely increase to address deteriorating road conditions.

NPS Preferred Alternative

The preferred alternative includes proposed road rehabilitation and bank stabilization measures needed to address the identified deficiencies along the 12.7-mile stretch of Deerlodge Road (FHWA 2012a; Figures 2–3). The proposed rehabilitation and modifications of the road may be constructed in two phases, depending on available funds. Phase I would include bank stabilization along the Yampa River near milepost 9.5, and Phase II would include the pavement rehabilitation and other parking area modifications. The proposed bank stabilization and pavement rehabilitation and parking area modifications are planned to start in 2013 and 2016, respectively. Both are subject to available funds with the estimated total construction cost between $8 million and $11 million. The following sections describe the proposed road rehabilitation and modifications.

Figure 2. Western Portion of the Project Area.

Figure 3. Eastern Portion of the Project Area.

Bank Stabilization

The lateral migration analysis technical memorandum reported that Yampa River is encroaching Deerlodge roadway approximately ten feet per year. In 2003, the roadway was realigned and boulders were placed between the roadway and the river embankment to mitigate the Yampa River encroachment. Lateral movement of the Yampa River has continued and is currently approximately 50 feet from the existing roadway with a portion of the original roadway eroded (FHWA 2011). The hydraulics recommendations report identified areas with erosion and drainage issues and bank stabilization recommendations (FHWA 2012b).

Bank stabilization would occur along approximately 1,500 feet (approximately 400 feet on the west end and less than 200 feet on the east end is on private land) of the bank to prevent further erosion and sedimentation (Figures 2 and 4). An agreement with the landowner for riprap installation on private land would be implemented prior to construction beginning. Exposed rock riprap with a launchable toe (would be used as the bank stabilization method. The design of the riprap would conform to FHWA guidelines.

Exposed Rock Riprap

Exposed rock riprap (Class IV, 18 to 24 inches in diameter) would be used as the bank stabilization method. Placement of the rock riprap would require installing a large "toe" into the natural riverbed substrate to ensure high flows would not compromise the structural integrity of the stabilized bank. This would be done using a launchable toe with Class 8 riprap (up to 30 inches in diameter) and water depths up to 8 feet. The riprap would be prepared and placed such that the gradation would form a homogenous mass with the smaller rock filling the voids of the larger rock. The launchable toe would slowly launch to scour depths as the river scours the river channel/bottom and the rock slides into the channel with sediment filling back over the launched material. The launchable toe would permanently impact 22,500 square feet (0.52 acre) of natural streambed. Bank stabilization project work would begin August 15 and would be completed by winter. This timeframe does go into the July 1–September 30 time restriction for Colorado pikeminnow spawning. However, the known Colorado pikeminnow spawning area is located downstream of the site, so impacts would be minimized by distance. Spawning is not known to occur within the project area. The work would also be done during low flow minimizing the amount of sediment drift downstream.

Placement of the rock riprap outside the riverbed would require excavation from the base of the existing bank slope away from the river to one inch above the estimated high water elevation. A slope would be graded at approximately 2 Vertical: 1 Horizontal. A type IV C erosion control geotextile would be placed below the riprap on the native soils to prevent soil loss through the riprap. A typical section for exposed riprap bank protection with a launchable toe is shown in Figure 5.

Safety features, such as guardrails or boulders, may be placed along Deerlodge road where the exposed rock riprap is closest to the roadway. Due to the proximity of the of the rock riprap slope to the edge of the roadway, these safety features may be installed to protect vehicles from leaving the roadway and rolling down the riprap slope.

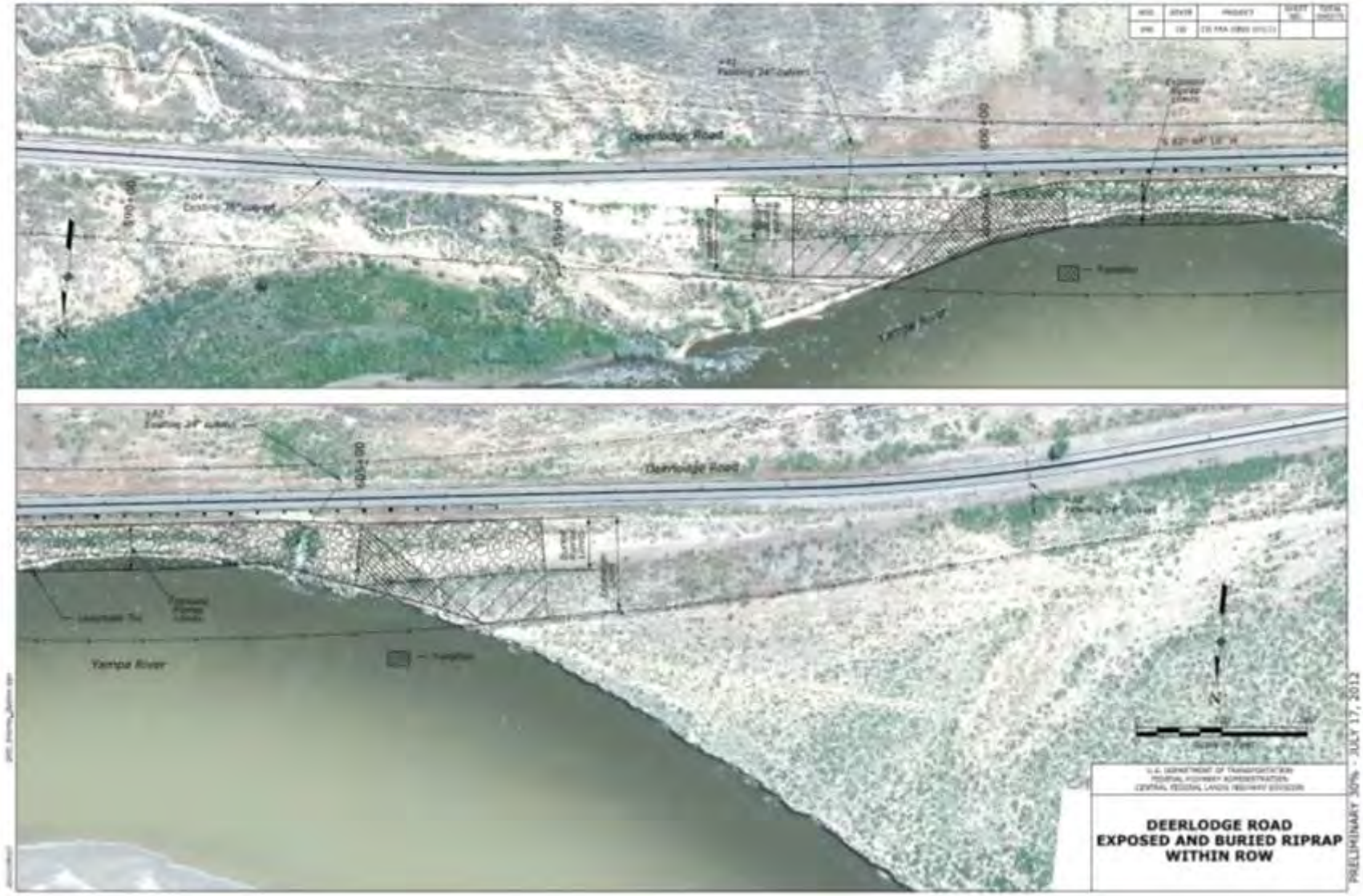


Figure 4. Riprap bank-stabilization design plans.

Road Design and Pavement

Road Width

The proposed Deerlodge roadway would maintain the same 40-foot roadway bench with nine-foot lane widths and one-foot paved shoulders. However, pavement raveling and erosion around four culverts has reduced road widths and caused pavement cracking and settling, respectively. The proposed road rehabilitation would include restoring the paved width of the road to the original design of 20 feet and painting new centerline and edge line pavement markings. In areas where the pavement has settled there may be a slight change in pavement width.

Pavement Considerations

Portions of the current pavement have exceeded their service life and have developed surface cracks, rutting, buckling, and unraveling of the pavement edge. Prior to repaving, six isolated sections of road would require improvements to the subgrade in locations where the existing soil has become soft and lost compaction or severe subgrade failure has occurred. In areas with subgrade issues, the subgrade and backfill would be removed and replaced to a depth of about 19.5 inches to 21 inches, prior to repaving.

Currently, the pavement consists of one and a half to three inches of multiple chip seal layers on top of 12 to 24 inches of aggregate base. The proposed pavement option is to remove the existing chip seal pavement and overlay with 3 inches of new hot asphalt pavement on top of 12 inches of aggregate base. The proposed treatment would remain on the roadway bench and maintain the same profile grade. In areas where the existing pavement is less than the proposed three inches, there may be a slight change in profile, which could alter the road width. In these areas, aggregate fill would be placed on the shoulders to fill in the side slope. A typical road section is shown in Figure 6.

Deerlodge Road right-of-way (ROW) encompasses approximately 308 acres with a 200-foot-wide ROW. All pavement rehabilitation would remain within the existing ROW limits.

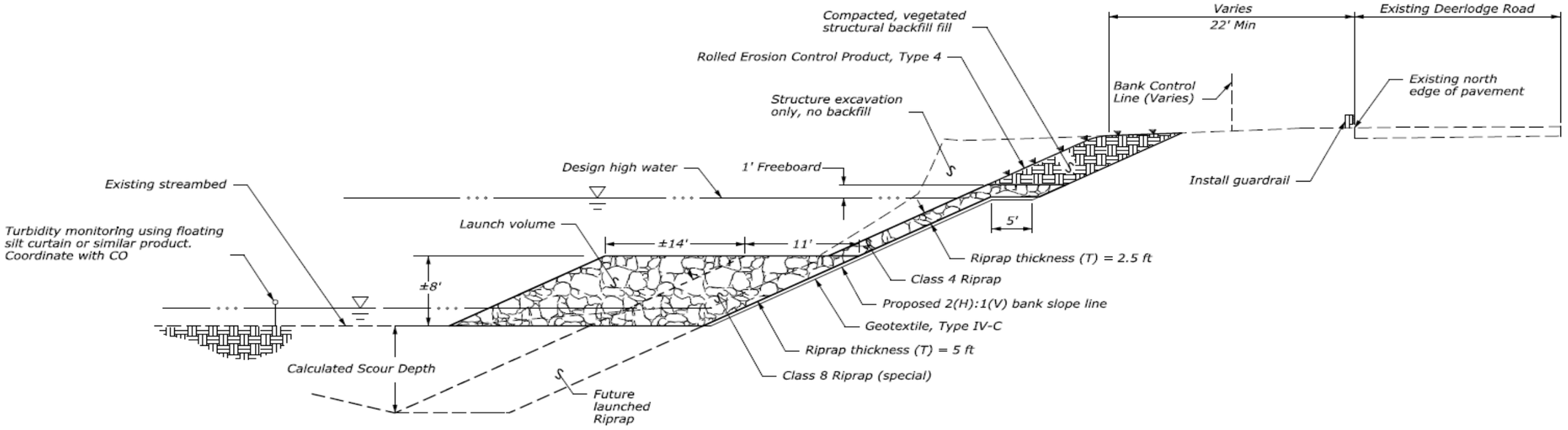


Figure 5. Typical Section for Exposed Riprap Bank Protection

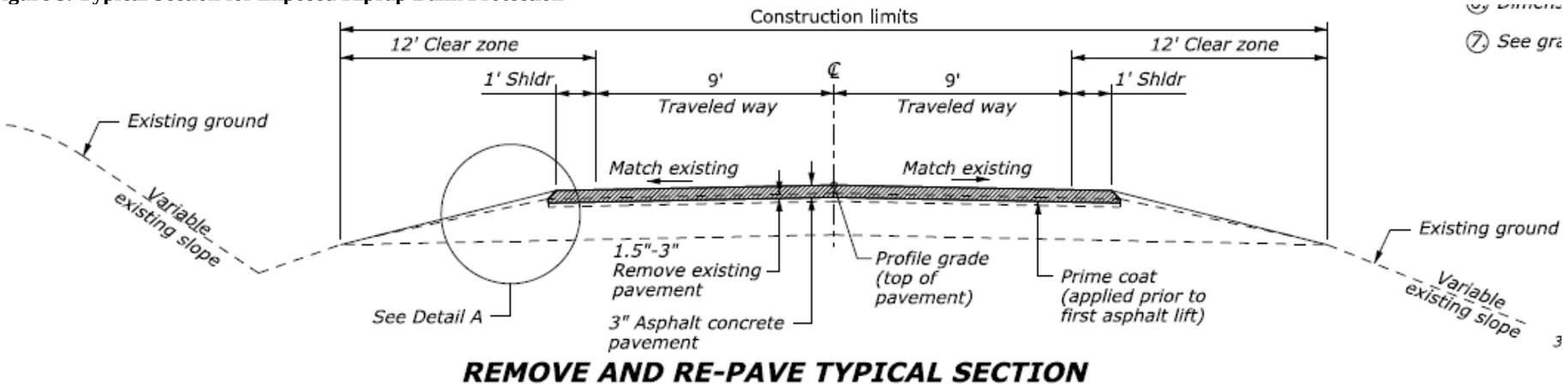


Figure 6. Typical Road Section.

Drainage

Two major parts of the road rehabilitation project involve drainage issues: culverts along Deerlodge Road and drainage around parking area improvements.

Deerlodge Road crosses approximately 93 culvert-crossing locations within the rehabilitation project limits. Most of the culverts are in fair condition with some showing signs of minor erosion and sediment deposition. Ten culverts were identified as having severe erosion at the downstream end of the culvert and would require erosion protection measures. The protection measures to stabilize the head cutting and to minimize erosion would be based on the head cutting information obtained during a field visit and information already obtained from the Preliminary Hydraulics Recommendations Report (FHWA 2012b).

Four culverts identified as potentially causing roadway damage and slumping would be replaced. An additional 1–3 culverts may be added within the bank stabilization area on private land. It was noted in the geotechnical report that leaks in the culvert walls, settlement of backfill, poor surface drainage, or inadequate cover over the corrugated metal pipe could be causing the damage (FHWA 2012c).

Pullouts and Parking Areas

The park entrance pullout with an information kiosk is not compliant with the Americans with Disability Act (ADA). A parking area and space for the information kiosk would be relocated on flatter terrain to be ADA compliant.

There are four parking areas along Deerlodge Road proposed for modifications—Needle parking area, Photo parking area, Boat Launch parking area, and Disappointment Draw Access Area.

Needle Parking Area

This parking area and access road would be modified by pulverizing the asphalt to a depth of eight inches and would remain unpaved with a crushed gravel surface. The turn-around loop would be obliterated by removing the asphalt and gravel. The obliterated area would then be re-contoured and revegetated.

Photo Parking Area

This parking area would be reduced by half the width and length and the existing asphalt curb would be removed. The remaining parking area would be repaved. The obliterated area would be re-contoured and revegetated.

Boat Launch Parking Area

Currently, the northern portion of the parking area is paved to a 15-foot-width and the southern portion is graveled from a zero to 15-foot-width The proposed modification is to pave the entire parking area. The gravel section would be removed to a depth about 15 inches and replaced with

12 inches of aggregate base overlayed with three inches of new hot asphalt. The current chip seal pavement portion would be removed and repaved with three inches of new asphalt.

Disappointment Draw Access Area

This parking area would be modified by removing the chip seal layers and overlaying with three inches of new asphalt. The turn-around loop would be obliterated by removing the asphalt and gravel. The obliterated area would then be re-contoured and revegetated. A short trail would be constructed to connect the existing informal trail to the new parking area. The existing curb, gutter, sidewalk, and the inlet and storm pipe located in the northeast corner of the existing parking area would be removed.

Traffic Control and Scheduling

Vehicle access along Deerlodge Road is an important component of the visitor experience at the park, and also an important route for residents to reach their homes and property. Thus, Deerlodge Road would remain open during construction work subject to periodic traffic delays and short closures. Sub-excavation and full depth pavement replacement may require short closures, which would consist of one-hour intervals allowing pass through on the hour with a flag person from the construction crew directing traffic. The temporary road closures in some locations would be to ensure the safety of the traveling public and park staff. Due to snow and snowdrifts during the winter months, the project may be shut down.

To minimize the potential impacts to the public visiting the Monument while still implementing road and bank stabilization work as efficiently as possible, the park would use the following traffic control guidelines:

- Roadwork would be conducted on Mondays through mid-day Friday. No work would occur on weekends without prior Park approval.
- Construction would typically occur between 7 a.m. and 7 p.m., although times would be adjusted seasonally according to day length by the park biologist. Work could occur at night. The contractor would notify the Park. The public would be notified.
- Work would require closure of at least one lane, and at times, both lanes would need to be temporarily closed. Road closures would be announced well in advance.
- Traffic control requirements would be dictated by the type of repairs being conducted and would vary with milling, pulverization, subgrade, and replacement construction. Traffic delays of up to 30 minutes could occur anytime.
- Flagmen, pilot cars, or signal lights would be used to control traffic through the one-lane section.

The park would implement a number of steps to provide timely and accurate information to park visitors during road rehabilitation to maintain a quality visitor experience. Both the park and the local communities would participate in providing clear and concise information on the status of rehabilitation work and any temporary traffic delays or suspensions. To facilitate visitor planning, the status of roadwork and traffic delays would be advertised two weeks in advance and updated daily. The status of road construction and travel restrictions would be communicated

via a number of outlets: the park website, newspaper, and radio; at entrance stations, visitor centers, and kiosks; and through news releases, local newspapers, variable message signs, media outlets, postings in local businesses, and other locations.

Staging Areas

Temporary staging areas for equipment and supplies during construction would use previously disturbed sites, such as pullouts and parking areas along Deerlodge Road.

Sustainability

The Park Service has adopted the concept of sustainable design as a guiding principle of facility planning and development. The objectives of sustainability are to design park facilities to minimize adverse effects on natural and cultural values, to reflect their environmental setting, and to maintain and encourage native biodiversity; to construct and retrofit facilities using energy-efficient materials and building techniques; to operate and maintain facilities to promote their sustainability; and to illustrate and promote conservation principles and practices through sustainable design and ecologically sensitive use. Essentially, sustainability is living within the environment with the least impact on the environment. The preferred alternative subscribes to and supports the practice of sustainable planning, design, and use of Deerlodge Road by limiting and mitigating resource impacts and promoting conservation principles by recycling pavement materials.

Mitigation Measures during the Proposed Action

To prevent and minimize potential adverse impacts associated with the preferred alternative, BMPs and resource protection measures would be implemented during construction and post-construction phases of the project (Table 2).

Table 2. Resource Protection/Mitigation Measures. Table continued on following pages.

Resource Area	Mitigation
General Considerations	All resource protection measures would be clearly stated in the construction specifications, and workers would be instructed to avoid conducting activities beyond the construction zone identified by the FHWA and park. Disturbances would be limited to roadsides, culvert areas, and other areas inside the designated construction limits. No machinery or equipment would access areas outside the construction limits. Construction equipment staging would occur in the road for active work areas or at designated pullouts and parking areas. Off-site equipment and vehicle parking would be limited to designated staging areas. Contractors would be required to properly maintain construction equipment (i.e., mufflers and brakes) to minimize noise. Construction vehicle engines would not be allowed to idle for extended periods. Material and equipment hauling would comply with all legal load restrictions. Load restrictions on park roads are identical to state load restrictions; however,

Resource Area	Mitigation
	the park superintendent may impose additional regulations. Water sprinkling would be used as needed to reduce fugitive dust in work zones. All tools, equipment, barricades, signs, surplus materials, and rubbish would be removed from the project work limits upon project completion.
Soils and Water Quality	Erosion-control BMPs for drainage and sediment control, as identified and used by the FHWA and Park Service, would be implemented to prevent or reduce nonpoint source pollution and minimize soil loss and sedimentation in drainage areas. These practices may include, but are not limited to, silt fencing, filter fabric, temporary sediment ponds, check dams of pea gravel-filled burlap bags or other material, and/or immediate mulching of exposed areas to minimize sedimentation and turbidity impacts as a result of construction activities. The placement and specific measures used would be dictated to a large degree by the topography immediately adjacent to the road in some portions of the project. Silt fencing fabric would be inspected daily during project work and weekly after project completion, until removed. Accumulated sediments would be removed when the fabric is estimated to be approximately 75% full. Silt removal would be accomplished in such a way as to avoid introduction into any flowing water bodies. Regular site inspections would be conducted to ensure that erosion-control measures are properly installed and functioning effectively. Erosion-control measures would be left in place at the completion of construction, after which time the park would be responsible for maintenance and removal once vegetation is established. The operation of ground-disturbing equipment would be temporarily suspended during large precipitation events to reduce the production of sediment that may be transported to streams. A storm water pollution prevention plan would be developed and approved by the park and submitted to the Colorado Water Quality Control Division prior to commencing any near-water activities. All equipment would be maintained in a clean and well-functioning state to avoid or minimize contamination from fluids and fuels. Prior to starting work each day, all machinery would be inspected for leaks (e.g., fuel, oil, and hydraulic fluid) and all necessary repairs would be made before the commencement of work. A hazardous spill plan would be required from the contractor prior to the start of construction stating what actions would be taken in the case of a spill and the preventive measures to be implemented. Hazardous spill clean-up materials would be on-site at all times. This measure is designed to avoid/minimize the introduction of chemical contaminants associated with machinery (e.g., fuel, oil, and hydraulic fluid) used in project implementation. Equipment would be refueled at least 100 feet from the stream channel, where any spill of fuel and lubricants cannot reach flowing water. Excavated topsoil would be salvaged, stockpiled in approved areas, and used to reclaim disturbed areas with similar vegetation communities; topsoil stockpiles would be covered to prevent windblown dust. All activities would be confined to areas defined by the drawings and

Resource Area	Mitigation
	specifications.
Vegetation	All disturbed ground would be reclaimed using appropriate BMPs that include using salvaged topsoil for revegetating soils and reseeding with native plant species. Erosion-control measures would be left in place at the completion of construction, after which time the park would be responsible for maintenance and removal once vegetation is established. Temporary barriers would be provided to protect existing trees, plants, and root zones. Trees or other plants would not be removed, injured, or destroyed without prior approval. To prevent the introduction of, and minimize the spread of, nonnative vegetation and noxious weeds, the following measures would be implemented during construction: • Soil disturbance would be minimized. • All construction equipment would be pressure washed and/or steam cleaned before entering the park to ensure that all equipment, machinery, rocks, gravel, and other materials are cleaned and weed free. • All haul trucks bringing fill materials from outside the park would be covered to prevent seed transport. • Vehicle and equipment parking would be limited to within construction limits or approved staging areas. • If staging areas outside the park were to be used, they would be surveyed for noxious weeds and treated appropriately prior to use. • All fill, rock, and additional topsoil would be obtained from stockpiles from previous projects or excess material from this project, if possible; and if not possible, then weed free fill, rock, or additional topsoil would be obtained from sources outside the park. The Moffat County, CO extension agent would certify that the source is weed free. • Monitoring and follow-up treatment of exotic vegetation would occur after project activities are completed. • Riprap, gravel, and topsoil sources would be inspected prior to use, and material currently supporting invasive exotic plants would be avoided. • Any disturbed areas would be reseeded with native upland species.
Wildlife	The specific hours designated for roadwork would be adjusted by the park biologist seasonally for varying day lengths, but would typically be between 7 a.m. and 7 p.m. Work could occur at night. The contractor would notify the Park and the public would be notified. The construction contractor would be required to keep all garbage and food waste contained and removed daily from the work site to avoid attracting wildlife into the construction zone. Construction workers would be instructed to remove food scraps and to not feed or approach wildlife. Equipment would be inspected for hydraulic fluid, antifreeze and oil leaks prior to use at staging and stockpiling sites, and materials would be kept on site for clean-up of any motor vehicle or heavy equipment fluid spills that might occur (such fluid spills are potential unnatural attractants to wildlife species). Adequate portable restroom facilities for construction workers would be provided to eliminate human waste as a wildlife attractant at construction sites.
Special Status Species	Erosion-control BMPs for drainage and sediment control, as identified and used by the FHWA and Park Service, would be implemented to prevent or reduce nonpoint source pollution and minimize soil loss and sedimentation of aquatic

Resource Area	Mitigation
	habitats used by Colorado pikeminnow, humpback chub, bonytail chub, and razorback sucker. These may include but are not limited to silt fences or fiber logs placed at the toe of the any disturbed slopes, just above the ordinary high water mark to prevent additional sedimentation until vegetation has stabilized the slopes. A hazardous spill plan would be prepared and implemented. All construction equipment would be pressure washed and/or steam cleaned before entering the park to ensure that all equipment, machinery, rocks, gravel, and other materials are cleaned and weed free and inspected daily for leaks. Leaking equipment would be removed from the project site until repaired and cleaned. Equipment would be refueled at least 100 feet from surface water and fuel, oil, hydraulic fluid, or substances of this nature would be stored within sealed, storage containers or facilities that are located outside the floodplain. The amount and duration of in-stream work would be limited as much as possible. Staging areas would be limited to existing roads and at designated pullouts and parking areas. Any disturbed slopes would be reseeded with native upland species placed down to the ordinary high water mark.
Floodplains	Work would be completed during low flow times such that any impact to the floodplain would be minimized. Equipment would be refueled at least 100 feet from surface water and fuel, oil, hydraulic fluid or substances of this nature would be stored within sealed, storage containers or facilities that are located outside the floodplain. The amount and duration of in-stream work would be limited as much as possible.
Cultural Resources	Archeological resources in the vicinity of the project area would be identified and delineated for avoidance prior to project work. The park would continue to coordinate with the state historic preservation office (SHPO) throughout the course of the project to protect and mitigate cultural resources affected by the preferred alternative. Should any archeological resources be uncovered during construction, work would be halted in the area and the park archeologist, SHPO, and appropriate American Indian tribes would be contacted for further consultation. Park cultural resources staff would be available during construction to advise or take appropriate actions should any archeological resources be uncovered during construction. In the unlikely event that human remains are discovered during construction, provisions outlined in the Native American Graves Protection and Repatriation Act (1990) would be followed. The Park Service would ensure that all contractors and subcontractors are informed of the penalties for illegally collecting artifacts or intentionally

Resource Area	Mitigation
	damaging archeological sites or historic properties. Contractors and subcontractors also would be instructed on procedures to follow in case previously unknown archeological resources are uncovered during construction. Equipment and material staging areas would avoid known archeological resources.
Visitor Experience, Public Health, Safety, and Park Operations	Visitors would be informed in advance of construction activities via a number of outlets including the park website, newspaper, radio, at the entrance station, variable message signs, visitor center, and kiosks. In addition, information on construction would be publicized in news releases, local newspapers, media outlets, postings in local businesses, visitor bureaus, chambers of commerce, and travel- and tourism-related businesses. Roadwork would generally be limited to Monday to Thursday to minimize impacts to visitors and local residents that travel the road on the weekends. Traffic delays during construction would be kept to a minimum, but travel would be subject to alternating one-way traffic with delays up to 30 minutes. Flagmen, pilot cars, or signal lights would be used to control traffic through the one-lane section. To facilitate visitor planning, the status of roadwork and traffic delays would be posted two weeks in advance and would be updated daily. The Monument public information officer would coordinate with the contractor on the construction schedule and update visitors and information sources periodically on construction work to inform visitors of project status and access. Provisions for emergency vehicle access through construction zones would be developed.

Alternatives Considered but Dismissed from Detailed Analysis

Stabilize the bank using soil cement

The use of soil cement to stabilize approximately 1,500 feet of stream bank and prevent further erosion of the Yampa River bank was considered. Soil cement as bank protection would require a completely dry work area by dewatering. Soils to make the soil-cement would be imported and the soil-cement mixture would be made off-site and transported to the construction site and placed in a completely dry environment. This bank stabilization method would require in-channel excavation of approximately 19,100 yd^3 of native streambed material, which would be replaced with soil cement to form the toe of the slope and stair-step construction. Approximately 6,100 yd^3 would be backfilled to cover the toe and about 13,000 yd^3 of the streambed material would be hauled away. This alternative was eliminated because the longer construction period and the dry environment requirement would be less advantageous compared to riprap installation. Riprap may be placed when water is present in shallow depths.

Stabilize the bank using spur dikes

The use of spur dikes to stabilize approximately 1,500 feet of stream bank and prevent further erosion of the Yampa River bank was considered. Spur dikes were dismissed due to negative environmental impacts from potential degradation of the channel and downstream erosion.

Realignment of road at milepost 9.5 and buried riprap

Relocating Deerlodge Road further away from the bank of Yampa River and using buried riprap as a bank stabilization option was considered. The buried riprap would have been constructed without excavation of the river channel. In order to relocate this section of road outside the existing ROW, right-of-way acquisition from private landowners would be required. The realignment would have been approximately 2,300 feet and would have impacted approximately 16 acres. This alternative was dismissed from further consideration because relocating the roadway would require considerable expense and the buried riprap could provide only a temporary solution, as the riprap would eventually become exposed.

Realignment of road at milepost 9.5 and no bank stabilization

Relocating Deerlodge Road further away from the bank of Yampa River with no bank stabilization was considered. Relocating this section of road would only provide a temporary solution as the Yampa River lateral migration would continue with no bank stabilization measures implemented. In addition, relocating this section of road outside the existing ROW would require land acquisition from private landowners. Realignment of this section alone would not address the need to improve road safety for private landowners, visitors, and employees. This alternative was dismissed from further consideration because it would not meet the project purpose and need.

Environmentally Preferable Alternative

According to the Council on Environmental Quality regulations implementing NEPA (43 CFR 46.30), the environmentally preferable alternative is the alternative "that causes the least damage to the biological and physical environment and best protects, preserves, and enhances historical, cultural, and natural resources. The environmentally preferable alternative is identified upon consideration and weighing by the Responsible Official of long-term environmental impacts against short-term impacts in evaluating what is the best protection of these resources. In some situations, such as when different alternatives impact different resources to different degrees, there may be more than one environmentally preferable alternative."

The preferred alternative, rehabilitation of Deerlodge Road, is the environmentally preferable alternative for several reasons: 1) it would best preserve the natural and cultural features along the road because it implements structural improvements that would provide long-term protection of environmental and cultural resources adjacent to the road; 2) drainage improvements would reduce the potential for erosion and impacts to water quality and cultural resources; and 3) it supports sustainable design concepts and energy efficiency by providing for the reuse of existing asphalt. For these reasons, the preferred alternative causes the least damage to the biological and

physical environment and best protects, preserves, and enhances historical, cultural, and natural resources, thereby making it the environmentally preferable alternative.

Under the no-action alternative, road rehabilitation and associated ground disturbance as well as bank stabilization would not occur, however, 1) it would not best preserve the park natural and cultural resources, as the road would continue to deteriorate without rehabilitation; 2) inadequate drainage could lead to erosion and impacts to water quality, natural resources, and cultural resources; and 3) continued high maintenance requirements would not be energy efficient.

Alternatives Comparison Table

A comparison of the alternatives and the degree to which each alternative fulfills the needs and objectives of the proposed project is summarized in Table 3.

Table 3. Alternatives Comparison.

No-action alternative	**NPS Preferred Alternative Rehabilitate Deerlodge Road**
Under the no-action alternative, road rehabilitation or improvements would not occur. Routine maintenance, minor repairs, and asphalt patching and sealing as needed would continue, but the road pavement and structural integrity would continue to deteriorate as well as the safety concerns associated with encroachment of the Yampa River on the roadway; failing pavement; and sharp drop-offs due to erosion around culverts.	Under the preferred alternative, road rehabilitation and modifications necessary to restore road conditions would occur. The proposed modifications would include resurface the road, repair damaged areas of road subgrade, improve drainage, implement bank stabilization measures, and modify parking areas and the park entrance pullout.
Meet Objectives?	
The no-action alternative does not meet the project objectives. Visitor enjoyment and safety concerns would not be addressed because problems associated with the Yampa River encroachment, deteriorating road conditions, drainage issues, and parking areas would not be addressed. The efficiency of park operations would not improve and maintenance costs would likely increase to address deteriorating road conditions.	The preferred alternative would meet the project objectives by implementing road rehabilitation and modifications needed. Visitor enjoyment and safety concerns would be addressed through measures implemented to improve the road and parking area conditions and to stabilize the encroaching Yampa River bank. Road improvements would provide safer access and parking for visitors. The efficiency of park operations would improve from better road conditions and reduced maintenance requirements. The natural and cultural resources would be protected by drainage improvements and bank stabilization measures. Road repairs and improvements would be implemented in a manner to minimize adverse effects on plants and wildlife and to protect cultural resource values. The Yampa River and road scenic quality would be maintained with the bank stabilization measures.

Summary of Environmental Consequences of the Alternatives

A summary of potential environmental effects for the alternatives is presented in Table 4.

Table 4. Impact Summary Table. Table continued on following pages.

Resource Topic	No Action	Preferred Alternative Rehabilitate Deerlodge Road
Soils	The no-action alternative would have local, long-term, minor, adverse impacts on soils from deterioration of the road, drainage problems that generate erosion and continued erosion of the Yampa River riverbanks.	The preferred alternative would have local, long-term, minor, beneficial impacts on soil resources from drainage improvements, removing and rehabilitating Needle and Disappointment Draw Access Area turn-around-loops, and half of the Photo parking area, and installing exposed rock riprap as a bank stabilization method near milepost 9.5.
Vegetation	The no-action alternative would result in local, negligible to minor, adverse, long-term impacts to vegetation because it would allow continued soil erosion around ten existing culverts and continued encroachment of the Yampa River on Deerlodge Road near milepost 9.5.	The preferred alternative would have local, minor, long-term adverse and beneficial impacts on local vegetation from road rehabilitation disturbances. Impacts would be confined to individuals and small areas but would be long term because of the time required to reestablish shrub cover. BMPs would limit erosion, plant mortality, and spread of invasive plant species. Improvements to drainage structures, bank stabilization, and removal and revegetation of turn-around loops in the Disappointment Draw Access Area and Needle parking areas would have a long-term, minor, beneficial impact on vegetation.
Wildlife	The no-action alternative would have indirect, adverse, minor to moderate, localized, long-term impacts to wildlife due to increased potential for local sedimentation and erosion effects on wildlife habitat and individuals.	The preferred alternative would result in indirect and direct, local, negligible to minor, short-term, adverse impacts to resident wildlife. Construction activities would be limited to the existing paved roadway and adjacent disturbed areas and, therefore, there would be negligible impacts to wildlife species and their habitat. Impacts to wildlife habitat would mainly occur in shrublands and the Yampa River around milepost 9.5 of Deerlodge Road. The timing of the construction related-actions would avoid impacts to nesting birds. BMPs would limit impacts to resident wildlife during

Resource Topic	No Action	Preferred Alternative Rehabilitate Deerlodge Road
		road rehabilitation activities and to fishes during the installation of the exposed riprap.
Special Status Species	There would be no impacts to special-status species under a no-action alternative. No road rehabilitation or bank stabilization related activities would occur. No fish, natural habitats, or listed critical habitats would be impacted. Thus, the no-action alternative would have no effect on the humpback chub, bonytail chub, Colorado pikeminnow, and razorback sucker or their designated critical habitat.	The preferred alternative would result in indirect, long-term, adverse moderate impacts. Installation of the 1,500 feet of exposed riprap with a launchable toe would not require in-stream work and thus would avoid the potential for incidental takes of fish. Potential impacts to bonytail chub, humpback chub, and the razorback sucker breeding fishes and/or their spawning grounds would be avoided; and a 25-mile buffer would be between the bank stabilization area and the Colorado pikeminnow spawning grounds. Smallmouth bass habitat could be created by installation of the riprap because it simulates boulder habitats used by this fish. However, the design of the launchable toe would minimize colonization of smallmouth bass in the bank stabilization area. BMPs and seasonal time constraints on construction activities in the Yampa River would limit construction-induced direct and indirect negative impacts to fishes and water quality. Thus, the preferred alternative would have "*a may affect, but not likely to adversely affect*" on the humpback chub, bonytail chub, Colorado pikeminnow, and razorback sucker and/or their designated critical habitat.
Water Resources and Floodplains	A no-action alternative would allow continued human-caused sediment deposition in the Yampa River. Impacts would be indirect, local, negligible, adverse, and long-term because eroding areas are ephemeral and storm fed and the river is naturally turbid suggests high sediment loads are a natural occurrence. There would be no	The preferred alternative would have local, short-term, minor, adverse and long-term beneficial, negligible impacts on hydrology and water quality. The replacement of problem culverts would result in indirect, local, long-term beneficial negligible impacts by reducing sediment runoff and ephemeral water channel erosion. The placement of riprap

Resource Topic	No Action	Preferred Alternative Rehabilitate Deerlodge Road
	impacts to floodplains beyond areas with eroding culverts.	along the bank of the Yampa River would result in local, long-term, minor, adverse impacts to the river channel and its natural lateral migration. Impacts to floodplains resulting from riprap installation would be local, long-term, negligible, and adverse because it would not alter the function or value of the floodplain, nor would it significantly reduce the amount of floodable land. The overall water quality of the area would not be impacted because of the use of BMPs and the naturally turbid river water.
Wetland Resources	The no-action alternative would allow continued human-caused sediment deposition and riverbank erosion into the riverine wetland. Impacts would be indirect, local, negligible, adverse, and long-term because soils would remain at risk for slumping, erosion, and being carried downstream, which could potentially lead to a slight decrease in wetland functions and values over time.	The preferred alternative would have long-term, local, adverse, minor impacts to wetland resources because a 1:1 ratio compensation for the loss of 0.52 acre of riverine wetland would result in no net loss of wetland resources.
Visitor Use and Experience	Effects on visitor use and experience under the no-action alternative would be local, long-term, minor, and adverse due to the continued road deterioration and routine road maintenance and the potential for reducing the scenic quality of the Yampa River and the road.	The effects on visitor use and experience would be short-term, moderate, adverse effects at the local and park wide level during periods of construction. Over the long-term, the proposed improvements to the condition of the road would provide a moderate, beneficial effect on the quality of the visitor experience and ensure protection of the road's structural integrity for visitor enjoyment and safe travel. Temporary, periodic traffic delays and short closures along the road could inconvenience visitors. To facilitate visitor planning, the status of roadwork and traffic delays would be advertised two weeks in advance and updated daily.
Public Health and Safety	Under the no-action alternative, there would be local, long-term, minor to moderate, adverse impacts to public health and safety due to continued deterioration of the road and drainage conditions and the	The preferred alternative would have local, long-term, moderate, beneficial effects on public health and safety from road improvements. Proposed rehabilitation and improvements would address safety

Resource Topic	No Action	Preferred Alternative Rehabilitate Deerlodge Road
	continued encroachment of the Yampa River. The potential for accidents would remain the same and could increase as the road deteriorates and encroachment of the Yampa River continues.	concerns associated with the road and parking areas. Subgrade structural repairs, new pavement, bank stabilization, and drainage work along the road would improve safety and driving conditions.

AFFECTED ENVIRONMENT and ENVIRONMENTAL CONSEQUENCES

Introduction

This section provides a description of the resources potentially impacted by the alternatives and the likely environmental consequences. It is organized by impact topics that were derived from internal park and external public scoping. Impacts are evaluated based on context, duration, intensity, and whether they are direct, indirect, or cumulative. More detailed information on resources in the Monument may be found in the general management plan (NPS 1991).

Methodology

The effects of each alternative are assessed for direct, indirect, and cumulative effects for each resource topic selected. The analysis is based on the assumption that the mitigation measures identified in the "Resource Protection Measures" section of this EA would be implemented for the preferred alternative. Overall, the Park Service based these impact analyses and conclusions on the review of existing literature and park studies, information provided by experts within the park and other agencies, professional judgment and park staff insights, and public input.

The following terms are used in the discussion of environmental consequences to assess the impact intensity threshold and the nature of impacts associated with each alternative:

Type: Describes the impact as beneficial or adverse; direct or indirect:

Beneficial: A positive change in the condition or appearance of the resource or a change that moves the resource toward a desired condition.

Adverse: A change that moves the resource away from a desired condition or detracts from its appearance or condition.

Direct: An effect that is caused by an action and occurs in the same time and place.

Indirect: An effect that is caused by an action but is later in time or farther removed in distance, but is still reasonably foreseeable.

Context: Describes the location or area where the impacts will occur.

1) Site-specific—impacts would occur within the location of the proposed action
2) Local—impacts would affect areas within the location of the proposed action and land adjacent to the proposed action
3) Regional—impacts would affect areas within the location of the proposed action, land adjacent to the proposed action, and land in surrounding communities.

Duration: Describes the length of time an impact would occur, as either short term or long term.

Short term: Impacts that generally last for the duration of the project. Some impact topics will have different short-term duration measures and these will be listed with the resource.

Long term: Impacts that generally last beyond the duration of the project. Some impact topics will have different long-term duration measures and these will be listed with the resource.

Intensity: Describes the degree, level, or strength of an impact. The impacts can be *negligible, minor, moderate*, or *major*. Definitions of intensity can vary by resource topic and are provided separately for each impact topic analyzed.

Cumulative Impacts

The Council on Environmental Quality (CEQ) regulations, which guide the implementation the National Environmental Policy Act of 1969 (42 USC 4321 et seq.), require assessment of cumulative impacts in the decision-making process for federal projects. Cumulative impacts are defined as "the impact on the environment which results 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 are considered for both alternatives.

Methods for Assessing Cumulative Impacts

Cumulative impacts were determined by combining the impacts of the alternative with other past, present, and reasonably foreseeable future actions. Therefore, it was necessary to identify other ongoing or reasonably foreseeable future projects in the Monument and, if applicable, the surrounding region. The temporal scope includes projects within a range of approximately 10 years. The following are past, present, and reasonably foreseeable future actions that have and could occur in the vicinity of the project area:

Past actions include activities that influenced and affected the current conditions of the environment near the project area. The boat ramp at the Disappointment Access Area was upgraded to concrete, movable ramps with boulders lining the sides to shore up to the parking area and river rock compacted between the concrete planks. A new waterline was installed for the campground and the existing cabin was replaced. In 2003, the Deerlodge Road section near milepost 9.5 was realigned and boulders were used as a stabilization method to armor the Yampa River bank. No other recent substantial rehabilitation work has been conducted other than periodic maintenance, repairs, and overlays by the Park Service.

No current or reasonably foreseeable actions were identified near the project area that would potentially contribute to cumulative effects. Traffic from park visitors is not expected to increase in the future (FHWA 2011).

Soils

Affected Environment

The project area includes twelve soil-mapping units as described by Natural Resources Conservation Service (NRCS; USDA, NRCS, Soil Survey Staff 2012). The soil units include loam, fine sandy loam, sandy loam, gravelly silty clay loam, silty clay loam, and loamy sand (USDA NRCS Soil Survey Staff 2012). These soils range from deep and well-drained sandy loams to somewhat excessively drained loamy sands and are derived from alluvium, eolian deposits, sandstone, and shale (USDA, NRCS, Soil Survey Staff 2012).

Impact Intensity Threshold

Available information on soils in the project area was compiled using available spatial data and literature. The thresholds for change for intensity of impacts on soils are defined in Table 5.

Table 5. Soil Impact and Intensity.

Impact Intensity	Intensity Description
Negligible	Adverse: The effects of the action on soils would be below or at a very low level of detection. Any effects on productivity or erosion potential would be slight. Beneficial: The action would slightly improve soil conditions, productivity, or reduce erosion.
Minor	Adverse: The effects of the action on soils would be detectable. The action would change a soil's profile in a relatively small area, but would not appreciably increase the potential for erosion of additional soil. If mitigation were needed to offset adverse effects, it would be relatively simple to implement and would likely be successful. Beneficial: The action would noticeably improve soil conditions, productivity, or reduce erosion.
Moderate	Adverse: The action would result in a change in quantity or alteration of the topsoil, overall biological productivity, or the potential for erosion to remove small quantities of soil. Changes to localized ecological processes would be limited. Mitigation measures would probably be necessary to offset adverse effects and would likely be successful. Beneficial: The action would substantially improve soil conditions, productivity, or reduce erosion.
Major	Adverse: The action would result in a change in the potential for erosion to remove large quantities of soil or in alterations to topsoil and overall biological productivity in a relatively large area. Key ecological processes would be altered, and landscape-level changes would be expected. Mitigation measures to offset adverse effects would be necessary, extensive, and their success could not be guaranteed. Beneficial: The action would exceptionally improve soil conditions, productivity, or reduction in erosion.

Short-term impact—recovers in less than three years
Long-term impact—takes more than three years to recover

Environmental Consequences

No-action alternative

Direct and Indirect Impacts. No direct disturbance to soil resources would occur because there would be no road construction or bank stabilization related actions. Deterioration of the road pavement (e.g., pavement edges, surface cracks, rutting, and buckling), erosion around culverts resulting in sharp drop-offs, and bank erosion around milepost 9.5 would continue, which would result in soil loss and erosion. The park would continue routine maintenance, minor repairs, and asphalt patching and sealing as needed. No bank stabilization measures around milepost 9.5 would occur, thus soils would remain at risk for slumping, erosion, and being carried downstream. The continued impacts to soils would be local, long-term, minor, and adverse.

Cumulative Impacts. Past, present, and future actions that have had or might have an impact on soils include Disappointment Draw Access Area improvements—replacing the existing cabin and installing a waterline; the realignment and bank stabilization of the Deerlodge Road section near milepost 9.5; and routine road maintenance, repairs, and overlays. These activities have affected soil resources from excavation, erosion, and a loss in soil and soil productivity. Soil productivity has been reduced from removal of soil to realign Deerlodge Road and from erosion reducing available soil water and nutrients for vegetation growth. The combined impact on soil resources of the no-action alternative in combination with past, present, and future activities would be local, long-term, minor, and adverse with a relatively small adverse contribution from the no-action alternative.

Conclusion. The no-action alternative would have local, long-term, minor, adverse impacts on soils from deterioration of the road, drainage problems, and continued erosion of the riverbanks of the Yampa River at MP 9.5. Cumulative impacts would be local, long-term, minor, and adverse.

Preferred Alternative—Rehabilitate Road

Direct and Indirect Impacts. Road rehabilitation activities such as excavating for subgrade road failures, milling, grading, repaving, and culvert replacements would occur within the existing ROW. Soil material exposed during construction would be subject to erosion until stabilized or revegetated. Impacts to soils during construction would be local, short-term, minor, and adverse. Proposed drainage improvements and correction of deteriorating road pavement would reduce the potential for long-term erosion and soil loss. Repairing existing road conditions that currently generate erosion would result in a local, long-term, minor, beneficial impact on soil resources. Closing and revegetating the turn-around-loops for the Needle and Disappointment Draw Access Area and half of the Photo parking area would reduce the potential for future erosion and restore soil productivity.

The bank stabilization near milepost 9.5 would disturb approximately 0.52 acre of soil during the rock riprap toe construction. The rock riprap used to armor the bank would effectively stabilize the bank and prevent further loss of soil and encroachment of Deerlodge Road at this site. Soil disturbance along with vegetation, litter and top soil removal and installation of the riprap would decrease the natural condition of the site and would have an adverse impact to soil resources.

However, all disturbed areas would be reclaimed using appropriate BMPs that include using salvaged topsoil for revegetating soils and reseeding with native plant species. In addition, use of temporary and permanent erosion-control BMPs from the Resource Protection Measures Section, including salvaging and stockpiling of excavated topsoil and covering topsoil stockpiles would reduce the potential for erosion and soil loss. Overall, the preferred alternative would result in local, long-term, minor, beneficial impacts on soil resources.

Cumulative Impacts. Past, present, and future actions that have had or might have an impact on soils include Disappointment Access Area improvements—replacing the existing cabin and installing a waterline; realignment and bank stabilization of the Deerlodge Road section near milepost 9.5; and routine road maintenance, repairs, and overlays. These activities have affected soil resources from excavation, erosion, and a loss in soil and soil productivity. Minor beneficial contributions from the preferred alternative would occur from restoring soil productivity in parking areas rehabilitated and reducing potential erosion in the parking areas, around culverts and along the Yampa River riverbank. The combined impact on soil resources of the preferred action alternative in combination with past, present, and future activities would be local, long-term, minor, and adverse with a minor, beneficial contribution from the preferred alternative.

Conclusion. The preferred alternative would have local, long-term, minor, beneficial impacts on soil resources from drainage improvements, removing and rehabilitating Needle and Disappointment Draw Access areas, turn-around-loops and half of the Photo parking area, and installing exposed rock riprap as a bank stabilization method near milepost 9.5. The proposed road rehabilitation actions would have local, short-term, minor, adverse effects on soil resources during construction from road grading and subgrade road repairs, drainage improvements, and excavation during exposed rock riprap and cofferdam construction. Minor beneficial contributions would occur from restoring soil productivity in parking areas rehabilitated and reducing potential erosion in the parking areas, around culverts and along the Yampa River riverbank. Cumulative impacts would be local, long-term, minor, and adverse with a minor, beneficial contribution from the preferred alternative when compared to the no-action alternative.

Vegetation

Affected Environment

Vegetation communities along Deerlodge Road are mapped as bottomland shrubland, sagebrush/rabbitbrush shrubland, mixed desert shrubland, piñon–juniper/sagebrush woodland, piñon–juniper/herbaceous woodland, native grassland, and weedy herbaceous vegetation (Dinosaur National Monument vegetation mapping GIS data provided by NPS).

The vegetation along Deerlodge Road is dominated by greasewood (*Sarcobatus vermiculatus*), big sagebrush (*Artemisia tridentata*), rubber rabbitbrush (*Ericameria nauseosa*), and the nonnatives cheatgrass (*Bromus tectorum*), crested wheatgrass (*Agropyron spicatum*), and annual wheatgrass (*Eremopyrum triticeum*). The Disappointment Draw Access Area and Needle parking areas are adjacent to riparian vegetation consisting of willow (*Salix exigua*), cottonwood (*Populus angustifolia*), and nonnative salt cedar (*Tamarix* sp.) and Russian olive (*Elaeagnus angustifolia*).

Impact Intensity Threshold

Predictions about impacts were based on the expected disturbance to vegetation communities and using available spatial data and literature. The thresholds for change for intensity of impacts on vegetation are defined in Table 6.

Table 6. Vegetation Impact and Intensity.

Impact Intensity	Intensity Description
Negligible	Adverse: The effects on vegetation (individuals or communities) would not be measurable. The abundance or distribution of individuals would not be affected or would be slightly affected. The effects would be on a small scale and no species of special concern would be affected. Ecological processes and biological productivity would not be affected. Beneficial: The action would slightly improve the condition, abundance, or distribution of individual plant species and communities in the project area.
Minor	Adverse: The action would not necessarily decrease or increase the project area's overall biological productivity. The alternative would affect the abundance or distribution of individuals in a localized area, but would not affect the viability of local or regional populations or communities. Mitigation to offset adverse effects, including special measures to avoid affecting species of special concern, would be required and would be effective. Mitigation may be needed to offset adverse effects, would be relatively simple to implement, and would likely be successful. Beneficial: The action would noticeably improve the condition, abundance, or distribution of individual plant species and communities in the project area.
Moderate	Adverse: The action would result in effects on some individual native plants and would also affect a sizeable segment of the species' population over a relatively large area. Permanent impacts would occur to native vegetation, but in a relatively small area. Some special status species would also be affected. Mitigation measures would be necessary to offset adverse effects and would likely be successful. Beneficial: The action would substantially improve the condition, abundance, or distribution of individual plant species and communities in the project area.
Major	Adverse: The action would have considerable effects on native plant populations, including special status species, and would affect a relatively large area within and outside the park. Extensive mitigation measures to offset the adverse effects would be required; success of the mitigation measures would not be guaranteed. Beneficial: The action would extensively improve the condition, abundance, or distribution of individual plant species and communities in the project area.

Short-term impact—recovers in less than one year
Long-term impact—takes more than one year to recover

Environmental Consequences

No-action alternative

Direct and Indirect Impacts. Vegetation adjacent to the existing road would continue to be affected by erosion of fill slopes from improper drainage and sediment deposition. The Yampa River would continue to encroach upon Deerlodge Road near milepost 9.5. The result would be a gradual, natural decrease in riverside greasewood-dominated habitat along the outside of the river bends in these two areas. An increase in lowland riparian habitat on the inside of the river

bends following the natural migration of the river channel would occur. The impacts would be local, negligible to minor, adverse, long-term.

The current ten culverts experiencing erosion would continue to erode under a no-action alternative, potentially leading to local, minor, adverse, long-term impacts to surrounding soils and vegetation. This impact would be localized near and around these problematic culverts; however, the area of impact would increase over time.

Cumulative Impacts. The no-action alternative would have local long-term negligible adverse effects on vegetation adjacent to the road from erosion and drainage problems (including bank stabilization). Past actions, such as waterline installation, Deerlodge Road realignment and maintenance activities, have resulted in vegetation clearing and potential introduction of invasive exotic plants. The no-action alternative in combination with the past, present, and reasonably foreseeable future actions would be local, long-term, minor, and adverse.

Conclusion. The no-action alternative would result in minor impacts to vegetation because it would allow continued soil erosion around ten existing culverts. The Yampa River would continue to encroach upon Deerlodge Road near milepost 9.5 resulting in natural changes in the abundance of vegetation communities on both sides of the river at these locations. Cumulative effects would be local, long-term, minor, and adverse.

Preferred Alternative—Rehabilitate Road

Direct and Indirect Impacts. The preferred alternative would result in direct, local, minor, long-term adverse impacts to local vegetation. The majority of impacts would occur along the existing roadway and parking areas and would not impact vegetation. Greasewood vegetation along milepost 9.5 would be impacted by machinery used for the placement of riprap. However, impacted vegetation types are widespread throughout the area and the preferred alternative would not impact vegetation communities or populations. Ten culverts currently experiencing erosion problems would be replaced, having local, minor, beneficial, long-term impacts on vegetation. This would prevent further erosion of soils in localized areas and would help to maintain the existing vegetation in these areas. Eroded areas could become unvegetated over time or areas of disturbance could harbor invasive plant species. Three parking areas would be reduced, with some areas of existing impervious surface restored to natural vegetation. BMPs would be used specifically to prevent topsoil erosion, plant mortality, and spread of invasive species, which could become established following roadside disturbance. Disturbed areas would be reseeded with native vegetation. There would be no impacts to the biological productivity of the area or to plant populations or communities.

Cumulative Impacts. Past actions, such as waterline installation, road realignment and maintenance activities, have resulted in vegetation clearing and potential introduction of invasive exotic plants. The river stabilization portion of the project is designed to protect the riverbank from major floods and would limit the need for future stabilization projects. The preferred alternative in combination with the past, present, and reasonably foreseeable future actions would result in local, long-term, minor, and adverse impacts.

Conclusion. The preferred alternative would have local, minor, long-term adverse and beneficial impacts on local vegetation from road rehabilitation disturbances. Impacts would be confined to individuals and small areas but would be long term because of the time required to reestablish shrub cover. BMPs would limit erosion, plant mortality, and spread of invasive plant species. Improvements to drainage structures, bank stabilization, and removal and revegetation of the turn-around loops in the Disappointment Draw Access Area and Needle parking areas would have a long-term, minor, beneficial impact on vegetation. There would be no impacts to plant populations, communities, or biological productivity. Cumulative effects would be local, long-term, minor, and adverse impacts

Wildlife

Affected Environment

Wildlife habitat in the project area is dominated by shrubs and grasses and the Yampa River. The project area is predominantly roadside and bordering parking areas, along with non-roadside habitat in the bank-stabilization near milepost 9.5. Vegetation communities along Deerlodge Road are mapped as bottomland shrubland, sagebrush/rabbitbrush shrubland, mixed desert shrubland, piñon–juniper/sagebrush woodland, piñon–juniper/herbaceous woodland, native grassland, and weedy herbaceous vegetation (Dinosaur National Monument vegetation mapping GIS data provided by NPS).

The vegetation along Deerlodge Road is dominated by greasewood, big sagebrush, rubber rabbitbrush, cheatgrass, crested wheatgrass, and annual wheatgrass. Needle parking lot is adjacent to riparian vegetation consisting of willow (*Salix exigua*), salt cedar (*Tamarix* sp.), cottonwood (*Populus angustifolia*), and Russian olive (*Elaeagnus angustifolia*). Native and nonnative shrub habitats provide cover for small mammals and nesting birds.

There have been 382 vertebrate species documented within the Monument (NPS 2012a). The Yampa River provides habitat for fourteen native fish species, of which four are federally endangered fishes (see Special Status Section), and nonnative fishes. The nonnative fishes of greatest concern are northern pike (*Esox lucius*), smallmouth bass (*Micropterus dolomieui*), and channel catfish (*Ictalurus punctatus*; Roehm 2004). All three species are thought to predate smaller life stages of the endangered fishes and native species, such as roundtail chub (*Gila robusta*), flannelmouth sucker (*Catostomus latipinnis*), and speckled dace (*Rhinichthys osculus*).

There have been over 200 bird species documented within the Monument, some year-round residents and some seasonal residents (NPS 2012a). Birds protected under the Migratory Bird Treaty Act that could nest in upland shrubs in the project area include Brewer's sparrow (*Spizella breweri*), vesper sparrow (*Pooecetes gramineus*), sage sparrow (*Amphispiza belli*), and black-throated sparrow (*Amphispiza bilineata*). Birds that could nest in riparian areas include belted kingfisher (*Megaceryle alcyon*) and bank swallow (*Riparia ripa*ria), in vertical river banks, and song sparrow (*Melospiza melodia*), black-headed grosbeak (*Pheucticus melanocephalus*), and western tanager (*Piranga ludoviciana*) in cottonwoods, willows, and Russian olive among others. Vegetated riparian along the river could function as stop-over migration habitat for numerous song birds. The river may attract various migrant waterfowl and some wading birds.

In Colorado, Golden eagles breed in montane habitat in the west and canyons in the southeast with limited breeding in the northeast (Colorado Parks and Wildlife 2012a). Wintering populations are more common across the state in a wide range of open habitats with native vegetation (Colorado Parks and Wildlife 2012a). Typical breeding habitat consists of mountainous canyon land, rimrock terrain of open desert and grassland areas in the western U.S. (Kochart et al. 2002). They primarily use cliffs to nest, but will also use trees. No known golden eagle nests have been documented in the project area (B. Holmes, CO Parks and Wildlife Terrestrial Biologist, pers. comm. with M. Brooks, EMI wildlife biologist). Historically, golden eagles nested on the west mouth of Cross Mountain Canyon (B. Holmes, CO Parks and Wildlife Terrestrial Biologist, pers. comm. with M. Brooks, EMI wildlife biologist). Cross Mountain Canyon is located adjacent to the Cross Mountain parking area, which is outside the project area.

The local hydrology is dominated by the Yampa River, which borders the project area to the north. The project area occurs in what is referred to as the middle Yampa and lower Yampa by the USFWS. The river north of the boat ramp is the lower end of the middle Yampa; the river below the boat ramp to the Green River is the lower Yampa. The Colorado Parks and Wildlife refers to the area as the lower Yampa in their Yampa River Basin Aquatic Management Plan (2010). Named ephemeral washes intersected by the project area include Calico Draw, Bay Gulch, Buffalo Gulch, Graham Gulch, and Twelvemile Gulch.

Impact Intensity Threshold

Predictions about impacts were based on the expected disturbance to wildlife communities and using available spatial data and literature. The thresholds for change for intensity of impacts on wildlife are defined in Table 7.

Table 7. Wildlife Impact and Intensity.

Impact Intensity	Intensity Description
Negligible	Adverse: The effects on wildlife (individuals or communities) would not be measurable. The abundance or distribution of individuals would not be affected or would be slightly affected. The effects would be on a small scale and no species of special concern would be affected. Ecological processes and biological productivity would not be affected. Beneficial: The action would slightly improve the condition, abundance, or distribution of individual wildlife species and communities in the project area.
Minor	Adverse: The action would not necessarily decrease or increase the project area's overall biological productivity. The alternative would affect the abundance or distribution of individuals in a localized area, but would not affect the viability of local or regional populations or communities. Mitigation to offset adverse effects, including special measures to avoid affecting species of special concern, would be required and would be effective. Mitigation may be needed to offset adverse effects, would be relatively simple to implement, and would likely be successful. Beneficial: The action would noticeably improve the condition, abundance, or distribution of individual wildlife species and communities in the project area.
Moderate	Adverse: The action would result in effects on some individual wildlife species and would also affect a sizeable segment of the species' population over a relatively large area. Permanent impacts would occur to wildlife species, but in a relatively small area. Some special status species would also be affected. Mitigation measures would be necessary to offset adverse effects and would likely be successful. Beneficial: The action would substantially improve the condition, abundance, or

Impact Intensity	Intensity Description
	distribution of individual wildlife species and communities in the project area.
Major	Adverse: The action would have considerable effects on wildlife populations, including special status species, and would affect a relatively large area within and outside the park. Extensive mitigation measures to offset the adverse effects would be required; success of the mitigation measures would not be guaranteed. Beneficial: The action would extensively improve the condition, abundance, or distribution of individual wildlife species and communities in the project area.

Short-term impact—recovers in less than one year
Long-term impact—takes more than one year to recover or effects would be permanent

Environmental Consequences

No-action alternative

Direct and Indirect Impacts. There would be no direct impacts to wildlife under the no alternative action. However, routine road maintenance would continue, as needed, which could temporarily displace individuals in the immediate area due to human presence and equipment noise. The Yampa River would continue to encroach upon the roadway and road conditions would continue to deteriorate. This could lead to increased levels of sedimentation into the Yampa River and increased erosion of riparian and upland habitats adjacent to the Yampa River. Indirect effects would be adverse, minor to moderate, localized, long-term impacts due to increased potential for local sedimentation and erosion effects on wildlife habitat and individuals.

Cumulative Impacts. The road and parking areas would continue to have routine maintenance as needed and the Yampa River would continue to encroach upon the roadway. Emergency bank stabilization could occur. Previously installed riprap exists along the south bank of the Yampa River adjacent to Deerlodge Road between the roadway and the riverbank. Long-term impacts to aquatic wildlife species could stem from habitat alteration associated with replacing natural bank materials with riprap. The no-action alternative, combined with past, present, and reasonably foreseeable future actions, would result in local, minor, adverse short- and long-term impacts to aquatic wildlife species.

Cumulative impacts to terrestrial wildlife from the no-action alternative in combination with the past, present, and reasonably foreseeable future actions would be site-specific, negligible, short-term, and adverse due to routine road maintenance.

Conclusion. Under the no-action alternative, there would be indirect impacts, adverse, minor to moderate, localized, long-term, to wildlife due to increased potential for local sedimentation and erosion effects on wildlife habitat and individuals. The no-action alternative, combined with past, present, and reasonably foreseeable future actions, would result in local, minor, adverse short- and long-term impacts to aquatic wildlife species. Cumulative impacts to terrestrial wildlife from the no-action alternative in combination with the past, present, and reasonably foreseeable future actions would be site-specific, negligible, short-term, and adverse due to routine road maintenance.

Preferred Alternative—Rehabilitate Road

Direct and Indirect Impacts. The preferred alternative would result in indirect and direct, local, negligible to minor, short-term, adverse impacts to resident wildlife. All construction activities would be limited to the existing paved roadway and adjacent disturbed areas and, therefore, would have negligible impacts to wildlife and their habitat. Disturbance of shrublands around milepost 9.5 would occur during the avian non-breeding season, so nesting birds would not be impacted. Human presence and construction noise would temporarily disturb and displace resident wildlife. Resident small mammals and birds may be temporarily displaced during operations. The local habitats, however, are widespread, and wildlife is expected to move into adjacent areas. Large mammals are typical highly mobile and have large ranges and would be able to avoid portions of the project area under construction without hampered access to suitable habitat and water. However, using the BMPs in Table 2, would reduce potential impacts to resident wildlife. Construction-related disturbance would be limited to one season; therefore, there would be no long-term adverse impacts to wildlife.

The installation of 1,500 feet of exposed riprap could create habitat for the invasive smallmouth bass by simulating boulder habitats (M. Trammell, fisheries biologist, National Park Service, pers. comm., Munther 1970, Todd and Rabeni 1989, Sammons and Bettoli 1999). The smallmouth bass can compete with or predate on native fishes (U.S. Department of Interior U.S. Fish and Wildlife Service 2002). However, BMPs and the launchable toe design would help to protect native fish in the Yampa River from potential smallmouth bass habitat creation and prevent erosion and chemical spills. The launchable toe design would be such that the gradation would form a homogeneous mass with the smaller rock filling the voids of the larger rock and sediment would fill back over the launched material as it slowly launches to scour depths. This would fill in the gaps within and between the riprap and underlying soil, thus minimizing colonization of smallmouth bass in the bank stabilization area near milepost 9.5. For all fish species, sedimentation from construction should not be an issue because this section of the river is highly turbid. Over the long term, implementation of the preferred alternative would result in fewer adverse effects on fish and other aquatic species by correcting drainage deficiencies and deteriorating road conditions that may impact water quality.

Cumulative Impacts. Deerlodge Road and the surrounding countryside are rural. The predominant land use for all lands (federal, private, state) in the area is grazing. Deerlodge Road serves primarily to access the Yampa River and adjacent grazing land. There is little to no other activities in the area beside river accessing and ranching. Any future actions would likely be related to road maintenance, river access, and small irrigation activities for watering livestock. Past actions that have affected the Yampa River include a berm created to conserve water for livestock using a bulldozer on private ranch land outside the project area. Future road maintenance and/or riverbank stabilization may be required regardless of whether the proposed action is implemented. Reasonably foreseeable future actions could include the need for implementation of a smallmouth bass removal program along the lower Yampa River to offset the effects of increased potential smallmouth bass habitat and possible increases in the smallmouth bass population due to exposed riprap installation. The preferred alternative in combination with the past, present, and reasonably foreseeable future actions would result in local, minor to moderate, adverse and beneficial impacts.

Conclusion. The preferred alternative would have local, negligible, short-term impacts to resident wildlife species. Impacts to wildlife habitat would mainly occur in shrublands and the Yampa River around milepost 9.5 of Deerlodge Road. The timing of the construction-related actions would avoid impacts to nesting birds. BMPs would limit impacts to resident wildlife during road rehabilitation activities and to fishes during the installation of the exposed riprap. Road improvement would not impact migration corridors of large mammals. Occasional impacts to individual animals would generally not affect wildlife populations, wildlife communities, or ecological processes. Cumulative impacts would result in negligible to minor, adverse, short-term impacts for terrestrial wildlife and minor, adverse, short-term impacts for aquatic wildlife with beneficial contribution from the preferred alternative.

Special Status Species

Affected Environment

Under the Endangered Species Act of 1973 (ESA), NPS has the responsibility to address impacts to federally listed, candidate, and proposed species. The terms "threatened" and "endangered" describe the official federal status and certain species in the Monument as defined by the Endangered Species Act. The term "candidate" is used officially by the U.S. U.S. Fish and Wildlife Service (USFWS) to describe species, which sufficient information exists on biological vulnerability and threats to support a "proposed rule to list," but issuance of the proposed rule is precluded. Colorado has enacted regulations similar to the ESA that confer threatened and endangered to certain species that inhabit areas within the state. NPS management policies dictate that federal candidate species, proposed species, and state species of concern are to be managed to the greatest extent possible as federal–listed endangered and threatened species (NPS 2006).

The majority of the project area follows existing roadways and parking areas. Undisturbed, natural areas that would be impacted include the Yampa River and upland greasewood habitat along milepost 9.5. Eleven special-status species were assessed for potential impacts (Table 8). There is no suitable habitat in the project area for yellow-billed cuckoo, Mexican spotted owl, North American wolverine, Canada lynx, black-footed ferret, and Ute ladies'-tresses. Greater sage-grouse could occasionally occur in the project area, but the area lacks preferred habitat (large expanses of sagebrush and forb cover), and there are no nearby leks. Suitable habitat for all four fish species occurs in the Yampa River where it borders and/or overlaps with the project area. Two species have listed critical habitat in the project area; two species have critical habitat approximately two miles downstream of the project area.

A Biological Assessment (BA) for the Deerlodge Road Rehabilitation Project (NPS 2012b) has been prepared in cooperation with U.S. Fish and Wildlife Service for a "may affect" determination for the fish species (Appendix B). Refer to the referenced BA for additional information and analysis regarding the humpback chub (*Gila cypha*), bonytail chub (*Gila elegans*), Colorado pikeminnow (*Ptychocheilus lucius*), and razorback sucker (*Xyrauchen texanus*).

Table 8. Federally listed and candidate species with potential to occur in the project area and effects summary. NLAA = not likely to adversely affect.

Common name	Scientific name	Status	Finding
Greater sage-grouse	*Centrocercus urophasianus*	Candidate	No effect
Yellow-billed cuckoo	*Coccyzus americanus*	Candidate	No effect
Mexican spotted owl	*Strix occidentalis lucida*	Threatened	No effect
Ute ladies'-tresses	*Spiranthes diluvialis*	Threatened	No effect
North American wolverine	*Gulo gulo luscus*	Candidate	No effect
Canada lynx	*Lynx canadensis*	Threatened	No effect
Black-footed ferret	*Mustela nigripes*	Endangered	No effect
Humpback chub*	*Gila cypha*	Endangered	May affect, NLAA
Bonytail chub*	*Gila elegans*	Endangered	May affect, NLAA
Colorado pikeminnow	*Ptychocheilus lucius*	Endangered	May affect, NLAA
Razorback sucker	*Xyrauchen texanus*	Endangered	May affect, NLAA

*Critical habitat in project area.
#Designated critical habitat approximately two miles downstream from project area.

Humpback chub—The humpback chub is endemic to the Colorado River Basin (USFWS 1984). First described in 1946 (Miller 1946), limited fish sampling in the Colorado River Basin, and the inaccessibility of certain areas assured limited knowledge of this fish's natural history until the last several decades. The known historic range of this 20-inch member of the minnow family was the Colorado River and four of its major tributaries: the Yampa, Green, White, and Little Colorado Rivers (USFWS 1984). The full extent of the historic range is unknown because impoundment projects altered some rivers before this fish was discovered and/or sampled. The Yampa River population is the smallest of all the existing populations and includes populations in the Yampa, Lodore, and Split Mountain Canyons (USFWS 2002a). Sampling along the Yampa River from 2003–2004 yielded low capture and recapture rates of adult and juvenile humpback chub (Finney 2006).

The humpback chub occurs in a variety of habitats. Habitats range from fast currents with deep pools and boulders (Valdez 1981, Valdez and Clemmer 1982) to more placid waters (Kaeding and Zimmerman 1983). Humpback chub in the Yampa River utilize shoreline eddies and runs over cobble and sand substrates in water about 5 feet deep (Tyus and Karp 1989). Habitat preferences vary somewhat between adult and juvenile fish. In general, adults tend to prefer deep, fast waters but will use microhabitats with slower water, while juveniles prefer shallower waters (USFWS 1984). Humpback chub have been found in association with riprap structures, which may reflect their preference for large rocky substrates (Valdez and Clemmer 1982).

Humpback chub spawning occurs in spring and early summer (Upper Colorado River Endangered Fish Recovery Program 2012). The exact timing of spawning depends on water level and water temperature. Preferred spawning habitat is shallow backwaters with cobble substrate

and in canyons (State of Utah Natural Resources Division of Wildlife Resources 2012; M. Trammel, NPS Fisheries Biologist, pers. comm. with G. Molitor, NPS Natural Resource Specialist). The nearest potential spawning areas are the Little Snake River, which meets the Yampa across from the project area, Cross Mountain Canyon, the lower end of which is located where Deerlodge Road meets the Yampa River, and Yampa Canyon, which begins approximately one mile downriver from the project area and continues to the Green River (M. Trammell, NPS Fisheries Biologist, pers. comm. with G. Molitor, NPS Natural Resource Specialist).

The humpback chub diet consists of insects, plankton, and plants (USFWS 2002a). They are considered mainly bottom feeders but will also feed on insects at the water's surface (USFWS 1984 and references therein).

Principal threats to the humpback chub include stream-flow regulation, habitat modification, predation by nonnative fishes, parasitism, hybridization with other native *Gila* species, and pollution (USFWS 2002). On the Yampa River, channel catfish (*Ictalurus punctatus*) are the main nonnative predator of humpback chub (USFWS 2002a).

Humpback chub critical habitat

A total of 379 miles were designated as critical habitat for the humpback chub along seven reaches of the Colorado River system, representing about 28% of the species' historic range (59 FR 13374). Designated critical habitat occurs in the Upper and Lower Colorado River Basins.

The project area is located in the Upper Colorado River Basin with designated critical habitat approximately 2 miles downstream from the bank-stabilization area (Figure 7).

Designated critical habitat typically occurs within the 100-year floodplain with portions of the floodplain containing the primary constituent elements (PCE) defined for the humpback chub.The PCEs for humpback chub critical habitat are: 1) Water—A Quantity of water of sufficient quality (i.e., temperature, dissolved oxygen, lack of contaminants, nutrients, turbidity, etc.) that is delivered to a specific location in accordance with a hydrologic regime that is required for the particular life stage for each species; 2) Physical Habitat—Areas of the Colorado River system that are inhabited or potentially habitable by fish for use in spawning, nursery, feeding, and rearing, or corridors between these areas. This also includes bottom lands, side channels, secondary channels, oxbows, backwaters, and other areas that when inundated provide spawning, nursery, feeding and rearing habitats, or access to these habitats; and 3) Biological Environment—Food supply, which is a function of nutrient supply, productivity, and availability to each life stage of the species, and predation and competition, which may be out of balance due to introduced nonnative fishes (USFWS 1994).

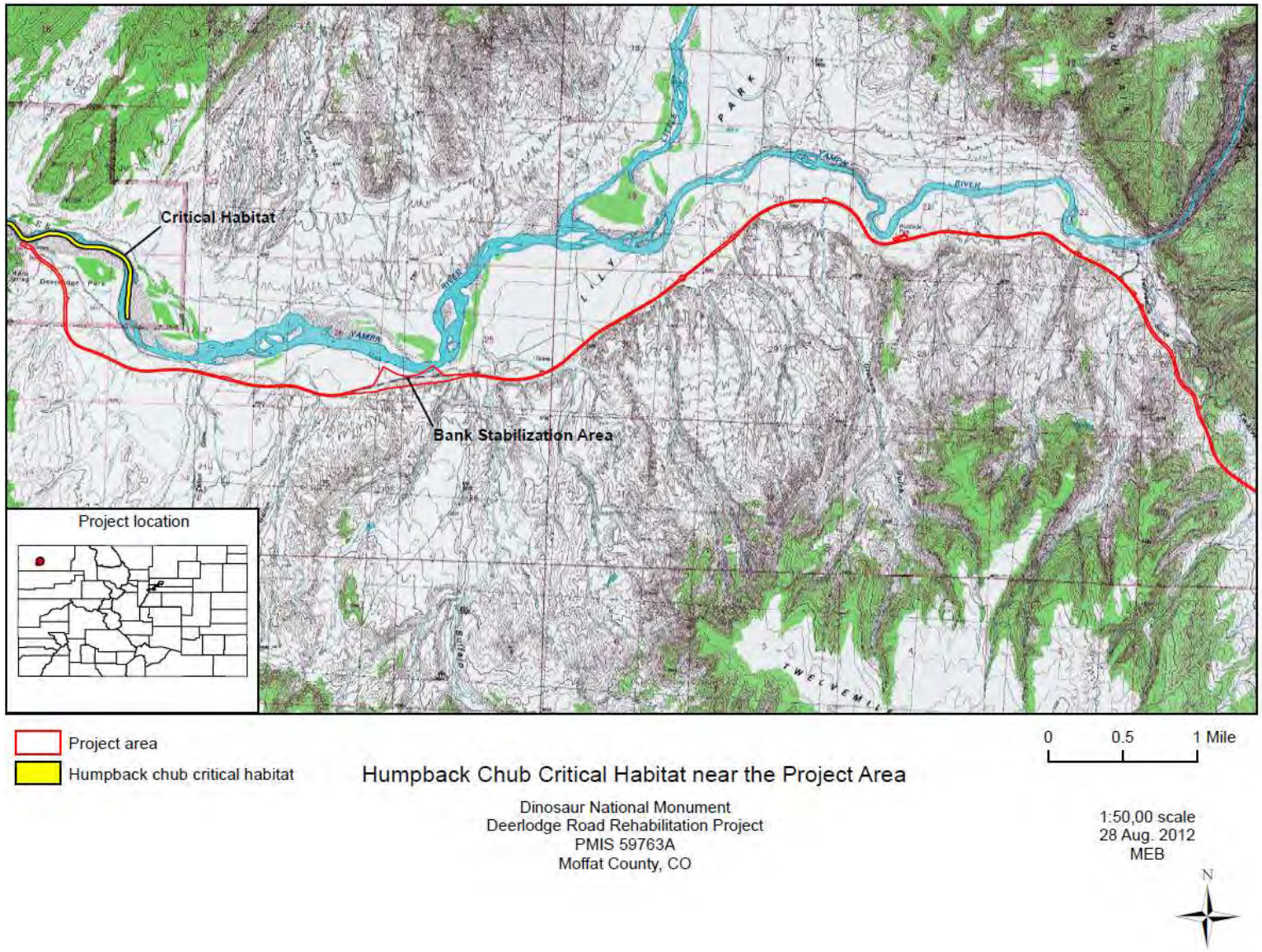


Figure 7. Humpback Chub Designated Critical Habitat Near the Project Area

Bonytail chub—The bonytail chub historically occurred throughout the Colorado River basin. No wild populations are thought to exist (Upper Colorado River Endangered Fish Recovery Program 2012a), making this 22-inch minnow one of the most endangered fishes in the world. Alterations in river flows, decreased water quality, and nonnative fishes all contributed to a serious decline in bonytail numbers by the 1930s (Miller 1961, USFWS 2002b). Thirty-six wild bonytail were captured in the lower Yampa and Green Rivers from 1967–1973 (Holden and Stalnaker 1975); one adult was captured in the lower Yampa River in 1979 (Holden and Crist 1981). The bonytail has been reintroduced in the Colorado, Green, and Yampa Rivers, and in Lake Havasu and Lake Mojave. A diversion structure upstream of the project area near Craig, Colorado, (Craig Diversion) was modified in 1992 to facilitate fish passage (USFWS 2002b). Bonytail raised in hatcheries are released into the Green and upper Colorado Rivers (Upper Colorado River Endangered Fish Recovery Program 2012b). In July 2000, 5,000 fingerling bonytail were stocked in the Green River above Lodore Canyon and 5,000 were stocked in the Yampa River at Echo Park by Colorado Parks and Wildlife. Echo Park is approximately 45 miles downstream of the project area. In March 2001, 13,000 fingerling bonytail were stocked in the Green River (Roehm 2004).

The bonytail is a large-river species that uses pools and eddies (USFWS 1990). Specific habitat preferences in the wild are largely unknown (Upper Colorado River Endangered Fish Recovery Program 2012a). Spawning in the wild is thought to have occurred in Dinosaur National Monument during late June and early July (Vanicek and Kramer 1969). Other estimates suggest that spawning generally occurred in spring and early summer (USFWS 1990). There are no known wild bonytail spawning grounds.

Threats to bonytail reestablishment are streamflow regulation, habitat modification, nonnative fishes, hybridization, and pesticides/pollutants (USFWS 2002b). Nonnative fishes that may impact bonytail include the common carp (*Cyprinus carpio*), channel catfish, flathead catfish (*Pylodictis olivaris*), smallmouth bass (*Micropterus dolomeiui*), largemouth bass (*Micropterus salmoides*), bluegill (*Lepomis macrochirus*), green sunfish (*Lepomis cyanellus*), redear sunfish (*Lepomis microlophus*), red shiner (*Cyprinella lutrensis*), sand shiner (*Notropis stramineus*), fathead minnow (*Pimephales promelas*), walleye (*Stizostedion vitreum*), and northern pike (*Esox lucius*; USFWS 2002b). Northern pike are a particular threat in the lower Yampa River, which includes a portion of the project area (USFWS 2002b). A removal program of northern pike and smallmouth bass is being conducted by the Upper Colorado River Basin Recovery Program in the Yampa River and is ongoing (M. Trammell, NPS fisheries biologist, pers. comm., Valdez et al 2008, Upper Colorado River Endangered Fish Recovery Program 2012b).

Bonytail critical habitat

A total of 312 miles of river has been designated as critical habitat for the bonytail in the Colorado River Basin, representing about 14% of the species' historic range (59 FR 13374). Designated critical habitat begins approximately 2 miles downstream from the Deerlodge Road bank stabilization area (Figure 8).

The PCE for bonytail critical habitat are: 1) Water—A Quantity of water of sufficient quality (i.e., temperature, dissolved oxygen, lack of contaminants, nutrients, turbidity, etc.) that is delivered to a specific location in accordance with a hydrologic regime that is required for the

particular life stage for each species; 2) Physical Habitat—Areas of the Colorado River system that are inhabited or potentially habitable by fish for use in spawning, nursery, feeding, and rearing, or corridors between these areas. This also includes bottom lands, side channels, secondary channels, oxbows, backwaters, and other areas that when inundated provide spawning, nursery, feeding and rearing habitats, or access to these habitats; and 3) Biological Environment—Food supply, which is a function of nutrient supply, productivity, and availability to each life stage of the species, and predation and competition, which may be out of balance due to introduced nonnative fishes (USFWS 1994).

Colorado pikeminnow—The Colorado pikeminnow is endemic to the Colorado River basin (U.S. Bureau of Reclamation 2012). It was historically abundant in the Yampa River from Craig, Colorado downstream to the Green River (U.S. Bureau of Reclamation 2012). It is still found in this section of the Yampa River but only occurs in the upper Colorado River basin in about 25% of its former range (U.S. Bureau of Reclamation 2012). It is known to breed in the Yampa River, and 1,400 adults were associated with spawning sites in the lower 20 miles of the Yampa River in the 1990s (Crowl and Bouwes 1997). Colorado pikeminnow populations have showed a continued decline since 2003, however, sampling in the Yampa River between 2006 and 2008 found the abundance of Colorado pikeminnow adults to be stable, but low (Bestgen et al. 2010). Fish sampling from 2004 to 2007 in the middle Yampa River and tributaries found an increase in the number of Colorado pikeminnow individuals collected each year (16 fish in 2004 to 25 fish in 2006) except for the last year (11 fish in 2007, Upper Colorado River Basin Recovery Implementation Program 2010).

The Colorado pikeminnow is a long-distance migrant that inhabits pools, deep runs, and eddies maintained by high spring flows. These spring flows are important in maintaining spawning habitats, food production, and nursery habitats (Roehm 2004). Spawning habitat, to which the pikeminnows will migrate over 200 miles, consist of gravel and cobble deposits. Spawning occurs in late spring and early summer. The nearest known Colorado pikeminnow spawning area is in the lower Yampa Canyon along the lower 20 miles of the Yampa River, which is approximately 25 miles downstream of the project area (Tyus and McAda 1984). After hatching, larvae drift downstream to backwater nurseries formed by high spring flows and maintained by stable base flows (U.S. Bureau of Reclamation 2012). Adult Colorado pikeminnow feed mainly on fish; young fish feed on insects and plankton (Upper Colorado River Endangered Fish Recovery Program 2012c).

Threats to the Colorado pikeminnow include streamflow regulation, habitat modification, nonnative fishes, and pesticides/pollutants (USFWS 2002c). Multiple species of nonnative fishes have been documented predating on Colorado pikeminnow larvae and yearlings, competing with the pikeminnow for limited resources, or both (USFWS 2002c). Nonnative fish that threaten the Colorado pikeminnow include black bullhead (*Ameiurus melas*), green sunfish, largemouth bass, red shiner, black crappie (*Pomoxis nigromaculatus*), and particularly along the Yampa River, the channel catfish and northern pike (USFWS 2002c). A nonnative fish removal program was conducted on parts of the Yampa River from 2004–2007 (Upper Colorado River Basin Recovery Implementation Program 2010). Northern pike were removed from the middle Yampa River from the upper terminus at Craig (river mile 134.2—South Beach boat launch) to the lower terminus in Lily Park (river mile 50.5—downstream of Cross Mountain Canyon).

Northern pike were removed from the middle Yampa River from the upper terminus at Craig (river mile 134.2—South Beach boat launch) to the lower terminus in Lily Park (river mile 50.5—downstream of Cross Mountain Canyon). Smallmouth bass were removed in the South Beach reach (river miles 134.2–124.0). Lily Park, the closest intensive removal area, is about 1.4 miles upstream from the bank stabilization project area. Smallmouth bass and northern pike have been periodically removed from Yampa Canyon beginning at the Deerlodge boat ramp downstream since 2003 (M. Trammell, NPS fisheries biologist, pers. comm.).

Colorado pikeminnow critical habitat

A total of 1,148 miles were designated as critical habitat along six reaches of the Colorado River system, representing about 29% of the species' historic range (59 FR 13374). Designated critical habitat occurs in the Upper Colorado River Basin in portions of the Colorado, Green, Yampa, White, and San Juan Rivers. The project area is located within the Upper Colorado River Basin and is located within designated critical habitat (Figure 9).

The PCE for Colorado pikeminnow critical habitat are: 1) Water—A Quantity of water of sufficient quality (i.e., temperature, dissolved oxygen, lack of contaminants, nutrients, turbidity, etc.) that is delivered to a specific location in accordance with a hydrologic regime that is required for the particular life stage for each species; 2) Physical Habitat—Areas of the Colorado River system that are inhabited or potentially habitable by fish for use in spawning, nursery, feeding, and rearing, or corridors between these areas. This also includes bottom lands, side channels, secondary channels, oxbows, backwaters, and other areas that when inundated provide spawning, nursery, feeding and rearing habitats, or access to these habitats; and 3) Biological Environment—Food supply, which is a function of nutrient supply, productivity, and availability to each life stage of the species, and predation and competition, which may be out of balance due to introduced nonnative fishes (USFWS 1994).

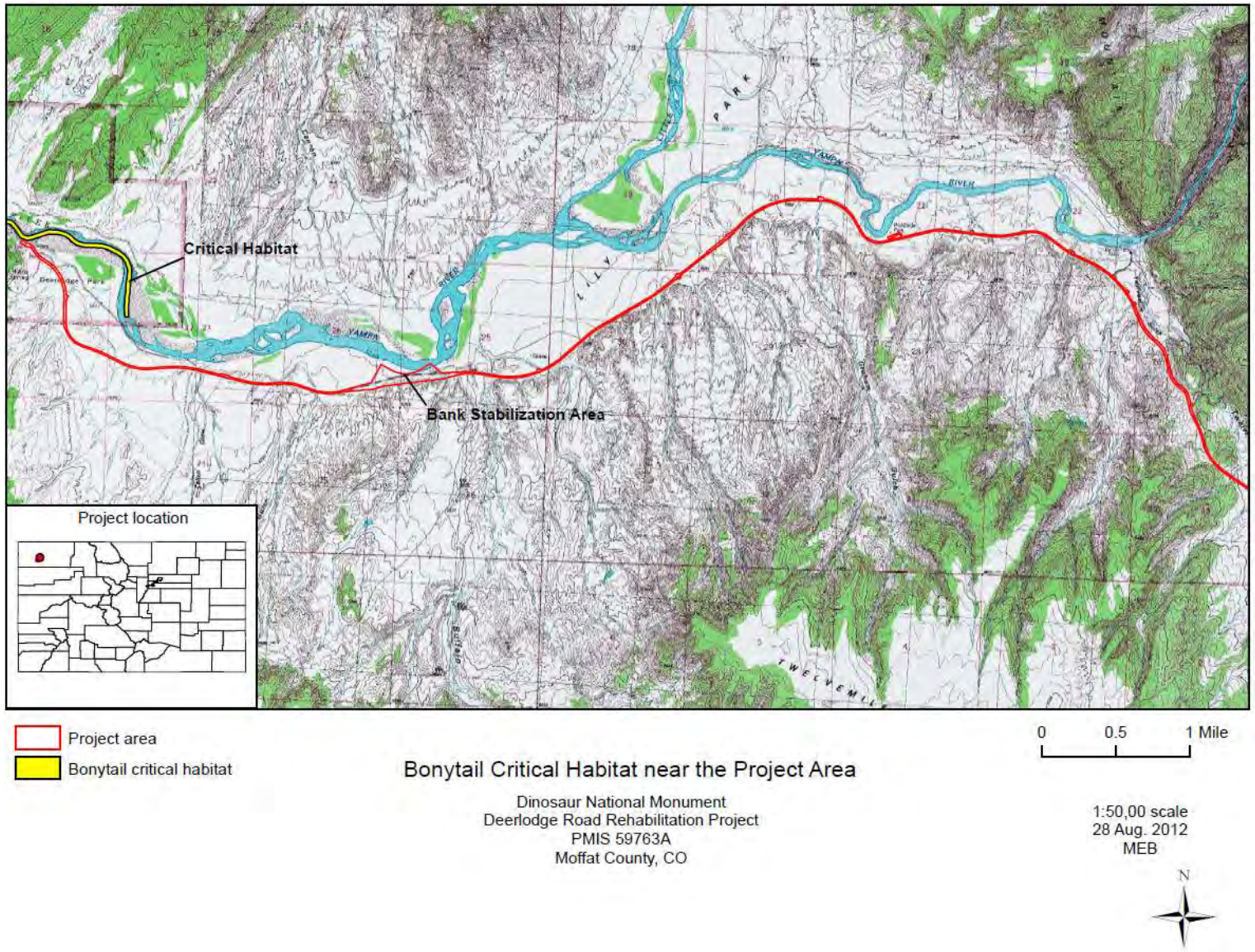


Figure 8. Bonytail Chub Designated Critical Habitat Near the Project Area

Razorback sucker—This fish, placed in the monotypic genus *Xyrauchen*, historically occurred throughout the Colorado River basin from Wyoming to Mexico (USFWS 2002d). Occurring in numerous tributaries of the Colorado River, they were known from the Green and Yampa Rivers (USFWS 1998 and references therein). Numbers began to decline in the 20th century due to nonnative fishes and habitat alteration affecting river flow. In the upper Colorado River basin, the largest concentrations of razorback suckers currently occur in the upper Green River from its confluence with the Duchesne River to the lower four miles of the Yampa River (USFWS 1998). This is thought to be a single, isolated reproductive population (Modde and Irving 1998) that is either stable or slowly declining (Modde et al. 1996). Razorback suckers are being reintroduced into the Colorado, Gunnison, Green, and San Juan rivers, and lakes Havasu and Mohave (Upper Colorado River Endangered Fish Recovery Program 2012c).

Adult razorback sucker habitats vary by season in response to natural flow rates. In spring, preferred habitats include deep runs, eddies, backwaters, and flooded off-channel environments. In summer, runs and pools are preferred, these being often associated with submerged sandbars in shallow water. Winter preferences include low-velocity runs, pools, and eddies (Roehm 2004). The razorback sucker also occurs in reservoirs and oxbow lakes (USFWS 1998). Juvenile habitat requirements are not well understood because young are rarely encountered (Tyus 1987).

Spawning in rivers occurs over cobble, gravel, and sand substrates during spring runoff. Spawning in reservoirs occurs over rocky shoals and shorelines. Young razorback sucker nursery requirements include quiet, warm, shallow water, backwaters, inundated floodplains, and coves or shorelines in reservoirs (Roehm 2004). Spawning migrations may exceed 100 km (Tyus 1987, Tyus and Karp 1990). Adult fish consume insects, plants, and plankton (Upper Colorado River Endangered Fish Recovery Program 2012). Two documented spawning areas are the Green River near Jenson, Utah, and the mouth of the Yampa River (Tyus and Karp 1990). The nearest known razorback sucker spawning ground is located approximately 45 miles downstream of the project area at the mouth of the Yampa River (Tyus and Karp 1990).

The primary threats to the razorback sucker are streamflow regulation, habitat modification, predation by nonnative fishes, and pesticides/pollutants (USFWS 2002d). Restricted streamflow does not allow for the creation or maintenance of the required habitat structures. Nonnative fishes that are known to predate or compete with the razorback sucker include the common carp, channel catfish, smallmouth bass, largemouth bass, bluegill, green sunfish, flathead catfish, redear sunfish, red shiner, sand shiner, fathead minnow, walleye, and northern pike (USFWS 2002d).

Razorback sucker critical habitat

A total of 1,724 miles were designated as critical habitat along 15 reaches of the Colorado River system, representing about 49% of the species' historic range (59 FR 13374). Designated critical habitat occurs in the Upper and Lower Colorado River Basins. The project area is located within the Upper Colorado River Basin and is located within designated critical habitat (Figure 10).

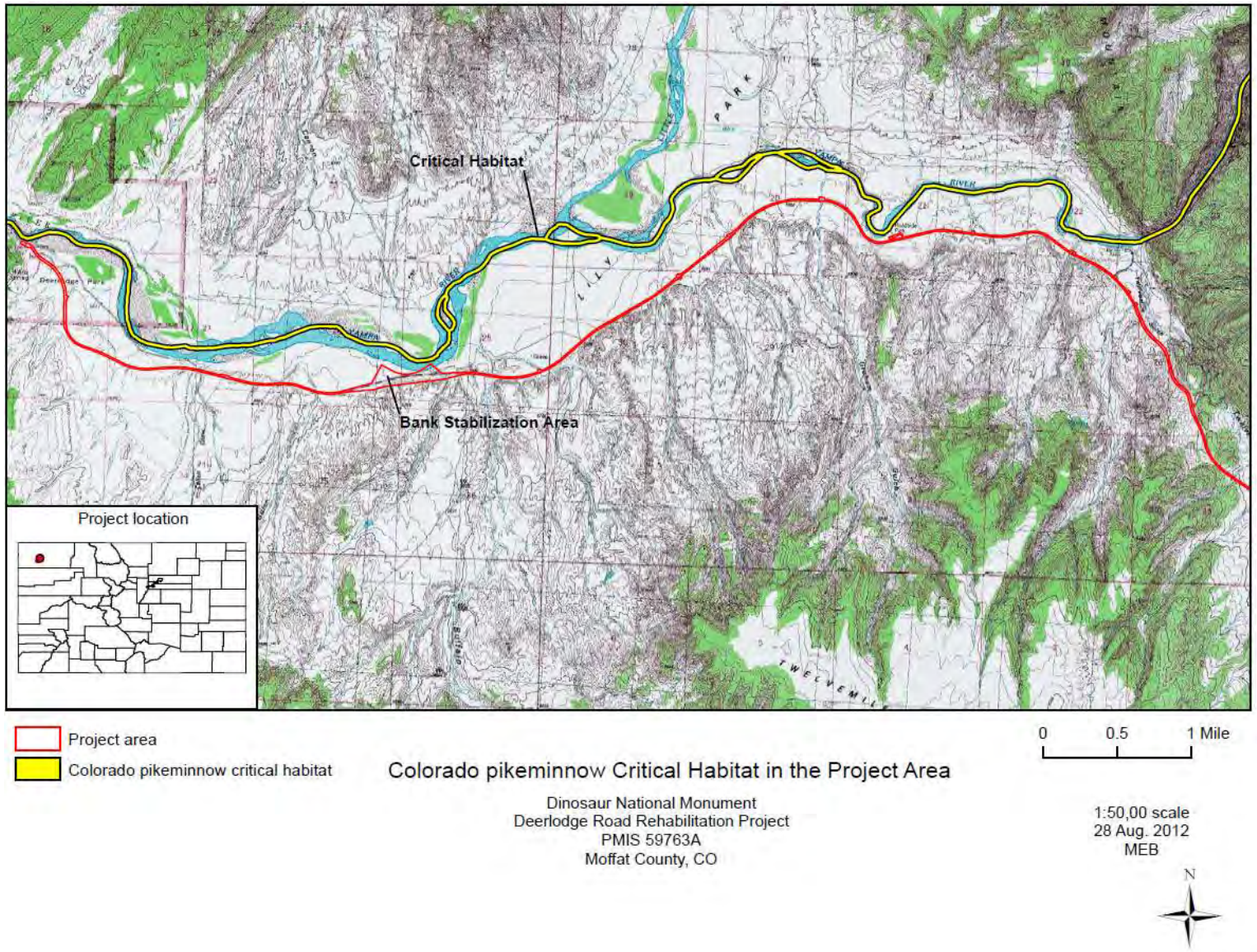


Figure 9. Colorado Pikeminnow Designated Critical Habitat in the Project Area

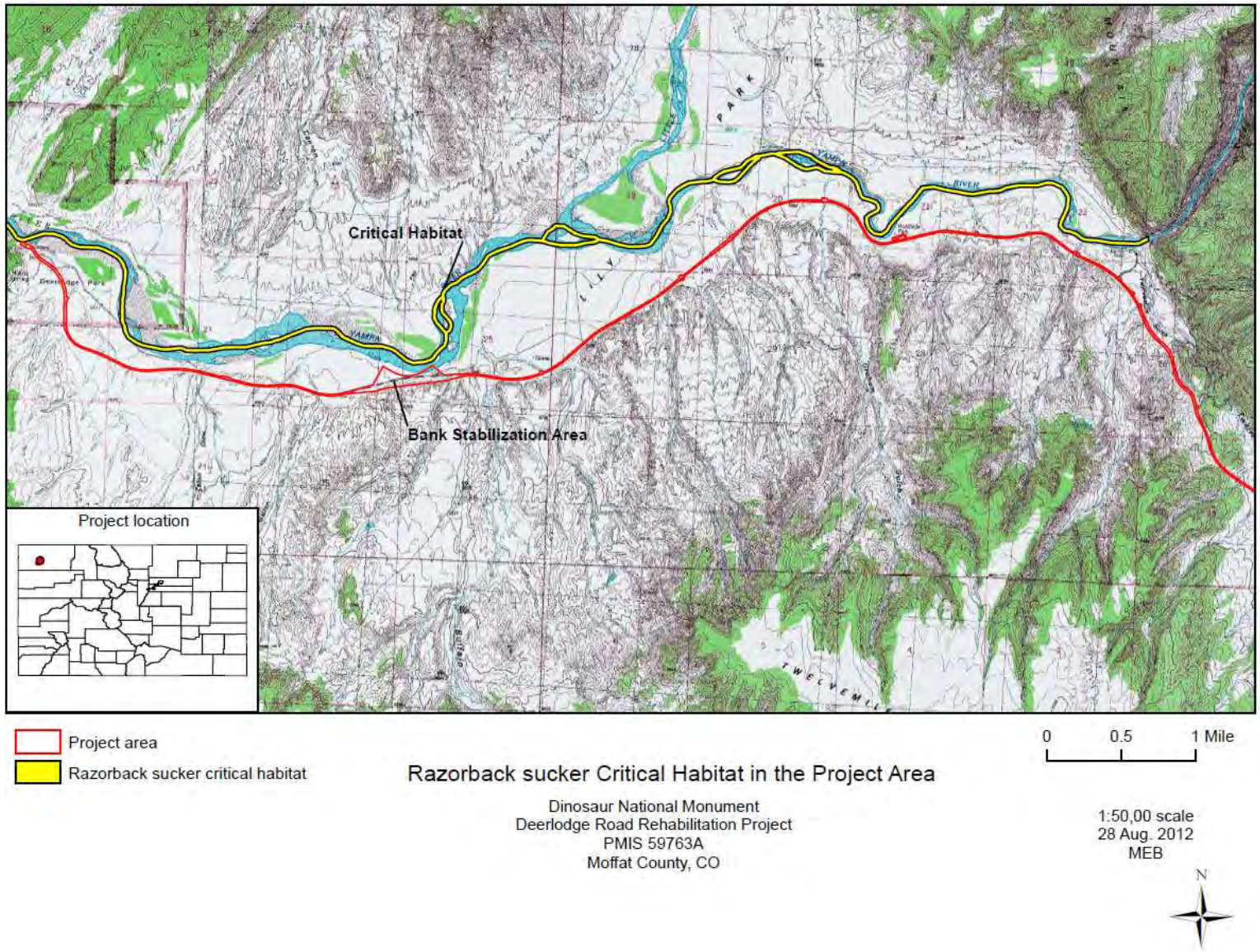


Figure 10. Razorback Sucker Designated Critical Habitat in the Project Area

The PCE for razorback sucker critical habitat are: 1) Water—A Quantity of water of sufficient quality (i.e., temperature, dissolved oxygen, lack of contaminants, nutrients, turbidity, etc.) that is delivered to a specific location in accordance with a hydrologic regime that is required for the particular life stage for each species; 2) Physical Habitat—Areas of the Colorado River system that are inhabited or potentially habitable by fish for use in spawning, nursery, feeding, and rearing, or corridors between these areas. This also includes bottom lands, side channels, secondary channels, oxbows, backwaters, and other areas that when inundated provide spawning, nursery, feeding and rearing habitats, or access to these habitats; and 3) Biological Environment—Food supply, which is a function of nutrient supply, productivity, and availability to each life stage of the species, and predation and competition, which may be out of balance due to introduced nonnative fishes (USFWS 1994, USFWS 1998). Special consideration was given to habitats required for reproduction and recruitment in the establishment of razorback sucker critical habitat because of the lack of recruitment for this species (USFWS 1994).

Adult razorback sucker are known to occur within the project area; the young of this species is not known to occur in the project area (M. Trammell, NPS Fisheries Biologist, pers. comm. with M. Brooks, EMI wildlife biologist).

Colorado State-listed Species

There are 21 Colorado state-listed species with potential to occur in Moffat County (Table 9). Five of these species are discussed in the biological assessment associated with this document. Four of the five are federally protected under the Endangered Species Act; the bald eagle is protected under the Migratory Bird Treaty and the Bald and Golden Eagle Protection Act.

Table 9. Colorado state-listed species with potential to occur in Moffat County, Colorado.
Table continued on the following page.

Common name	Scientific name	Status
Birds		
Western burrowing owl	*Athene cunicularia*	State Threatened*
Ferruginous hawk	*Buteo regalis*	State Special Concern*
Greater sage-grouse	*Centrocercus urophasianus*	State Special Concern
Mountain plover	*Charadrius montanus*	State Special Concern*
Southwestern willow flycatcher	*Empidonax traillii extimus*	State Endangered*
Peregrine falcon	*Falco peregrinus*	State Special Concern*
Whooping crane	*Grus americana*	State Endangered*
Greater sandhill crane	*Grus canadensis tabida*	State Special Concern*
Bald eagle	*Haliaeetus leucocephalus*	State Threatened*
Long-billed curlew	*Numenius americanus*	State Special Concern*
Plains sharp-tailed grouse	*Tympanuchus phasianellus jamesii*	State Endangered
Mammals		
Wolverine	*Gulo gulo*	State Endangered
Northern river otter	*Lutra canadensis*	State Threatened
Lynx	*Lynx canadensis*	State Endangered
Black-footed ferret	*Mustela nigripes*	State Endangered
Townsend's big-eared bat	*Plecotus townsendii*	State Special Concern

Common name	Scientific name	Status
Northern pocket gopher	*Thomomys talpoides*	State Special Concern
Kit fox	*Vulpes macrotis*	State Endangered
Reptiles and Amphibians		
Boreal toad	*Anaxyrus boreas boreas*	State Endangered
Midget faded rattlesnake	*Crotalus viridis concolor*	State Special Concern
Northern leopard frog	*Lithobates pipiens*	State Special Concern

*Protected under the Migratory Bird Treaty Act

Of the species not addressed in the biological assessment, nine species from Table 9 could potentially occur in the project area. These species and potential impacts from the proposed action are discussed below.

Plains sharp-tailed grouse—This species occurs in non-conifer shrublands. They also make use of riparian areas, especially during fall and winter (Colorado Parks and Wildlife 2012). Hence, this species could occur in the project area. It is unlikely, however, that this species would lek adjacent to the road or in the narrow confine between the bank-stabilization area and road. Leks are typically located in wet meadows, burned areas, ridges, and knolls (Colorado Parks and Wildlife 2012b). The proposed roadside and riverside project would not alter local grouse habitat.

Northern river otter—This species occurs mainly in the Colorado, Gunnison, Piedra, and Dolores Rivers in Colorado. This species is uncommon in Moffat County. Otters could potentially occur in the Yampa River along the project area. Disruption of otter dens could occur within the bank-stabilization portion of the project. However, the bank where riprap would be placed erodes yearly from river flow and spring runoff. Otter dens located along this section of bank may be unstable. The bank-stabilization portion of the project would occur outside the otter's breeding season.

Townsend's big-eared bat—This species occurs in a variety of habitats and could potentially use the project area for foraging (Western Bat Working Group 2005). It roosts and breeds in caves and abandoned mines (New Mexico Energy, Minerals and Natural Resources Department: Mining and Minerals Division 2012). The proposed action would not impact nocturnal foraging bats.

Northern pocket gopher—This species occurs in a variety of habitats and is considered common in Moffat County (Colorado Parks and Wildlife 2012b). Roadside construction and any disturbance of unpaved soils could impact individual gophers. Impacts, however, would be restricted to the individual level and would not impact the local population.

Boreal toad—This species occurs in spruce-fir forests and alpine meadows, which are suitable for breeding (Colorado Parks and Wildlife 2013). It is unlikely to occur and breed in the proposed project area due to lack of suitable habitat.

Midget faded rattlesnake—This species occurs on rocky outcrops in sagebrush habitat. It could occur throughout the project area. The installation of riprap would not likely impact this species more than regular traffic would impact it.

Northern leopard frog—This locally common species occurs in wet meadows, banks and shallows of marshes, ponds, glacial kettle ponds, beaver ponds, lakes, reservoirs, streams, and irrigation ditches. Occurrence in rivers and large streams is restricted because of fish predation of frogs, tadpoles, and eggs. It is unlikely to occur in the project area.

Bald eagle—In Colorado, the bald eagle wintering population is uncommon to locally common in the western valleys, mountain parks and eastern plains associated with rivers and reservoirs (Andrews and Righter 1992). Bald Eagles have been documented using cottonwood trees for winter roosting along the lower Yampa River. There are some suitable trees for bald eagle nesting and winter roosting adjacent to portions of the project area. No known nests have been documented along Lily or Deerlodge Road areas (B. Holmes, CO Parks and Wildlife Terrestrial Biologist, pers. comm. with M. Brooks, EMI wildlife biologist). No cottonwood trees would be removed. Potential impacts would be limited to disturbance of nesting eagles from construction noise and human presence. The road, however, is used by people and their vehicles, and it is unlikely a bald eagle would nest close to the road.

Peregrine falcon—A known eerie occurs in Cross Mountain Canyon adjacent to the Cross Mountain parking area, which is outside the project area. Potential impacts would be limited to disturbance of nesting peregrines from construction noise. However, the temporary disturbance from road improvements would not likely affect this species more than regular traffic using Deerlodge Road.

Impact Intensity Threshold

Predictions about impacts were based on the expected disturbance to special status species and using available spatial data and literature. The thresholds for change for intensity of impacts on special status species are defined in Table 10.

Table 10. Special Status Species Impact and Intensity. Table continued on the next page.

Impact Intensity	Intensity Description
Negligible	Adverse: No individuals of a special-status species would be affected but a very localized area of their habitats could be affected; the change would be so small that it would not be of any measurable or perceptible consequence to the protected individual or its population. Negligible effect would equate with a "no effect" determination in U.S. U.S. Fish and Wildlife Service terms. Beneficial: The action would slightly improve the condition, abundance, or distribution of individual special status species and/or their habitats in the project area.
Minor	Adverse: The action would affect a few individuals of special status species or localized areas of their respective habitats would be affected, but the species' population would not be affected. Mitigation to offset adverse effects, including special measures to avoid affecting special status species, would be required and would be effective. Mitigation may be needed to offset adverse effects, would be relatively simple to implement, and would likely be successful. Minor effect would equate with a "may affect, not likely to adversely affect" determination for the species in U.S. U.S. Fish and Wildlife Service terms and

Impact Intensity	Intensity Description
	would require informal consultation. Beneficial: The action would noticeably improve the condition, abundance, or distribution of individual special status species and/or their habitat in the project area.
Moderate	Adverse: An individual or population of a listed species, or its critical habitat, would be noticeably affected with a vital consequence to the individual, population, or habitat. Permanent impacts would occur to special status species, but in a relatively small area. Mitigation measures would be necessary to offset adverse effects and would likely be successful. Major effect would equate with a "may affect, likely to adversely affect" or "not likely to adversely affect" determination in U.S. U.S. Fish and Wildlife Service terms and would require formal consultation. Beneficial: The action would substantially improve the condition, abundance, or distribution of individual special status species and/or their habitat in the project area.
Major	Adverse: An individual or population of a listed species, or its critical habitat, would be noticeably affected with a vital consequence to the individual, population, or habitat. The action would affect a relatively large area within the park. Extensive mitigation measures to offset the adverse effects would be required; success of the mitigation measures would not be guaranteed. Beneficial: The action would extensively improve the condition, abundance, or distribution of individual special status species and/or their habitat in the project area.

Short-term impact—recovers in less than one year
Long-term impact—takes more than one year to recover or effects would be permanent

Environmental Consequences

No-action alternative

Direct and Indirect Impacts. There would be no impacts to special-status species under a no-action alternative. No road rehabilitation or bank stabilization related activities would occur. No fish, natural habitats, or listed critical habitats would be impacted.

Thus, the no-action alternative would have "*no effect*" on the humpback chub, bonytail chub, Colorado pikeminnow, and razorback sucker or their designated critical habitat.

Cumulative Impacts. The no-action alternative would have no cumulative impacts because no bank stabilization related activities would occur.

Conclusion. There would be no impacts to special-status species under a no-action alternative. Only the fishes have suitable habitat in the project area. The no-action alternative would have no impact on fish habitat, water quality, or invasive fish species.

Preferred Alternative—Rehabilitate Road

Direct and Indirect Impacts. The preferred alternative would result in local, indirect, long-term, adverse, moderate impacts that could affect a portion of the lower Yampa River. Installation of the 1,500 feet of exposed riprap with a launchable toe would not require in-stream work and thus would avoid the potential for incidental takes of fish. However, fish could be temporarily displaced during construction of the exposed rock riprap due to the physical disturbance of the riverside and the noise. The temporary displacement would be local and is

unlikely to restrict or limit fish access to the water or physical habitat, primary constituent elements of the critical habitats. In addition, adult fish would likely avoid the project area due to noise disturbance during construction and no young of the endangered fish are known to occur within the project area (M. Trammell, NPS Fisheries Biologist, pers. comm. with G. Molitor, NPS Natural Resource Specialist). Furthermore, only two large juveniles or adult endangered fishes of any species have been captured in the bank-stabilization area during surveys—one pikeminnow in 1999 and one pikeminnow in 2000 (M. Trammell, NPS Fisheries Biologist, pers. comm. with G. Molitor, NPS Natural Resource Specialist). No young have been captured in the project area during intensive sampling efforts conducted during nonnative removal projects (M. Trammell pers. comm., Valdez et al 2008, Upper Colorado River Endangered Fish Recovery Program 2012b).

Potential impacts to all breeding fishes and/or their spawning grounds except for the Colorado pikeminnow would be avoided by conducting construction in the fall outside the spawning season. Bank stabilization work would begin sometime between August 15 and September 30 and would be completed by winter. This timeframe does go into the July 1–September 30 Colorado pikeminnow spawning period as recognized by the USFWS (Patty Gelatt, USFWS fisheries biologist, pers. comm.). Disturbance from the proposed action would not disrupt pikeminnow spawning because the approximate 25-mile distance between the project area and the nearest spawning grounds would be an adequate buffer between spawning and construction activities.

The installation of 1,500 feet of exposed riprap could create habitat for the invasive smallmouth bass, which predate on the larvae of the endangered fishes (Johnson et al. 2008), because it simulates boulder habitats used by this fish (M. Trammell, fisheries biologist, National Park Service, pers. comm., Munther 1970, Todd and Rabeni 1989, Sammons and Bettoli 1999). The design of the launchable toe would minimize colonization of smallmouth bass in the bank stabilization area. The launchable toe design would allow smaller rock to fill the voids of the larger rock and sediment would fill back over the launched material as it slowly launches to scour depths. This would fill in the gaps within and between the riprap and underlying soil, thus minimizing creation of smallmouth bass habitat in the bank stabilization area. Furthermore, the nonnative fish-removal program efforts to remove smallmouth bass from the project area would continue (M. Trammell pers. comm., Valdez et al 2008, Upper Colorado River Endangered Fish Recovery Program 2012b)).

BMPs and seasonal time constraints on construction activities in the Yampa River would limit construction-induced direct and indirect negative impacts to fishes and water quality. Erosion-control measures would limit sediment runoff into the river channel, and the replacement of eroding culverts would reduce current sediment runoff in these areas. For all fish species, sedimentation from construction should not be an issue because this section of the river is highly turbid (M. Trammell, NPS Fisheries Biologist, pers. comm. with M. Brooks, EMI wildlife biologist).

Critical habitat

Impacts to water quality and the biological environment PCEs would be avoided. Impacts from sedimentation and chemical contamination would be avoided. Specific construction procedures

and BMPs listed in Table 2 would be followed to prevent further contamination and erosion impacts to the Yampa River. Sedimentation from construction should not be an issue because this section of the river is highly turbid (M. Trammell, NPS Fisheries Biologist, pers. comm. with M. Brooks, EMI wildlife biologist). Erosion-control measures would limit sediment runoff into the river channel, and the replacement of eroding culverts would reduce current sediment runoff in problem areas.

Impacts to the biological environment, creation of smallmouth bass habitat, would be minimized by the launchable toe design. The launchable toe design would allow smaller rock to fill the voids of the larger rock and sediment would fill back over the launched material as it slowly launches to scour depths. This would fill in the gaps within and between the riprap and underlying soil, thus minimizing creation of smallmouth bass habitat in the bank stabilization area.

The bank-stabilization project would temporarily disturb physical habitat of the Colorado pikeminnow and razorback sucker by increased noise and the construction activities. The proposed action would result in the permanent stabilization of approximately 1,500 feet of the Yampa River bank. Hard stabilization and the loss of energy dissipation associated with natural bank erosion could affect local or downstream river hydrology such as the creation of point bars or natural sediment loads. These effects may be dispersed over a large area or localized. It is unlikely, however, that the stabilization of a single bend in the river would alter the overall hydrology or physical habitat in any way that would significantly impact the river's functions in terms of providing habitats for spawning, nursery, feeding, rearing, and corridors between these areas.

The preferred alternative would have "*a may affect, but not likely to adversely affect*" on the humpback chub, bonytail chub, Colorado pikeminnow, and razorback sucker and/or their designated critical habitat.

Cumulative Impacts. Reasonably foreseeable future actions could include the need for implementation of a smallmouth bass removal program along the lower Yampa River to offset the effects of increased potential smallmouth bass habitat and possible increases in the smallmouth bass population due to exposed riprap installation. The preferred alternative in combination with the past, present, and reasonably foreseeable future actions would result in local, minor to moderate, adverse and beneficial impacts.

Conclusion. The proposed action preferred alternative would result in indirect, long-term, adverse moderate impacts. The installation of exposed riprap could create approximately 1,500 feet of smallmouth bass habitat within and two miles above critical habitat for the four endangered fish species. This habitat could augment the local invasive smallmouth bass population and potentially impact a substantial area of the lower Yampa River. This additional habitat may require implementation of a smallmouth bass removal program along the lower Yampa River to offset the effects of a potential increase in the smallmouth bass population.

Water Resources and Floodplains

Affected Environment

The hydrology in the project area is dominated by the lower Yampa River (Hydrologic Unit Code 14050002), which is a tributary to the Green River. Named ephemeral washes that traverse the project area include Calico Draw, Bay Gulch, Buffalo Gulch, Graham Gulch, and Twelvemile Gulch. Numerous small, unnamed channels pass under Deerlodge Road via culverts. Deerlodge Road crosses approximately 93 culverts within the rehabilitation project limits. Ten culverts were identified as having severe erosion at the downstream end of the culvert and would require erosion protection measures to prevent head cutting. The Yampa River is not listed as a Colorado 303 (d) impaired stream. 303(d) impaired streams are streams that are too polluted or degraded to meet water quality standards set by the state.

This section of the Yampa River appears to transport significant amounts of sediment with sediment deposition occurring on a sand bar north of the project area (FHWA 2011). The sediment load tends to push the river southward toward the bank adjacent to Deerlodge Road and the higher velocities are causing erosion along the bank, providing a new sediment source to be transported downstream (FHWA 2011). This is the natural process for the river.

The hydraulics of the Yampa River within the project area were analyzed using the Hydrologic Engineering Center-River Analysis System (HEC-RAS) software developed by the US Army Corps of Engineers. Eleven cross sections of the Yampa River within the project area (Figure 11) were used for the HEC-RAS modeling. Results of the HEC-RAS modeling are presented in Table 11. The depth and high velocity for the peak flow of 33,000 cubic feet per second (cfs) were used to determine the riprap size and depth of scour needed along the bank of the Yampa River near milepost 9.5 (FHWA 2012b).

The federal emergency management agency has not mapped or classified the flood hazard zones in the project area. The majority of river-side habitat where the project area approaches the river (e.g., Cross Mountain parking area, milepost 9.5) is upland habitat and probably outside of the 100-year floodplain. Areas where the project area may overlap the 100-year floodplain include the Disappointment Draw and Needle parking areas (Appendix C, Floodplain Statement of Findings). These types of facilities are exempt from Director's Order #77-2. The order states that projects involving "picnic facilities, scenic overlooks, foot trails, and small associated daytime parking facilities in non-high hazard areas provided that the impacts of these facilities on floodplain values are minimized" are exempt (NPS 2012b). Impact to the floodplain would be limited to the installation of 1,500 feet of riprap along the southern riverbank of the Yampa River. See Appendix C, Floodplain Statement of Findings, for more detailed information. A Floodplain Statement of Findings analyzes the potential impacts the proposed action would have on the values and functions of the 100-year floodplain and provides mitigation measures to avoid or minimize potential impacts.

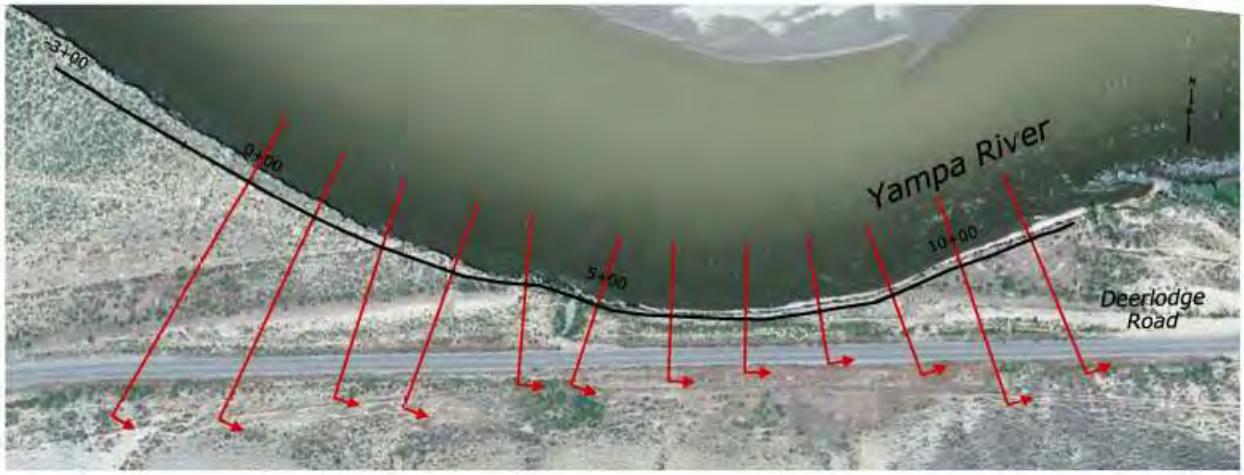


Figure 11. HEC-RAS Cross Sections along MP 9.5.

Table 11. HEC-RAS model output for Yampa River site conditions within the project area

River Station	Velocity (ft/sec) 2,800 cfs	Velocity (ft/sec) 33,800 cfs	Maximum Channel Depth (ft) 2,800 cfs	Maximum Channel Depth (ft) 33,000 cfs
100	4.33	10.82	3.61	8.49
200	3.58	10.01	4.18	9.50
300	4.41	10.24	3.93	9.44
400	2.67	8.33	5.65	11.78
500	4.44	9.27	3.52	9.78
600	2.82	7.96	4.31	10.85
700	4.91	8.95	2.88	9.43
800	5.46	10.31	2.88	8.55
900	3.59	9.71	4.31	10.00
1000	2.16	7.64	4.93	11.36
1100	1.71	6.69	6.53	13.35

Data Source: FHWA Preliminary Hydraulics Recommendations Report.

Impact Intensity Threshold

Available information on hydrology and water quality in the project area was compiled. The thresholds for change for intensity of impacts on water resources are defined in Table 12.

Table 12. Water Resources and Floodplains Impact and Intensity. Table continued on following page.

Impact Intensity	Intensity Description
Negligible	Adverse: Neither water quality nor hydrology would be affected, nor would the changes be either non-detectable or if detected, would have effects that would be considered slight and non-measurable. Beneficial: The action would slightly improve water quality and natural hydrologic flow or patterns, or would reduce features that impede water quality or natural surface water flow or patterns in the project area.
Minor	Adverse: The action would change hydrology or water quality, but the change would be small, localized, and of little consequence. Beneficial: The action would noticeably improve water quality and natural hydrologic flow or patterns, or would reduce features that impede water quality or natural surface water flow or patterns in the project area.
Moderate	Adverse: The action would change hydrology or water quality; the change would be measurable and of consequence. Beneficial: The action would substantially improve water quality and natural hydrologic flow or patterns, or would reduce features that impede water quality or natural surface water flow or patterns in the project area.
Major	Adverse: The action would noticeably change hydrology or water quality; the change would be measurable and result in a severely adverse or major beneficial impact with regional consequences. Beneficial: The action would exceptionally improve water quality and natural hydrologic flow or patterns, or would reduce features that impede water quality or natural surface water flow or patterns in the project area.

Short-term impact—following project completion, recovers in less than one year
Long-term impact—following project completion, takes more than one year to recover

Environmental Consequences

No-action alternative

Direct and Indirect Impacts. Under the no-action alternative, no new disturbances would occur that would impact water resources. Impacts to water resources under the no-action alternative would be indirect, local, negligible, adverse, and long-term. Negligible to minor impacts would occur due to the continued local erosion around the ten culverts traversing Deerlodge Road. Head cutting is occurring at these areas, which causes incising of the water channel and increased sediment loads. The increased sediment load could potentially lead to erosion and soil transport into the Yampa River. However, the lower Yampa River is naturally turbid, so the additional sediment load from culvert erosion would be difficult to measure except perhaps at the source. There would be no impacts to floodplains beyond areas with eroding culverts under the no-action alternative.

Cumulative Impacts. Original construction of the road has modified the natural drainage patterns of ephemeral washes and seeps. Road drainage structures currently route runoff, snowmelt, and seep discharges to natural drainages via ditches, inlets, and culverts. The existing asphalt road adds impervious surface, which increases runoff during precipitation events. If continued local erosion around culverts is not addressed the problem could worsen over time, requiring more intensive recovery efforts in the future. The cumulative effects to water quality from the no-action alternative in combination with past, present, and reasonably foreseeable future actions would be local, long-term, minor, and adverse, with a negligible adverse contribution from the no-action alternative.

Conclusion. A no-action alternative would allow continued human-caused sediment deposition in the Yampa River. Impacts would be indirect, local, negligible, adverse, and long-term because eroding areas are ephemeral and storm fed and the river is naturally turbid suggests high sediment loads are a natural occurrence. The cumulative effects to water quality from the no-action alternative in combination with past, present, and reasonably foreseeable future actions would be local, long-term, minor, and adverse, with a negligible adverse contribution from the no-action alternative.

Preferred Alternative—Rehabilitate Road

Direct and Indirect Impacts. Proposed road rehabilitation involving excavating, grading, and exposing soil material would increase the potential for erosion until vegetation is established, paving is completed, drainage work is installed, and other stabilization work is finished. The transport of sediment to Yampa River or other ephemeral drainages is possible during construction, although soil- and erosion-control BMPs would be used to contain and control erosion. No measurable effects on water quality would occur because of the use of BMPs and because any sediment contributions would be very minor in relation to the supply of sediment and erosion naturally occurring in this watershed. Local, short-term, minor, adverse effects on hydrology and water quality are possible during construction, but the replacement of culverts in eroding areas would result in local, long-term beneficial, negligible impacts by reducing sediment runoff and ephemeral water channel erosion.

The placement of riprap along the south bank of the Yampa River at milepost 9.5 would result in local, long-term, minor, adverse impacts to natural river channel migration. The placement of riprap along approximately 1,500 feet of riverbank would stabilize the bank but would limit lateral migration of the channel and natural changes to the shape of the river bend. Riprap installation would alter the high-flow energy dispersal by hardening one side of the channel, leading to water being displaced and deflected along another portion of the stream. This could cause increased erosion on the opposite side of the stream or farther downstream. However, the placement of riprap would have little impact on the overall water quality of the river, which is naturally turbid. Impacts to floodplains resulting from riprap installation would be local, long-term, negligible, and adverse. The installation of riprap would not alter the function or value of the floodplain, nor would it significantly reduce the amount of floodable land. Construction at the Disappointment Draw and Needle parking areas would occur within existing parking areas. The total area of impervious surface in these lots would be reduced, and previously paved areas would be revegetated.

BMPs would be used to limit impacts to the river and floodplains during construction. These would include but are not limited to: sediment retention and erosion control, chemical spill prevention and response plan, and limitations to in-stream work.

Cumulative Impacts. Past, present, and reasonably foreseeable actions that have impacted water resources and floodplains include the original construction of the road, realignment and bank stabilization of the Deerlodge Road section near milepost 9.5, and routine road maintenance, repairs, and overlays. These activities have affected water and floodplain resources through erosion and altering natural drainage patterns of seeps and ephemeral washes. The preferred alternative would repair Deerlodge Road and its culverts and limit the need for road and culvert repair in the immediate future. The stabilization of the riverbank would protect the road from river encroachment thus limiting the need for future road repair and/or bank-stabilization projects. As described above, implementation of the preferred alternative would result in both short-term minor adverse impacts and long-term minor beneficial impacts to hydrology and water quality. The impacts of the preferred alternative in combination with past, present, and reasonably foreseeable future actions would result in local long-term, minor, adverse cumulative effects with beneficial effects from the preferred alternative.

Conclusion. The preferred alternative would result in various impacts. The replacement of problem culverts would result in indirect, local, long-term beneficial negligible impacts by reducing sediment runoff and ephemeral water channel erosion. The placement of riprap along the bank of the Yampa River would result in local, long-term, minor, adverse impacts to the river channel and its natural lateral migration. Impacts to floodplains resulting from riprap installation would be local, long-term, negligible, and adverse because it would not alter the function or value of the floodplain, nor would it significantly reduce the amount of floodable land. The overall water quality of the area would have negligible impacts because of the use of BMPs and the naturally turbid river water.

Wetland Resources

Affected Environment

The Cowardin et al. (1979) wetland and deepwater classification system was used to classify all wetland types in the project area. Wetlands were classified with this system regardless if they were U.S. Army Corps of Engineers jurisdictional wetlands. For example, an exposed rocky riverbed may not be a wetland because of lack of hydric soils, but could be classified as a wetland by the Cowardin system. Such an area would still be a jurisdictional water of the U.S., but not a jurisdictional wetland. This system is not intended to be used in purely aquatic habitats (Cowardin et al. 1979).

The Yampa River section within the project area is not a jurisdictional wetland because of lack of hydric soils, but is classified as a Riverine–Upper Perennial–Unconsolidated Bottom wetland based on the Cowardin system. This type of wetland is characterized as having a high gradient and fast water velocity with rock, cobbles, or gravel with occasional patches of sand as substrate and less than 30% vegetation cover. The Yampa River section includes a willow stand (*Salix* spp.) in the eastern corner; there was no hydrophytic vegetation below the ordinary high water

mark along the steep riverbank that is comprised of an abrupt cliff. See Appendix D, Wetland Statement of Findings for more detailed information.

Impact Intensity Threshold

Wetland Resources are present within the project area along the Deerlodge Road section near milepost 9.5. The thresholds for change for intensity of impacts on wetlands are defined in Table 13.

Table 13. Wetland Resources Impact and Intensity.

Impact Intensity	Intensity Description
Negligible	Wetland resources would not be affected or the impacts on the resources would be below or at the lower levels of detection.
Minor	The impacts on wetland resources would be detectable and relatively small in terms of area and the nature of change. The action would affect a limited number of individual plant or wildlife species within the wetlands.
Moderate	The impacts on wetland resources would be readily apparent over a relatively small area, but the impact could be mitigated by restoring previously degraded wetlands. The action would have a measurable impact on plant or wildlife species within the wetlands, but all species would remain indefinitely viable.
Major	The impacts on wetland resources would be readily apparent over a relatively large area. The action would have measurable consequences for the wetland area that could not be mitigated. Wetland species dynamics would be upset, and plant and/or animal species would be at risk of extirpation from the area.

Short-term impact—following project completion, recovers in less than three years
Long-term impact—following project completion, takes more than three years to recover

Environmental Consequences

No-action alternative

Direct and Indirect Impacts

Under the no-action alternative, the existing riverine wetland would not be impacted. Negligible to minor impacts would occur due to the continued deterioration of the road pavement (e.g., pavement edges, surface cracks, rutting, and buckling), local erosion around the culverts traversing Deerlodge Road, and bank erosion around milepost 9.5 No bank stabilization measures around milepost 9.5 would occur, thus soils would remain at risk for slumping, erosion, and being carried downstream. The increased sediment load could potentially lead to a slight decrease in wetland functions and values over time. Impacts to wetland resources under the no-action alternative would be indirect, local, negligible, adverse, and long-term.

Cumulative Impacts

Past, present, and reasonably foreseeable future actions have and continue to contribute to the cumulative impact on wetland resources within the study area. These actions include the paving of Deerlodge Road; realignment and bank stabilization of the Deerlodge Road section near milepost 9.5; and routine road maintenance, repairs, and overlays. These activities have affected wetland resources from modifying natural drainage patterns, adding an impervious surface, which increases runoff during precipitation events, and erosion. The combined impact on wetland resources of the no-action alternative in combination with past, present, and future activities would be local, long-term, minor, and adverse with a relatively negligible adverse contribution from the no-action alternative by not providing any improvements.

Conclusion

The no-action alternative would have local, long-term, minor, adverse impacts on wetland resources from deterioration of the road, drainage problems, and continued erosion of the riverbanks of the Yampa River at MP 9.5. Cumulative impacts would be local, long-term, minor, and adverse.

Preferred Alternative—Rehabilitate Road

Direct and Indirect Impacts

Under the preferred alternative, 0.52 acre of riverine wetland would be permanently impacted. However, the bank stabilization near milepost 9.5 would improve conditions by reducing the potential risk for soil slumping, erosion, and being carried downstream into adjacent wetland resources. In addition, the 0.52 acre of riverine wetland would be compensated on a 1:1 ratio. There are two locations being considered for wetland mitigation efforts, the Needle and Disappointment Draw Access areas. Both areas are adjacent to riparian woody vegetation and would be suitable to restore to wetland habitat. The preferred alternative would result in long-term, local, adverse, minor impacts to wetland resources from affecting 0.52 acre of riverine wetland, but would be mitigated by compensating on a 1:1 ratio with no net loss in wetlands.

A 5-year monitoring program would also be implemented to monitor the success of the mitigation area. The mitigation measures would be considered a success if the following conditions are realized by the end of the 5-year monitoring period:

- Mitigation areas contain no more than 20 percent total cover by exotic and nuisance plant species,
- Hydrophytic vegetation has become established (60% survival rate),
- A mosaic of wetland and upland habitat with no less than 70 percent of the area supporting hydrophytic vegetation, and
- At least a 65 percent survival rate of native trees. To ensure survival of 65 percent, seedlings will be protected with biodegradable mesh tubes. Dead seedlings will also be replaced as needed through the 5-year restoration period.

Cumulative Impacts

Past, present, and reasonably foreseeable future actions have and continue to contribute to the cumulative impact on wetland resources within the study area. These actions include the paving of Deerlodge Road; realignment and bank stabilization of the Deerlodge Road section near milepost 9.5; and routine road maintenance, repairs, and overlays. These activities have affected wetland resources from modifying natural drainage patterns, adding an impervious surface, which increases runoff during precipitation events, and erosion. The combined impact on wetland resources of the preferred alternative in combination with past, present, and future activities would be local, long-term, minor, and adverse with a relatively negligible adverse contribution from the preferred alternative by compensating for the wetland and resulting in no net loss of wetlands.

Conclusion

The preferred alternative would have local, long-term, minor, adverse impacts on wetland resources due to impacting 0.52 acre of riverine wetland. However, this would be mitigated on a 1:1 ratio with no net loss of wetlands. Cumulative impacts would be local, long-term, minor, and adverse.

Visitor Use and Experience

Affected Environment

Visitors come to the Monument to learn about dinosaurs through first-hand, tactile experiences with fossils, and to explore the Monument's 210,000 acres of natural areas. Visitors enjoy a variety of activities at the Monument, including interpretation of the quarry wall containing *in situ* exposed fossils at the Quarry Visitor Center, biking, bird watching, camping, and various water activities on the Yampa and Green Rivers. Ranger-led talks and walks are provided at the visitor center and throughout the Monument, both day and evening. Deerlodge Road is the only entrance to the eastern portion of the Monument, providing access to the public campground, ranger station, Yampa River boat launch site, BLM lands, and private lands.

Annual visitation to the Monument was approximately 213,560 during 2011, with most visitors arriving between June and September (NPS 2012e). December through February is the slowest time for visitation with approximately 4,000 to 2,600 visitors per month (NPS 2012e). Most traffic along Deerlodge Road occurs from May through September as rafters and kayakers take advantage of higher flows in the Yampa River from winter snow melt. Deerlodge Road is plowed in the winter, but may be closed during the winter months due to snow and snowdrifts.

Impact Intensity Threshold

NPS *Management Policies 2006* state that the enjoyment of park resources and values by the people of the United States is part of the fundamental purpose of all parks and that the Park Service is committed to providing appropriate high-quality opportunities for visitors to enjoy the parks. The Monument was established to administer lands for preservation of natural resources and public use.

Public scoping input and observation of visitation patterns, combined with assessment of amenities available to visitors under current park management, were used to estimate the effects of the alternatives. Impacts on the ability of visitors to experience a full range of park resources was analyzed by examining resources and objectives presented in the park significance statements, as derived from its enabling legislation. The potential for change in visitor experience proposed by the alternatives was evaluated by identifying projected increases or decreases in access and other visitor uses, and determining whether or how these projected changes would affect the desired visitor experience, to what degree, and for how long. The thresholds for change for intensity of impacts on visitor use and experience are defined in Table 14.

Table 14. Visitor Use and Experience Impact and Intensity.

Impact Intensity	Intensity Description
Negligible	Adverse: Changes in visitor use and recreation experience would be below or at an imperceptible level of detection. The visitor would not likely be aware of the effects associated with the action. Beneficial: The action would slightly improve or increase visitor use opportunities and/or experience or would reduce features that impede visitor use and/or experience in the project area.
Minor	Adverse: Changes in visitor use and recreation experience would be detectable, although the changes would be slight. The visitor would be aware of the effects associated with the action, but the effects would be slight. Beneficial: The action would noticeably improve or increase visitor use opportunities and/or experience or would reduce features that impede visitor use and/or experience in the project area.
Moderate	Adverse: Changes in visitor use and recreation experience would be readily apparent. The visitor would be aware of the effects associated with the action and would likely express an opinion about the changes. Beneficial: The action would substantially improve or increase visitor use opportunities and/or experience or would reduce features that impede visitor use and/or experience in the project area.
Major	Adverse: Changes in visitor use and recreation experience would be readily apparent and severely adverse or exceptionally beneficial. The visitor would be aware of the effects associated with the action and would likely express a strong opinion about the changes. Beneficial: The action would exceptionally improve or increase visitor use opportunities and/or experience or would reduce features that impede visitor use and/or experience in the project area.

Short-term—occurs only during project construction
Long-term—continues after project construction

Environmental Consequences

No-action alternative

Direct and Indirect Impacts. There would be no change to visitor use and experience along Deerlodge Road under the no-action alternative. The road would remain open and visitors would continue to have access to Monument resources. As road conditions continue to deteriorate, periodic maintenance projects would require traffic delays and increased noise from equipment, which could inconvenience visitors. Continued road deterioration could reduce the quality of visitor experiences by increasing the potential for road closures and reducing the scenic quality of the Yampa River and the road. Effects on visitor use and experience under the no-action alternative would be local, long-term, minor, and adverse.

Cumulative Impacts. Past and present routine road maintenance has allowed visitors to continue to access and enjoy the Monument and its resources. The Deerlodge Campground improvements—replacing the existing cabin and installing a waterline and the boat ramp upgrade—have enhanced visitor use and enjoyment. The no-action alternative combined with past, present, and reasonably foreseeable future actions would result in park wide long-term minor beneficial effects on visitor use and experience. The overall cumulative effects to visitor use and experience from the no-action alternative in combination with past, present, and reasonably foreseeable future actions would remain park wide, long-term, minor, and beneficial with the no-action alternative contributing a noticeable adverse effect.

Conclusion. Effects on visitor use and experience under the no-action alternative would be local, long-term, minor, and adverse due to the continued road deterioration and routine road maintenance and the potential for reducing the scenic quality of the Yampa River and the road. The overall cumulative effects to visitor use and experience from the no-action alternative in combination with past, present, and reasonably foreseeable future actions would result in park wide, long-term, minor, and beneficial impacts with the no-action alternative contributing a noticeable adverse effect.

Preferred Alternative—Rehabilitate Road

Direct and Indirect Impacts. Visitor use and experience would be impacted by construction and bank stabilization related activities. As described in Table 2, the park would implement a number of measures to reduce visitor impacts and maintain the quality of the visitor experience and access to recreation resources during construction. There would be temporary, periodic traffic delays and short closures along the road and increased noise from the construction equipment that could inconvenience visitors. Sub-excavation and full depth pavement replacement may require short closures, which would consist of one-hour intervals allowing pass through on the hour with a flag person from the construction crew directing traffic. Visitors would be informed in advance of construction via a number of sources so they can best plan their schedule and activities. In addition, the visual presence of the exposed rock riprap would remain, but visitors driving on the road may not notice the permanent structure. However, road improvements including bank stabilization near milepost 9.5 would improve the visitor use and experience over the long-term. Under the preferred alternative, routine road maintenance and

potential road closures would be reduced and the scenic quality of the Yampa River and the road would be maintained.

Planned work on Deerlodge road may be constructed in two phases, depending on available funds. Phase I would include bank stabilization along the Yampa River near milepost 9.5, and Phase II would include the pavement rehabilitation and parking area improvements. The proposed bank stabilization and pavement rehabilitation and parking area improvements are planned to start in 2013 and 2016, respectively. During this time, traffic delays of up to 30 minutes could occur anytime. To facilitate visitor planning, the status of roadwork and traffic delays would be advertised two weeks in advance and updated daily.

The newly constructed parallel parking area and space for the information kiosk located at the entrance pullout would be ADA compliant and have beneficial impacts, increasing the visitor enjoyment and experience for some guests.

Under the preferred alternative, short-term, moderate, adverse effects on the quality of the visitor experience would occur at the local and park wide level during periods of construction. While construction activities and traffic delays would temporarily inconvenience visitors, substantial changes in the number of visitors to the park are not expected. Over the long-term, the proposed improvements to the condition of the road would provide a moderate, beneficial effect on the quality of the visitor experience and ensure protection of the road's structural integrity for visitor enjoyment and safe travel.

Cumulative Impacts. Past and on-going road maintenance has allowed visitors to continue to enjoy and access the Monument and its resources. The Deerlodge Campground improvements—replacing the existing cabin and installing a waterline and the boat ramp upgrade—have enhanced visitor use and enjoyment. The preferred alternative would temporarily inconvenience visitors during construction activities and associated traffic delays. The preferred alternative combined with past, present, and reasonably foreseeable future actions would have local to park wide, minor, beneficial and adverse, long-term impacts to visitor experience as the scenic quality of the Yampa River and the road would be maintained, but the exposed rock riprap would remain visible.

Conclusion. Temporary, periodic traffic delays and short closures along the road could inconvenience visitors. To facilitate visitor planning, the status of roadwork and traffic delays would be advertised two weeks in advance and updated daily. The effects on visitor use and experience would be short-term, moderate, adverse effects at the local and park wide level during periods of construction. Over the long-term, the proposed improvements to the condition of the road would provide a moderate, beneficial effect on the quality of the visitor experience and ensure protection of the road's structural integrity for visitor enjoyment and safe travel. Cumulative impacts would be local to park wide, long-term, minor, and beneficial and adverse.

Public Health and Safety

Affected Environment

Monument staff are responsible for the day-to-day maintenance of the portions of Deerlodge Road within the Monument and other Monument facilities to provide a safe environment for visitors. Routine road maintenance includes minor repairs, asphalt patching and sealing, and culvert and ditch maintenance. Snowplowing and application of traction sand typically allows the road to remain open throughout the winter. Deerlodge Road is the only entrance to the eastern portion of the Monument, providing access to the public campground, ranger station, Yampa River boat launch site, BLM lands, and private lands. The Yampa River boat launch site is also the only way river users can access the Yampa River to float through the park, making it a popular launch site. In addition to the public facilities, the Monument interpretive staff uses the Deerlodge area to host numerous school groups for environmental education purposes.

Portions of Deerlodge Road pavement have exceeded their service life and have developed surface cracks, rutting, buckling, and unraveling of the pavement edge. The Yampa River has also encroached to within approximately 50 feet of the edge of the pavement near milepost 9.5 (Oxbow area). Another high flow year in the Yampa River could result in additional erosion and perhaps even threaten the road itself. The bank stabilization measures installed in 2003 are no longer providing adequate protection to the road. The riverbank needs to be stabilized before another large runoff occurs and additional bank erosion destroys the road in the project area. The purpose of the proposed project is to provide safer access and parking for private landowners, visitors, and employees by rehabilitating, restoring, and resurfacing Deerlodge Road and stabilizing the Yampa riverbank where it has encroached on the roadway. There is no formal accident history data of the road, but Gary Mott, the Facility Manger, stated there have been no vehicle accidents that NPS is aware of; however, there have been incidents with wildlife and a dropped trailer one time (FHWA 2012a).

Impact Intensity Threshold

Public health and safety refers to the ability of the Park Service to provide a healthy and safe environment for visitors and park staff, to protect human life, and to provide for injury free visits and appropriate responses when accidents and injuries occur. Facilities included in the analysis are the road, trailheads, campgrounds, pullouts, and parking areas. The thresholds for change for intensity of impacts on public health and safety are defined in Table 15.

Table 15. Public Health and Safety Impact and Intensity. Table continued on following page.

Impact Intensity	Intensity Description
Negligible	Adverse: The effects would be at low levels of detection and would not have appreciable effects on public health and safety. Beneficial: The action would slightly improve the quality of park roads and the ability of park staff to maintain and protect public health and safety.
Minor	Adverse: The effects would be detectable and would be of a magnitude that would not have appreciable effects on public health and safety. If mitigation is needed to offset adverse effects, it would be simple and likely successful. Beneficial: The action would noticeably improve the quality of park roads and the ability of

Impact Intensity	Intensity Description
	park staff to maintain and protect public health and safety.
Moderate	Adverse: The effects would be readily apparent and would result in a change in public health, safety that would be noticeable to park staff and the public. Mitigation measures would be necessary to offset adverse effects and would likely be successful. Beneficial: The action would substantially improve the quality of park roads and the ability of park staff to maintain and protect public health and safety.
Major	Adverse: The effects would be readily apparent; would result in a substantial change in public health and safety in a manner noticeable to staff and the public; and would be markedly different from existing operations. Mitigation measures to offset adverse effects would be needed and extensive, and success could not be guaranteed. Beneficial: The action would exceptionally improve the quality of park roads and the ability of park staff to maintain and protect public health and safety.

Environmental Consequences

No-action alternative

Direct and Indirect Impacts. Continued routine road maintenance as needed would occur under the no-action alternative. Road maintenance work would likely increase as the road conditions deteriorate and the Yampa River continues to encroach the section near milepost 9.5. Safety issues and maintenance concerns associated with deteriorating road pavement, subgrade failures, drainage issues, and bank stabilization would not be addressed. Eroded areas from existing culverts creating undesirable slopes would not be addressed. The potential for accidents would remain the same and could increase as the road deteriorates and encroachment of the Yampa River continues. Under the no-action alternative, there would be local, long-term, minor-to-moderate, adverse impacts to public health and safety.

Cumulative Impacts. Past and on-going road maintenance to Deerlodge Road, the replacement of the existing cabin, and installation of the waterline into Deerlodge campground has been implemented to improve public health and safety. Continued deterioration of road conditions along milepost 9.5 and around culverts would increase potential safety issues, such as subgrade failures and undesirable slopes. The no-action alternative combined with past, present, and reasonably foreseeable future actions would have local, long-term, minor, and adverse impacts with a noticeable adverse contribution from this alternative.

Conclusion. Under the no-action alternative, there would be local, long-term, minor to moderate, adverse impacts to public health and safety due to continued deterioration of the road and drainage conditions and the continued encroachment of the Yampa River. The potential for accidents would remain the same and could increase as the road deteriorates and encroachment of the Yampa River continues. Cumulative impacts would have local, long-term, minor, and adverse impacts with a moderate adverse contribution from the no-action alternative.

Preferred Alternative—Rehabilitate Road

Direct and Indirect Impacts. Proposed road rehabilitation would address safety concerns with access and parking. Improvements to the road pavement and drainage concerns (i.e., bank

stabilization, culvert replacements, parking area drainage) would improve safety and driving conditions. The service life of the road, parking areas, and culverts would be extended.

As stated under the NPS Preferred Alternative section and in Table 2, traffic-control measures would be implemented to protect visitors during construction. Upon completion of the project, local, long-term, moderate, beneficial effects on public health and safety are expected from road improvements.

Cumulative Impacts. Past and on-going road maintenance to Deerlodge Road, the replacement of the Deerlodge cabin, and installation of the waterline into Deerlodge campground has been implemented to improve public health and safety. The preferred alternative combined with past, present, and reasonably foreseeable future actions would have local, long-term, moderate, and beneficial impacts. The preferred alternative would contribute long-term, beneficial effects by providing safer access and parking for visitors, employees, and private landowners.

Conclusion. Proposed rehabilitation and improvements would address safety concerns associated with the road and parking areas. Subgrade structural repairs, new pavement, bank stabilization, and drainage work along the road would improve safety and driving conditions. Upon completion of the project, local, long-term, moderate, beneficial effects on public health and safety are expected from road improvements. Cumulative effects would be local, long-term, moderate, and beneficial.

CONSULTATION and COORDINATION

Internal Scoping

Internal scoping was conducted by an interdisciplinary team of professionals from the Monument, DSC staff, FHWA, environmental consultants, and consulting engineers. Team members met multiple times in 2012 to discuss the purpose and need for the project, various alternatives, potential environmental impacts, reasonably foreseeable future actions that may have a cumulative effect, and possible resource protection measures.

External Scoping

Scoping is an early and open process to determine the breadth of issues and alternatives to be addressed in an environmental assessment. The Monument initiated external public scoping with a news release on June 5, 2012 to provide the public and interested parties an opportunity to comment on the proposed project (Appendix E). The Monument also sent 246 letters to interested individuals; organizations; federal, state, county, and local governments; and American Indian tribes traditionally associated with the Monument describing the project and asking for comments. In addition, the scoping letter was sent to the Colorado State Historic Preservation Office and the U.S. Fish and Wildlife Service. Additional information on consultation with federal and state agencies and American Indian tribes is found in the "Consultation and Coordination" section.

The Monument did not receive any scoping comments during the 30-day comment period that ended July 11, 2012.

Internal and external scoping comments were considered in the choice of impact topics and were used in the development and evaluation of alternatives discussed in this EA. Scoping issues or impact topics that were considered, but not evaluated further, are discussed in "Impact Topics Dismissed from Further Analysis Section." The public, agencies and American Indian groups traditionally associated with the lands of the Monument will also have an opportunity to review and comment on this EA.

Agency Consultation

Compliance with Section 106 of the NHPA is not being subsumed under NEPA, but is being conducted separately through ongoing consultation with the Colorado SHPO, which was notified of the proposed project by letter on June 6, 2012. The park provided the Colorado SHPO with an Assessment of Effect on December 19, 2012. On December 24, 2012, Colorado SHPO concurred with the park's finding that no historic properties would be affected by the preferred alternative. A copy of the EA was forwarded to the Colorado SHPO for review and comment.

In accordance with the Endangered Species Act, the Park Service consulted with the U.S. Fish and Wildlife Service via phone multiple times in May, June, and September of 2012 to solicit input on threatened, endangered, and species of concern for the proposed project. A copy of this EA will be sent to the U.S. Fish and Wildlife Service for review along with a request for their concurrence with the Monument's determination of effects on federally listed species. A biological assessment is also being submitted to the U.S. Fish and Wildlife Service for review and concurrence.

The Colorado Parks and Wildlife was contacted by letter on June 6, 2012 during the public scoping period asking for information on and potential effects to special status plant and animal species in the area. No comments were received as of the date of the EA. A copy of this EA will be sent to the Colorado Parks and Wildlife for review and comment.

American Indian Consultation

The Monument contacted 33 American Indian tribes (See list below) on June 6, 2012 informing them of the proposed project and soliciting comments. Information from the tribes also was requested to determine if any ethnographic resources are in the project area and if the tribe wanted to be involved in the environmental compliance process. The Monument has not received any written comments as of the date of this EA. American Indian groups traditionally associated with the lands of the Monument also will have an opportunity to review and comment on this EA.

American Indian Tribes contacted include the following:

Arapaho Tribe of the Wind River Reservation
Comanche Nation of Oklahoma
Crow Tribe of Montana
Hopi Tribe
Navajo Nation

Paiute Indian Tribe of Utah—Cedar Band, Kanosh Band, Indian Peaks Band, Koosharem Band, and Shivwits Band
Pueblo of Acoma
Pueblo of Cochiti
Pueblo of Isleta
Pueblo of Jemez
Pueblo of Laguna
Pueblo of Nambe
Pueblo of Picuris
Pueblo of Pojoaque
Pueblo of San Felipe
Pueblo of San Ildefonso
Ohkay Owingeh
Pueblo of Sandia
Pueblo of Santa Ana
Pueblo of Santa Clara
Kewa Pueblo
Taos Pueblo
Pueblo of Tesuque
Pueblo of Zuni
San Juan Southern Paiute Tribe
Shoshone-Bannock Tribes
Southern Ute Tribe
Uintah and Ouray Ute Tribe
Ute Mountain Ute Tribe
Zuni Tribe
Absentee–Shawnee Tribe of Indians of Oklahoma
San Juan Southern Paiute Tribe and Eastern Shoshone Tribe

Environmental Assessment Review and List of Recipients

This EA will be released for a 30-day public comment period. To inform the public of the availability of the EA, the Park Service will publish and distribute a letter to various agencies, tribes, and members of the public on the park's mailing list, and issue a press release. Copies of the EA will be provided to interested individuals, upon request. Copies of the EA will also be available for review on the Internet at http://parkplanning.nps.gov/dino.

During the public comment period, the public is encouraged to submit their comments to the NPS address provided on the cover page at the beginning of this document. Following the close of the comment period, all public comments will be reviewed and analyzed prior to the release of a decision document. The Park Service will issue responses to substantive comments received during the public comment period and will make appropriate changes to this EA, as needed.

List of Prepares and Contributors

National Park Service, Dinosaur National Monument

Mary Risser, Superintendent
Wayne Prokopetz, Chief of Research and Resource Management
Gary Mott, General Maintenance Operations Supervisor
Tamara Naumann, Botanist
Joel Brumm, Natural Resource Program Manager

National Park Service, Denver Service Center

Richard Boston, Cultural Resources Specialist
Ginger Molitor, Natural Resources Specialist
Cam Hugie, Project Manager

Federal Highway Administration (Central Federal Lands Highway Division

Matt Ambroziak, Engineer

Ecosystem Management, Inc.

Stephanie Lee, NEPA Specialist
Matt Brooks, Wildlife Biologist
Mike Tremble, Project Manager

COMPLIANCE WITH FEDERAL and STATE REGULATIONS

The Park Service and FHWA would comply with all applicable federal and state regulations when implementing the preferred alternative to rehabilitate the road. Permitting and regulatory requirements for the preferred alternative are listed in Table 16.

Table 16. Environmental Compliance Requirements. Table continued on following page.

Agency	Statute, Regulation, or Order	Purpose	Project Application
Federal			
National Park Service	National Environmental Policy Act	Applies to federal actions that may significantly affect the quality of the environment.	Environmental review of proposed action and decision to prepare a FONSI or EIS.
	National Historic Preservation Act, Section 106	Protection of historic and cultural resources.	The park is consulting with the SHPO and American Indian tribes to address potential effects and mitigation for cultural resources.
	EO 11990, "Protection of Wetlands"	Requires avoidance of adverse wetland impacts where practicable and mitigation, if necessary.	A 1:1 ratio compensation for the loss of 0.52 acres of riverine wetland would be implemented.
	EO 11988, "Floodplain Management"	Requires avoidance of adverse floodplain impacts where practicable and mitigation, if necessary.	Best management practices would be used to limit impacts to the river and floodplains during construction.
	NPS DO-77-2: *Floodplain Management*	Protection of natural resources and floodplains.	Best management practices would be used to limit impacts to the river and floodplains during construction.
U.S. Army Corps of Engineers	Clean Water Act–Section 404 Permit to discharge dredge and fill material	Authorizes placement of fill or dredge material in waters of the U.S. including wetlands.	A Nationwide permit is being obtained by CH2MHILL for placement of the toe construction in the Yampa River.

Agency	Statute, Regulation, or Order	Purpose	Project Application
			No jurisdictional wetland impacts were identified.
U.S. Fish and Wildlife Service	Endangered Species Act	Protection of federally listed threatened or endangered species and designated critical habitat.	The park consulted with the U.S. Fish and Wildlife Service as part of the NEPA process.
	Migratory Bird Treaty Act	Protection of migratory birds	Addressed potential impacts in this EA as part of the NEPA process
	Bald and Golden Eagle Management Act	Protection of Bald and Golden Eagles	Addressed potential impacts in this EA as part of the NEPA process
U.S. Environmental Protection Agency	Clean Water Act–Section 402 NPDES Permit for storm water discharge associated with industrial activity to waters of the United States.	Erosion control and protection of water quality.	A storm water pollution prevention plan would be developed prior to grading and surface disturbances.
State of Colorado			
Colorado Department of Public Health and Environment Air Pollution Control Division	Air Quality general permit for fugitive dust control	Applies to construction disturbances greater than 25 contiguous acres and greater than 6 months in duration.	A general permit with a Fugitive Dust Control Plan would be completed prior to grading and surface disturbance.

REFERENCES

Andrews, R. and R. Righter
1992 Colorado birds: a reference to their distribution and habitat. Denver Museum of Life History, Denver, Colorado.

Bestgen, K. R., J. A. Hawkins, G. C. White, C. D. Walford, P. Badame, and L. Monroe
2010 Population Status of Colorado Pikeminnow in the Green River Basin, Utah and Colorado, 2006–2008. Colorado River Recovery Implementation Program Project Number 128.

Colorado Parks and Wildlife
2010 Yampa River basin aquatic management plan. Colorado Parks and Wildlife, Aquatic Wildlife Section, Denver, Colorado

2012a Wildlife species profiles: golden eagle. Accessed October 2012 from http://wildlife.state.co.us/WildlifeSpecies/Profiles/Birds/Pages/GoldenEagle.aspx.

2012b Natural diversity information source. Accessed 11 November 2012 from http://ndis.nrel.colostate.edu/index.html.

2013 Natural diversity information source. Accessed 21 January 2013 from http://ndis.nrel.colostate.edu/index.html.

Crowl, T. A., and N. W. Bouwes
1997 Modeling Population Dynamics of Colorado Squawfish, Razorback Sucker, and Humpback Chub: for Management Objective Development. Utah State University, Logan Utah.

Federal Highway Administration (FHWA), U.S. Department of Transportation (USDOT)
2011 U.S. Technical Memorandum of the Yampa River near Deerlodge Road (CO PRA DINO 101(1)), Dinosaur National Monument. U. S. Department of Transportation Federal Highway Administration Central Federal Lands Highway Division and CH2M HILL. Federal Highway Division, Lakewood, Colorado.

2012a U.S. Technical Memorandum of the 30% Design for Deerlodge Road Rehabilitation, Dinosaur National Monument. CH2MHILL. Federal Highway Division, Lakewood, Colorado.

2012b Preliminary Hydraulics Recommendations Report for Deerlodge Road Improvements, Dinosaur National Monument. CH2MHILL. Federal Highway Division, Lakewood, Colorado.

2012c Draft Pavement and Design Report, Dinosaur National Monument. Yeh and Associates, Inc. Federal Highway Division, Lakewood, Colorado.

Finney, S.
2006 Adult and Juvenile Humpback Chub Monitoring for the Yampa River Population, 2003–2004. Upper Colorado River Basin Recovery Implementation Program Project No. 133.

Green, G. N.
1992 The digital geologic map of Colorado in ARC/INFO format: U.S. Geological Survey, Open-File Report OFR-92-507. Accessed 08 April 2012 from http://pubs.usgs.gov/of/ofr-92-0507/.

Holden, P. B., and L. W. Crist
1981 Documentation of Changes in the Macroinvertebrate and Fish Populations in the Green River due to Inlet Modification of Flaming Gorge Dam: Final Report PR-16-5. U.S. Fish and Wildlife Service, Salt Lake City, Utah.

Holden, P. B., and C. B. Stalnaker
1975 Distribution of Fishes in the Dolores and Yampa River Systems of the Upper Colorado Basin. Southwestern Naturalist 19:403–412.

Johnson, B. M., P. J. Martinez, J. A. Hawkins, and K. R. Bestgen
2008 Ranking Predatory Threats by Nonnative Fishes in the Yampa River, Colorado, via Bioenergetics Modeling. North American Journal of Fisheries Management 28:1941–1953.

Kochert, M. N., K. Steenhof, C. L. Mcintyre and E. H. Craig
2002 Golden Eagle (*Aquila chrysaetos*), the birds of North America online (A. Poole, Ed.). Cornell Lab of Ornithology, Ithaca, New York. Online: http://bna.birds.cornell.edu. bnaproxy.birds.cornell.edu/bna/species/684 doi:10.2173/bna.684.

Miller, R. R.
1946 *Gila cypha*, a Remarkable New Species of Cyprinid Fish from the Colorado River in Grand Canyon, Arizona. Journal of the Washington Academy of Science 36:409–415.

Modde, T., and D. B. Irving
1998 Use of Multiple Spawning Sites and Seasonal Movement by Razorback Sucker in the Middle Green River, Utah. North American Journal of Fisheries Management 18:318–326.

Modde, T., K. P. Burnham, and E. J. Wick
1996 Population Status of the Razorback Sucker in the Middle Green River. Conservation Biology 10:110–119.

Munther, G. L.
1970 Movement and Distribution of Smallmouth Bass in the Middle Snake River. Transactions of the American Fisheries Society 99:44–53.

National Park Service [NPS], Department of the Interior
1986 General Management Plan, Development Concept Plans, Land Protection Plan Environmental Assessment. With Revisions to Land Protection Plan in 1988 and 1991. Dinosaur National Monument, Colorado-Utah.

2003 Dinosaur National Monument: Comprehensive Interpretive Plan.

2006 Management Policies 2006. NPS D1416. U.S. Department of the Interior, National Park Service.

2012a Wetland Determination and Delineation Report for Deerlodge Road and Cross Mountain Parking Area, Dinosaur National Monument. Ecosystem Management, Inc. National Park Service, Denver Service Center, Denver, Colorado.

2012b NPS Certified Species List for Dinosaur National Monument. Accessed September 2012 from https://irma.nps.gov/App/Species/Search.

2012c Biological Assessment for Deerlodge Road and Cross Mountain Rehabilitation Projects, Dinosaur National Monument. Ecosystem Management, Inc. National Park Service, Denver Service Center, Denver, Colorado.

2012d Procedural manual 77-2: Floodplain Management. V. scope. B. exempted actions. Accessed September 2012 from http://www.nature.nps.gov/Rm77/pm77_2/scope.cfm#exc.

2012e Public Use Statistics Office: Annual Visits for Dinosaur National Monument. Accessed: August 2012 from http://www.nature.nps.gov/stats/viewReport.cfm.

New Mexico Energy, Minerals and Natural Resources Department: Mining and Minerals Division
2012 Wildlife in abandoned mines. Accessed 11 November 2012 from http://www.emnrd.state.nm.us/MMD/AML/AML-Wildlife.html.

Roehm, G. W.
2004 Management Plan for Endangered Fishes in the Yampa River Basin and Environmental Assessment. U.S. Fish and Wildlife Service, Mountain-Prairie Region (6). Denver, Colorado.

Sammons, S. M., and P. W. Bettoli
1999 Spatial and Temporal Variation in Electrofishing Catch Rates of Three Species of Black Bass (*Micropterus* spp.) from Normandy Reservoir, Tennessee. North American Journal of Fisheries Management 19:454–461.

State of Utah Natural Resources Division of Wildlife Resources
2012 Utah Conservation Data Center. Accessed 25 May 2012 from http://dwrcdc.nr.utah.gov/ucdc/default.asp.

Todd, B. L., and C. F. Rabeni
1989 Movement and Habitat Use by Stream-dwelling Smallmouth Bass. Transactions of the American Fisheries Society 118:229–242.

Tyus, H. M., and C. A. Karp
1990 Spawning and Movements of Razorback Sucker, *Xyrauchen texanus*, in the Green River Basin of Colorado and Utah. Southwestern Naturalist 35:427–433.

1989 Habitat Use and Streamflow Needs of Rare and Endangered Fishes, Yampa River, Colorado. U.S. Fish and Wildlife Service, Biological Report 89, Washington D.C., USA.

Tyus, H. M.
1987 Distribution, Reproduction, and Habitat Use of the Razorback Sucker in the Green River, Utah, 1979–1986. Transactions of the American Fisheries Society 116:111–116.

Upper Colorado River Endangered Fish Recovery Program
2012a Bonytail chub (*Gila elegans*). Accessed 25 May 2012 from http://www.coloradoriverrecovery.org/general-information/the-fish/bonytail.html.

2012b Recovery implementation program section 7 consultation, sufficient progress, and historic projects agreement and recovery implementation program recovery action plan (RIPRAP).

2012c Fish facts. Accessed 28 June 2012 from http://www.coloradoriverrecovery.org/general-information/general-publications/fish-fact-sheets/endangeredfishfacts.pdf.

Upper Colorado River Basin Recovery Implementation Program
2010 Middle Yampa River Northern Pike and Smallmouth Bass Removal and Evaluation; Colorado Pikeminnow and Roundtail Chub Evaluation: 2004–2007. Upper Colorado River Basin Recovery Implementation Program Project No. 98a.

U.S. Bureau of Reclamation
2012 Life history of the Colorado Pikeminnow. Accessed 28 June 2012 from http://www.usbr.gov/lc/phoenix/biology/azfish/pdf/CopikeminnowApp.pdf.

U.S. Department of Agriculture Natural Resources Conservation Service Soil Survey Staff
2012 Web soil survey. Accessed 08 April 2012 from http://websoilsurvey.nrcs.usda.gov/.

U.S. Department of Interior U.S. Fish and Wildlife Service
2002a Humpback Chub (*Gila cypha*) Recovery Goals: Amendment and Supplement to the Humpback Chub Recovery Plan. U.S. Fish and Wildlife Service, Mountain-Prairie Region (6), Denver, Colorado, USA.

2002b Bonytail (*Gila elegans*) Recovery Goals: Amendment and Supplement to the Bonytail Chub Recovery Plan. U.S. Fish and Wildlife Service, Mountain-Prairie Region (6), Denver, Colorado, USA.

2002c Colorado Pikeminnow (*Ptychocheilus lucius*) Recovery Goals: Amendment and Supplement to the Colorado Squawfish Recovery Plan. U .S. Fish and Wildlife Service, Mountain-Prairie Region (6), Denver, Colorado, USA.

2002d Razorback Sucker (*Xyrauchen texanus*) Recovery Goals. U .S. Fish and Wildlife Service, Mountain-Prairie Region (6), Denver, Colorado.

1998 Razorback Sucker Recovery Plan. U.S. Fish and Wildlife Service, Mountain-Prairie Region (6), Denver, Colorado, USA.

1994 Federal Register 59 FR 13374 13400. U .S. Fish and Wildlife Service, Washington, D.C.

1990 Bonytail recover plan. U.S. Fish and Wildlife Service, Mountain-Prairie Region (6), Denver, Colorado, USA.

1984 Humpback Chub Recovery Plan. U.S. Fish and Wildlife Service, Mountain-Prairie Region (6), Denver, Colorado, USA.

U.S. Environmental Protection Agency (EPA)
1998 EPA's Final Guidance for Incorporating Environmental Justice Concerns in EPA's NEPA Compliance Analyses. Accessed August 2012 from http://www.epa.gov/environmental justice/resources/policy/ej_guidance_nepa_epa0498.pdf.

Valdez, R. A., and G. H. Clemmer
1982 Life History and Prospects for Recovery of the Humpback and Bonytail Chub. Pages 109–119 *in* W.M. Miller, H.M. Tyus, and C.A. Carlson, editors. Proceedings of a Symposium on Fishes of the Upper Colorado River System: Present and Future. American Fisheries Society, Bethesda, Maryland, USA.

Western Bat Working Group
2005 Species accounts: Townsend's big-eared bat. Accessed 11 November 2012 from http://www.wbwg.org/speciesinfo/species_accounts/vespertilonidae/coto.pdf.

This page intentionally left blank

APPENDICES

Appendix A—Colorado SHPO Concurrence Letter
Appendix B—Biological Assessment
Appendix C—Floodplain Statement of Findings
Appendix D—Wetland Statement of Findings
Appendix E—Scoping Notice

This page intentionally left blank

APPENDIX A
Colorado SHPO Concurrence Letter

HISTORY Colorado

December 24, 2012

Mary Risser
Superintendent
National Park Service
Dinosaur National Monument
4545 Highway 40
Dinosaur, Colorado 81610

Re: 36 CFR 800.3(c), Consultation under the National Historic Preservation Act Section 106 Regarding a Proposed Federal Undertaking: Rehabilitate Deerlodge Road and Erosion Mitigation Project (CHS #63116)

Dear Ms. Risser:

Thank you for your correspondence dated December 19, 2012 (received by our office on December 21, 2012) regarding the subject project.

Based on our review of the documentation provided, we concur with your determination that site 5MF485 requires additional information ("need data") to fully assess its National Register eligibility and look forward to additional consultation on the proposed evaluation of this resource. We concur with your determination that site 5MF7701 (changed from 5MF7001) and isolated finds 5MF7702 through 5MF7704 (incorrectly denoted as 5MF7002, 5MF7003, and 5MF7004) are not eligible for the NRHP.

We understand that the currently defined area of potential effects excludes the Cross Mountain parking area and that no historic properties were identified outside of this area. As such, we concur that a finding of no historic properties affected is appropriate for the revised undertaking pursuant to 36 CFR 800.4(d)(1). Our office anticipates an opportunity to consult on the proposed testing methodology, determination of National Register eligibility, and if applicable, the resolution of adverse effect to site 5MF485 prior to parking lot and bank reconstruction activities within the Cross Mountain Parking area.

The consultation process does involve other consulting parties such as local governments and Tribes, which as stipulated in 36 CFR 800.3 are required to be notified of the undertaking. Additional information provided by the local government, Tribes or other consulting parties may cause our office to re-evaluate our comments and recommendations.

Should unidentified archaeological resources be discovered in the course of the projects, work must be interrupted until the resources have been evaluated in terms of the National Register of Historic Places eligibility criteria (36 CFR 60.4) in consultation with our office.

Thank you for the opportunity to comment. If we may be of further assistance please contact Mark Tobias, Section 106 Compliance Manager, at (303) 866-4674 or mark.tobias@state.co.us.

Sincerely,

for Edward C. Nichols
State Historic Preservation Officer
ECN/MAT

APPENDIX B
Biological Assessment

This page intentionally left blank

National Park Service
Department of the Interior

Dinosaur National Monument
Colorado

Biological Assessment

for

Dinosaur National Monument

Deerlodge Road Rehabilitation Project

Dinosaur National Monument
Moffat County, Colorado

Prepared for
Department of Interior National Park Service
Denver Service Center
12795 West Alameda Parkway
P.O. Box 25287
Denver CO 80225-0287
PMIS 59763A

Prepared by: Ecosystem Management, Inc.
January 2013

This page intentionally left blank

Table of Contents

List of Figures

List of Tables

INTRODUCTION

The National Park Service (NPS) in cooperation with the Central Federal Lands Highway Division (CFLHD) of the Federal Highway Administration (FHWA) is proposing to rehabilitate, restore, and resurface 12.5 miles of Deerlodge Road (road) and to stabilize the Yampa riverbank where it has encroached on the roadway (Figure 1–Figure 3) in Dinosaur National Monument. Rehabilitation is needed because of the deteriorating road conditions and safety concerns.

The purpose of this biological assessment (BA) is to review the proposed Deerlodge Road Rehabilitation Project to determine to what extent the proposed action may affect threatened, endangered, or candidate species listed under the Endangered Species Act (ESA). This BA was prepared in accordance with legal requirements set forth under Section 7 of the ESA of 1973, as amended (16 USC 1536, et seq.), and follows the standards established in the National Park Service (NPS) Director's Order 12 (DO -12).

The NPS is preparing an Environmental Assessment (EA) concurrently with this BA. The EA will evaluate potential environmental, socioeconomic, and cultural resource effects from the preferred alternative to rehabilitate the road, and a no action alternative that does not rehabilitate or improve the road. The EA will be prepared in compliance with the National Environmental Policy Act (NEPA) of 1969 and implementing regulations, 40 CFR Parts 1500-1508 and NPS DO-12 and Handbook, Conservation Planning, Environmental Impact Analysis, and Decision-making.

Ecosystem Management, Inc. (EMI) was contracted to conduct a biological assessment of the project area. A site visit of the project area was conducted by EMI biologists on May 9, 2012.

The analysis area for this biological assessment varies by organism. For birds and mammals, the analysis area includes the project area and the surrounding river valley on both sides of the river. This is because noise from the proposed action may travel beyond the project boundaries, and construction activities could disturb some species beyond the project area (e.g., nesting raptors). For plants, the analysis area is the project area. For fishes, the analysis area includes the project area and the downriver portions of the Yampa River and its 100-year floodplain to the confluence of the Yampa and Green Rivers approximately 50 river miles from the project area.

CONSULTATION TO DATE

There has been no formal consultation with the U.S. Department of Interior Fish and Wildlife Service (USFWS). In accordance with the Endangered Species Act, the Park Service consulted informally with the U.S. Fish and Wildlife Service via phone multiple times in May, June, and September of 2012 to solicit input on threatened, endangered, and species of concern for the proposed project. EMI wildlife biologists informally consulted with Patty Gelatt, Assistant Field Supervisor for the Western Colorado Field Office for the USFWS, and Melissa Trammell, Fisheries Biologist for the National Park Service, about potential impacts of the project on endangered and threatened fishes. The National Park Service Denver Service Center also consulted informally with Melissa Trammell about potential impacts of the project on endangered and threatened fishes.

On June 5, 2012, a list of threatened, endangered, species of concern, or designated critical habitat for the proposed action was provided by the USFWS Western Colorado Ecological Services Field Office (Appendix B).

BACKGROUND

Deerlodge Road is a 12.7-mile two-lane road following the Yampa River in the eastern portion of Dinosaur National Monument in Moffat County, Colorado. This road is currently threatened by erosion at a section of road along the middle of the route near mile 9.5. Deerlodge Road is rated as a Functional Class 1, principle park road, with an Average Daily Traffic of less than 350 vehicles. Deerlodge Road provides access to the Disappointment Draw Access Area and Ranger Station, Yampa River, Bureau of Land Management (BLM) land, private property, county roads, and a county bridge over the Yampa River. It is also used for park-related education activities.

Above-average snowmelt runoff in 2011 caused high erosion to the above-mentioned area as the river cut away the outside bank. Previous bank stabilization installed in 2003 was exposed as a result of erosion in 2011. The river is within approximately 50 feet of Deerlodge Road at the main road erosion area. This area is at risk of failure due to erosion if there is another year of high precipitation.

The proposed action is a federally funded Federal Lands Highway Program (FLHP) rehabilitate, restore, and resurface (3R) project. The construction design is provided by the Central Federal Lands Highway Division of the Federal Highway Administration (CFLHD).

The only previous analysis conducted in the project area was an environmental assessment for a buried riprap bank-stabilization project conducted in 2003 at the same approximate location where the current riprap would be located (see below). The project did not include in-water work. The preferred alternative was to bury a riprap curtain between the abandoned roadway and the realigned road. The curtain was set back 40–80 feet from the riverbank. The actual curtain was approximately 300–500 feet long and 20 feet high x 3 feet wide. The top of the curtain was placed about 7–10 feet below the ground surface. The environmental assessment concluded that there were no federally listed species in the project area, although it did mention the four endangered fish species that occur in the Yampa River. The report determined no effect on wildlife (Dinosaur National Monument 2001).

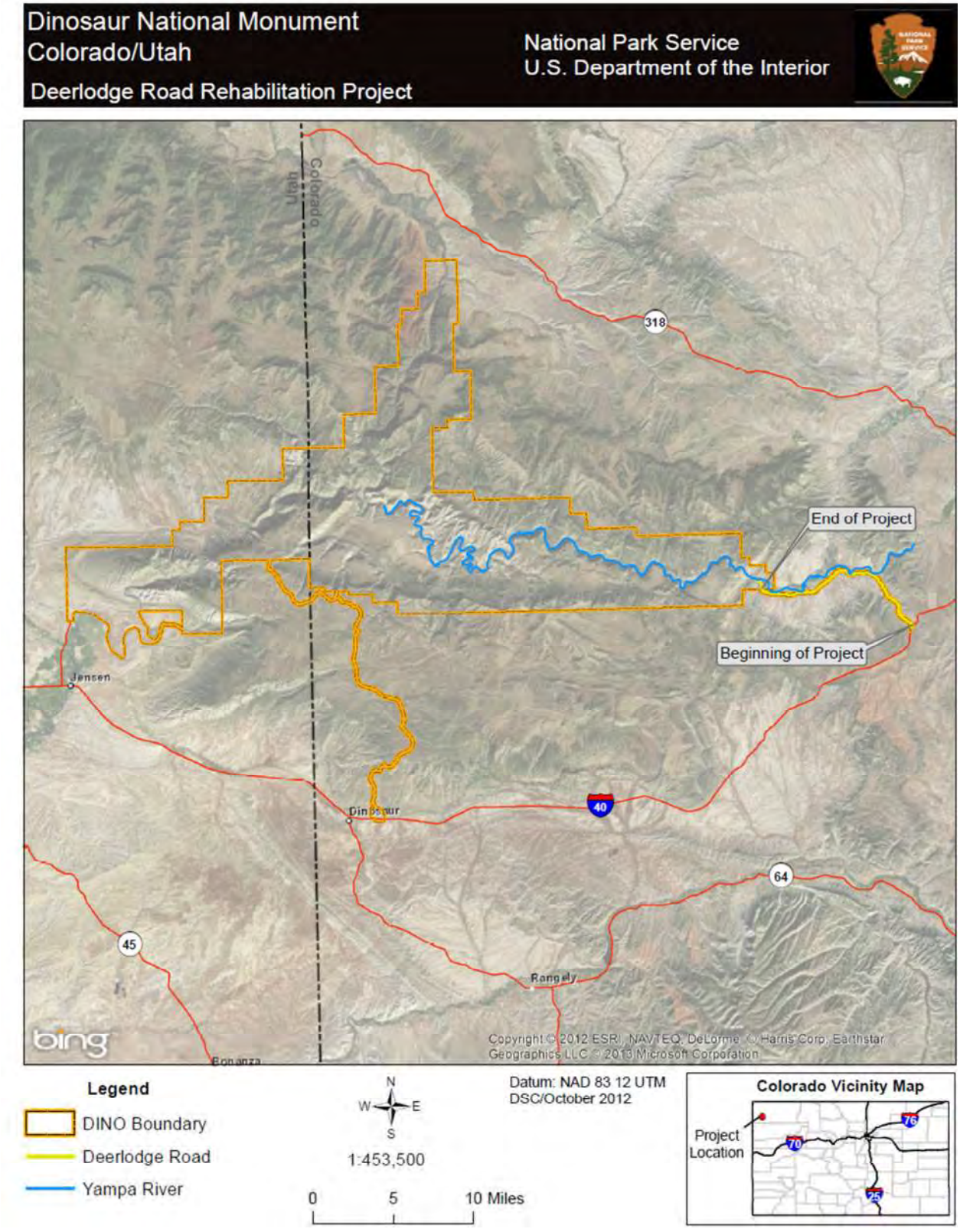


Figure 1. Project area location.

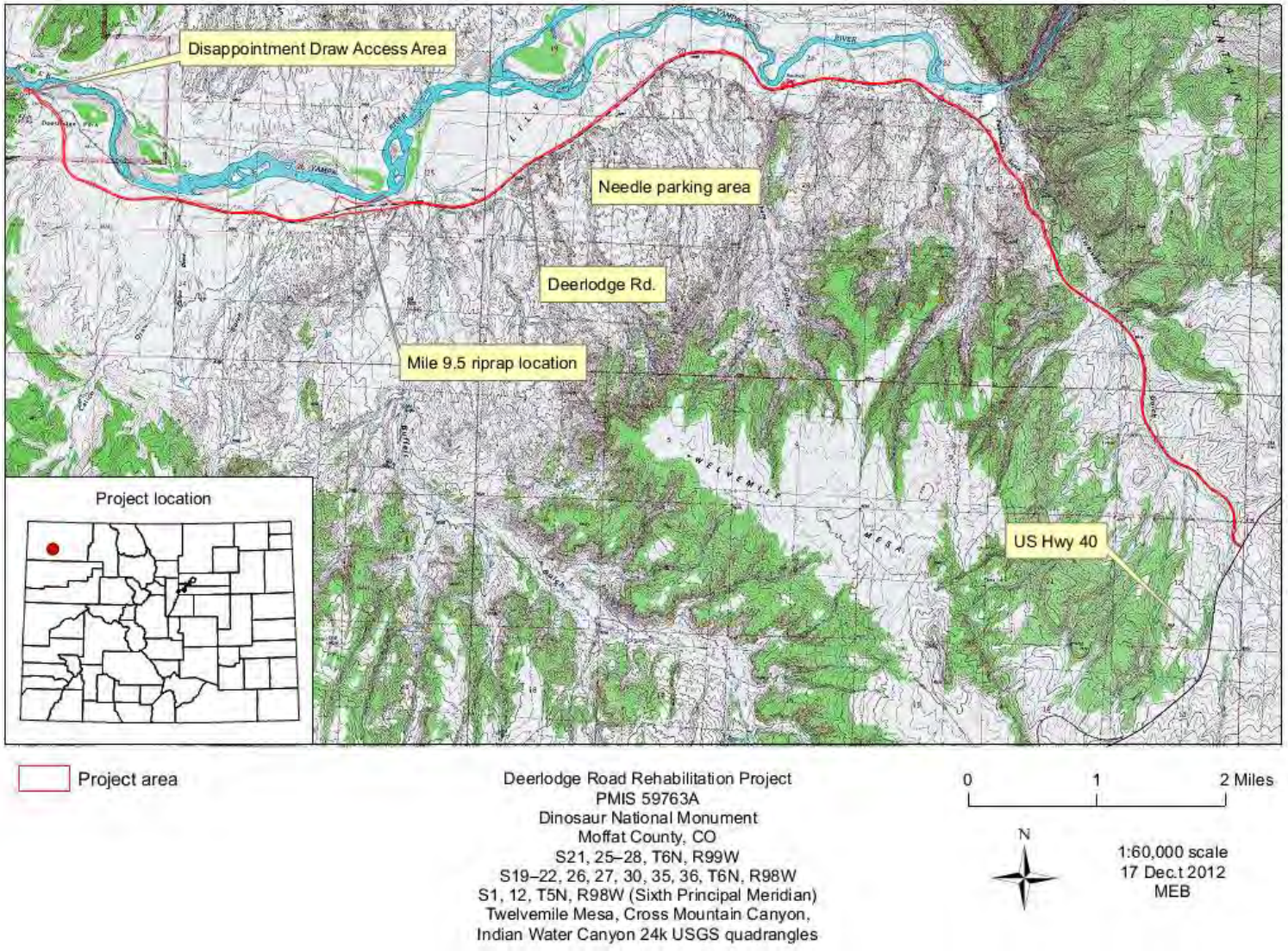


Figure 2. Map of Deerlodge Road rehabilitation project location.

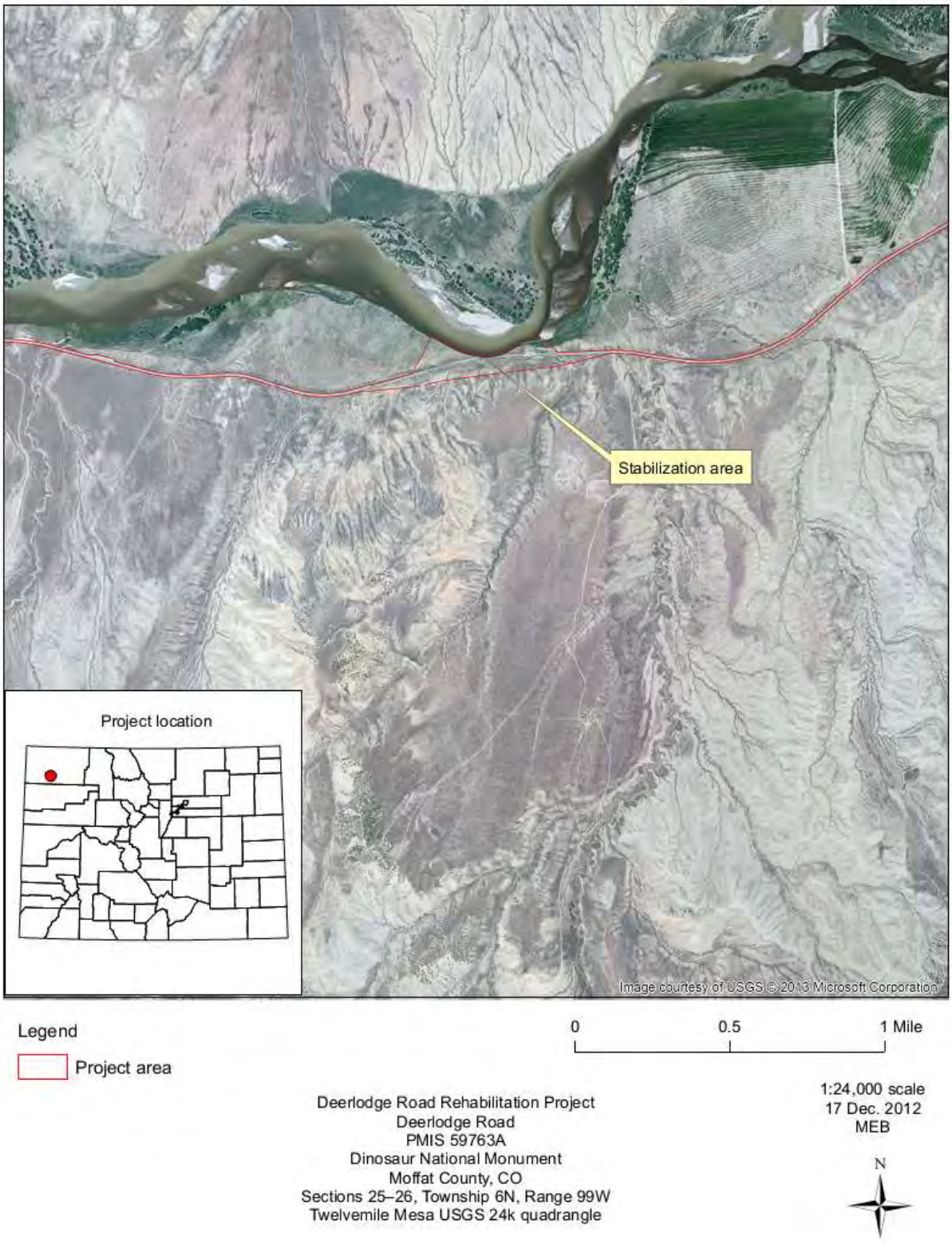


Figure 3. Map of the road stabilization project area in Dinosaur National Monument.

PROPOSED ACTION

No Action Alternative

This alternative provides a baseline for comparing and evaluating the impacts to the environment by the preferred alternative and the respective environmental consequences. Under the no action alternative, Deerlodge Road would not be rehabilitated and NPS would respond to future needs and conditions without major actions or changes in the present course. Dinosaur National Monument staff would continue routine maintenance, minor repairs, and asphalt patching and sealing as needed. The road pavement and structural integrity would continue to deteriorate and the safety concerns associated with encroachment of the Yampa River on the roadway; failing pavement; and sharp drop-offs due to erosion around culverts would continue. No highway funds would be expended for rehabilitation, improvements, or bank stabilization; however, road maintenance costs would likely increase to address deteriorating road conditions.

NPS Preferred Alternative

The preferred alternative includes proposed road rehabilitation and bank stabilization measures needed to address the identified deficiencies along the 12.7-mile stretch of Deerlodge Road (FHWA 2012a). The proposed rehabilitation and modifications of the road may be constructed in two phases, depending on available funds. Phase I would include bank stabilization along the Yampa River near milepost 9.5, and Phase II would include the pavement rehabilitation and other parking area modifications. The proposed bank stabilization and pavement rehabilitation and parking area modifications are planned to start in 2013 and 2016, respectively. Both are subject to available funds with the estimated total construction cost of $8 million to $11 million. The following sections describe the proposed road rehabilitation and modifications.

Bank Stabilization

The lateral migration analysis technical memorandum reported that the Yampa River is encroaching Deerlodge roadway approximately ten feet per year. In 2003, the roadway was realigned and boulders were placed between the roadway and the river embankment to mitigate the Yampa River encroachment. Lateral movement of the Yampa River has continued and is currently approximately 50 feet from the existing roadway with a portion of the original roadway eroded (FHWA 2011). The hydraulics recommendations report identified areas with erosion and drainage issues and bank stabilization recommendations (FHWA 2012a).

Bank stabilization would occur along approximately 1,500 feet (approximately 400 feet on the west end and less than 200 feet on the east end is on private land) of the bank to prevent further erosion and sedimentation (Figure 3). An agreement with the landowner for riprap installation on private land would be implemented prior to construction beginning. Exposed rock riprap with a launchable toe would be used as the bank stabilization method. The design of the riprap would conform to FHWA guidelines.

Exposed Rock Riprap

Exposed rock riprap (Class IV, 18 to 24 inches in diameter) would be used as the bank-stabilization method. Placement of the rock riprap would require installing a large "toe" into the natural riverbed substrate to ensure high flows would not compromise the structural integrity of the stabilized bank (Figure 4–Figure 5). This would be done using a launchable toe with Class 8 riprap (up to 30 inches in diameter) and water depths up to 8 feet. The riprap would be prepared and placed such that the gradation would form a homogenous mass with the smaller rock filling the voids of the larger rock. The launchable toe would slowly launch to scour depths as the river scours the river channel/bottom and the rock slides into the channel with sediment filling back over the launched material. The launchable toe would permanently impact 22,500 square feet (0.52 acre) of natural streambed.

Placement of the rock riprap outside the riverbed would require excavation from the base of the existing bank slope away from the river to one inch above the estimated high water elevation. A slope would be graded at approximately 2 Vertical: 1 Horizontal. A type IV C erosion-control geotextile would be placed below the riprap on the native soils to prevent soil loss through the riprap. A typical section for exposed riprap bank protection with a launchable toe is shown in Figure 4.

The bank stabilization design in the 30% submittal showed a design which extended onto private ROW. As a result of that review, an alternative design was developed which would not impact ROW. This design consisted of a combination of exposed riprap and buried riprap. The riprap would be exposed nearest to the roadway encroachment and then become buried at each end so that the improvements remained in the ROW. As scour continues along the buried improvements, the buried riprap would become exposed and the embankment would remain stable. However, this would allow a significant portion of the existing bank to erode prior to reaching the stabilization at each end. The downstream length required for the solution on the private property (1.5 times the channel width, or 450') could not be achieved within the right-of-way due to gradually decreasing distance between the right-of-way line and the edge of road. This length is required to "train" the flow in a straight direction after a bend. Therefore it is likely that erosion could continue beyond the end limit of the placed riprap within the right-of-way and compromise the road.

Safety features, such as guardrails or boulders, may be placed along Deerlodge road where the exposed rock riprap is closest to the roadway. Due to the proximity of the of the rock riprap slope to the edge of the roadway, these safety features may be installed to protect vehicles from leaving the roadway and rolling down the riprap slope.

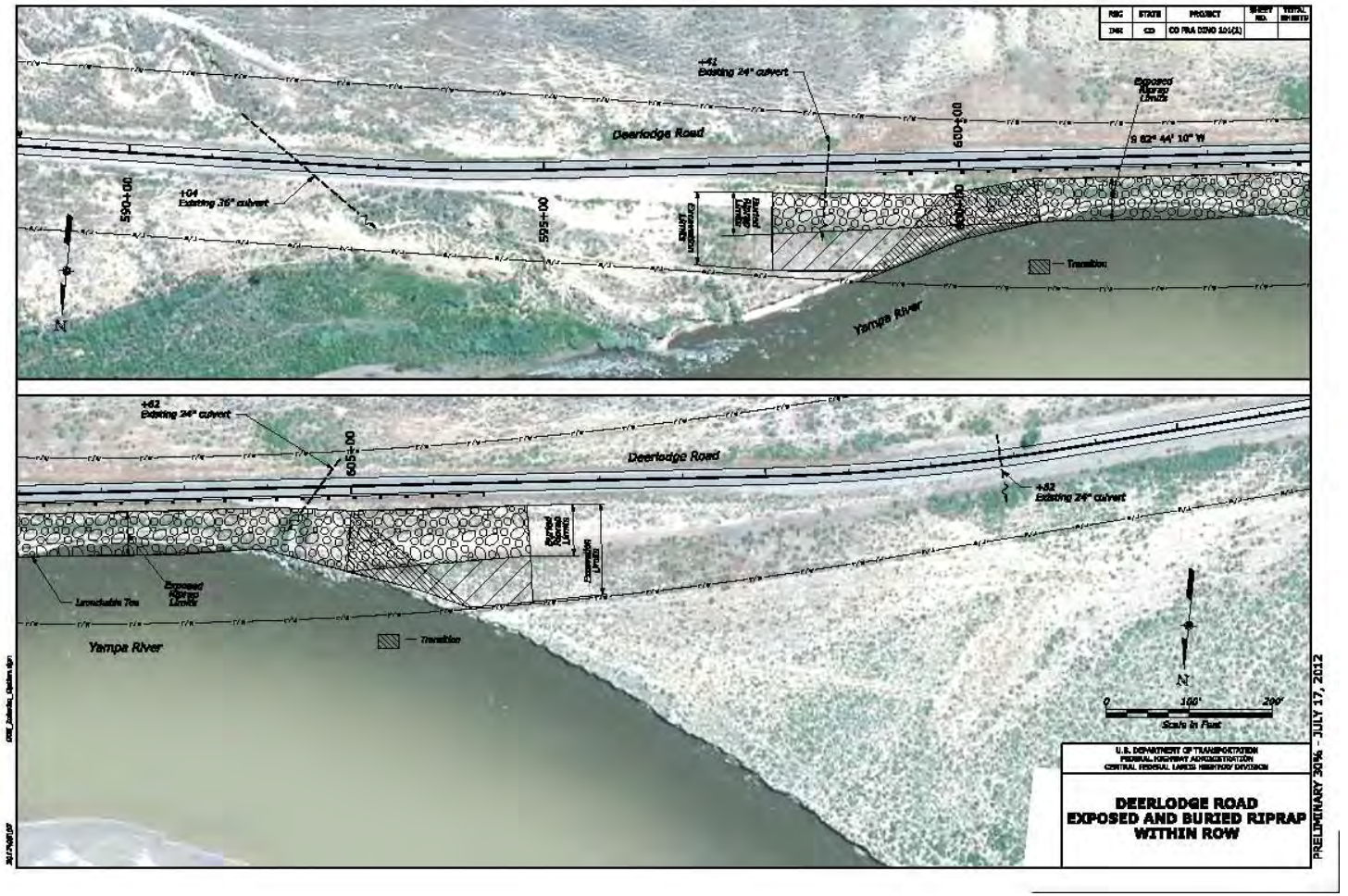
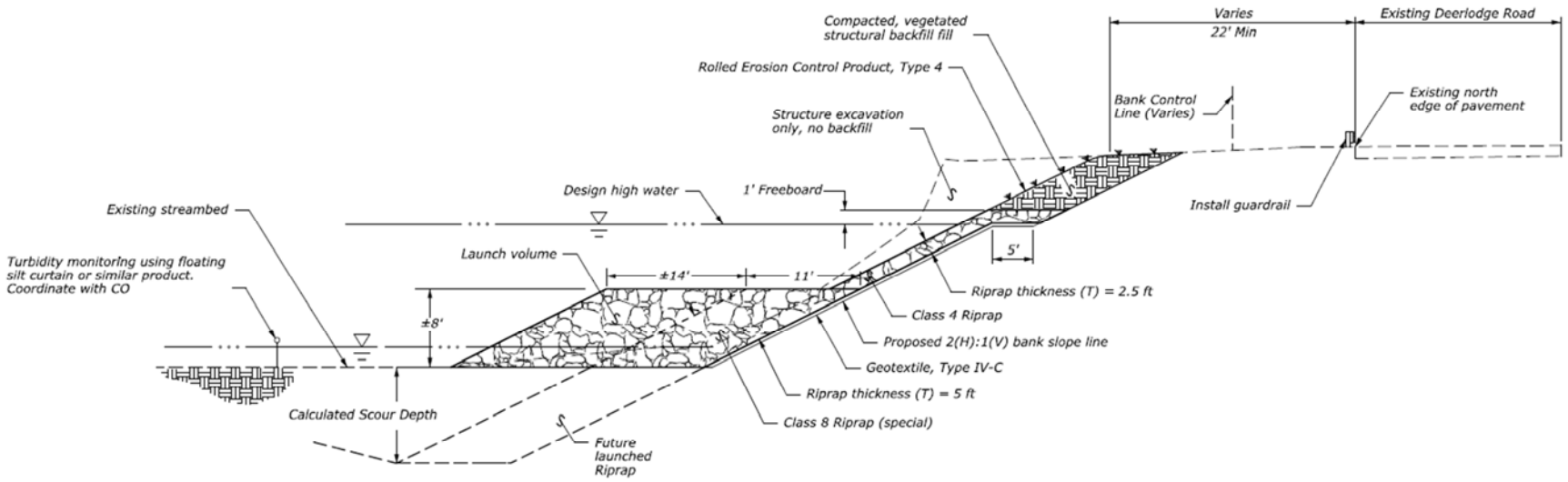


Figure 4. Riprap bank-stabilization design plans.



EXPOSED RIPRAP SLOPE PROTECTION WITH LAUNCHABLE RIPRAP TOE TYPICAL SECTION

Figure 5. Typical section for exposed riprap bank protection with launchable toe.

Road Design and Pavement

Road Width

The proposed Deerlodge roadway would maintain the same 40-foot roadway bench with nine-foot lane widths and one-foot shoulders. However, pavement raveling and erosion around four culverts has reduced road widths and caused pavement cracking and settling, respectively. The proposed road rehabilitation would include restoring the paved width of the road to the original design of 20 feet. In areas where the pavement has settled there may be a slight change in pavement width. New centerline and edge line pavement markings would be painted.

Pavement Considerations

Portions of the current pavement have exceeded their service life and have developed surface cracks, rutting, buckling, and unraveling of the pavement edge. Prior to repaving, six isolated sections of road would require improvements to the subgrade in locations where the existing soil has become soft and lost compaction or severe subgrade failure has occurred. In areas with subgrade issues, the subgrade and backfill would be removed and replaced to a depth of about 19.5 inches to 21 inches, prior to repaving.

Currently, the pavement consists of one and a half to three inches of multiple chip seal layers on top of 12 to 24 inches of aggregate base. The proposed pavement option is to pulverize the existing chip seal pavement and overlay with 3 inches of new hot asphalt pavement on top of 12 inches of aggregate base. The proposed treatment would remain on the roadway bench and maintain the same profile grade. In areas where the existing pavement is less than the proposed three inches, there may be a slight change in profile, which could alter the road width. In these areas, aggregate fill would be placed on the shoulders to fill in the side slope.

Deerlodge Road right-of-way (ROW) encompasses approximately 308 acres with a 200- foot-wide ROW. All pavement rehabilitation would remain within the existing ROW limits.

Drainage

Two major parts of the road rehabilitation project involve drainage: culverts along Deerlodge Road and drainage around parking area improvements.

Deerlodge Road crosses approximately 93 culvert-crossing locations within the rehabilitation project limits. Most of the culverts are in fair condition with some showing signs of minor erosion and sediment deposition. Ten culverts were identified as having severe erosion at the downstream end of the culvert and would require erosion protection measures. The protection measures to stabilize the head cutting and to minimize erosion would be based on the head cutting information obtained during a field visit and information already obtained from the Preliminary Hydraulics Recommendations Report (FHWA 2012a).

Four culverts identified as potentially causing roadway damage and slumping would be replaced. Additional 1–3 culverts may be added within the bank-stabilization area on private land. It was

noted in the geotechnical report that leaks in the culvert walls, settlement of backfill, poor surface drainage, or inadequate cover over the corrugated metal pipe could be causing the damage (FHWA 2012c).

Pullouts and Parking Areas

The park entrance pullout with an information kiosk is not compliant with the Americans with Disability Act (ADA). A parking area and space for the information kiosk would be relocated on flatter terrain to be ADA compliant.

There are four parking areas along Deerlodge Road proposed for modifications—Needle Parking Area, Photo Parking Area, Boat Launch Parking Area, and Disappointment Draw Access Area.

Needle Parking Area

The existing parking area and informal social trail would be pulverized, relocated, and constructed of aggregate material. The asphalt would be pulverized to a depth of eight inches and would remain unpaved with an aggregate material surface. The turn-around loop would be obliterated by removing the asphalt and gravel. The obliterated area would then be re-contoured and revegetated.

Photo Parking Area

This parking area would be reduced by half the width and length and would remove the existing asphalt curb. The remaining parking area would be repaved. The obliterated area would be re-contoured and revegetated.

Boat Launch Parking Area

Currently, the northern portion of the parking area is paved to a 15-foot width and the southern portion is graveled from a 0- to 15-foot width. The proposed modification is to pave the entire parking area. The gravel section would be removed to a depth about 15 inches and replaced with 12 inches of aggregate base overlaid with three inches of new hot asphalt. The current chip seal pavement portion would be removed and repaved with three inches of new asphalt.

Disappointment Draw Access Area

This parking area would be modified by removing the chip seal layers and overlaying with three inches of new asphalt. The turn-around loop would be obliterated by removing the asphalt and gravel. The obliterated area would be re-contoured and revegetated. A short trail would be constructed to connect the existing informal trail to the new parking area. The existing curb, gutter, sidewalk, and the inlet and storm pipe located in the northeast corner of the existing parking area would be removed.

Staging Areas

Temporary staging areas for equipment and supplies during construction would use previously disturbed sites, such as pullouts and parking areas along Deerlodge Road.

Purpose and Scope

The purpose of the proposed project is to provide safer access and parking for private landowners, visitors, and employees by rehabilitating, restoring, and resurfacing about 12.5 miles of Deerlodge Road and stabilizing the Yampa riverbank where it has encroached on the roadway. Road improvements are needed to correct roadway deficiencies. The objectives of the proposed project are to:

Improve the Efficiency of Park Operations

- Repair damaged and deteriorating road pavement, and address drainage, riverbank instabilities, and other structural features that require rehabilitation and restoration
- Reduce maintenance requirements and costs due to deficiencies in the road condition and prevent catastrophic failure that could lead to road or parking area closure

Provide for Visitor Enjoyment and Safety

- Improve the condition of the road to more safely accommodate traffic
- Reduce the risk of traffic accidents
- Efficiently implement rehabilitation work while minimizing visitor impacts

Protect Park Resources

- Maintain the scenic quality of the Yampa River and the road
- Protect park natural resources and values
- Protect park cultural resources

The proposed project is being considered to address deficiencies in road conditions and safety concerns. Portions of the current pavement have exceeded their service life and have developed surface cracks, rutting, buckling, and unraveling of the pavement edge. The road distress may be caused by subgrade failures and drainage issues with culverts. These conditions are necessitating increased costs for road maintenance. Deerlodge Road is the only entrance to the eastern portion of Dinosaur National Monument, providing access to the public campground, ranger station, Yampa River boat launch site, BLM lands, and private lands. The Yampa River boat launch site is also the only way river users can access the Yampa River to float through the park, making it a very popular launch site. In addition to the public facilities, Dinosaur National Monument interpretive staff uses the Deerlodge area to host numerous school groups for environmental education purposes.

In 2003, Dinosaur National Monument attempted to stabilize the south bank of the Yampa River adjacent to Deerlodge Road by burying riprap in a trench between the roadway and the riverbank. However, in 2011, above-average snowmelt and runoff caused substantial bank erosion due to the migration of the Yampa River along Deerlodge Road and damaging the previous bank stabilization work. The Yampa River has encroached to within approximately 50

feet of the edge of the pavement in this oxbow area (milepost 9.5). Another high flow year in the Yampa River could result in additional erosion and perhaps even threaten the road itself. The measures installed in 2003 are no longer providing adequate protection to the road. The riverbank needs to be stabilized before another large runoff occurs and additional bank erosion destroys the road in the project area.

CONSERVATION MEASURES

The beginning of the riprap installation would depend on water levels. Work during the Colorado pikeminnow spawning season would occur during low flows to reduce sediment transport downstream toward the Colorado pikeminnow's spawning grounds. Increased sedimentation in the river from construction should not be an issue because of the river's naturally high turbidity (M. Trammell, NPS Fisheries Biologist, pers. comm. with M. Brooks, EMI wildlife biologist)

The design of the launchable toe would minimize colonization of smallmouth bass in the bank-stabilization area. The launchable toe would be placed such that the gradation would form a homogeneous mass with the smaller rock filling the voids of the larger rock and sediment would fill back over the launched material as it slowly launches to scour depths. This would fill in the gaps within and between the riprap and underlying soil, thus minimizing creation of smallmouth bass habitat in the bank-stabilization area near milepost 9.5. Furthermore, efforts to remove smallmouth bass from the project area would continue (M. Trammell, NPS Fisheries Biologist, pers. comm. with G. Molitor, NPS Natural Resource Specialist).

Specific construction procedures would be followed to prevent impacts to fish habitat. The construction design should not reduce the amount of floodable habitat (e.g., no fill in backwater and no berms or levee-type structures) because this is important habitat for fish nurseries. The bank-stabilization design would extend inland and not into the existing river. That is, the design would specify that the installment of riprap should start at the bottom of the riverbank and slope back inland versus starting at the bottom of the riverbank and extending into the river.

Resource Mitigation Measures would be used for all construction activities (Table 1). These would be focused on minimizing impacts to native vegetation, wildlife, and the river. Erosion-prevention measures would be taken to prevent sediment runoff into the river. A chemical-spill avoidance and response plan would be in place. A plan would be in place to prevent the spread of noxious weeds by machinery and clothing.

Table 1. Resource Mitigation Measures for the proposed action. Table continued on following pages.

Resource Area	Mitigation
General Considerations	All resource protection measures would be clearly stated in the construction specifications, and workers would be instructed to avoid conducting activities beyond the construction zone identified by the FHWA and park. Disturbances would be limited to roadsides, culvert areas, and other areas inside the designated construction limits. No machinery or equipment would access areas outside the construction limits. Construction equipment staging would occur in the road for active work areas or

Resource Area	Mitigation
	at designated pullouts and parking areas. Off-site equipment and vehicle parking would be limited to designated staging areas. Contractors would be required to properly maintain construction equipment (i.e., mufflers and brakes) to minimize noise. Construction vehicle engines would not be allowed to idle for extended periods. Material and equipment hauling would comply with all legal load restrictions. Load restrictions on park roads are identical to state load restrictions; however, the park superintendent may impose additional regulations. Water sprinkling would be used as needed to reduce fugitive dust in work zones. All tools, equipment, barricades, signs, surplus materials, and rubbish would be removed from the project work limits upon project completion.
Soils and Water Quality	Erosion-control BMPs for drainage and sediment control, as identified and used by the FHWA and Park Service, would be implemented to prevent or reduce nonpoint source pollution and minimize soil loss and sedimentation in drainage areas. These practices may include, but are not limited to, silt fencing, filter fabric, temporary sediment ponds, check dams of pea gravel-filled burlap bags or other material, and/or immediate mulching of exposed areas to minimize sedimentation and turbidity impacts as a result of construction activities. The placement and specific measures used would be dictated to a large degree by the topography immediately adjacent to the road in some portions of the project. Silt fencing fabric would be inspected daily during project work and weekly after project completion, until removed. Accumulated sediments would be removed when the fabric is estimated to be approximately 75% full. Silt removal would be accomplished in such a way as to avoid introduction into any flowing water bodies. Regular site inspections would be conducted to ensure that erosion-control measures are properly installed and functioning effectively. Erosion-control measures would be left in place at the completion of construction, after which time the park would be responsible for maintenance and removal once vegetation is established. The operation of ground-disturbing equipment would be temporarily suspended during large precipitation events to reduce the production of sediment that may be transported to streams. A storm water pollution prevention plan would be developed and approved by the park and submitted to the Colorado Water Quality Control Division prior to commencing any near-water activities. All equipment would be maintained in a clean and well-functioning state to avoid or minimize contamination from fluids and fuels. Prior to starting work each day, all machinery would be inspected for leaks (e.g., fuel, oil, and hydraulic fluid) and all necessary repairs would be made before the commencement of work. A hazardous spill plan would be required from the contractor prior to the start of construction stating what actions would be taken in the case of a spill and the preventive measures to be implemented. Hazardous spill clean-up materials would be on-site at all times. This measure is designed to avoid/minimize the introduction of chemical contaminants associated with machinery (e.g., fuel, oil, and hydraulic fluid) used in project implementation.

Resource Area	Mitigation
	Equipment would be refueled at least 100 feet from the stream channel, where any spill of fuel and lubricants cannot reach flowing water. Excavated topsoil would be salvaged, stockpiled in approved areas, and used to reclaim disturbed areas with similar vegetation communities; topsoil stockpiles would be covered to prevent windblown dust. All activities would be confined to areas defined by the drawings and specifications.
Vegetation	All disturbed ground would be reclaimed using appropriate BMPs that include using salvaged topsoil for revegetating soils and reseeding with native plant species. Erosion-control measures would be left in place at the completion of construction, after which time the park would be responsible for maintenance and removal once vegetation is established. Temporary barriers would be provided to protect existing trees, plants, and root zones. Trees or other plants would not be removed, injured, or destroyed without prior approval. To prevent the introduction of, and minimize the spread of, nonnative vegetation and noxious weeds, the following measures would be implemented during construction: • Soil disturbance would be minimized. • All construction equipment would be pressure washed and/or steam cleaned before entering the park to ensure that all equipment, machinery, rocks, gravel, and other materials are cleaned and weed free. • All haul trucks bringing fill materials from outside the park would be covered to prevent seed transport. • Vehicle and equipment parking would be limited to within construction limits or approved staging areas. • If staging areas outside the park were to be used, they would be surveyed for noxious weeds and treated appropriately prior to use. • All fill, rock, and additional topsoil would be obtained from stockpiles from previous projects or excess material from this project, if possible; and if not possible, then weed free fill, rock, or additional topsoil would be obtained from sources outside the park. NPS personnel would certify that the source is weed free. • Monitoring and follow-up treatment of exotic vegetation would occur after project activities are completed. • Riprap, gravel, and topsoil sources would be inspected prior to use, and material currently supporting invasive exotic plants would be avoided. • Any disturbed areas would be reseeded with native upland species.
Wildlife	The specific hours designated for roadwork would be adjusted by the park biologist seasonally for varying day lengths, but would typically be between 7 a.m. and 7 p.m. Work could occur at night. The contractor would notify the Park. The public would be notified. The construction contractor would be required to keep all garbage and food waste contained and removed daily from the work site to avoid attracting wildlife into the construction zone. Construction workers would be instructed to remove food scraps and to not feed or approach wildlife. Equipment would be inspected for hydraulic fluid, antifreeze and oil leaks prior

Resource Area	Mitigation
	to use at staging and stockpiling sites, and materials would be kept on site for clean-up of any motor vehicle or heavy equipment fluid spills that might occur (such fluid spills are potential unnatural attractants to wildlife species). Adequate portable restroom facilities for construction workers would be provided to eliminate human waste as a wildlife attractant at construction sites.
Special Status Species	Erosion-control BMPs for drainage and sediment control, as identified and used by the FHWA and Park Service, would be implemented to prevent or reduce nonpoint-source pollution and minimize soil loss and sedimentation of aquatic habitats used by Colorado pikeminnow, humpback chub, bonytail, and razorback sucker. These may include but are not limited to silt fences or fiber logs placed at the toe of the any disturbed slopes, just above the ordinary high water mark to prevent additional sedimentation until vegetation has stabilized the slopes. A hazardous spill plan would be prepared and implemented. All construction equipment would be pressure washed and/or steam cleaned before entering the park to ensure that all equipment, machinery, rocks, gravel, and other materials are cleaned and weed free and inspected daily for leaks. Leaking equipment would be removed from the project site until repaired and cleaned. Equipment would be refueled at least 100 feet from surface water and fuel, oil, hydraulic fluid, or substances of this nature would be stored within sealed, storage containers or facilities that are located outside the floodplain. The amount and duration of in-stream work would be limited as much as possible. Staging areas would be limited to existing roads and at designated pullouts and parking areas. Any disturbed slopes would be reseeded with native upland species placed down to the ordinary high water mark.
Floodplains	Work would be completed during low flow times such that any impact to the floodplain would be minimized. Equipment would be refueled at least 100 feet from surface water and fuel, oil, hydraulic fluid or substances of this nature would be stored within sealed, storage containers or facilities that are located outside the floodplain. The amount and duration of in-stream work would be limited as much as possible.

Description of Project Area

The project area is located in Dinosaur National Monument in Moffat County, Colorado. The legal descriptions are Sections 21, 25–28, Township 6N, Range 99W; Sections 19–22, 26, 27, 30, 35, 36, Township 6N, Range 98W; and Sections 1, 12, Township 5N, Range 98W (Sixth Principal Meridian), in the Twelvemile Mesa, Cross Mountain Canyon, and Indian Water

Canyon 24k USGS quadrangles. The elevation ranges approximately 5,600–6,200 feet (1,700–1,890 meters).

The local geology is mapped as Cretaceous shale and sandstone, Tertiary sandstone and siltstone, Jurassic mudstone and sandstone, and Jurassic–Triassic sandstone (Green 1992).

The local hydrology is dominated by the Yampa River, which borders the project area to the north. The project area occurs in what is referred to as the middle Yampa and lower Yampa by the USFWS. The river north of the boat ramp is the lower end of the middle Yampa; the river below the boat ramp to the Green River is the lower Yampa. The Colorado Division of Wildlife refers to the area as the lower Yampa in their Yampa River Basin Aquatic Management Plan (2010). The Little Snake River converges with the north side of the Yampa River across from the project area. Named ephemeral washes intersected by the project area include Calico Draw, Bay Gulch, Buffalo Gulch, Graham Gulch, and Twelvemile Gulch.

Vegetation communities along Deerlodge Road are mapped as bottomland shrubland, sagebrush/rabbitbrush shrubland, mixed desert shrubland, piñon–juniper/sagebrush woodland, piñon–juniper/herbaceous woodland, native grassland, and weedy herbaceous vegetation (Dinosaur National Monument vegetation mapping GIS data provided by NPS).

The vegetation along Deerlodge Road is dominated by greasewood (*Sarcobatus vermiculatus*), big sagebrush (*Artemisia tridentata*), rubber rabbitbrush (*Ericameria nauseosa*), cheatgrass (*Bromus tectorum*), crested wheatgrass (*Agropyron spicatum*), and annual wheatgrass (*Eremopyrum triticeum*). The Disappointment Draw Access and Needle parking areas are adjacent to riparian vegetation consisting of willow (*Salix exigua*), salt cedar (*Tamarix* sp.), cottonwood (*Populus angustifolia*), and Russian olive (*Elaeagnus angustifolia*), boxelder (*Acer negundo*), hawthorn (*Crataegus* sp.), buffaloberry (*Shepherdia argentea*), three-leaf sumac (*Rhus aromatica*), snowberry (*Symphoricarpos* sp.), wild rose (*Rosa* sp.), and red-osier dogwood (*Cornus sericea*).

SPECIES ACCOUNTS AND STATUS OF THE SPECIES IN THE ACTION AREA

Federally Listed and Candidate Species

Table 2 presents federally listed and candidate species with potential to occur in Moffat County, CO. A summary of the finding of potential effects discussed in the following section is also included. Species habitat preferences are discussed below.

Table 2. Federally listed and candidate species with potential to occur in the project area and effects summary. Table continued on following page.

Common name	Scientific name	Status
Greater sage-grouse	*Centrocercus urophasianus*	Candidate
Yellow-billed cuckoo	*Coccyzus americanus*	Candidate

Common name	Scientific name	Status
Mexican spotted owl	*Strix occidentalis lucida*	Threatened
Ute ladies'-tresses	*Spiranthes diluvialis*	Threatened
North American wolverine	*Gulo gulo luscus*	Candidate
Canada lynx	*Lynx canadensis*	Threatened
Black-footed ferret	*Mustela nigripes*	Endangered
Humpback chub*	*Gila cypha*	Endangered
Bonytail*	*Gila elegans*	Endangered
Colorado pikeminnow†	*Ptychocheilus lucius*	Endangered
Razorback sucker†	*Xyrauchen texanus*	Endangered

* Critical habitat approximately two miles downstream from project area.
† Critical habitat in project area.

Greater Sage-Grouse—The greater sage-grouse once ranged throughout sagebrush habitats in the Intermountain West (Schroeder et al. 1999). The species is now extirpated in British Columbia, Arizona, New Mexico, Oklahoma, Kansas, and Nebraska. In Colorado, greater sage-grouse are present in portions of the western half of the state (Braun 1995) with populations in Moffat County being one of the largest and open to hunting (Colorado Division of Wildlife 2012a). Remaining populations have been greatly reduced due to fire, overgrazing, and fragmentation (Braun 1998).

The greater sage-grouse depends on mature big sagebrush habitat with appropriate vegetation structure and forb abundance. Habitat-specific preferences vary between breeding, summer brood-rearing, and winter seasons. Sage-grouse have adapted to a variety of sagebrush structures and types. These include tall sagebrushes such as big sagebrush, three-tip sagebrush (*Artemisia tripartita*), and silver sagebrush (*A. cana*); low-growing sagebrushes such as low sagebrush (*A. arbuscula*) and black sagebrush (*A. nova*); and mosaics of low and tall sagebrush with abundant forb cover (Schroeder et al. 1999 and references therein). Other habitats occasionally used include riparian meadows, steppe dominated by native grasses and forbs, willow thickets, and sagebrush savannas with juniper (*Juniperus* spp.), ponderosa pine (*Pinus ponderosa*), and quaking aspen (*Populus tremuloides*; Schroeder et al. 1999 and references therein). Forb cover for browse is an important component of sage-grouse habitat (Department of Interior BLM, Idaho 2000).

Based on the field visit to the project area by EMI biologists, the project area does not contain greater sage-grouse habitat. Although some sagebrush is present, upland areas are mostly dominated by rabbitbrush and greasewood and lack adequate sagebrush and forb cover. The area is also mostly too arid for sage-grouse (Brian Holmes, Colorado Parks and Wildlife Area Terrestrial Biologist, pers. comm. with Matt Brooks, EMI wildlife biologist). Lily and Deerlodge Parks are classified by the BLM and Colorado Parks and Wildlife as "general habitat," which means they are only occasionally used by sage-grouse, and there are no leks. The nearest known active greater sage-grouse lek is approximately 4 miles to the northeast of the project area (Brian Holmes, Colorado Parks and Wildlife Area Terrestrial Biologist, pers. comm. with Matt Brooks,

EMI wildlife biologist). There is one winter radio-telemetry sage-grouse record from 2006 about one mile south of the bank-stabilization area (Brian Holmes, Colorado Parks and Wildlife Area Terrestrial Biologist, pers. comm. with Matt Brooks, EMI wildlife biologist). Based on the above information, it is likely that greater sage-grouse would only occasionally and briefly occur in the project area due to lack of preferred habitat.

Yellow-billed Cuckoo—The current breeding distribution includes most of the United States, southeastern Canada, Greater Antilles, and Mexico (Hughes 1999). The only historic record of breeding cuckoos for western Colorado was along the Yampa River in Routt County in 1988 (Beason 2009). There were three cuckoo detections in Moffat County, Colorado between 2007 and 2008 (Beason 2009). Surveys for cuckoos in Dinosaur National Monument were conducted from July 10, 2008 to August 6, 2008 using a variation of the broadcast survey method specified by the Western Yellow-billed Cuckoo Working Group (Halterman 1991 and Johnson unpublished data). Specific survey areas included Cub Creek, Deerlodge Park, and Jones Hole in Dinosaur National Monument and private lands in Lily Park, River Ridge, Wyman Museum, and the Yampa State Wildlife Area. No cuckoos were detected during surveys (Beason 2009).

The western yellow-billed cuckoo is a neotropical migrant that breeds in riparian forests. Typical habitats include mature cottonwoods (*Populus* spp.) and dense willow (*Salix* spp.) and tamarisk (*Tamarix chinensis*) thickets. Cuckoos require larger patches of suitable habitat and have home ranges between 12 and 50 acres (5 and 20 ha; Halterman et al. 2009). Riparian woody vegetation does occur at the end of Deerlodge Road at the Disappointment Draw Access Area and Needle parking areas. However, the parking areas do not provide large, contiguous areas of riparian woody vegetation that would support viable populations of the cuckoo. Construction at the Disappointment Draw Access Area and parking areas would not disturb cottonwoods or other woody riparian vegetation.

The project area does not contain yellow-billed cuckoo habitat. Although some riparian woody vegetation is present, the areas do not provide large, contiguous riparian habitat that typically supports cuckoos. This species is not likely to occur in or near the project area due to lack of habitat.

Mexican Spotted Owl—The project area does not contain Mexican spotted owl habitat. This owl subspecies is patchily distributed throughout Mexico, Arizona, New Mexico, and southern Utah and Colorado (Gutiérrez et al. 1995). In Colorado, only two breeding populations are known to exist in the following areas: Mesa Verde National Park, approximately 212 miles south of the project area, and the south-central mountains near Pikes Peak and the Wet Mountains over 200 miles to the southeast (Colorado Partners in Flight 2000).

The Mexican spotted owl inhabits mature mixed-conifer forests and is typically associated with steep slopes and cliff/canyon complexes. The winter habitats of Mexican spotted owls include lower-elevation piñon–juniper habitat and mixed, uneven-aged coniferous forests (New Mexico Game and Fish 2010). There is also a preference for downed woody debris and snags. High canopy closure and tree density is an important component in breeding and wintering habitats (New Mexico Game and Fish 2010). Mixed-age forests are often preferred along with proximity to water (Gutiérrez et al. 1995).

It is highly unlikely Mexican spotted owl would occur in or near the project area due to lack of habitat.

Ute ladies'-tresses—This orchid is found across the western U.S. It occurs in Colorado, Idaho, Montana, western Nebraska, Nevada, Washington, and Wyoming and Utah (Fertig et al. 2005). In Colorado, this orchid is known to occur along water bodies in St. Vrain, Boulder, Larimer, and Moffat Counties (Fertig et al. 2005). In Moffat County, populations are known to occur along the Green River from Browns Park to Lodore Canyon (NPS 1998). Lodore Canyon is approximately 45 miles downstream of the project area and extends north to Browns Park.

The Ute ladies'-tresses occurs in a variety of open wetland and moist habitats. Examples include moist meadows associated with perennial stream terraces, floodplains, and oxbows; seasonally flooded river terraces, sub-irrigated or spring-fed abandoned stream channels and valleys, and lakeshores; along irrigation canals, berms, levees, irrigated meadows, excavated gravel pits, roadside barrow pits, reservoirs, and other human-modified wetlands. The elevation ranges 4,300–7,000 feet. Most occupied areas are not overly grazed or disturbed by humans (Jennings 1989, US Fish and Wildlife Service 1992).

Rivers are one of the three major hydrological types in which this species occurs. Green River populations are found primarily in mid-seral moist meadow communities on floodplain terraces dominated by *Agrostis stolonifera*, *Equisetum laevigatum*, various forbs, or scattered stands of *Salix exigua* (Fertig et al. 2005).

This perennial plant is mainly bee pollinated. Flowering occurs late July through September (Utah Native Plant Society 2012). Seeds are produced in late August and September and are wind or water pollinated.

Based on the field visit to the project area by EMI biologists, the project area does not contain Ute ladies'-tresses habitat. A wetland in Twelvemile Gulch next to the Cross Mountain parking lot may provide suitable habitat; however, this area is located approximately 60 feet east of the project area. There are no known Ute ladies'-tresses populations in the Yampa River drainage (T. Naumann, NPS Botanist, pers. comm. with M. Brooks, EMI wildlife biologist). The nearest known population to the project area is approximately 24 miles (~50 miles by river) away on the Green River in Lodore Canyon above the confluence with the Yampa River (T. Naumann, NPS Botanist, pers. comm. with M. Brooks, EMI wildlife biologist).

North American wolverine—This species occurs in high-elevation alpine habitats in North America and Eurasia (Colorado Division of Wildlife 2012b). In North America, wolverines occupy western mountains in Canada and Alaska and extend into the lower 48 states, including Wyoming, Idaho, Montana, and Washington (Colorado Divisoin of Wildlife 2012b). In Colorado, wolverine sightings were nonexistent from 1919 until 2009. In 2009, one wolverine was observed in north central Colorado.

In the western United States, wolverines are restricted to high mountain environments near treeline, where conditions are cold year-round and snow cover persists well into the month of

May. Deep, persistent, spring snow is required for successful wolverine reproduction because female wolverines dig elaborate dens in the snow for their offspring. These den structures are thought to protect wolverine kits from predators and the harsh conditions of alpine winters. Wolverines live in remote and inhospitable places, at high elevations away from human populations. Wolverines naturally occur at low densities, and are rarely encountered where they do occur.

The project area lacks high-elevation forested habitat required for this species. This species is unlikely to occur in the project area due to lack of habitat.

Canada lynx—The lynx has been extirpated from much of its historical range. In 1997, Colorado Division of Wildlife began a lynx reintroduction program. The first documented reproduction in Colorado was in 2003 (Colorado Division of Wildlife 2012c). The main reintroduced lynx distribution in Colorado is in the south-central part of the state.

The species occurs in high-elevation spruce–fir (*Picea* sp.–*Abies* sp.) forests and along avalanche chutes and willow-dominated mountain streams (Colorado Division of Wildlife 2012d). These preferred habitats correspond with the lynx's preferred prey, the snowshoe hare (*Lepus americanus*), on which the lynx is dependent for its main prey.

The project area does not occur in high-elevation forested habitat. Therefore, this species is unlikely to occur in the proposed project area due to lack of habitat.

Black-footed ferret—Historically, this species occurred from the Canadian Great Plains to the intermountain Southwest (USFWS 1988). In Colorado, this species was found statewide in the eastern plains and western valleys (Colorado Division of Wildlife 2012e). In 2001, black-footed ferrets were reintroduced at two locations in Moffat County—Coyote Basin west of Rangely and the BLM's Wolf Creek Management Area southeast of Dinosaur National Monument (Colorado Division of Wildlife 2012e).

This species is a prairie dog (*Cynomys* spp.) town obligate. It depends on prairie dog towns over 200 acres or over 20 burrows per 2.5 acres. The project area and surrounding habitats lack prairie dog towns. Furthermore, the project area is not large enough to physically support or contain large prairie dog towns.

The project area lacks prairie dog towns required for this species. Therefore, this species is unlikely to occur in or near the project area due to lack of habitat.

Humpback chub—The humpback chub is endemic to the Colorado River Basin (USFWS 1984). First described in 1946 (Miller 1946), limited fish sampling in the Colorado River Basin, and the inaccessibility of certain areas assured limited knowledge of this fish's natural history until the last several decades. The known historic range of this 20-inch member of the minnow family was the Colorado River and four of its major tributaries: the Yampa, Green, White, and Little Colorado Rivers (USFWS 1984). The full extent of the historic range is unknown because impoundment projects altered some rivers before this fish was discovered and/or sampled. The Yampa River population is the smallest of all the existing populations and includes populations

in the Yampa, Lodore, and Split Mountain Canyons (USFWS 2002a). Sampling along the Yampa River from 2003–2004 yielded low capture and recapture rates of adult and juvenile humpback chub (Finney 2006).

The humpback chub occurs in a variety of habitats. Habitats range from fast currents with deep pools and boulders (Valdez 1981, Valdez and Clemmer 1982) to more placid waters (Kaeding and Zimmerman 1983). Humpback chub in the Yampa River utilize shoreline eddies and runs over cobble and sand substrates in water about 5 feet deep (Tyus and Karp 1989). Habitat preferences vary somewhat between adult and juvenile fish. In general, adults tend to prefer deep, fast waters but will use microhabitats with slower water, while juveniles prefer shallower waters (USFWS 1984). Humpback chub have been found in association with riprap structures, which may reflect their preference for large rocky substrates (Valdez and Clemmer 1982).

Humpback chub spawning occurs in spring and early summer (Upper Colorado River Endangered Fish Recovery Program 2012a). The exact timing of spawning depends on water level and water temperature. Preferred spawning habitat is unknown, but suspected to be in in or near shoreline eddies, and areas of complex habitat structure over cobble or gravel substrate (USFWS 2002a; M. Trammell, NPS Fisheries Biologist, pers. comm. with G. Molitor, NPS Natural Resource Specialist). The nearest potential spawning areas are the Little Snake River, which meets the Yampa across from the project area, Cross Mountain Canyon, the lower end of which is located where Deerlodge Road meets the Yampa River, and Yampa Canyon, which begins approximately one mile downriver from the project area and continues to the Green River (M. Trammell, NPS Fisheries Biologist, pers. comm. with G. Molitor, NPS Natural Resource Specialist).

The humpback chub diet consists of insects, plankton, plants, and small fish (USFWS 2002a). They are considered mainly bottom feeders but will also feed on insects at the water's surface (USFWS 1984 and references therein).

Principal threats to the humpback chub include stream-flow regulation, habitat modification, predation by nonnative fishes, parasitism, hybridization with other native *Gila* species, and pollution (USFWS 2002a). On the Yampa River, channel catfish (*Ictalurus punctatus*) were identified as the main nonnative predator of humpback chub prior to 2000 (USFWS 2002a); however, more recent information suggests that expanding populations of smallmouth bass (*Micropterus dolomieu*) and northern pike (*Esox lucius*) have replaced channel catfish as the main nonnative fish predators in the Yampa since 2000 (M. Trammell, NPS fisheries biologist, pers. comm., Finney 2006). Northern pike and smallmouth bass are a particular threat in the lower Yampa River, which includes a portion of the project area (USFWS 2002b). A removal program of northern pike and smallmouth bass is being conducted by the Upper Colorado River Basin Recovery Program in the Yampa River and is ongoing (M. Trammell, NPS fisheries biologist, pers. comm., Valdez et al 2008, Upper Colorado River Endangered Fish Recovery Program 2012b).

Humpback chub critical habitat—A total of 379 miles were designated as critical habitat for the humpback chub along seven reaches of the Colorado River system, representing about 28% of the species's historic range (U.S. Department of Interior Fish and Wildlife Service 1994).

Designated critical habitat occurs in the Upper and Lower Colorado River Basins. The project area is located in the Upper Colorado River Basin with designated critical habitat approximately 2 miles downstream from the bank-stabilization area (Figure 6).

Fish critical habitat generally includes the 100-year floodplain where portions of the floodplain contain the primary constituent elements (PCE) defined for the critical habitat. The PCE for humpback chub critical habitat are: 1) Water—A Quantity of water of sufficient quality (i.e., temperature, dissolved oxygen, lack of contaminants, nutrients, turbidity, etc.) that is delivered to a specific location in accordance with a hydrologic regime that is required for the particular life stage for each species; 2) Physical Habitat—Areas of the Colorado River system that are inhabited or potentially habitable by fish for use in spawning, nursery, feeding, and rearing, or corridors between these areas. This also includes bottom lands, side channels, secondary channels, oxbows, backwaters, and other areas that when inundated provide spawning, nursery, feeding and rearing habitats, or access to these habitats; and 3) Biological Environment—Food supply, which is a function of nutrient supply, productivity, and availability to each life stage of the species, and predation and competition, which may be out of balance due to introduced nonnative fishes (USFWS 1994).

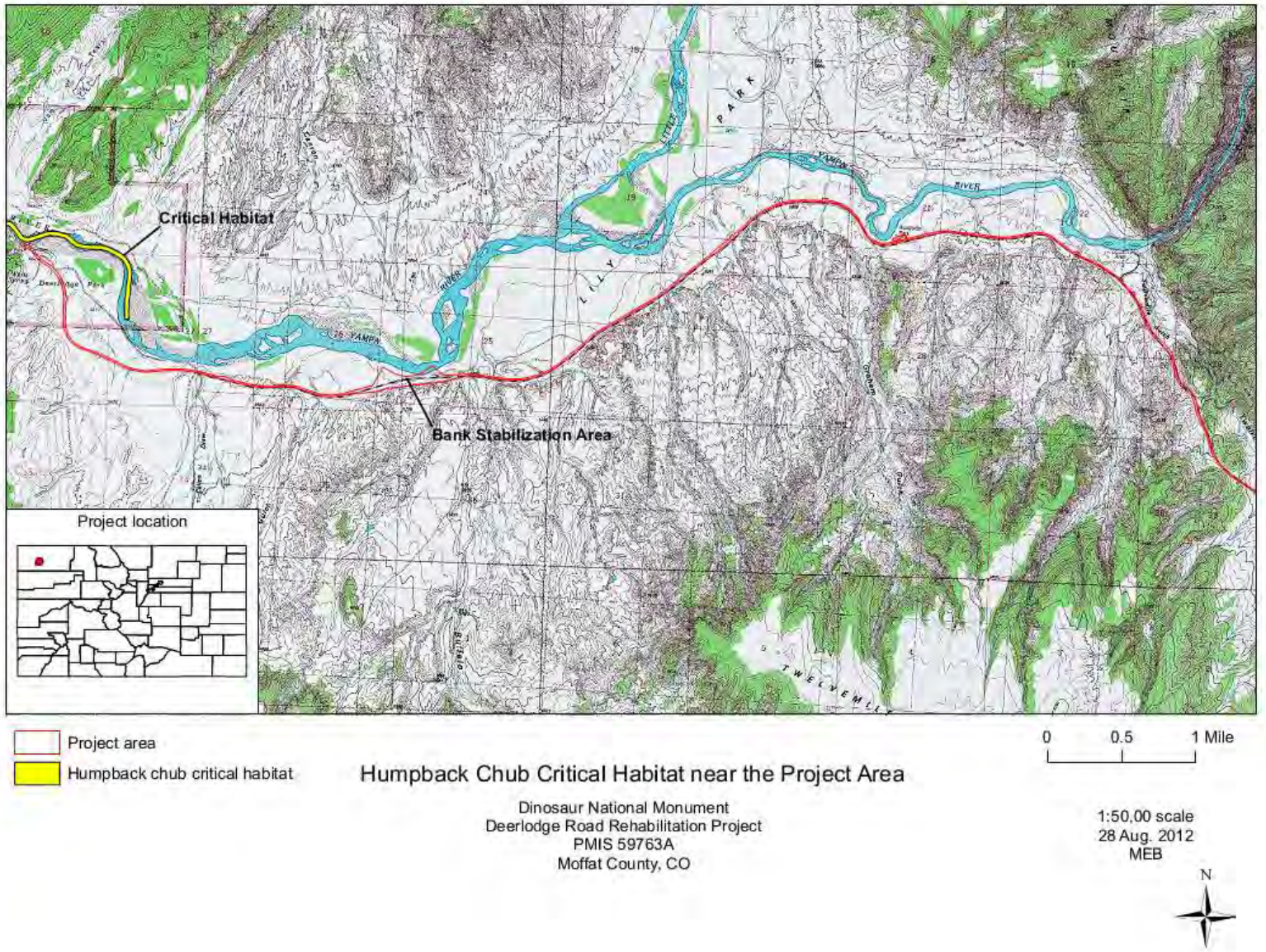


Figure 6. Humpback chub critical habitat near the project area.

Bonytail—The bonytail historically occurred throughout the Colorado River basin. No wild populations are thought to exist (Upper Colorado River Endangered Fish Recovery Program 2012c), making this 22-inch minnow one of the most endangered fishes in the world. Alterations in river flows, decreased water quality, and nonnative fishes all contributed to a serious decline in bonytail numbers by the 1930s (Miller 1961, USFWS 2002b). Thirty-six wild bonytail were captured in the lower Yampa and Green Rivers from 1967–1973 (Holden and Stalnaker 1975); one adult was captured in the lower Yampa River in 1979 (Holden and Crist 1981). The bonytail has been reintroduced in the Colorado, Green, and Yampa Rivers, and in Lake Havasu and Lake Mojave. A diversion structure upstream of the project area near Craig, Colorado, (Craig Diversion) was modified in 1992 to facilitate fish passage (USFWS 2002b). Bonytail raised in hatcheries are released into the Green and upper Colorado Rivers (Upper Colorado River Endangered Fish Recovery Program 2012b).

The bonytail is a large-river species that uses pools and eddies (USFWS 1990). Specific habitat preferences in the wild are largely unknown (Upper Colorado River Endangered Fish Recovery Program 2012c). Spawning in the wild is thought to have occurred in Dinosaur National Monument during late June and early July (Vanicek and Kramer 1969). Other estimates suggest that spawning generally occurred in spring and early summer (USFWS 1990). Not much is known about bonytail young, but it is speculated that young would probably collect in backwaters and flooded bottomlands (M. Trammell, NPS Fisheries Biologist, pers. comm. with G. Molitor, NPS Natural Resource Specialist). The bonytail eats a variety of aquatic and terrestrial insects in river systems. Plankton and plant matter are frequently consumed in reservoirs (USFWS 1990).

Threats to bonytail reestablishment are streamflow regulation, habitat modification, nonnative fishes, hybridization, and pesticides/pollutants (USFWS 2002b). Nonnative fishes that may impact bonytail include the common carp (*Cyprinus carpio*), channel catfish, smallmouth bass, largemouth bass (*Micropterus salmoides*), bluegill (*Lepomis macrochirus*), green sunfish (*Lepomis cyanellus*), red shiner (*Cyprinella lutrensis*), sand shiner (*Notropis stramineus*), fathead minnow (*Pimephales promelas*), walleye (*Stizostedion vitreum*), and northern pike (USFWS 2002b). Northern pike and smallmouth bass are a particular threat in the lower Yampa River, which includes a portion of the project area (USFWS 2002b). A removal program of northern pike and smallmouth bass is being conducted by the Upper Colorado River Basin Recovery Program in the Yampa River and is ongoing (M. Trammell, NPS fisheries biologist, pers. comm., Valdez et al 2008, Upper Colorado River Endangered Fish Recovery Program 2012b).

Bonytail critical habitat—A total of 312 miles of river has been designated as critical habitat for the bonytail in the Colorado River Basin, representing about 14% of the species' historic range (59 FR 13374). Designated Critical Habitat begins approximately 2 miles downstream from the Deerlodge Road bank-stabilization area (Figure 7).

The PCE for bonytail critical habitat are: 1) Water—A Quantity of water of sufficient quality (i.e., temperature, dissolved oxygen, lack of contaminants, nutrients, turbidity, etc.) that is delivered to a specific location in accordance with a hydrologic regime that is required for the particular life stage for each species; 2) Physical Habitat—Areas of the Colorado River system that are inhabited or potentially habitable by fish for use in spawning, nursery, feeding, and

rearing, or corridors between these areas. This also includes bottom lands, side channels, secondary channels, oxbows, backwaters, and other areas that when inundated provide spawning, nursery, feeding and rearing habitats, or access to these habitats; and 3) Biological Environment—Food supply, which is a function of nutrient supply, productivity, and availability to each life stage of the species, and predation and competition, which may be out of balance due to introduced nonnative fishes (USFWS 1994).

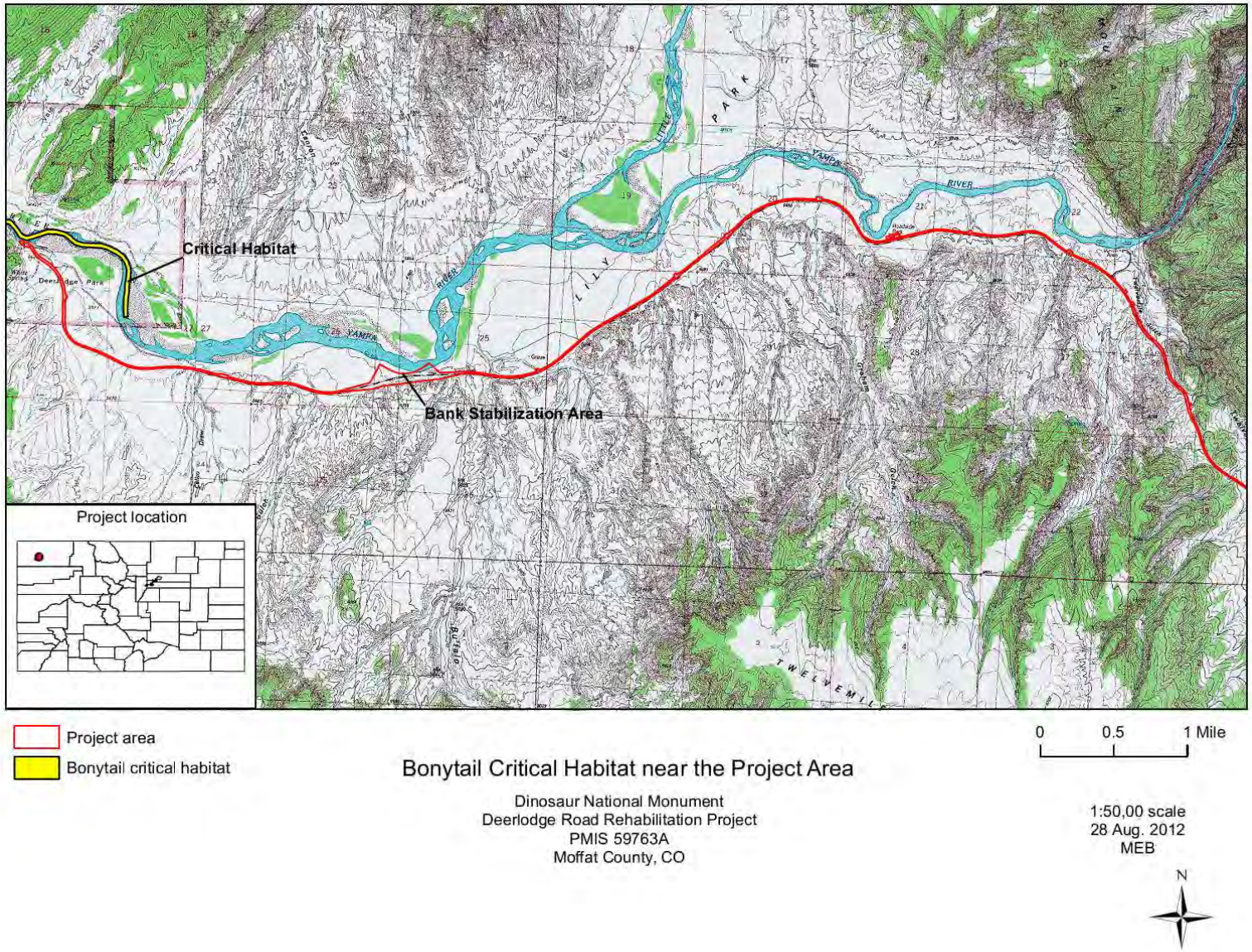


Figure 7. Bonytail critical habitat near the project area.

Colorado pikeminnow—The Colorado pikeminnow is endemic to the Colorado River basin (U.S. Department of Interior Bureau of Reclamation 2012). It was historically abundant in the Yampa River from Craig, Colorado downstream to the Green River (U.S. Department of Interior Bureau of Reclamation 2012). It is still found in this section of the Yampa River but only occurs in the upper Colorado River basin in about 25% of its former range (U.S. Department of Interior Bureau of Reclamation 2012). It is known to breed in the Yampa River, and 1,400 adults were associated with spawning sites in the lower 20 miles of the Yampa River in the 1990s (Crowl and Bouwes 1997). Colorado pikeminnow populations have showed a continued decline since 2003, however, sampling in the Yampa River between 2006 and 2008 found the abundance of Colorado pikeminnow adults to be stable, but low (Bestgen et al. 2010). Fish sampling from 2004 to 2007 in the middle Yampa River and tributaries found an increase in the number of Colorado pikeminnow individuals collected each year (16 fish in 2004 to 25 fish in 2006) except for the last year (11 fish in 2007, Upper Colorado River Endangered Fish Recovery Program 2010).

The Colorado pikeminnow is a long-distance migrant that inhabits pools, deep runs, and eddies maintained by high spring flows. These spring flows are important in maintaining spawning habitats, food production, and nursery habitats (Roehm 2004). Spawning habitat, to which the pikeminnows will migrate over 200 miles, consist of gravel and cobble deposits. Spawning occurs in late spring and early summer. The locally known Colorado pikeminnow spawning area is in the lower Yampa Canyon along the lower 32 kilometers of the Yampa River downstream of the project area (Tyus and McAda 1984). After hatching, larvae drift downstream to backwater nurseries formed by high spring flows and maintained by stable base flows (U.S. Department of Interior Bureau of Reclamation 2012). Adult Colorado pikeminnow feed mainly on fish; young fish feed on insects and plankton (Upper Colorado River Endangered Fish Recovery Program 2012a).

Threats to the Colorado pikeminnow include streamflow regulation, habitat modification, nonnative fishes, and pesticides/pollutants (USFWS 2002c). Multiple species of nonnative fishes have been documented predating on Colorado pikeminnow larvae and yearlings, competing with the pikeminnow for limited resources, or both (USFWS 2002c). Nonnative fish that threaten the Colorado pikeminnow include black bullhead (*Ameiurus melas*), green sunfish, largemouth bass, red shiner, black crappie (*Pomoxis nigromaculatus*), and particularly along the Yampa River, the channel catfish and northern pike (USFWS 2002c). Recent information suggests that expanding populations of smallmouth bass and northern pike have replaced channel catfish as the main nonnative fish predators in the Yampa since 2000 (M. Trammell, NPS fisheries biologist, pers. comm., Finney 2006). Northern pike and smallmouth bass are a particular threat in the lower Yampa River, which includes a portion of the project area (USFWS 2002b). A removal program of northern pike and smallmouth bass is being conducted by the Upper Colorado River Basin Recovery Program in the Yampa River and is ongoing (M. Trammell, NPS fisheries biologist, pers. comm., Valdez et al 2008, Upper Colorado River Endangered Fish Recovery Program 2012b).

A nonnative fish removal program was conducted on parts of the Yampa River from 2004–2007 (Upper Colorado River Endangered Fish Recovery Program 2010). Northern pike were removed from the middle Yampa River from the upper terminus at Craig (river mile 134.2—South Beach

boat launch) to the lower terminus in Lily Park (river mile 50.5—downstream of Cross Mountain Canyon). Smallmouth bass were removed in the South Beach reach (river miles 134.2–124.0). Lily Park, the closest intensive removal area, is about 1.4 miles upstream from the bank stabilization project area. Smallmouth bass and northern pike have been periodically removed from Yampa Canyon beginning at the Deerlodge boat ramp downstream since 2003 (M. Trammell, NPS fisheries biologist, pers. comm.).

Colorado pikeminnow critical habitat—A total of 1,148 miles were designated as critical habitat along six reaches of the Colorado River system, representing about 29% of the species' historic range (59 FR 13374). Designated critical habitat occurs in the Upper Colorado River Basin in portions of the Colorado, Green, Yampa, White, and San Juan Rivers. The project area is located within the Upper Colorado River Basin and is located within designated critical habitat (Figure 8).

The PCE for Colorado pikeminnow critical habitat are: 1) Water—A Quantity of water of sufficient quality (i.e., temperature, dissolved oxygen, lack of contaminants, nutrients, turbidity, etc.) that is delivered to a specific location in accordance with a hydrologic regime that is required for the particular life stage for each species; 2) Physical Habitat—Areas of the Colorado River system that are inhabited or potentially habitable by fish for use in spawning, nursery, feeding, and rearing, or corridors between these areas. This also includes bottom lands, side channels, secondary channels, oxbows, backwaters, and other areas that when inundated provide spawning, nursery, feeding and rearing habitats, or access to these habitats; and 3) Biological Environment—Food supply, which is a function of nutrient supply, productivity, and availability to each life stage of the species, and predation and competition, which may be out of balance due to introduced nonnative fishes (USFWS 1994).

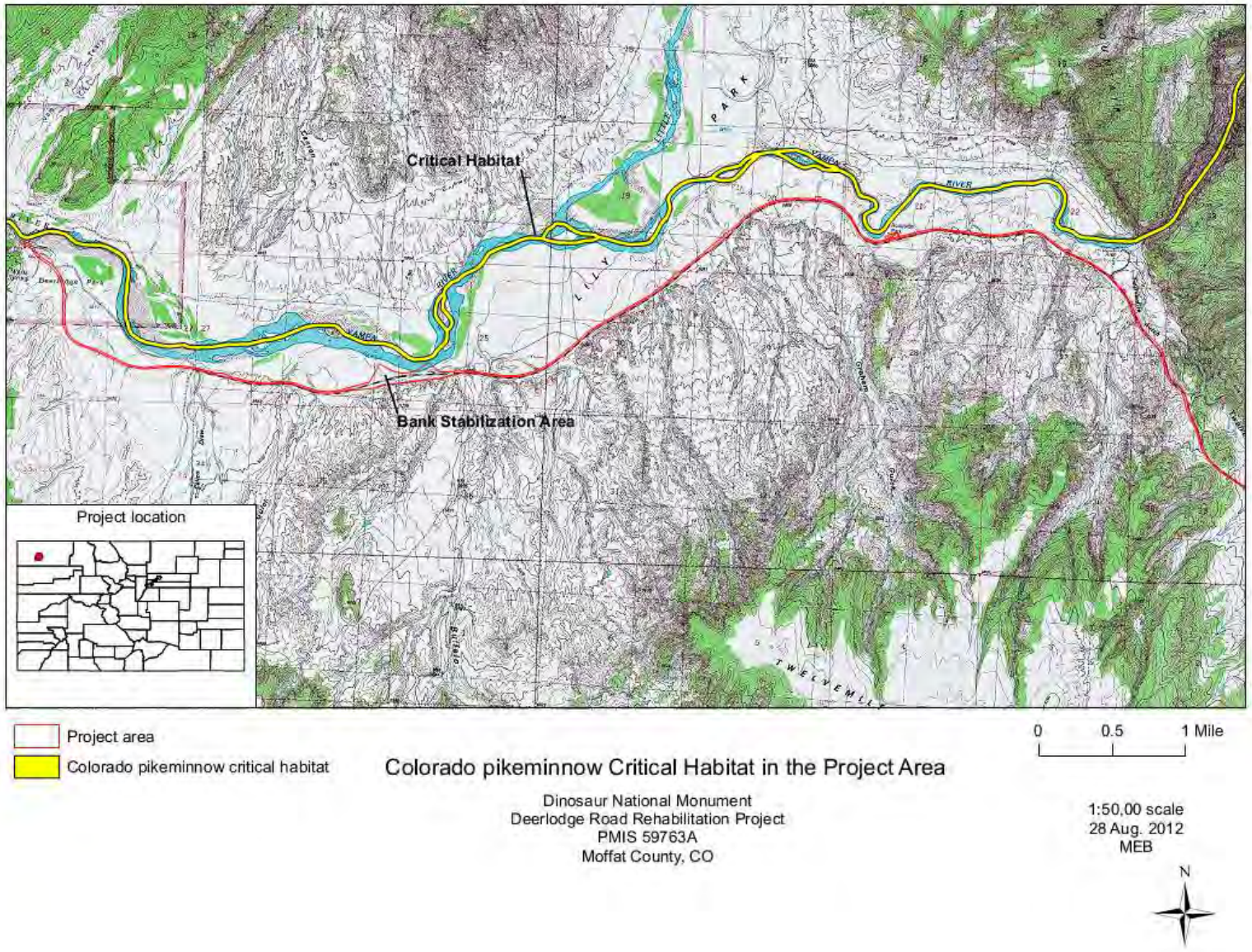


Figure 8. Colorado pikeminnow critical habitat in the project area.

Razorback sucker—This fish, placed in the monotypic genus *Xyrauchen*, historically occurred throughout the Colorado River basin from Wyoming to Mexico (USFWS 2002d). Occurring in numerous tributaries of the Colorado River, they were known from the Green and Yampa Rivers (USFWS 1998 and references therein). Numbers began to decline in the 20th century due to nonnative fishes and habitat alteration affecting river flow. In the upper Colorado River basin, the largest concentrations of razorback suckers currently occur in the upper Green River from its confluence with the Duchesne River to the lower four miles of the Yampa River (USFWS 1998). This is thought to be a single, isolated reproductive population (Modde and Irving 1998) that is either stable or slowly declining (Modde et al. 1996). Razorback suckers are being reintroduced into the Colorado, Gunnison, Green, and San Juan rivers, and lakes Havasu and Mohave (Upper Colorado River Endangered Fish Recovery Program 2012a).

Adult razorback sucker habitats vary by season in response to natural flow rates. In spring, preferred habitats include deep runs, eddies, backwaters, and flooded off-channel environments. In summer, runs and pools are preferred, these being often associated with submerged sandbars in shallow water. Winter preferences include low-velocity runs, pools, and eddies (Roehm 2004). The razorback sucker also occurs in reservoirs and oxbow lakes (USFWS 1998). Juvenile habitat requirements are not well understood because young are rarely encountered (Tyus 1987).

Spawning in rivers occurs over cobble, gravel, and sand substrates during spring runoff. Spawning in reservoirs occurs over rocky shoals and shorelines. Young razorback sucker nursery requirements include quiet, warm, shallow water, backwaters, inundated floodplains, and coves or shorelines in reservoirs (Roehm 2004). Spawning migrations may exceed 100 km (Tyus 1987, Tyus and Karp 1990). Adult fish consume insects, plants, and plankton (Upper Colorado River Endangered Fish Recovery Program 2012a). Two documented spawning areas are the Green River near Jenson, Utah, and the mouth of the Yampa River (Tyus and Karp 1990).

The primary threats to the razorback sucker are streamflow regulation, habitat modification, predation by nonnative fishes, and pesticides/pollutants (USFWS 2002d). Restricted streamflow does not allow for the creation or maintenance of the required habitat structures. Nonnative fishes that are known to predate or compete with the razorback sucker include the common carp, channel catfish, smallmouth bass, largemouth bass, bluegill, green sunfish, red shiner, sand shiner, fathead minnow, walleye, and northern pike (USFWS 2002d). Recent information suggests that expanding populations of smallmouth bass and northern pike have replaced channel catfish as the main nonnative fish predators in the Yampa since 2000 (M. Trammell, NPS fisheries biologist, pers. comm., Finney 2006). Northern pike and smallmouth bass are a particular threat in the lower Yampa River, which includes a portion of the project area (USFWS 2002b). A removal program of northern pike and smallmouth bass is being conducted by the Upper Colorado River Basin Recovery Program in the Yampa River and is ongoing (M. Trammell, NPS fisheries biologist, pers. comm., Valdez et al 2008, Upper Colorado River Endangered Fish Recovery Program 2012b).

Razorback sucker critical habitat—A total of 1,724 miles were designated as critical habitat along 15 reaches of the Colorado River system, representing about 49% of the species' historic range (59 FR 13374). Designated critical habitat occurs in the Upper and Lower Colorado River

Basins. The project area is located within the Upper Colorado River Basin and is located within designated critical habitat (Figure 9).

The PCE for razorback sucker critical habitat are: 1) Water—A Quantity of water of sufficient quality (i.e., temperature, dissolved oxygen, lack of contaminants, nutrients, turbidity, etc.) that is delivered to a specific location in accordance with a hydrologic regime that is required for the particular life stage for each species; 2) Physical Habitat—Areas of the Colorado River system that are inhabited or potentially habitable by fish for use in spawning, nursery, feeding, and rearing, or corridors between these areas. This also includes bottom lands, side channels, secondary channels, oxbows, backwaters, and other areas that when inundated provide spawning, nursery, feeding and rearing habitats, or access to these habitats; and 3) Biological Environment—Food supply, which is a function of nutrient supply, productivity, and availability to each life stage of the species, and predation and competition, which may be out of balance due to introduced nonnative fishes (USFWS 1994, USFWS 1998). Special consideration was given to habitats required for reproduction and recruitment in the establishment of razorback sucker critical habitat because of the lack of recruitment for this species (USFWS 1994).

Adult razorback sucker are known to occur within the project area; the young of this species is not known to occur in the project area (M. Trammell, NPS Fisheries Biologist, pers. comm. with M. Brooks, EMI wildlife biologist).

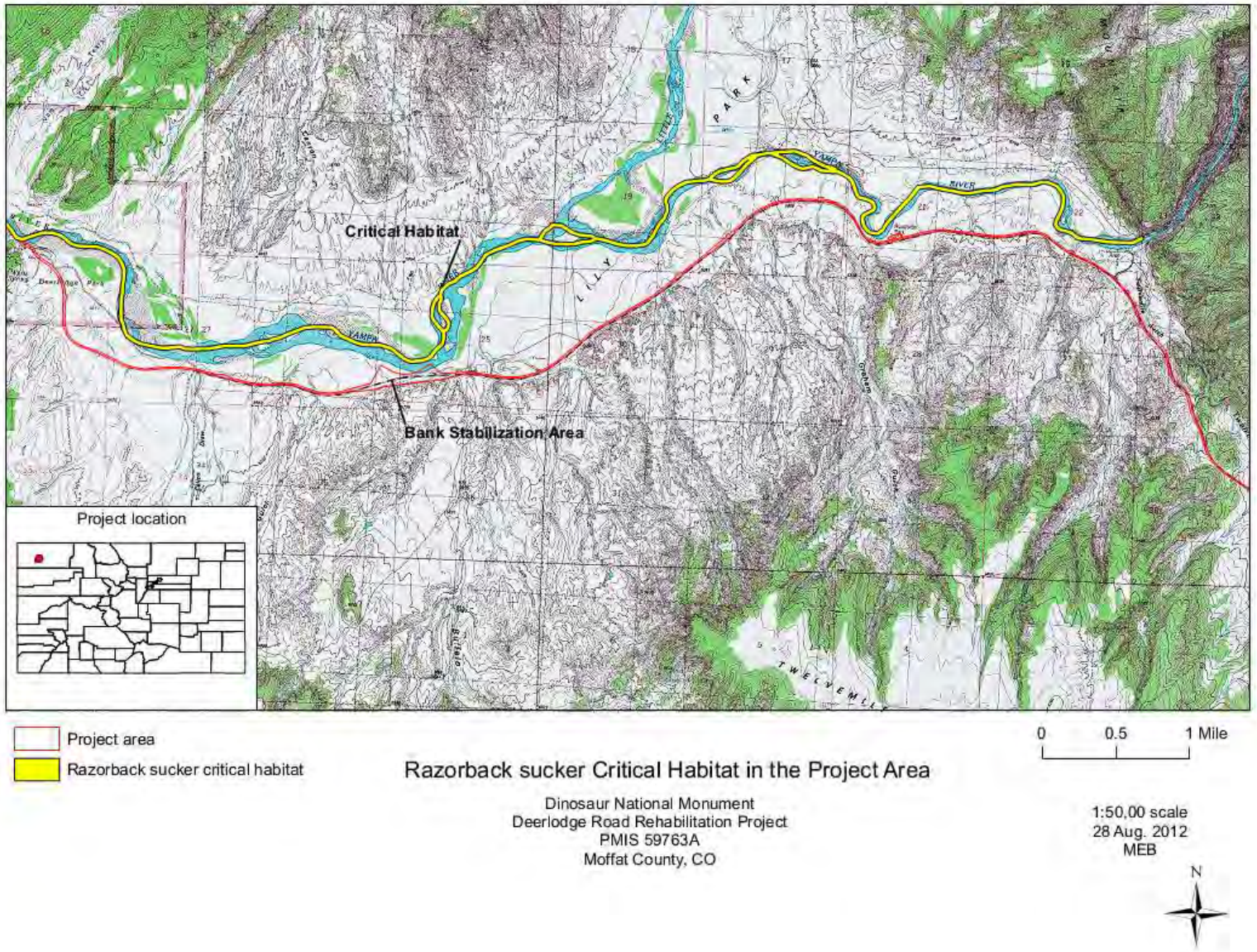


Figure 9. Razorback sucker critical habitat in the project area.

EFFECTS ANALYSIS

This section will analyze potential effects of the proposed action on species protected under the Endangered Species Act and their designated critical habitats. The discussion will be restricted to the four fish species—humpback chub, bonytail, Colorado pikeminnow, and razorback sucker—in Table 1. All four fish species have designated critical habitat in or near the project area.

Based on field-visit observations, there is no suitable habitat for yellow-billed cuckoo, Mexican spotted owl, North American wolverine, Canada lynx, and black-footed ferret in the project area. Greater sage-grouse could occasionally occur in the project area, but the area lacks preferred habitat (large expanses of sagebrush and forb cover), there are no nearby leks, and the proposed action would not further fragment the habitat or erect elevated structures that could serve as purchases for avian predators. Therefore, this proposed action would have "no effect" on these species.

Based on field observations, there is no suitable habitat for Ute ladies'-tresses in the project area. Furthermore, no populations are known from the Yampa River drainage, and the nearest population is approximately 50 miles to the west on the Green River (T. Naumann, NPS Botanist, pers. comm. with M. Brooks, EMI wildlife biologist).

Fishes

Occurrence: Any of the four fish species could occur in the project area. However, only two large juveniles or adult endangered fishes of any species have been captured in the bank-stabilization area during surveys—one pikeminnow in 1999 and one pikeminnow in 2000 (M. Trammell, NPS Fisheries Biologist, pers. comm. with G. Molitor, NPS Natural Resource Specialist). No young have been captured in the project area during intensive sampling efforts conducted during nonnative removal projects (M. Trammell pers. comm., Valdez et al 2008, Upper Colorado River Endangered Fish Recovery Program 2012b).

Take: Direct impacts to fishes during riprap-installation would be avoided. There would be no incidental take because the design of the launchable toe would exclude the need for intensive in-water work. Placement of the rock riprap outside the riverbed would require excavation from the base of the existing bank slope away from the river to one inch above the estimated high water elevation. Adult fish would also likely avoid the project area during riprap installation because of noise disturbance (M. Trammell, NPS Fisheries Biologist, pers. comm. with G. Molitor, NPS Natural Resource Specialist).

Displacement: Displacement of fishes from the project area could occur because of riverside physical and audio disturbances during installation of the riprap. No displacement would occur from spawning grounds (see below). Displacement from construction activities, however, would be localized and temporary and is unlikely to restrict or limit fish access to the water or physical habitat primary constituent elements of the critical habitats.

Spawning grounds: Impacts to breeding fishes or spawning areas would be avoided. The nearest known humpback chub spawning ground is located in Yampa Canyon, which begins

approximately one mile downriver from the project area, although spawning is suspected to occur in the Little Snake River and Cross Mountain Canyon upstream of the project area. There are no known wild bonytail spawning grounds. The nearest known Colorado pikeminnow spawning ground is in the lower Yampa Canyon along the lower 20 miles of the Yampa River (Tyus and McAda 1984) approximately 25 miles downstream from the project area. The nearest known razorback sucker spawning ground is located approximately 45 miles downstream of the project area at the mouth of the Yampa River (Tyus and Karp 1990).

Construction would take place in autumn outside of the spawning season for all fishes except the Colorado pikeminnow. Bank-stabilization work would begin sometime between August 15 and September 30 and would be completed by winter. This timeframe does go into the July 1–September 30 Colorado pikeminnow spawning period as recognized by the USFWS (Patty Gelatt, USFWS fisheries biologist, pers. comm.). Disturbance from the proposed action would not disrupt pikeminnow spawning because the approximate 25-mile distance between the project area and the nearest spawning grounds would be an adequate buffer between spawning and construction activities.

Invasive species habitat: Creation of nonnative fish habitat would be avoided. Riprap can create habitat for the invasive smallmouth bass, which predate on the larvae and young of native fishes (Johnson et al. 2008), because it simulates boulder habitats used by the fish (M. Trammell, fisheries biologist, National Park Service, pers. comm., Munther 1970, Todd and Rabeni 1989, Sammons and Bettoli 1999). The design of the launchable toe for the riprap would minimize colonization of smallmouth bass in the bank-stabilization area by allowing smaller rock to fill the voids of the larger rock and sediment would fill back over the launched material as it slowly launches to scour depths. This would fill in the gaps within and between the riprap and underlying soil, thus minimizing creation of smallmouth bass habitat in the bank-stabilization area. Furthermore, a nonnative fish-removal program has been ongoing in and around the project area; this would continue after installation of the riprap (M. Trammell pers. comm., Valdez et al 2008, Upper Colorado River Endangered Fish Recovery Program 2012b).

Sedimentation and contamination: There would be no indirect impacts from increased sedimentation because: 1) sedimentation is not a concern because the river is already turbid (M. Trammell, NPS Fisheries Biologist, pers. comm. with M. Brooks, EMI wildlife biologist); and 2) erosion- and contamination-prevention measures would be adequate to prevent contamination of the river during construction (Table 1).

Critical Habitats—Impacts to critical habitats are analyzed by the three PCE.

Water: Impacts to water quality would be avoided. For the proposed action, turbidity and contamination of the Yampa River are the principal concerns. Impacts from sedimentation and chemical contamination would be avoided. Sedimentation is not a concern because the river is already turbid (M. Trammell, NPS Fisheries Biologist, pers. comm. with M. Brooks, EMI wildlife biologist). Erosion- and contamination-prevention measures would be adequate to prevent contamination of the river during construction (Table 1). The installation of new culverts would reduce or eliminate future erosion at existing problem areas.

Physical habitat: The bank-stabilization project would temporarily disturb physical habitat of the Colorado pikeminnow and razorback sucker by increased noise and the construction activities. The proposed action would result in the permanent stabilization of approximately 1,500 feet of the Yampa River bank. Hard stabilization and the loss of energy dissipation associated with natural bank erosion could affect local or downstream river hydrology such as the creation of point bars or natural sediment loads. These effects may be dispersed over a large area or localized. It is unlikely, however, that the stabilization of a single bend in the river would alter the overall hydrology or physical habitat in any way that would significantly impact the river's functions in terms of providing habitats for spawning, nursery, feeding, rearing, and corridors between these areas.

Besides the bank-stabilization portion of the proposed action, there would be no additional disturbance of the 100-year floodplain beyond the existing road and parking areas.

Biological environment: Impacts to the biological environment would be avoided. For the proposed action, the creation of additional smallmouth bass habitat in the Yampa River is the principal concern. No additional habitat for the invasive smallmouth bass would be created. The design of the launchable toe for the riprap would minimize colonization of smallmouth bass in the bank-stabilization area by allowing smaller rock to fill the voids of the larger rock and sediment would fill back over the launched material as it slowly launches to scour depths. This would fill in the gaps within and between the riprap and underlying soil, thus minimizing creation of smallmouth bass habitat in the bank-stabilization area.

CUMULATIVE EFFECTS

Deerlodge Road serves primarily to access the Yampa River and adjacent private and BLM grazing land. Most traffic along Deerlodge Road occurs from May through September as rafters and kayakers take advantage of higher flows in the Yampa River from winter snow melt. Deerlodge Road is plowed in the winter, but may be closed during the winter months due to snow and snowdrifts. The current condition of Deerlodge Road does not inhibit or impact the amount of use it currently receives (e.g., off-road vehicles not required); therefore, the improvement and protection (via bank stabilization) of the road would not encourage or lead to increased use of surrounding lands or the river. The proposed action would not create additional river access for recreationist.

The surrounding countryside is rural, and the predominant land use for all lands (federal, private, and state) in the area is grazing. The number of ranchers that use the road is not expected to increase because there would be no additional river access created or an increase in irrigation structures.

There are no foreseeable state or private actions that would affect, in combination with effects from the proposed action, federally listed species or critical habitats.

EFFECTS DETERMINATION

The proposed action would have *no effect* on the following species because of lack of suitable habitat and occurrence in and around the project area: yellow-billed cuckoo, Mexican spotted owl, Ute ladies'-tresses, North American wolverine, Canada lynx, and black-footed ferret.

Greater sage-grouse could occasionally use the project area, but the area lacks preferred habitat (large expanses of sagebrush and forb cover), there are no nearby leks, and the proposed action would not further fragment the habitat or erect elevated structures that could serve as purchases for avian predators. Therefore, the proposed action would have *no effect* on the greater sage-grouse.

Humpback chub—The proposed action *may affect but is not likely to adversely affect* the humpback chub because any potential effects would be insignificant and discountable. Spawning, larvae, and young—the most sensitive age classes of the fish—have not been documented in the project area (as determined by periodic sampling). There would be no incidental take because the design of the launchable toe would exclude the need for intensive in-water work. Placement of the rock riprap outside the riverbed would require excavation from the base of the existing bank slope away from the river to one inch above the estimated high water elevation. Displacement from construction activities would be localized and temporary and are unlikely to restrict or limit fish access to the water or physical habitat primary constituent elements of the critical habitats. Spawning habitat is located within one mile of the project area downstream, but in-water activities would occur outside this species's spawning season. The riprap design plan would minimize the creation of additional smallmouth bass habitat, and nonnative fish removal would continue in and around the project area. Sedimentation would have no effect because of the river's natural turbidity, and, regardless, the conservation measures that would be applied during the riprap installation and road improvement would prevent sedimentation and chemical contamination of the river.

Bonytail—The proposed action *may affect but is not likely to adversely affect* the bonytail because any potential effects would be insignificant and discountable. Spawning, larvae, and young—the most sensitive age classes of the fish—have not been documented in the project area (as determined by periodic sampling). There would be no incidental take because the design of the launchable toe would exclude the need for intensive in-water work. Placement of the rock riprap outside the riverbed would require excavation from the base of the existing bank slope away from the river to one inch above the estimated high water elevation. Displacement from construction activities would be localized and temporary and are unlikely to restrict or limit fish access to the water or physical habitat primary constituent elements of the critical habitats. There are no wild bonytail spawning grounds. The riprap design plan would minimize the creation of additional smallmouth bass habitat, and nonnative fish removal would continue in and around the project area. Sedimentation would have no effect because of the river's natural turbidity, and, regardless, the conservation measures that would be applied during the riprap installation and road improvement would prevent sedimentation and chemical contamination of the river.

Colorado pikeminnow—The proposed action *may affect but is not likely to adversely affect* the Colorado pikeminnow because any potential effects would be insignificant and discountable.

Spawning, larvae, and young—the most sensitive age classes of the fish—have not been documented in the project area, and only two adult Colorado pikeminnow have been documented in the area (as determined by periodic sampling). There would be no incidental take because the design of the launchable toe would exclude the need for intensive in-water work. Placement of the rock riprap outside the riverbed would require excavation from the base of the existing bank slope away from the river to one inch above the estimated high water elevation. Displacement from construction activities would be localized and temporary and are unlikely to restrict or limit fish access to the water or physical habitat primary constituent elements of the critical habitats. The nearest spawning area is located approximately 25 miles downriver from the project area, and although in-water activities would occur during the pikeminnow spawning season, impacts would be negated by distance. The riprap design plan would minimize the creation of additional smallmouth bass habitat, and nonnative fish removal would continue in and around the project area. Sedimentation would have no effect because of the river's natural turbidity, and, regardless, the conservation measures that would be applied during the riprap installation and road improvement would prevent sedimentation and chemical contamination of the river.

Spawning, larvae, and young are not known to occur in the project area. Adults are likely to avoid the area due to noise disturbance. In-water work would begin sometime between August 15 and September 30 and would be completed by winter. This time frame does go into the July 1–September 30 time restriction for Colorado pikeminnow spawning. However, the known Colorado pikeminnow spawning area is located downstream of the site, so impacts would be minimized by distance. Spawning is not known to occur within the project area. The work would also be done during low flow minimizing the amount of sediment drift downstream. The issue of an increased smallmouth bass population as a result of improved habitat would be minimized by the installation of riprap in a manner that would limit the creation of smallmouth bass habitat and a continued nonnative fish removal program in the area.

Razorback sucker—The proposed action *may affect but is not likely to adversely affect* the razorback sucker because any potential effects would be insignificant and discountable. Spawning, larvae, and young—the most sensitive age classes of the fish—have not been documented in the project area (as determined by periodic sampling). There would be no incidental take because the design of the launchable toe would exclude the need for intensive in-water work. Placement of the rock riprap outside the riverbed would require excavation from the base of the existing bank slope away from the river to one inch above the estimated high water elevation. Displacement from construction activities would be localized and temporary and are unlikely to restrict or limit fish access to the water or physical habitat primary constituent elements of the critical habitats. The nearest spawning area is located approximately 45 miles downriver from the project area, and in-water activities would occur outside this species's spawning season. The riprap design plan would minimize the creation of additional smallmouth bass habitat, and nonnative fish removal would continue in and around the project area. Sedimentation would have no effect because of the river's natural turbidity, and, regardless, the conservation measures that would be applied during the riprap installation and road improvement would prevent sedimentation and chemical contamination of the river.

Critical habitats—The proposed action *may affect but is not likely to adversely affect* the critical habitats for the four listed fishes of concern because any potential effects would be insignificant

and discountable. This was determined because the proposed action would not have any significant long-term effects on the PCE of the critical habitats. Water quality would be protected by extensive conservation measures, and sedimentation is not an issue because of the natural turbidity of the river. Physical habitat of the river and its 100-year floodplain impacts would be localized and are unlikely to significantly affect the river's function in terms of providing habitats for spawning, nursery, feeding, rearing, and corridors between these areas. The biological environment would not be affected because the bank-stabilization plans would minimize the creation of nonnative fish habitat, and the nonnative fish removal program would continue in and around the project area.

LIST OF CONTACTS/PREPARERS

National Park Service, Dinosaur National Monument

Tamara Naumann, Botanist

Melissa Trammell, Fisheries Biologist

National Park Service, Denver Service Center

Ginger Molitor, Natural Resources Specialist

Ecosystem Management, Inc.

Matthew E. Brooks, Wildlife Biologist

REFERENCES

Beason, J. P.
2009 Surveys for Yellow-billed Cuckoos on lands managed by the National Park Service in Dinosaur National Monument and northwest Colorado. Technical Report # SC-YBCU-NPS-09-1. Rocky Mountain Bird Observatory, Brighton, Colorado. 19 pp.

Bestgen, K. R., J. A. Hawkins, G. C. White, C. D. Walford, P. Badame, and L. Monroe
2010 Population status of Colorado pikeminnow in the Green River basin, Utah and Colorado, 2006–2008. Colorado River Recovery Implementation Program Project Number 128.

Braun, C. E.
1995 Distribution and status of Sage Grouse in Colorado. Prairie Naturalist 27:1–9.

1998 Sage-grouse declines in western North America: what are the problems? Proceedings of the Western Association of State Fish and Wildlife Agencies 78:139–156.

Colorado Parks and Wildlife.
2012a Wildlife species profiles: Greater sage-grouse. Accessed October 2012 from http://wildlife.state.co.us/WildlifeSpecies/Profiles/Birds/Pages/GreaterSageGrouse.aspx.

2012b Wildlife species of concern: wolverine. Colorado Parks and Wildlife. Accessed 18 July 2012 from http://wildlife.state.co.us/WildlifeSpecies/SpeciesOfConcern/Mammals/Pages/Wolverine.aspx.

2012c Success of the Colorado Division of Wildlife's lynx reintroduction program. Colorado Parks and Wildlife. Accessed 18 July 2012 from http://wildlife.state.co.us/SiteCollectionDocuments/DOW/Research/Mammals/ColoradoLynxReintroductionAssessment_090710.pdf.

2012d Wildlife species of concern: lynx. Colorado Parks and Wildlife. Accessed 18 July 2012 from http://wildlife.state.co.us/WildlifeSpecies/SpeciesOfConcern/Mammals/Lynx/Pages/Lynx.aspx.

2012e Wildlife species of concern: black-footed ferret. Accessed October 2012 from http://wildlife.state.co.us/WildlifeSpecies/SpeciesOfConcern/Mammals/Pages/BlackfootedFerret.aspx.

2010 Yampa River basin aquatic management plan. Colorado Parks and Wildlife, Aquatic Wildlife Section, Denver, Colorado.

Colorado Partners in Flight
2000 Physiographic Region 62: southern Rocky Mountains, Mexican spotted owl. Accessed October 2012 from http://www.rmbo.org/pif/bcp/phy62/ppine/meso.htm.

Cowardin, L. M., V. Carter, F. C. Golet, and E. T. LaRoe
1979 Classification of wetlands and deepwater habitats of the United States. United States Department of the Interior Geological Service, Washington, D.C.

Crowl, T. A., and N. W. Bouwes
1997 Modeling population dynamics of Colorado squawfish, razorback sucker, and humpback chub: for management objective development. Utah State University, Logan, Utah.

Dinosaur National Monument
2001 Deerlodge Road riprap curtain Dinosaur National Monument environmental assessment. Dinosaur National Monument, Dinosaur, Colorado.

Federal Highway Administration (FHWA), U.S. Department of Transportation (USDOT)
2011. U.S. Technical Memorandum of the Yampa River near Deerlodge Road (CO PRA DINO 101(1)), Dinosaur National Monument. U. S. Department of Transportation Federal Highway Administration Central Federal Lands Highway Division and CH2M HILL. Federal Highway Division, Lakewood, Colorado.

2012a Preliminary Hydraulics Recommendations Report for Deerlodge Road Improvements, Dinosaur National Monument. CH2MHILL. Federal Highway Division, Lakewood, Colorado.

2012b Draft Pavement and Design Report, Dinosaur National Monument. Yeh and Associates, Inc. Federal Highway Division, Lakewood, Colorado.

Fertig, W., R. Black, and P. Wolken
2005 Rangewide status review of Ute ladies'-tresses (*Spiranthes diluvialis*). U.S. Fish and Wildlife Service and Central Utah Water Conservancy District.

Finney, S.
2006 Adult and juvenile humpback chub monitoring for the Yampa River population, 2003–2004. Upper Colorado River Endangered Fish Recovery Program Project No. 133.

Green, G. N.
1992 The digital geologic map of Colorado in ARC/INFO format: U.S. Geological Survey, Open-File Report OFR-92-507. Accessed May 2012 from http://pubs.usgs.gov/of/ofr-92-0507/.

Gutiérrez, R. J., A. B. Franklin, and W. S. Lahaye
1995 Spotted Owl (*Strix occidentalis*), the birds of North America online (A. Poole, Ed.). Cornell Lab of Ornithology, Ithaca, New York. Online: http://bna.birds.cornell.edu.bnaproxy.birds.cornell.edu/bna/species/179.

Halterman, M.
1991 Distribution and Habitat Use of the Yellow-Billed Cuckoo (*Coccyzus americanus occidentalis*) on the Sacramento River, California, 1987-90, MS Thesis. California State University, Chico, California.

Halterman, M., M. J. Johnson, and J. A. Holmes
2009 Western Yellow-billed Cuckoo natural history summary and survey methodology, version 3.4. Southern Sierra Research Station, Weldon, CA, and Colorado Plateau Research Station, Northern Arizona University, Flagstaff, Arizona.

Holden, P. B., and C. B. Stalnaker
1975 Distribution of fishes in the Dolores and Yampa river systems of the upper Colorado basin. Southwestern Naturalist 19:403–412.

Holden, P. B., and L. W. Crist
1981 Documentation of changes in the macroinvertebrate and fish populations in the Green River due to inlet modification of Flaming Gorge Dam. Final Report PR-16-5 U.S. Fish and Wildlife Service, Salt Lake City, Utah.

Hughes, J. M.
1999 Yellow-billed Cuckoo (*Coccyzus americanus*), the birds of North America online (A. Poole, Ed). Cornell Lab of Ornithology, Ithaca, NY. Online: http://bna.birds.cornell.edu.bnaproxy.birds.cornell.edu/bna/species/418 doi:10.2173/bna.418.

Jennings, W. F.
1990 Final report Colorado natural history small grants program. species studied: *Spiranthes diluvialis*, *Sisyrinchium pallidum*. Prepared for The Nature Conservancy, Boulder, Colorado.

Johnson, B. M., P. J. Martinez, J. A. Hawkins, and K. R. Bestgen
2008 Ranking predatory threats by nonnative fishes in the Yampa River, Colorado, via bioenergetics modeling. North American Journal of Fisheries Management 28:1941–1953.

Kaeding, L. R., and M. A. Zimmerman.
1983 Life history and ecology of the humpback chub in the Little Colorado and Colorado Rivers of the Grand Canyon. Transactions of the American Fisheries Society 112:577–594.

Miller, R. R.
1961 Man and the changing fish fauna of the American Southwest. Michigan Academy of Science, Arts, and Letters Paper 46:365–404.

1946 *Gila cypha*, a remarkable new species of cyprinid fish from the Colorado River in Grand Canyon, Arizona. Journal of the Washington Academy of Science 36:409–415.

Modde, T., and D. B. Irving
1998 Use of multiple spawning sites and seasonal movement by razorback sucker in the middle Green River, Utah. North American Journal of Fisheries Management 18:318–326.

Modde, T., K. P. Burnham, and E. J. Wick
1996 Population status of the razorback sucker in the middle Green River. Conservation Biology 10:110–119.

Munther, G. L.
1970 Movement and distribution of smallmouth bass in the middle Snake River. Transactions of the American Fisheries Society 99:44–53.

New Mexico Game and Fish
2010 Biotic information system of New Mexico: Mexican Spotted Owl. New Mexico Game and Fish. Accessed August 2012 from http://www.bison-m.org/speciesbooklet.aspx.

Roehm, G. W.
2004 Management plan for endangered fishes in the Yampa River basin and environmental assessment. U.S. Fish and Wildlife Service, Mountain-Prairie Region (6). Denver, Colorado.

Sammons, S. M., and P. W. Bettoli
1999 Spatial and temporal variation in electrofishing catch rates of three species of black bass (*Micropterus* spp.) from Normandy Reservoir, Tennessee. North American Journal of Fisheries Management 19:454–461.

Schroeder, M. A., J. R. Young, and C. E. Braun
1999 Greater Sage-Grouse (*Centrocercus urophasianus*), the birds of North America online (A. Poole, Ed.). Cornell Lab of Ornithology, Ithaca, New York. Online: http://bna.birds.cornell.edu.bnaproxy.birds.cornell.edu/bna/species/425doi:10.2173/bna.425.

State of Utah Natural Resources Division of Wildlife Resources
2012 Utah conservation data center. Accessed 25 May 2012 from http://dwrcdc.nr.utah.gov/ucdc/default.asp.

Todd, B. L., and C. F. Rabeni
1989 Movement and habitat use by stream-dwelling smallmouth bass. Transactions of the American Fisheries Society 118:229–242.

Tyus, H. M.
1987 Distribution, reproduction, and habitat use of the razorback sucker in the Green River, Utah, 1979–1986. Transactions of the American Fisheries Society 116:111–116.

Tyus, H. M., and C. A. Karp
1989 Habitat use and streamflow needs of rare and endangered fishes, Yampa River, Colorado. U.S. Fish and Wildlife Service, Biological Report 89. 27 pp.

1990 Spawning and movements of razorback sucker, *Xyrauchen texanus*, in the Green River Basin of Colorado and Utah. Southwestern Naturalist 35:427–433.

Tyus, H. M., and C. W. McAda
1984 Migration, movements and habitat preferences of Colorado squawfish, *Ptychocheilus lucius*, in the Green, White and Yampa rivers, Colorado and Utah. Southwestern Naturalist 29:289–299.

Upper Colorado River Endangered Fish Recovery Program
2012a Fish facts. Accessed 28 June 2012 from http://www.coloradoriverrecovery.org/general-information/general-publications/fish-fact-sheets/endangeredfishfacts.pdf.

2012b Recovery implementation program section 7 consultation, sufficient progress, and historic projects agreement and recovery implementation program recovery action plan (RIPRAP).

2012c Bonytail (*Gila elegans*). Accessed 25 May 2012 from http://www.colorado riverrecovery.org/general-information/the-fish/bonytail.html.

2010 Middle Yampa River northern pike and smallmouth bass removal and evaluation; Colorado pikeminnow and roundtail chub evaluation: 2004–2007. Upper Colorado River Endangered Fish Recovery Program Project No. 98a.

U.S. Department of Interior Bureau of Land Management, Idaho
2000 A framework to assist in making sage-grouse habitat assessments. Bureau of Land Management, Idaho, Upper Snake River, Lower Snake River, and Upper Columbia-Salmon Clearwater Districts.

U.S. Department of Interior Bureau of Reclamation
2012 Life history of the Colorado pikeminnow. Accessed 28 June 2012 from http://www.usbr.gov/lc/phoenix/biology/azfish/pdf/CopikeminnowApp.pdf.

U.S. Department of Interior Fish and Wildlife Service (USFWS)
2002a Humpback chub (*Gila cypha*) recovery goals: amendment and supplement to the Humpback Chub Recovery Plan. U. S. Fish and Wildlife Service, Mountain-Prairie Region (6), Denver, Colorado.

2002b Bonytail (*Gila elegans*) recovery goals: amendment and supplement to the bonytail recovery plan. U.S. Fish and Wildlife Service, Mountain-Prairie Region (6), Denver, Colorado.

2002c Colorado pikeminnow (*Ptychocheilus lucius*) recovery goals: amendment and supplement to the Colorado squawfish recovery plan. U .S. Fish and Wildlife Service, Mountain-Prairie Region (6), Denver, Colorado.

2002d Razorback sucker (*Xyrauchen texanus*) recovery goals. U .S. Fish and Wildlife Service, Mountain-Prairie Region (6), Denver, Colorado.

1998 Razorback sucker recovery plan. U .S. Fish and Wildlife Service, Mountain-Prairie Region (6), Denver, Colorado.

1994 Federal Register 59 FR 13374 13400. U .S. Fish and Wildlife Service, Washington, D.C.

1992 Endangered and threatened wildlife and plants; final rule to list the plant *Spiranthes diluvialis* as a threatened species. Federal Register 57:2048–2054.

1990 Bonytail recover plan. U.S. Fish and Wildlife Service, Mountain-Prairie Region (6), Denver, Colorado.

1988 Black-footed ferret recovery plan. U.S. Fish and Wildlife Service, Denver, Colorado.

1984 Humpback chub recovery plan. U.S. Fish and Wildlife Service, Mountain-Prairie Region (6), Denver, Colorado.

U.S. Department of Transportation Federal Highway Administration
2003 Standard specifications for construction of roads and bridges on federal highway projects, FP-02 U.S. customary units. U.S. Department of Transportation, Washington, D.C.

Utah Native Plant Society
2012. Utah rare plant guide. Accessed 25 May 2012 from http://www.utahrareplants.org/.

Valdez, R. A.
1981 Status of the distribution and taxonomy of *Gila cypha* in the upper Colorado River. Proceedings of the Desert Fishes Council 12:53–68.

Valdez R. A., T. Chart, T. Nesler, D. Speas, and M. Trammell
2008 Yampa River nonnative fish control strategy. Upper Colorado River Endangered Fish Recovery Program.

Vanicek, C. D., and R. H. Kramer
1969 Life history of the Colorado squawfish, *Ptvchocheilus lucius*, and the Colorado chub, *Gila robusta*, in the Green River in Dinosaur National Monument, 1964–1966. Transactions of the American Fisheries Society 98:193–208.

Ward, J. and T. Naumann
1998 Ute ladies'-tresses orchid (*Spiranthes diluvialis* Sheviak) inventory, Dinosaur National Monument and Browns Park National Wildlife Refuge. National Park Service, Dinosaur National Monument, Colorado.

Appendix A. Photos of the bank-stabilization area.

Photo 1. Erosion along Deerlodge Road bank-stabilization area looking east.

Photo 2. Erosion along Deerlodge Road bank-stabilization area looking west.

Appendix B. USFWS data request response letter.

United States Department of the Interior

FISH AND WILDLIFE SERVICE
WESTERN COLORADO ECOLOGICAL SERVICES FIELD OFFICE
764 HORIZON DRIVE, BUILDING B
GRAND JUNCTION, CO 81506
PHONE: (970)243-2778 FAX: (970)245-6933
URL: www.fws.gov/mountain-prairie/es/Colorado/;
www.fws.gov/platteriver/

Consultation Tracking Number: 06E24100-2012-SLI-0181 June 05, 2012
Project Name: Dinosaur National Monument Deerlodge Road Rehab

Subject: List of threatened and endangered species that may occur in your proposed project location, and/or may be affected by your proposed project.

To Whom It May Concern:

The enclosed species list identifies threatened, endangered, and proposed species, designated critical habitat, and candidate species that may occur within the boundary of your proposed project and/or may be affected by your proposed project. The species list fulfills the requirements of the U.S. Fish and Wildlife Service (Service) under section 7(c) of the Endangered Species Act (Act) of 1973, as amended (16 U.S.C. 1531 *et seq.*).

New information based on updated surveys, changes in the abundance and distribution of species, changed habitat conditions, or other factors could change this list. Please feel free to contact us if you need more current information or assistance regarding the potential impacts to federally proposed, listed, and candidate species and federally designated and proposed critical habitat. Please note that under 50 CFR 402.12(e) of the regulations implementing section 7 of the Act, the accuracy of this species list should be verified after 90 days. This verification can be completed formally or informally as desired. The Service recommends that verification be completed by visiting the ECOS-IPaC website at regular intervals during project planning and implementation for updates to species lists and information. An updated list may be requested through the ECOS-IPaC system by completing the same process used to receive the enclosed list.

The purpose of the Act is to provide a means whereby threatened and endangered species and the ecosystems upon which they depend may be conserved. Under sections 7(a)(1) and 7(a)(2) of the Act and its implementing regulations (50 CFR 402 *et seq.*), Federal agencies are required to utilize their authorities to carry out programs for the conservation of threatened and endangered species and to determine whether projects may affect threatened and endangered species and/or designated critical habitat.

A Biological Assessment is required for construction projects (or other undertakings having similar physical impacts) that are major Federal actions significantly affecting the quality of the human environment as defined in the National Environmental Policy Act (42 U.S.C. 4332(2)(c)). For projects other than major construction activities, the Service suggests that a biological evaluation similar to a Biological Assessment be prepared to determine whether the project may affect listed or proposed species and/or designated or proposed critical habitat. Recommended contents of a Biological Assessment are described at 50 CFR 402.12.

If a Federal agency determines, based on the Biological Assessment or biological evaluation, that listed species and/or designated critical habitat may be affected by the proposed project, the agency is required to consult with the Service pursuant to 50 CFR 402. In addition, the Service recommends that candidate species, proposed species and proposed critical habitat be addressed within the consultation. More information on the regulations and procedures for section 7 consultation, including the role of permit or license applicants, can be found in the "Endangered Species Consultation Handbook" at:

http://www.fws.gov/endangered/esa-library/pdf/TOC-GLOS.PDF

Please be aware that bald and golden eagles are protected under the Bald and Golden Eagle Protection Act (16 U.S.C. 668 *et seq.*), and projects affecting these species may require development of an eagle conservation plan (http://www.fws.gov/windenergy/eagle_guidance.html). Additionally, wind energy projects should follow the wind energy guidelines (http://www.fws.gov/windenergy/) for minimizing impacts to migratory birds and bats.

Guidance for minimizing impacts to migratory birds for projects including communications towers (e.g., cellular, digital television, radio, and emergency broadcast) can be found at: http://www.fws.gov/migratorybirds/CurrentBirdIssues/Hazards/towers/towers.htm; http://www.towerkill.com; and http://www.fws.gov/migratorybirds/CurrentBirdIssues/Hazards/towers/comtow.html.

We appreciate your concern for threatened and endangered species. The Service encourages Federal agencies to include conservation of threatened and endangered species into their project planning to further the purposes of the Act. Please include the Consultation Tracking Number in the header of this letter with any request for consultation or correspondence about your project that you submit to our office.

Attachment

United States Department of Interior
Fish and Wildlife Service

Project name: Dinosaur National Monument Deerlodge Road Rehab

Official Species List

Provided by:

WESTERN COLORADO ECOLOGICAL SERVICES FIELD OFFICE
764 HORIZON DRIVE, BUILDING B
GRAND JUNCTION, CO 81506
(970) 243-2778
http://www.fws.gov/mountain-prairie/es/Colorado/
http://www.fws.gov/platteriver/

Consultation Tracking Number: 06E24100-2012-SLI-0181
Project Type: Stream / Waterbody / Canals / Levees / Dikes
Project Description: Dinosaur National Monument proposes to rehabilitate Deerlodge Road in Moffat County, Colorado. The proposed action would mill and pave approximately 12.5 miles of the road, rehabilitate drainage conditions along the road, and construct bank stabilization measures at two locations where the Yampa River is encroaching on Deerlodge Road and the Cross Mountain Parking Area.

Project Counties: Moffat, CO

United States Department of Interior
Fish and Wildlife Service

Project name: Dinosaur National Monument Deerlodge Road Rehab

Endangered Species Act Species List

Species lists are not entirely based upon the current range of a species but may also take into consideration actions that affect a species that exists in another geographic area. For example, certain fish may appear on the species list because a project could affect downstream species. Please contact the designated FWS office if you have questions.

Black-Footed ferret *(Mustela nigripes)*

Population: entire population, except where EXPN

Listing Status: Endangered

Black-Footed ferret *(Mustela nigripes)*

Population: U.S.A. (specific portions of AZ, CO, MT, SD, UT, and WY)

Listing Status: Experimental Population, Non-Essential

Bonytail chub *(Gila elegans)*

Population: entire

Listing Status: Endangered

Critical Habitat: Final designated

Canada Lynx *(Lynx canadensis)*

Population: (Contiguous U.S. DPS)

Listing Status: Threatened

Colorado pikeminnow *(Ptychocheilus lucius)*

Population: except Salt and Verde R. drainages, AZ

Listing Status: Endangered

Critical Habitat: Final designated

Greater sage-grouse *(Centrocercus urophasianus)*

Population: entire

Listing Status: Candidate

Humpback chub *(Gila cypha)*

Population: entire

Listing Status: Endangered

Critical Habitat: Final designated

Mexican Spotted owl *(Strix occidentalis lucida)*

Listing Status: Threatened

North American wolverine *(Gulo gulo luscus)*

Listing Status: Candidate

Razorback sucker *(Xyrauchen texanus)*

Population: entire

Listing Status: Endangered

Critical Habitat: Final designated

Ute ladies'-tresses *(Spiranthes diluvialis)*

Listing Status: Threatened

Yellow-Billed Cuckoo *(Coccyzus americanus)*

Population: Western U.S. DPS

Listing Status: Candidate

APPENDIX C
Floodplain Statement of Findings

This page intentionally left blank

National Park Service
Department of the Interior

Dinosaur National Monument
Colorado

FLOODPLAIN STATEMENT OF FINDINGS

DEERLODGE ROAD REHABILITATION PROJECT

PMIS 59763

DINOSAUR NATIONAL MONUMENT

MOFFAT COUNTY, COLORADO

Recommended: _____
Mary Risser, Superintendent Date

Concurred: _____
Ed Harvey, Water Resource Division Date

Approved: _____
John Wessels, Director Date

This page intentionally left blank

INTRODUCTION

Executive Order 11988 requires federal agencies to evaluate proposed actions on floodplains. Director's Order #77-2 (floodplain protection) establishes guidelines for the National Park Service's implementation of Executive Order 11988. Guidelines for Director's Order #77-2 are presented in Procedural Manual 77-2: Floodplain Management (US Department of Agriculture National Park Service 2003). The manual states that if proposed actions cannot be designed in a way to avoid potential impacts within the 100-year floodplain then a Statement of Findings (SOF) must be prepared and approved according to procedures defined in Director's Order #77-2.

The Department of Interior National Park Service, in cooperation with the Federal Lands Highway Program (FLHP), is proposing to provide safer access and parking for private landowners, visitors, and employees by rehabilitating, restoring, and resurfacing about 12.7 miles of Deerlodge Road and stabilizing the Yampa riverbank where it has encroached the roadway.

In 2003, Dinosaur National Monument attempted to stabilize the south bank of the Yampa River adjacent to Deerlodge Road by burying riprap in a trench between the roadway and the riverbank. However, in 2011, above average snowmelt and runoff caused substantial bank erosion due to the migration of the Yampa River along Deerlodge Road and damaged the previous bank stabilization work. The Yampa River has encroached to within approximately 50 feet of the edge of the pavement in this Oxbow area (milepost 9.5). Another high flow year in the Yampa River could result in additional erosion and perhaps even threaten the road itself. The measures installed in 2003 are no longer providing adequate protection to the road. The riverbank needs to be stabilized before another large runoff occurs and additional bank erosion damages the road in the project area.

The Proposed action is a Federal Lands Highway Program (FLHP) rehabilitate, restore, and resurface (3R) project. The construction design is provided by the Central Federal Lands Highway Division of the Federal Highway Administration (CFLHD).

The project area is located in Dinosaur National Monument in Moffat County, Colorado. The legal descriptions are Sections 21, 25–28, Township 6N, Range 99W; Sections 19–22, 26, 27, 30, 35, 36, Township 6N, Range 98W; and Sections 1, 12, Township 5N, Range 98W (Sixth Principal Meridian), in the Twelvemile Mesa, Cross Mountain Canyon, and Indian Water Canyon 24k USGS quadrangles.

PROPOSED ACTION

Bank Stabilization

The lateral migration analysis technical memorandum reported that the Yampa River is encroaching Deerlodge roadway approximately ten feet per year. In 2002, the roadway was realigned and boulders were placed between the roadway and the river embankment to mitigate the Yampa River encroachment. Lateral movement of the Yampa River has continued and is currently approximately 50 feet from the existing roadway with a portion of the original roadway eroded (FHWA 2011). The hydraulics recommendations report identified areas with erosion and drainage issues and bank stabilization recommendations (FHWA 2012a).

Bank stabilization would occur along approximately 1,500 feet (approximately 400 feet on the west end and less than 200 feet on the east end is on private land) of the bank to prevent further erosion and sedimentation. Exposed rock riprap with a launchable toe would be used as the bank stabilization method. The design of the riprap would conform to FHWA guidelines.

Exposed Rock Riprap

Exposed rock riprap (Class IV, 18 to 24 inches in diameter) would be used as the bank stabilization method. Placement of the rock riprap would require installing a large "toe" into the natural riverbed substrate to ensure high flows would not compromise the structural integrity of the stabilized bank. This would be done using a launchable toe with Class 8 riprap (up to 30 inches in diameter) and water depths up to 8 feet. The riprap would be prepared and placed such that the gradation would form a homogenous mass with the smaller rock filling the voids of the larger rock. The launchable toe would slowly launch to scour depths as the river scours the river channel/bottom and the rock slides into the channel with sediment filling back over the launched material. The launchable toe would permanently impact 22,500 square feet (0.52 acres) of natural streambed. Project work would occur during low flow.

Placement of the rock riprap outside the riverbed would require excavation from the base of the existing bank slope away from the river to one inch above the estimated high water elevation. A slope would be graded at approximately 2 Vertical: 1 Horizontal. A type IV C erosion control geotextile would be placed below the riprap on the native soils to prevent soil loss through the riprap.

The bank stabilization design in the 30% submittal showed a design which extended onto private ROW. As a result of that review, an alternative design was developed which would not impact ROW. This design consisted of a combination of exposed riprap and buried riprap. The riprap would be exposed nearest to the roadway encroachment and then become buried at each end so that the improvements remained in the ROW. As scour continues along the buried improvements, the buried riprap would become exposed and the embankment would remain stable. However, this would allow a significant portion of the existing bank to erode prior to reaching the stabilization at each end. The downstream length required for the solution on the private property (1.5 times the channel width, or 450 feet) could not be achieved within the right-of-way due to gradually decreasing distance between the right-of-way line and the edge of road.

This length is required to "train" the flow in a straight direction after a bend. Therefore it is likely that erosion could continue beyond the end limit of the placed riprap within the right-of-way and compromise the road.

Safety features, such as guardrails or boulders, may be placed along Deerlodge Road where the exposed rock riprap is closest to the roadway. Due to the proximity of the of the rock riprap slope to the edge of the roadway, these safety features may be installed to protect vehicles from leaving the roadway and rolling down the riprap slope.

Road Design and Pavement

Road Width

The proposed Deerlodge roadway would maintain the same 40-foot roadway bench with nine-foot lane widths and one-foot shoulders. However, pavement raveling and erosion around four culverts has reduced road widths and caused pavement cracking and settling, respectively. The proposed road rehabilitation would include restoring the paved width of the road to the original design of 20 feet. In areas where the pavement has settled there may be a slight change in pavement width. New centerline and edge line pavement markings would be painted.

Pavement Considerations

Portions of the current pavement have exceeded their service life and have developed surface cracks, rutting, buckling, and unraveling of the pavement edge. Prior to repaving, six isolated sections of road would require improvements to the subgrade in locations where the existing soil has become soft and lost compaction or severe subgrade failure has occurred. In areas with subgrade issues, the subgrade and backfill would be removed and replaced to a depth of about 19.5 inches to 21 inches, prior to repaving.

Currently, the pavement consists of one and a half to three inches of multiple chip seal layers on top of 12 to 24 inches of aggregate base. The proposed pavement option is to pulverize or remove the existing chip seal pavement and overlay with 3 inches of new hot asphalt pavement on top of 12 inches of aggregate base. The proposed treatment would remain on the roadway bench and maintain the same profile grade. In areas where the existing pavement is less than the proposed three inches, there may be a slight change in profile, which could alter the road width. In these areas, aggregate fill would be placed on the shoulders to fill in the side slope.

Deerlodge Road right-of-way (ROW) encompasses approximately 308 acres with a 200-foot-wide ROW. All pavement rehabilitation would remain within the existing ROW limits.

Drainage

Two major parts of the road rehabilitation project involve drainage: culverts along Deerlodge Road and drainage around parking area improvements.

Deerlodge Road crosses approximately 93 culvert-crossing locations within the rehabilitation project limits. Most of the culverts are in fair condition with some showing signs of minor erosion and sediment deposition. Ten culverts were identified as having severe erosion at the downstream end of the culvert and would require erosion protection measures. The protection measures to stabilize the head cutting and to minimize erosion would be based on the head cutting information obtained during a field visit and information already obtained from the Preliminary Hydraulics Recommendations Report (FHWA 2012a).

Four culverts identified as potentially causing roadway damage and slumping would be replaced. An additional 1–3 culverts may be added within the bank stabilization area on private land. It was noted in the geotechnical report that leaks in the culvert walls, settlement of backfill, poor surface drainage, or inadequate cover over the corrugated metal pipe could be causing the damage (FHWA 2012b).

Pullouts and Parking Areas

The park entrance pullout with an information kiosk is not compliant with the Americans with Disability Act (ADA). A parking area and space for the information kiosk would be relocated on flatter terrain to be ADA compliant.

There are four parking areas along Deerlodge Road proposed for modifications— Needle Parking Area, Photo Parking Area, Boat Launch Parking Area, and Disappointment Draw Access Area.

Needle Parking Area

This parking area and access road would be modified by pulverizing the asphalt to a depth of eight inches and would remain unpaved with a crushed gravel surface. The turn-around loop would be obliterated by removing the asphalt and gravel. The obliterated area would then be re-contoured and revegetated.

Photo Parking Area

This parking area would be reduced by half the width and length and removing the existing asphalt curb. The remaining parking area would be repaved. The obliterated area would be re-contoured and revegetated.

Boat Launch Parking Area

Currently, the northern portion of the parking area is paved to a 15-foot width and the southern portion is graveled from a 0- to 15-foot width. The proposed modification is to pave the entire parking area. The gravel section would be removed to a depth about 15 inches and replaced with 12 inches of aggregate base overlaid with three inches of new hot asphalt. The current chip seal pavement portion would be removed and repaved with three inches of new asphalt.

Disappointment Draw Access Area

This parking area would be modified by removing the chip seal layers and overlaying with three inches of new asphalt. The turn-around loop would be obliterated by removing the asphalt and gravel. The obliterated area would then be re-contoured and revegetated A short trail would be constructed to connect the existing informal trail to the new parking area. The existing curb, gutter, sidewalk, and the inlet and storm pipe located in the northeast corner of the existing parking area would be removed.

Staging Areas

Temporary staging areas for equipment and supplies during construction would use previously disturbed sites, such as pullouts and parking areas along Deerlodge Road.

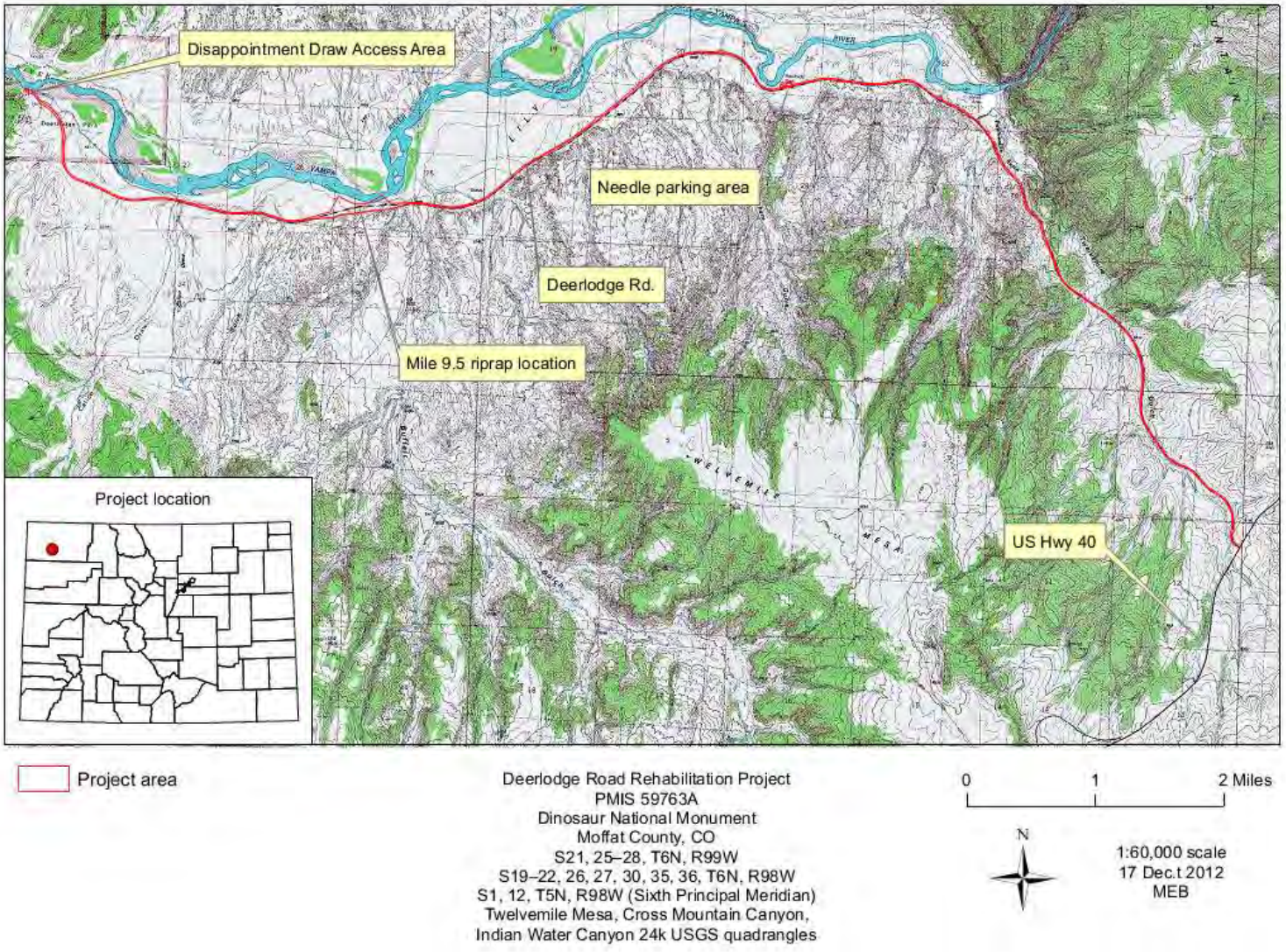


Figure 1. Map of project location in Dinosaur National Monument, Moffat County, CO and areas in potential river floodplain.

Design Alternatives Considered

No Action Alternative

This alternative provides a baseline for comparing and evaluating the impacts to the environment by the preferred alternative and the respective environmental consequences. Under the no action alternative, Deerlodge Road would not be rehabilitated and NPS would respond to future needs and conditions without major actions or changes in the present course. Dinosaur National Monument staff would continue routine maintenance, minor repairs, and asphalt patching and sealing as needed. The road pavement and structural integrity would continue to deteriorate and the safety concerns associated with encroachment of the Yampa River on the roadway; failing pavement; and sharp drop-offs due to erosion around culverts would continue. No highway funds would be expended for rehabilitation, improvements, or bank stabilization; however, road maintenance costs would likely increase to address deteriorating road conditions.

NPS Preferred Alternative

The preferred alternative includes proposed road rehabilitation and bank stabilization measures needed to address the identified deficiencies along the 12.7-mile stretch of Deerlodge Road (FHWA 2012a). The proposed rehabilitation and modifications of the road may be constructed in two phases, depending on available funds. Phase I would include bank stabilization along the Yampa River near milepost 9.5, and Phase II would include the pavement rehabilitation and other parking area modifications. The proposed bank stabilization and pavement rehabilitation and parking area modifications are planned to start in 2013 and 2016, respectively. Both are subject to available funds with the estimated total construction cost between $8 million and $11 million.

FLOODPLAINS IN PROJECT AREA

The area has not been mapped and classified into Flood Hazard Zones by the Federal Emergency Management Agency (FEMA) or by another agency. The majority of Deerlodge Road is located outside the Yampa River 100-year floodplain. The Disappointment Draw Access Area located at the end of Deerlodge Road is adjacent to a stand of cottonwoods (*Populus* sp.), and the Needle parking area is adjacent to woody riparian shrubs; both areas may be within the 100-year floodplain. The installation of 1,600 feet of riprap into the Yampa River and its southern bank would impact the 100-year floodplain.

Justification for Use of Floodplains

Deerlodge Road is a 12.7-mile two-lane road following the Yampa River in the eastern portion of Dinosaur National Monument in Colorado. This road is currently threatened by erosion from the Yampa River at a section of road along the middle of the route near mile 9.5. Deerlodge Road provides access to the Disappointment Access Draw Area and Ranger Station, Yampa River, BLM land, private property, county roads, and a county bridge over the Yampa River. It is also used for park-related education activities.

Above-average snowmelt runoff in 2011 caused high erosion to the two above-mentioned areas as the river shifted towards the outside banks. Previous bank stabilization installed in 2003 was exposed as a result of erosion in 2011. The river is within approximately 50 feet of Deerlodge Road at the main road erosion area. Both of these areas are in need of erosion control before they are lost to the river, which could occur if another year of high precipitation occurs.

The purpose of the proposed action is to protect Deerlodge Road from the encroachment of the Yampa River and improve Deerlodge Road. Erosion-control measures would be designed to protect the riverbank and road from 25- to 30-year floods. Such floods would not inundate the road itself, but would increase the rate of bank erosion and the potential for the river to migrate toward the existing road location.

Hydrologic Risks

There will be minimal hydrologic risks associated with the proposed action. The proposed action would impact the 100-year floodplain on the Yampa River by the installation of 1,500 feet of exposed riprap along the river bank (requiring Clean Water Act 404 permit/401 certification). No riprap would extend out into the river. It would be placed along the river bank and extend inland away from the river channel. The riprap would impact the natural migration of the river and alter high-flow energy dispersal. The installed riprap would not alter the function or value of the floodplain, nor would it significantly reduce the amount of floodable land.

Portions of the proposed action are exempt from Director's Order #77-2. The order states that projects involving "picnic facilities, scenic overlooks, foot trails, and small associated daytime parking facilities in non-high hazard areas provided that the impacts of these facilities on floodplain values are minimized" are exempt (U.S. Department of Interior National Park Service 2012). The road-improvement portion of the project would not result in impacts to the floodplain. Construction at the Disappointment Draw Access and Needle parking areas would be focused mainly in existing lots. The obliteration of the turn-around loops will restore small areas of impervious surface to natural, vegetated floodplain. Vegetated floodplains function much better hydrologically (e.g., flood retention) than impervious surfaces. The placement of boulders at this location and the installation of a graded drainage ditch at the Disappointment Draw Access Area would have little influence on a 100-year flood in a river the size of the Yampa River.

The replacement of four culverts and potential installation of additional 1–3 culverts would have little influence on the 100-year floodplain. These modifications would have more influence on local precipitation drainage into the river. The replacement of problem culverts and new culverts would reduce localized erosion along Deerlodge Road thus serving to improve the floodplain along the south side of the Yampa River in the project area. The culverts would be designed to improve runoff and reduce erosion. Poorly designed and/or installed culverts, like the problem culverts being replaced, can cause head cutting.

Avoidance and Minimization

Avoiding work along the Yampa River would result in the continued erosion of Deer Mountain parking lot and the eventual destruction of Deerlodge Road. Resource Mitigation Measures would be used during construction activities to protect floodplain areas. Disturbed natural areas would be restored and reseeded after operations. Replacement culverts would be designed to minimize scouring, deposition, and damage to floodplains and would reduce current erosion issues caused by derelict culverts.

COMPLIANCE AND CONCLUSIONS

The majority of the proposed action would not impact floodplains. Impacts to jurisdictional waters of the U.S. will be covered under Clean Water Act Section 404 permitting and Section 401 Certification. There is one riverine wetland within the project area.

The installation of riprap along the Yampa riverbank would have only minor, local impacts to the floodplain. The riprap would not substantially reduce the amount of floodable land in the 100-year flood. Impacted habitat along the riverbank would be revegetated and not substantially altered. Other impacts would include the alteration of the natural river migration and the alteration of local aquatic habitat by creating artificial boulder habitat.

The installation of riprap would not alter the function or value of the floodplain, nor would it significantly reduce the amount of floodable land. The proposed action would limit impacts to floodplains by incorporating resource mitigation measures. The majority of the proposed action would alter and improve existing parking areas and Deerlodge Road. The National Park Service finds the proposed action in compliance with Executive Order 11988.

REFERENCES CITED

Federal Highway Administration (FHWA)

2012a Preliminary Hydraulics Recommendations Report for Deerlodge Road Improvements, Dinosaur National Monument. CH2MHILL. Federal Highway Division, Lakewood, Colorado.

2012b Draft Pavement and Design Report, Dinosaur National Monument. Yeh and Associates, Inc. Federal Highway Division, Lakewood, Colorado.

U.S. Department of Interior National Park Service

2003 Director's Order #77-2: floodplain management. U.S. Department of Interior National Park Service, Washington, D.C.

2012 Procedural manual 77-2: floodplain management. V. scope. B. exempted actions. Accessed 07 September 2012 from http://www.nature.nps.gov/Rm77/pm77_2/scope.cfm#exc.

This page intentionally left blank

APPENDIX D
Wetland Statement of Findings

This page intentionally left blank

National Park Service
Department of the Interior

Dinosaur National Monument
Colorado

WETLAND STATEMENT OF FINDINGS

DEERLODGE ROAD REHABILITATION PROJECT

PMIS 59763

DINOSAUR NATIONAL MONUMENT

MOFFAT COUNTY, COLORADO

Recommended: _____

Mary Risser, Superintendent Date

Concurred: _____

Ed Harvey, Water Resource Division Date

Approved: _____

John Wessels, Regional Director, Intermountain Region Date

This page intentionally left blank

INTRODUCTION

The National Park Service, in cooperation with the Federal Lands Highway Program (FLHP), is proposing to provide safer access and parking for private landowners, visitors, and employees by rehabilitating, restoring, and resurfacing about 12.7 miles of Deerlodge Road and stabilizing the Yampa riverbank where it has encroached on the roadway.

The proposed project is located in Dinosaur National Monument in Moffat County, Colorado. The project area is bordered on the north by the Yampa River (Figures 1–2). The legal descriptions are Sections 21, 25–28, Township 6N, Range 99W; Sections 19–22, 26, 27, 30, 35, 36, Township 6N, Range 98W; and Sections 1, 12, Township 5N, Range 98W (Sixth Principal Meridian), in the Twelvemile Mesa, Cross Mountain Canyon, and Indian Water Canyon 24k USGS quadrangles. The elevation ranges approximately 5,600–6,200 feet (1,700–1,890 meters).

Deerlodge Road is a 12.7-mile two-lane road following the Yampa River in the eastern portion of Dinosaur National Monument in Colorado. This road is currently threatened by erosion from the Yampa River at a section of road along an oxbow area (milepost 9.5). Deerlodge Road provides access to the Disappointment Draw Access Area and Ranger Station, Yampa River, BLM land, private property, county roads, and a county bridge over the Yampa River. It is also used for park-related education activities.

In 2003, Dinosaur National Monument attempted to stabilize the south bank of the Yampa River adjacent to Deerlodge Road by burying riprap in a trench between the roadway and the riverbank. However, in 2011, above average snowmelt and runoff caused substantial bank erosion due to the migration of the Yampa River along Deerlodge Road and damaging the previous bank stabilization work. The Yampa River has encroached to within approximately 50 feet of the edge of the pavement in this Oxbow area (milepost 9.5). Another high flow year in the Yampa River could result in additional erosion and perhaps even threaten the road itself. The measures installed in 2003 are no longer providing adequate protection to the road. The riverbank needs to be stabilized before another large runoff occurs and additional bank erosion destroys the road in the project area.

The Proposed Action is a Federal Lands Highway Program (FLHP) rehabilitate, restore, and resurface (3R) project. The construction design is provided by the Central Federal Lands Highway Division of the Federal Highway Administration (CFLHD).

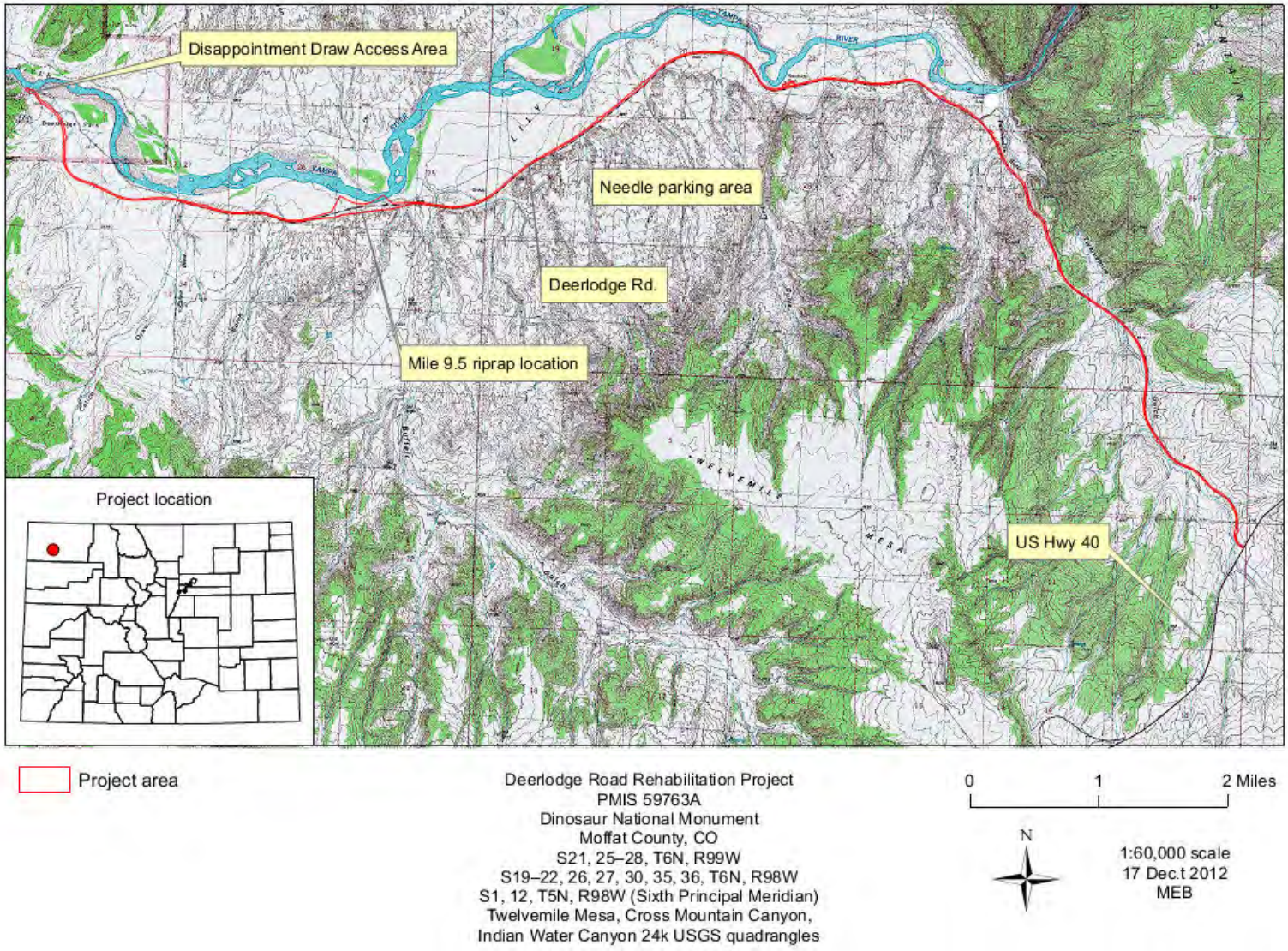


Figure 1. Map of project location in Dinosaur National Monument, Moffat County, CO.

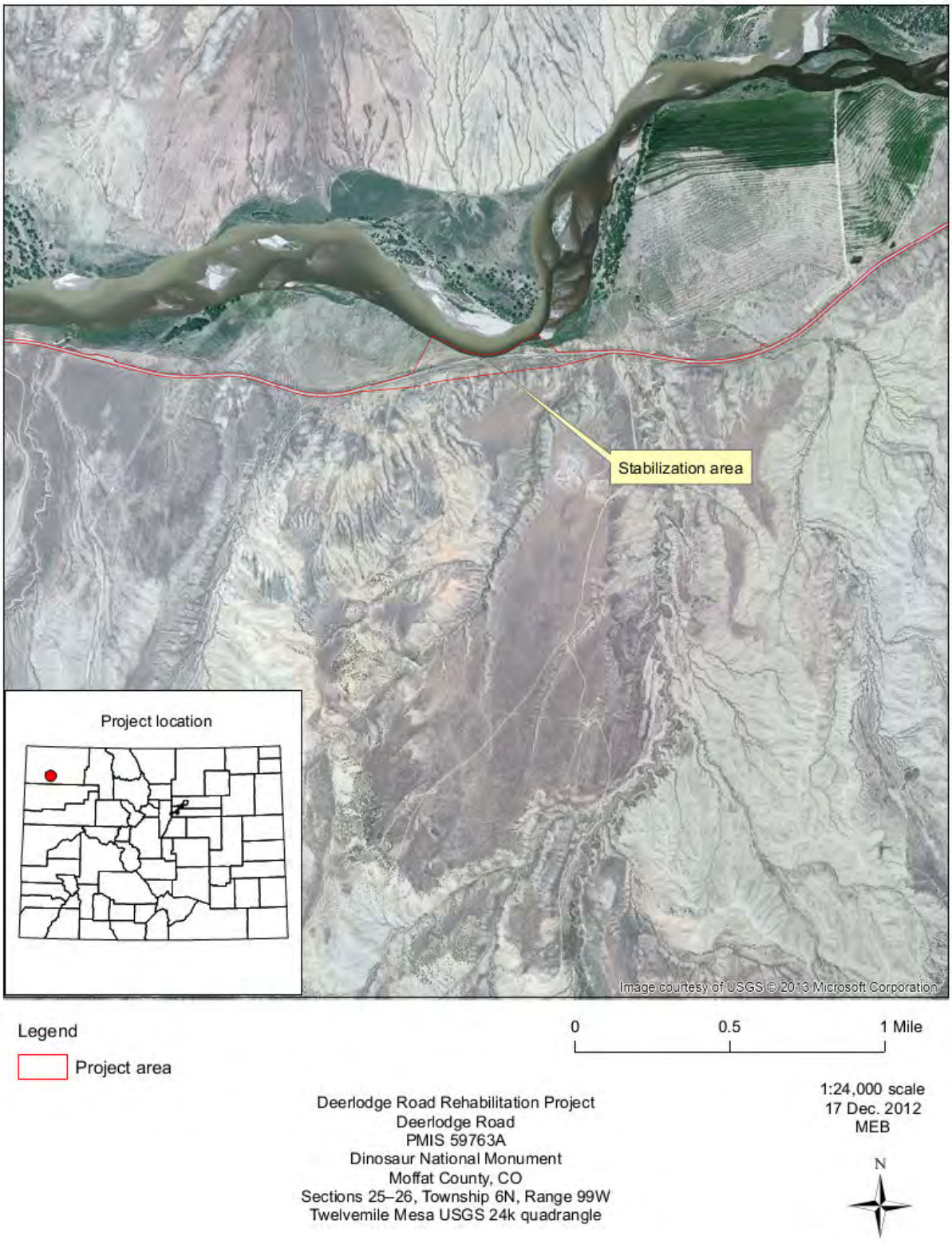


Figure 2. Map of the Deerlodge Road bank stabilization location in Dinosaur National Monument.

PROPOSED ACTION

Bank Stabilization

The lateral migration analysis technical memorandum reported that the Yampa River is encroaching Deerlodge roadway approximately ten feet per year. In 2002, the roadway was realigned and boulders were placed between the roadway and the river embankment to mitigate the Yampa River encroachment. Lateral movement of the Yampa River has continued and is currently approximately 50 feet from the existing roadway with a portion of the original roadway eroded (FHWA 2011). The hydraulics recommendations report identified areas with erosion and drainage issues and bank stabilization recommendations (FHWA 2012a).

Bank stabilization would occur along approximately 1,500 feet (approximately 400 feet on the west end and less than 200 feet on the east end is on private land) of the bank to prevent further erosion and sedimentation. Exposed rock riprap with a launchable toe would be used as the bank stabilization method. The design of the riprap would conform to FHWA guidelines.

Exposed Rock Riprap

Exposed rock riprap (Class IV, 18 to 24 inches in diameter) would be used as the bank stabilization method. Placement of the rock riprap would require installing a large "toe" into the natural riverbed substrate to ensure high flows would not compromise the structural integrity of the stabilized bank (Figure 3; Appendix A). This would be done using a launchable toe with Class 8 riprap (up to 30 inches in diameter) and water depths up to 8 feet. The riprap would be prepared and placed such that the gradation would form a homogenous mass with the smaller rock filling the voids of the larger rock. The launchable toe would slowly launch to scour depths as the river scours the river channel/bottom and the rock slides into the channel with sediment filling back over the launched material. The launchable toe would permanently impact 22,500 square feet (0.52 acre) of natural streambed. Project work would occur during low flow.

Placement of the rock riprap outside the riverbed would require excavation from the base of the existing bank slope away from the river to one inch above the estimated high water elevation. A slope would be graded at approximately 2 Vertical: 1 Horizontal. A type IV C erosion control geotextile would be placed below the riprap on the native soils to prevent soil loss through the riprap.

Placement of the exposed rock riprap outside the riverbed would require excavation from the base of the existing bank slope away from the river to one inch above the estimated high water elevation. A slope would be graded at approximately 2 Vertical: 1 Horizontal. A type IV C erosion control geotextile would be placed below the riprap on the native soils to prevent soil loss through the riprap.

Safety features, such as guardrails or boulders, may be placed along Deerlodge Road where the exposed rock riprap is closest to the roadway. Due to the proximity of the of the rock riprap slope to the edge of the roadway, these safety features may be installed to protect vehicles from leaving the roadway and rolling down the riprap slope.

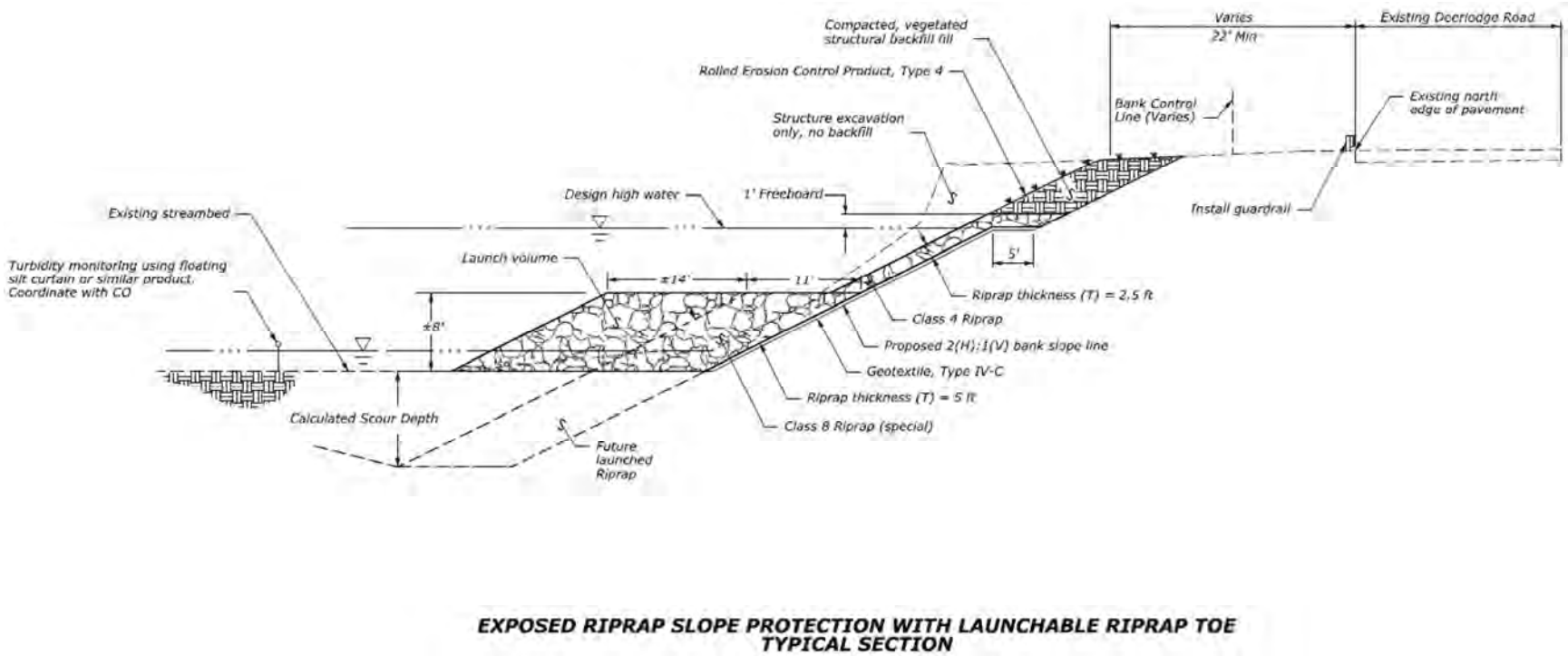


Figure 3. Typical Section for Exposed Riprap Bank Protection.

Road Design and Pavement

The proposed Deerlodge roadway would maintain the same 40-foot roadway bench with nine-foot lane widths and one-foot shoulders. However, pavement raveling and erosion around four culverts has reduced road widths and caused pavement cracking and settling, respectively. The proposed road rehabilitation would include restoring the paved width of the road to the original design of 20 feet. The Deerlodge Road Rehabilitation Project Environmental Assessment contains detailed information on the proposed road design and repaving (NPS 2012a).

Deerlodge Road right-of-way (ROW) encompasses approximately 308 acres with a 200-foot wide-ROW. All pavement rehabilitation would remain within the existing ROW limits.

Drainage

Two major parts of the road rehabilitation project involve drainage: culverts along Deerlodge Road and drainage around parking area improvements.

Deerlodge Road crosses approximately 93 culvert-crossing locations within the rehabilitation project limits. Most of the culverts are in fair condition with some showing signs of minor erosion and sediment deposition. Ten culverts were identified as having severe erosion at the downstream end of the culvert and would require erosion protection measures. The protection measures to stabilize the head cutting and to minimize erosion would be based on the head cutting information obtained during a field visit and information already obtained from the Preliminary Hydraulics Recommendations Report (FHWA 2012a).

Four culverts identified as potentially causing roadway damage and slumping would be replaced. An additional 1–3 culverts may be added within the bank stabilization area on private land. It was noted in the geotechnical report that leaks in the culvert walls, settlement of backfill, poor surface drainage, or inadequate cover over the corrugated metal pipe could be causing the damage (FHWA 2012b).

Pullouts and Parking Areas

There are four parking areas along Deerlodge Road proposed for modifications—Needle Parking Area, Photo Parking Area, Boat Launch Parking Area, and the Disappointment Draw Access Area. The Deerlodge Road Rehabilitation Project Environmental Assessment contains detailed information on the proposed pullout and parking area modifications and no wetlands will be impacted by the pullout and parking area modifications. (NPS 2012a).

Needle Parking Area

The turn-around loop would be obliterated by removing the asphalt and gravel. The obliterated area would then be re-contoured and revegetated. This parking area is being proposed as a wetland mitigation site for the proposed action.

Staging Areas

Temporary staging areas for equipment and supplies during construction would use previously disturbed sites, such as pullouts and parking areas along Deerlodge Road.

Design Alternatives Considered

No Action Alternative

This alternative provides a baseline for comparing and evaluating the impacts to the environment by the preferred alternative and the respective environmental consequences. Under the no action alternative, Deerlodge Road would not be rehabilitated and NPS would respond to future needs and conditions without major actions or changes in the present course. Dinosaur National Monument staff would continue routine maintenance, minor repairs, and asphalt patching and sealing as needed. The road pavement and structural integrity would continue to deteriorate and the safety concerns associated with encroachment of the Yampa River on the roadway; failing pavement; and sharp drop-offs due to erosion around culverts would continue. No highway funds would be expended for rehabilitation, improvements, or bank stabilization; however, road maintenance costs would likely increase to address deteriorating road conditions.

NPS Preferred Alternative

The preferred alternative includes proposed road rehabilitation and bank stabilization measures needed to address the identified deficiencies along the 12.7-mile stretch of Deerlodge Road (FHWA 2012a). The proposed rehabilitation and modifications of the road may be constructed in two phases, depending on available funds. Phase I would include bank stabilization along the Yampa River near milepost 9.5, and Phase II would include the pavement rehabilitation and other parking area modifications. The proposed bank stabilization and pavement rehabilitation and parking area modifications are planned to start in 2013 and 2016, respectively. Both are subject to available funds with the estimated total construction cost of $8 million to $11 million.

Wetlands in the Project Area

Wetland delineation fieldwork was conducted on May 9, 2012, using the technical criteria and procedures outlined in the revised 1987 U.S. Army Corps of Engineers (USACE) Wetlands Delineation Manual (Wetland Training Institute, Inc. 1995) and the regional supplement to the USACE wetland delineation manual: Western Mountains, Valleys, and Coast Region (USACE 2008). The delineation was conducted by Bill Hevron and Matt Brooks. In addition, the wetland delineation and classification efforts were kept consistent with the National Park Service Procedural Manual 77-1: Wetland Protection (U.S. Department of the Interior National Park Service 2012), including the use of a wetland classification scheme based on Cowardin et al. (1979). A complete report of the wetland delineation methods and findings, including photographs and data sheets is available under a separate cover (NPS 2012b).

The bank stabilization near milepost 9.5 would impact 0.52 acre of wetlands (Figure 4). This area is characterized as a Riverine-Upper Perennial-Unconsolidated Bottom wetland. This area

consists of upland vegetation that transition directly to the riverine habitat of the Yampa River channel below the ordinary high water mark via the steep, vertical river bank. The channel area could be exposed and contain early successional vegetation (e.g., *Salix exigua*, annual forbs, grasses, and sedges) during times of low water.

Functions

The biotic, hydrologic, and cultural functions as well as the research/scientific values of the delineated wetlands were assessed through field observations.

Biotic Functions—This area serves as shallow riverside habitat most of the year. Small fishes that prefer shallow water may use this area; however, because it is the outside of a river bend, the current would be faster in this area. Fish that prefer slow-moving, shallow water would not use this area. During times of low water, some river bottom may become exposed. Early colonizing vegetation may become established temporarily. The vertical river bank above the high water mark could be used by bank-nesting birds such as the belted kingfisher (*Megaceryle alcyon*) and bank swallow (*Riparia riparia*). Wading birds may use the water's edge during low water.

Hydrologic Functions—This area is located at the inside of a bend in the river. The primary function is to absorb energy from the river via the gradual erosion of the river bank and lateral migration of the river. Soil removed from the river bank would most likely be deposited downstream in the form of a point bar. This process creates the natural sinuosity of the river that is important in the dispersion of water energy, sediment deposition, flow rates, river bed and bank scouring, and channel slope. This section of the river will not function after riprap is installed. Energy that would be absorbed by the eroding river bank will be distributed to another portion of the river.

Cultural Functions—This area does not have any cultural functions.

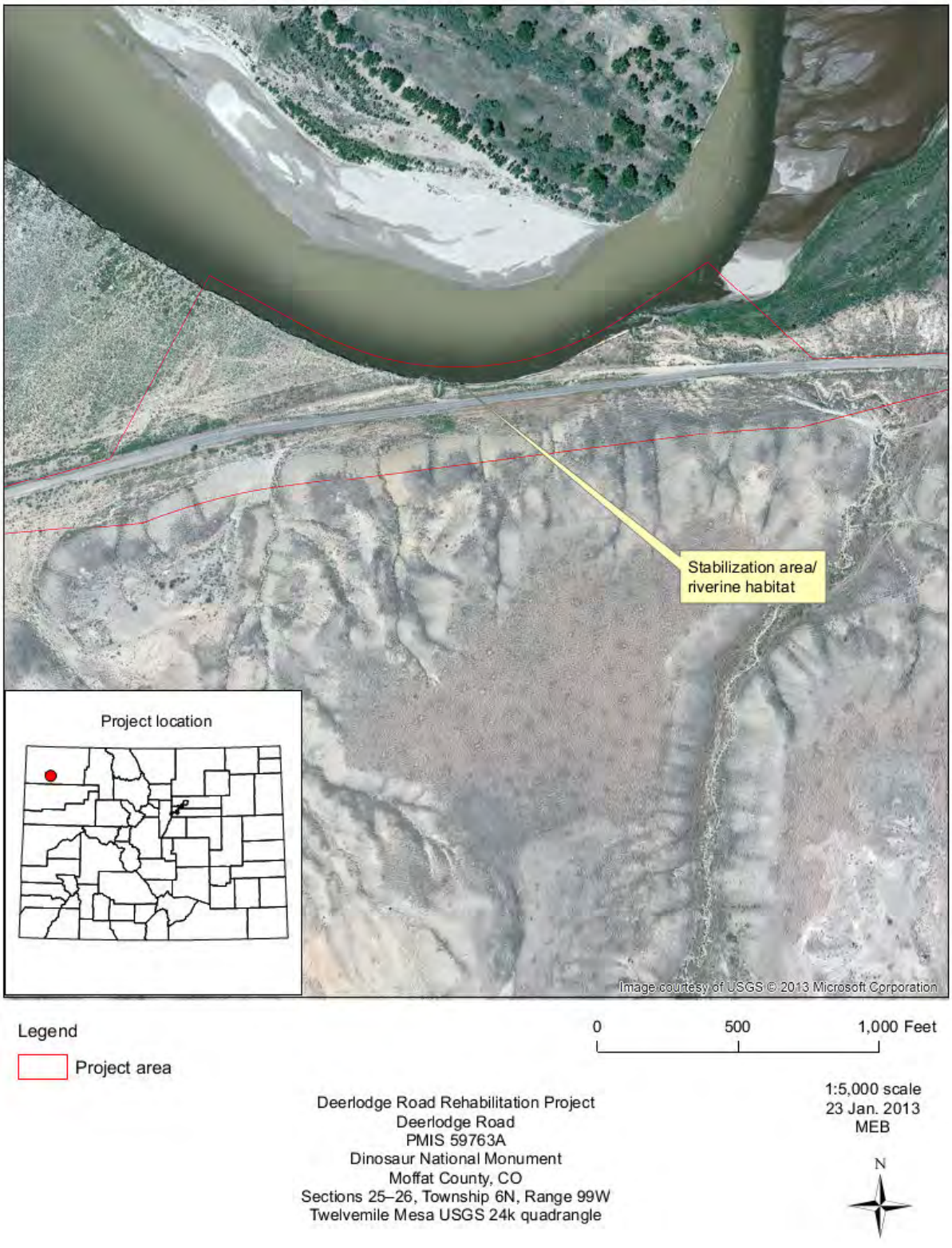


Figure 4. Riverine wetland in project area.

Research/Scientific Values—This area serves as a good example of natural river migration and sinuosity that has been unimpeded by dams and other water control structures. Most of the major rivers in the upper Colorado River basin have been dammed.

Avoidance and Minimization

The NPS in cooperation with the FLHP is proposing to provide safer access and parking for private landowners, visitors, and employees by rehabilitating, restoring, and resurfacing about 12.7 miles of Deerlodge Road and stabilizing the Yampa riverbank where it has encroached on the roadway. The bank stabilization near milepost 9.5 would impact 0.52 acre of wetlands. The need to stabilize the Yampa riverbank near milepost 9.5 to provide safer access and parking precludes the complete avoidance of impacts to wetlands. Impacts would include the filling in of the stream-channel wetland and removal and injury to any aquatic habitat and wetland vegetation present. These impacts are described in detail below.

Design emphasis has been to avoid and minimize impacts to wetland resources. Placement of the exposed rock riprap would require installing a large "toe" into the natural riverbed substrate to ensure high flows would not compromise the structural integrity of the stabilized bank. This would be done using a launchable toe with Class 8 riprap (up to 30 inches in diameter) and water depths up to 8 feet. The launchable toe would slowly launch to scour depths as the river scours the river channel/bottom and the rock slides into the channel with sediment filling back over the launched material. The installation of the launchable tow would permanently compact soils in the construction footprint. The wetland area is unvegetated except during periods of extended low water. It is unlikely the removal of wetland vegetation would occur. Any vegetation in the area would likely be ephemeral. Construction activities on the riverbank would temporarily increase sedimentation into the river and riverine wetlands downstream, which could also impact aquatic organisms, such as insects, fish, and wildlife using the Yampa River and riverbank. A typical section for exposed riprap bank protection with a launchable toe is shown in Figure 3.

Compensatory Mitigation

Approximately 0.52 acre of riverine wetland would be impacted by bank stabilization construction. The NPS will provide compensation through restoration of 0.09 acre of wetlands at the Needle parking area at a 1:1 ratio and 0.86 acre of tamarisk removal along the bank of the Yampa River at a 2:1 ratio (Figures 5). The Needle parking area is adjacent to riparian woody vegetation and would be suitable to restore to wetland habitat. The Needle parking area mitigation is at a 1:1 ratio because it is a similar type of wetland. The tamarisk removal mitigation is at a 2:1 ratio because it is invasive species removal (vs. wetland restoration), but would nonetheless improve riverine wetland habitat.

In general, in-kind mitigation is preferable to out-of-kind mitigation because it is most likely to compensate for the functions and services lost in the area impacted. The wetland restoration at the Needle parking area is being proposed as a compensatory mitigation site to be paired with tamarisk removal in high priority endangered fish habitat areas in or adjacent to the Yampa River channel downstream of the wetland impact area.

The restoration effort would include the removal of fill areas back to the original grade elevations and the expansion of depressional areas to make the topography and hydrologic conditions consistent with the existing wetland. The restoration effort would include the development, prior to construction, of a revegetation plan specifically for this area.

The proposed road construction project (mile 9.5 riprap project) is located in designated critical habitat for endangered Colorado Pikeminnow and Razorback Sucker. It is proposed that a portion of the wetland mitigation requirements (0.86 acre) be met by removing invasive tamarisk from important native fish habitat and recreation sites located downstream of the wetland impact (bank stabilization) site. The proposed tamarisk removal from NPS sites include:

- Point bar (spawning habitat) on river-left at mile 18 (above Mather Hole) on the Yampa River.
- Mid-channel cobble bar (spawning habitat) at mile 16.75 (near Cleopatra's Couch) on the Yampa River.
- Mid-channel island (historical nursery habitat) at the confluence of the Yampa and Green rivers in Echo Park.
- Jones Hole Creek debris fan, downstream of Jones Hole #3 river camp (significant recreation site and breeding bird habitat) at mile 218.5 on the Green River in Whirlpool Canyon.
- Placer Point (significant recreation site and area for outreach/education activities related to native fish recovery efforts) at mile 196.2 on the Green River, downstream of Split Mountain Canyon and upstream of the Razorback Sucker spawning bar.

Tamarisk biomass will be removed from these sites in an amount equal to 0.86 acres utilizing techniques as described in established plans.

TAMARISK PLANS

- Within Recommended Wilderness areas, tamarisk will be removed mechanically from river camps, lunch beaches, other high-recreation-value sites, and important native fish habitat by the least intrusive tool feasible. For most plants, this may include hand-pulling, weed wrenches, shovels, picks, pry bars, loppers, saws, tripod/ratchet puller and other hand tools. In situations where the plants are growing in dense stands in vertical or near-vertical banks or cobble bars located in the active river channel, a gas-powered water pump may be used to dislodge the plants, if it is determined that hand-tools will not accomplish the task. In situations where mechanical removal is not feasible or desirable (root crown lodged in rocky substrate or small diameter plants sparsely distributed in dense native vegetation), cut-stump or basal bark herbicide applications will be used. Choice of a particular herbicide will be based on the most effective and least hazardous material, given site- and weather-specific circumstances.
- Outside of Recommended Wilderness (e.g., Gates of Lodore, Deerlodge, Echo Park, Rainbow Park, Split Mountain and Green River campgrounds), additional tools may be employed, where the benefits to high-value recreational resources warrant. Such

tools may include chainsaws, chipper or other motorized equipment used primarily for debris management.

- In areas where high-value natural habitat has been invaded by tamarisk, cut-stump or basal bark herbicide application will be used, when it is desirable to eliminate the structural disruption caused by tamarisk presence. In other areas, biological control agents will be encouraged, where feasible, to gradually reduce tamarisk infestation. In a very limited number of sites, where (and if) large tamarisk stands succumb to biological control agents, it may be desirable to remove the dead biomass (e.g., islands in Echo Park) to aid re-establishment of natural geomorphic processes important to creation or maintenance of endangered fish spawning or nursery habitat; chainsaws may be employed in this situation, if the benefit to natural resources is significant.
- Debris management is not an insignificant component of tamarisk management. In any areas subject to flooding along the Yampa or Green rivers, stems will be cut into lengths not longer than 8 feet and stacked in piles with the cut end facing toward the river. Whenever possible, these piles will be placed above the high water mark to ensure that they will not be buried under sediment or carried away by flood waters. The piles will be left to dry for at least one year and then broken down and tossed into the river as close to peak flow as possible. Tamarisk stems are capable of sprouting both new root and new stem tissue—care must be taken to ensure that fresh-cut stems are not placed in contact with moist soil.
- In tributaries, tamarisk stems will be lopped and scattered so as to leave as natural an appearance as possible.
- Outside of Recommended Wilderness, debris may be chipped and moved off site, especially if the volume is substantial. Chipped material may be used to mulch for weed control around restrooms, in campsites or other developed areas. In no instance will the chipped material be placed back on to the cleared areas, as research suggests that this hampers recovery of native vegetation.
- At this time, burning is not an option for management of debris piles in the river corridors, even outside of Recommended Wilderness. Early attempts to burn tamarisk piles required excessive fuel and staff time and still burned with difficulty and may have caused irreparable damage to soil structure and beneficial microbes.
- The tamarisk removal areas would be maintained free of tamarisk for five years after the initial removal. Tamarisk management may occur at any time of year when the ground and/or stems are not frozen, with the following exceptions: 1) within 50 feet of the bank of the Yampa and Green Rivers, Garlon 4 applications will occur only between August 15 and November 15, 2) areas that are only accessible by boat can only be treated during the boating season, and 3) when temperatures exceed 85° F, Garlon® 4 herbicide applications will cease and be replaced with Habitat® herbicide applications in situations where the work cannot be rescheduled.
- Removal areas contain important breeding bird habitat, so work would be planned for time periods outside of the breeding bird season.

Schedule

Implementation of the mitigation plan will require 1 to 2 seasons depending upon the depth of water at the site and access to the site.

Compensatory Mitigation Success Criteria

For tamarisk removal sites the objective is absence of woody vegetation, especially in the priority fish habitat areas. The fish need bare cobble substrate. Tamarisk causes accretion of sand on top of cobble. Removing the tamarisk reverses this process. Established populations of tamarisk leaf beetles (*Diorhabda carinulata*) will prevent or slow reinvasion of these critical geomorphic features. Therefore, the success criterion for the tamarisk removal areas is successful removal of all above-ground tamarisk biomass in the subject area. Over the 5-year monitoring period, the sites would be maintained tamarisk-free but may or may not become vegetated with native vegetation.

On-Site Monitoring

Monitoring Methodology

Monitoring would be conducted for the Needle Parking area beginning immediately after the restoration (after re-grading and planting of vegetation), which would be designated as time-zero or the beginning of the restoration time period. Monitoring surveys would be done by qualified personnel after the first growing season of restoration planting to identify and remove or determine the survival of the restoration plantings. If needed, supplemental restoration planting would be done, and another monitoring survey would be done after the second growing season. By this time, plantings on the restoration site should be at the point where they are sustainable.

Vegetation, wildlife, and general climate data at the restoration site would be documented. Photographs would be taken. A time-zero post-construction and planting (as-built conditions) report would document plant densities and describe the conditions of the restoration areas after restoration is completed. The monitoring reports would be prepared by qualified individuals and would document the progress of the restoration efforts. All reports would be kept on file at monument headquarters. Any issues that arise or corrective action that needs to be taken would also be included in the monitoring reports. Observations of vegetation would be made at the restoration site throughout the time-zero and the subsequent reporting cycles.

Figure 5. Needle parking wetland mitigation site.

Wildlife Monitoring

During the monitoring program, observations of wildlife would be made in the restoration area during monitoring surveys through both visual means and inspection of physical evidence.

Tamarisk Removal Monitoring

The tamarisk removal areas would be maintained free of tamarisk for five years after the initial removal. Dinosaur National Monument staff would periodically visit the removal sites for five years to monitor for reinvasion of tamarisk or invasion of other noxious weeds.

Photographic Documentation

Photograph stations would be identified at the Needle Parking area. These locations would be used to document the physical condition of the restoration area during the five-year monitoring program. Photographs would be taken at tamarisk-removal sites to document the presence or absence of tamarisk.

Monitoring Reports

Monitoring reports would be prepared by a qualified individual who will be coordinating the revegetation monitoring. These reports would provide documentation of the success of the mitigation program and the general condition of the enhanced area.

Monitoring reports would consist of the following information:

- Narrative description of the enhancement activities performed since the last report
- Explanation of maintenance work to be conducted over the next year
- List of wildlife species observed
- Results of vegetative monitoring
- Photographs taken at photo station locations on compass points
- General weather description
- Description of any remedial action recommendations (if necessary)

These reports would be submitted to the Dinosaur National Monument Chief of Resources for review and filed at Dinosaur National Monument.

Justification for Use of Wetlands

The Proposed Action would impact 0.52 acre of riverine wetland. The NPS finds that there are no practicable alternatives to the Proposed Action that would avoid wetland disturbance completely. A no-action alternative would result in the eventual loss of Deerlodge Road. River access by recreationalist, researchers, park staff, and ranchers would be severely limited. Wetlands have been avoided to the maximum extent possible, and unavoidable wetland impacts would be compensated at a two-to-one ratio (over 1.04 acres of combined tamarisk removal and wetland restoration area to compensate for the 0.52 acre of wetland loss), which is consistent

with the National Park Service's implementation of the NPS Director's Order and Procedural Manual #77-1.

Compliance

This document is required in order to comply with the National Park Service's Director's Order #77-1: Wetland Protection. Compliance with other agency regulations will be completed (if appropriate for this project) separately from this document. Separate compliance with other appropriate federal laws and regulations is required as per the NPS's Director's Oder #77-1: Wetland Protection and Procedural Manual. For example, NPS activities that involve the discharge of dredged or fill material into wetlands or other waters of the United States may have to comply with Sections 401 and 404 of the Clean Water act and Section 10 of the Rivers and Harbors Act. And if appropriate, the NPS may also have to comply with the Fish and Wildlife Coordination Act; the Wild and Scenic Rivers Act; the Endangered Species Act; the National Historic Preservation Act; and other relevant laws and regulations governing actions in wetlands and other aquatic environments.

Clean Water Act Section 401 and Section 404, and National Pollution Discharge Elimination System (NPDES)

The Proposed Action would impact waters of the U.S. as defined under the Clean Water Act. A Section 404 permit, issued by the U.S. Army Corps of Engineers, and a Section 401 Water Quality Certification, issued by the Colorado Water Quality Control Division, will be required. Section 404 permits and 401 Certifications are required for any activities that would discharge dredge or fill into waters of the U.S. A Section 401 Certification also insures that projects adhere to a state's water quality standards. The National Pollution Discharge Elimination System (NPDES) permit program regulates point sources that discharge pollutants into waters of the U.S. The Proposed Action would not discharge point source pollutants into waters of the U.S. Section 404 general conditions, Colorado regional conditions, Colorado water quality standards, project-specific conditions, and resource mitigation measures would be followed to assure the project is in compliance with all regulatory agencies.

National Environmental Policy Act

The NPS environmental assessment, finding of no significant impact, Section 106 compliance review, NPS floodplain statement of findings for Executive Order 11988, Floodplain Management, and this NPS wetland statement of findings for Executive Order 11990 are required to fulfill the NPS Director's Order #12 for this project.

REFERENCES CITED

Cowardin, L. M., V. Carter, F. C. Golet, and E. T. LaRoe
1979 Classification of wetlands and deepwater habitats of the United States. United States Department of the Interior, Geological Service.

Federal Highway Administration (FHWA), U.S. Department of Transportation (USDOT)
2011 U.S. Technical Memorandum of the Yampa River near Deerlodge Road (CO PRA DINO 101(1)), Dinosaur National Monument. U. S. Department of Transportation Federal Highway Administration Central Federal Lands Highway Division and CH2M HILL. Federal Highway Division, Lakewood, CO.

2012a Preliminary Hydraulics Recommendations Report for Deerlodge Road Improvements, Dinosaur National Monument. CH2MHILL. Federal Highway Division, Lakewood, CO.

2012b Draft Pavement and Design Report, Dinosaur National Monument. Yeh and Associates, Inc. Federal Highway Division, Lakewood, CO.

National Park Service [NPS], Department of the Interior
2012a Deerlodge road rehabilitation project, draft environmental assessment, Dinosaur National Monument. Ecosystem Management, Inc. National Park Service, Denver Service Center, Denver, Colorado.

2012b Wetland determination and delineation report for Deerlodge road and Cross Mountain Parking Area, Dinosaur National Monument. Ecosystem Management, Inc. National Park Service, Denver Service Center, Denver, Colorado.

U.S. Army Corps of Engineers
2008 Regional supplement to the Corps of Engineers wetland delineation manual: western mountains, valleys, and coast region, (J. S. Wakeley, R. W. Lichvar, and C. V. Noble, Eds.). ERDC/EL TR-08-13. U.S. Army Engineer Research and Development Center, Vicksburg, MS.

U.S. Department of the Interior National Park Service
2012 National Park Service procedural manual #77-1: wetland protection.

Wetland Training Institute, Inc.
1995 Field guide for wetland delineation: 1987 Corps of Engineers manual. WTI 02-1. Wetland Training Institute, Inc., Glenwood, NM.

This page intentionally left blank

APPENDIX E
Scoping Announcement

Public Scoping News Release

This page intentionally left blank

National Park Service
U.S. Department of the Interior

Dinosaur National Monument
4545 Highway 40
Dinosaur, CO 81610

Dinosaur National Monument News Release

For Immediate Release – June 5, 2012

Contact: Wayne Prokopetz, Chief of Research and Resource Management
435-781-7721

Dinosaur National Monument Plans to Rehabilitate Deerlodge Road

Dinosaur, CO—Superintendent Mary Risser announces that Dinosaur National Monument in partnership with the Federal Highway Administration (FHWA) proposes to rehabilitate Deerlodge Road in Moffat County, Colorado. The proposed undertaking would mill and pave approximately 12.5 miles of the road, rehabilitate drainage conditions along the road, and construct bank stabilization measures at two locations where the Yampa River is encroaching on Deerlodge Road and the Cross Mountain Parking Area. The rehabilitation of Deerlodge Road would also potentially include reducing the size of six existing parking lots. In accordance with the National Environmental Policy Act (NEPA), the National Park Service is initiating preparation of an environmental assessment (EA) for this project. The EA will analyze and disclose potential impacts of alternatives for rehabilitating the road and the bank stabilization construction. Potential action alternatives would include milling and re-paving the road, replacing culverts and using rip rap embankment or other protective measures as bank stabilization measures and the no action alternative.

Rehabilitation of drainage conditions and milling and paving, if deemed necessary, is anticipated in 2016. The bank stabilization construction, if deemed necessary, is anticipated in 2013. The Federal Highway Administration, under an interagency agreement with the NPS, would engage a contractor to perform the rehabilitation work and construct the bank stabilization on the Yampa River.

The National Park Service is soliciting input from organizations, agencies, and individuals as part of the scoping process. The purpose of scoping is to identify the range of issues to be addressed in the EA, as well as potential alternatives for the project. The public is invited to direct concerns or comments regarding this project to Superintendent Risser online at http://parkplanning.nps.gov/dino, by sending an email to dino_superintendent@nps.gov, or by writing her at Dinosaur National Monument, 4545 E. Highway 40, Dinosaur, CO 81610-9724. You may also contact Wayne Prokopetz, DINO Chief of Research and Resource Management by e-mail at A_Wayne_Prokopetz@nps.gov or by telephone at (435-781-7721).

Dinosaur National Monument
Colorado/Utah

Deerlodge Road Project

National Park Service
U.S. Department of the Interior

Legend

- Yampa River
- DINO Boundary
- Bank Stabilization Areas
- Deerlodge Road

N
W E
S

1:83,500

0 1.25 2.5 Miles

Datum: NAD 83 12 UTM
DSC/May 2012

Colorado Vicinity Map

As the nation's principal conservation agency, the Department of the Interior has the responsibility for most of our nationally owned public lands and natural resources. This includes fostering sound use of our land and water resources; protecting our fish, wildlife, and biological diversity; preserving the environmental and cultural values of our national parks and historic places; and providing for the enjoyment of life through outdoor recreation. The department assesses our energy and mineral resources and works to ensure that their development is in the best interests of all our people by encouraging stewardship and citizen participation in their care. The department also has a major responsibility for American Indian reservation communities and for people who live in island territories under U.S. Administration.

PMIS 59763A

NPS DINO NPS 122/116898 January 2013

United States Department of the Interior National Park Service