

National Park Service
U.S. Department of the Interior

Great Basin National Park
Nevada



SNAKE CREEK FISH BARRIER

Environmental Assessment
March 2013



Summary

Great Basin National Park is proposing to construct a fish barrier on the lower portion of Snake Creek, near the park boundary. The proposed fish barrier is intended to prevent the upstream invasion of non-native fishes and aquatic invasive species into Snake Creek within the park, including portions occupied by a species of management concern, Bonneville cutthroat trout (*Onchorynchus clarki utah*, BCT). This action would help the park meet the Nevada Conservation Agreement and Conservation Strategy goals for BCT populations.

Two alternatives are presented: 1) Alternative A, the No Action Alternative, would not allow the Snake Creek Fish Barrier project to be undertaken and would continue the status quo of having an assumed fish barrier 9.0 km (5.6 mi) upstream from the park boundary; and 2) Alternative B, the Proposed Action, which would allow for the construction of a fish barrier on Snake Creek near the park boundary.

The Preferred Alternative is the Proposed Action. This alternative would have minor, short-term impacts to soils, streamflow characteristics and beneficial, minor to moderate impacts to species of special concern, native aquatic species, long-term management of resources, and upholding the Conservation Agreement and Conservation Strategy (CA/CS) for Bonneville cutthroat trout in the State of Nevada. Long-term benefits derived from this project outweigh short-term adverse impacts. The Proposed Action is also the environmentally preferred alternative.

There will be a 30-day comment period on the Environmental Assessment (EA). Comments may be submitted online at: <http://parkplanning.nps.gov/fishbarrier>, or in writing to the following address:

Planning
Great Basin National Park
100 Great Basin National Park
Baker, NV 89311

Abbreviations and Acronyms

BCT – Bonneville cutthroat trout
BLM – Bureau of Land Management
CEQ – Council on Environmental Quality
CA/CS – Conservation Agreement/Conservation Strategy
cfs – cubic feet per second
CWA – Clean Water Act
DOI – Department of the Interior
EA – Environmental Assessment
EPA – Environmental Protection Agency
ESA – Endangered Species Act
GMP – General Management Plan
GRBA – Great Basin National Park
NDEP – Nevada Division of Environmental Protection
NDOW – Nevada Department of Wildlife
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
NRS – Nevada Revised Statute
SHPO – State Historic Preservation Officer
USACE – United States Army Corps of Engineers
USFWS – United States Fish and Wildlife Service
USGS – United States Geologic Survey

Conversion Factors

To convert from	To	Multiply by
Length		
foot (ft)	kilometer (km)	0.000305
foot (ft)	meter (m)	0.305
foot (ft)	mile (mi)	0.000189
kilometer (km)	foot (ft)	3,280
kilometer (km)	mile (mi)	0.621
meter (m)	foot (ft)	3.28
mile (mi)	foot (ft)	5,280
mile (mi)	kilometer (km)	1.61
Area		
sq. kilometer (km ²)	sq. mile (mi ²)	0.386
sq. mile (mi ²)	sq. kilometer (km ²)	2.59

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1.0 PURPOSE AND NEED

1.1 INTRODUCTION

This Environmental Assessment (EA) has been prepared to satisfy the requirements of the National Environmental Policy Act (NEPA) of 1969, as amended, as well as other laws and regulations pertaining to the management of activities within the National Park Service (NPS), specifically within Great Basin National Park (GRBA, “the Park”). The purpose of this Environmental Assessment is to identify, evaluate, document, and disclose the potential environmental consequences of the proposed Snake Creek Fish Barrier Project.

1.1.1 Project Background

Great Basin National Park is home to five Bonneville cutthroat trout (*Onchorynchus clarki utah*; BCT) populations. Based on the park’s Fisheries Management Plan (1999), park staff have worked to expand and maintain this native species and have designated them as a species of management concern.

The Park is a signatory to the *Conservation Agreement and Conservation Strategy for Bonneville Cutthroat Trout in the State of Nevada* (NV CA/CS; 2006). The desired outcome is to ensure the long-term conservation of the BCT within its historic range in Nevada, and contribute to development of range-wide conservation efforts for BCT. By implementing the proposed conservation measures, the need to list BCT as a Threatened or Endangered species may be precluded.

In 2002 upper Snake Creek above the water diversion inlet was chemically treated to eradicate non-native salmonids. In 2005 pure BCT were reintroduced above that section (located at 2,300 m (7,600 ft elevation) and 9.0 km (5.6 mi) from the park boundary). Fin clips collected in 2010 identified the Snake Creek BCT population as still 100% genetically pure. Despite this work, the resident BCT are at risk. Snake Creek has been compromised by the introduction of non-native fish species and is susceptible to the upstream invasion of disease and aquatic invasive species.

Great Basin National Park is proposing to construct a fish barrier on the lower portion of Snake Creek, inside the park boundary. The proposed fish barrier is intended to prevent the upstream invasion of additional non-native fishes and aquatic invasive species into portions of Snake Creek occupied by BCT. The construction of a barrier would also facilitate future BCT reintroduction and restoration efforts, although no other action is currently planned.

1.1.2 Background of the Park

Great Basin National Park consists of 31,194 hectares (77,082 acres) situated on mountains within the southern Snake Range in east-central Nevada (Figure 1). The Park was established in 1986, expanding the boundaries around and incorporating the previous Lehman Caves National Monument. The Park occupies higher portions of two hydrologic basins, Spring Valley to the west and Snake Valley to the east. All but 80 acres of the Park are located in the mountain range, with a small administrative site located in the basin next to the community of Baker, Nevada, 8

km (5 mi) from park headquarters. Surrounding the Park are mostly public lands administered by the Bureau of Land Management (BLM), along with a few private holdings. The Park is 480 km (300 mi) north of Las Vegas, Nevada; 370 km (230 mi) southwest of Salt Lake City, Utah; and 560 km (350 mi) east of Reno, Nevada. About 105 km (65 mi) to the west, Ely, Nevada, provides major services and a regional airport. Delta, Utah, is 160 km (100 mi) to the east and also provides major services.

Purpose and Significance of Great Basin National Park

Great Basin National Park boasts the second highest peak in the state of Nevada, Wheeler Peak, at 3982 m (13,063 ft). It also is home to highly decorated Lehman Caves, along with 42 other caves. Several of the caves are home to endemic invertebrate species, including some that are new to science. Several old-growth bristlecone pine groves are nestled at high elevations, with trees dated over 3,000 years old. The Park is home to the only remaining glacier in Nevada; it also contains several rock glaciers and other glacial features. A wide diversity of wildlife and vegetation is found throughout the Park, and the Park is pursuing several restoration projects to enhance native species and habitats.

1.2 PURPOSE AND NEED

The purpose of the action is to better protect the Snake Creek BCT population within Great Basin National Park from invading invasive species and diseases. The need is that potential threats, including hybridization and/or competition with non-native salmonids, diseases, and aquatic invasive species threaten BCT populations. As a signatory to the NV CA/CS (2006) and the *Range-wide Conservation Agreement and Strategy for Bonneville Cutthroat Trout* (Lentsch et al. 2000), Great Basin National Park is committed to taking measures to restore, maintain, and expand five Bonneville cutthroat trout populations within the park, including the Snake Creek population. These actions are necessary to prevent the possible listing of the species, which would have significant consequences for both federal land managers and private landowners.

Decision to be Made

The NPS will decide whether or not to better protect the Snake Creek BCT population and other native species within the park, especially from the upstream advance of non-native species and diseases, with the construction of a fish barrier.

1.3 SCOPE OF ENVIRONMENTAL ASSESSMENT

This EA analyzes an Action Alternative and the No Action Alternative relative to their impacts on the human and natural environment. It fully describes project alternatives, existing conditions in the project area, and analyzes the potential effects of each project alternative on the environment.

This EA was prepared pursuant to the National Environmental Policy Act (NEPA) of 1969 (42 U.S.C. 4341 et seq.), as amended in 1975 by P.L. 94-52 and P.L. 94-83. Additional guidance includes NPS Director's Order 12 (NPS, 2001) which implements Section 102(2) of NEPA and the regulations established by the Council on Environmental Quality (CEQ) (40 CFR 1500-1508). The project must comply with requirements of NEPA as well as other legislation that governs land use, natural resource protection, and other policy issues within the Park.

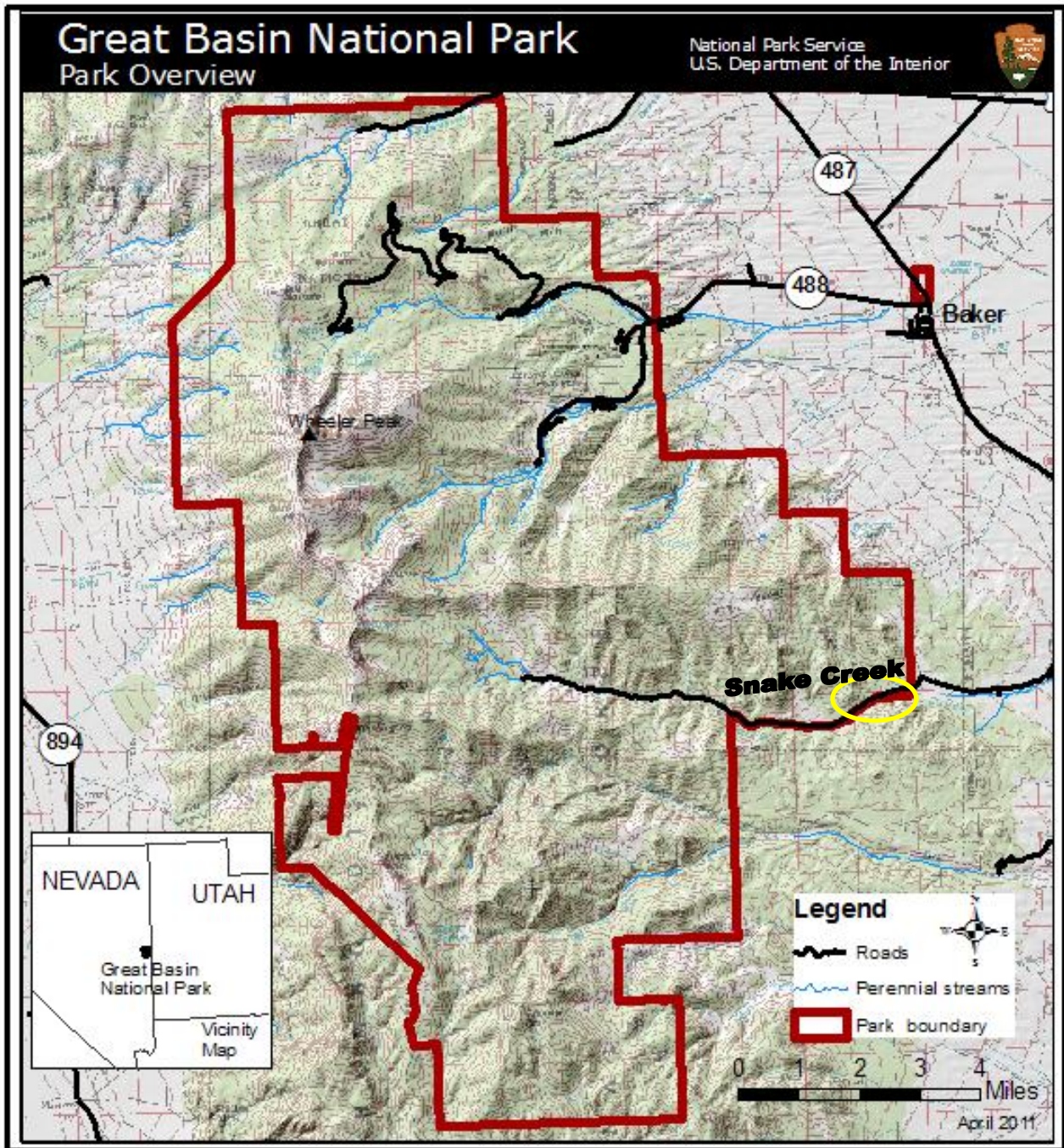


Figure 1. Map of Great Basin National Park, with the Snake Creek Fish Barrier project area circled.

1.4 RELATED LAWS, LEGISLATION AND MANAGEMENT GUIDELINES

The following is a summary of all relevant guidance documents and regulations for this EA. Specific sections applicable to analysis are cited in section 3.2, Affected Environment and Analysis of Alternatives.

Conservation Agreement and Conservation Strategy (CA/CS) for Bonneville Cutthroat Trout in the State of Nevada

Great Basin National Park is a signatory of the 2006 *Conservation Agreement and Conservation Strategy for Bonneville Cutthroat Trout in the State of Nevada* along with the Nevada Department of Wildlife (NDOW), Humboldt-Toiyabe National Forest, U.S. Fish and Wildlife Service (USFWS) and BLM. The signing of the CA/CS was an instrumental factor in the decision by the USFWS to preclude listing of the Bonneville cutthroat trout under the Endangered Species Act.

The goal of the Agreement is to ensure the long-term existence of BCT within its historic range in Nevada by coordinating conservation efforts with multiple agencies. The first objective states that the group will manage for a minimum of 14 conservation populations of BCT in Nevada , with 5 populations in the park, and explore opportunities for further expansion of BCT. The second objective states that the group will eliminate the threats to BCT in Nevada that may warrant listing as a Threatened or Endangered species under the Endangered Species Act (ESA).

National Park Service Organic Act

The NPS Organic Act directs the NPS to manage units “to conserve the scenery and the natural and historic objects and the wildlife therein and to provide for the enjoyment of the same in such a manner as will leave them unimpaired for the enjoyment of future generations.” (16 U.S.C. § 1). Congress reiterated this mandate in the Redwood National Park Expansion Act of 1978 by stating that the NPS must conduct its actions in a manner that will ensure no “derogation of the values and purposes for which these various areas have been established, except as may have been or shall be directly and specifically provided by Congress.” (16 U.S.C. § 1 a-1). The Organic Act prohibits actions that permanently impair park resources unless a law directly and specifically allows for the acts. An action constitutes an impairment when its impacts “harm the integrity of park resources or values, including the opportunities that otherwise would be present for the enjoyment of those resources and values.” (*Management Policies 2006* 1.4.3).

NPS Management Policies 2006

NPS Management Policies 2006 include direction for preserving and protecting cultural resources, natural resources, processes, systems, and values (NPS 2006). Although management policies are not applicable to non-NPS lands, it is the goal of the NPS to avoid or minimize potential impacts to resources to the greatest extent practicable consistent with the management policies.

National Historic Preservation Act of 1966

Section 106 of the National Historic Preservation Act (NHPA) of 1966 (as amended) requires that proposals and alternatives relating to actions that could affect cultural resources both directly and indirectly, and the potential effects of those actions, be provided for review and comment by the State Historic Preservation Officer (SHPO), Tribal Historic Preservation Officer, and the Advisory Council on Historic Preservation. Therefore, the document will be submitted to the appropriate offices for review and comment according to the procedures in 36 CFR Part 800 and guidelines delineated in the Nationwide Programmatic Agreement 2008 signed by the NPS, the National Conference of State Historic Officers, and the Advisory Council on Historic

Preservation.

Great Basin National Park Legislation

Lehman Caves National Monument was established in 1922. After decades of proposals to expand the national monument and to re-designate it as a national park, the idea came to fruition when the authorizing legislation for Great Basin National Park was signed on October 27, 1986. Public Law 99-565 established Great Basin National Park “to preserve for the benefit and inspiration of the people a representative segment of the Great Basin of the Western United States possessing outstanding resources and significant geological and scenic values.” It further stated that the NPS is to “protect, manage and administer the Park in such a manner as to conserve and protect scenery, the natural, geologic, historic and archeological resources of the Park, including fish and wildlife and to provide for the public use and enjoyment of the same in such a manner as to perpetuate these qualities for future generations.”

General Management Plan for Great Basin National Park

The Record of Decision for the GMP for the Park was approved March 2, 1993. The purpose was to guide visitor use, natural and cultural resource management, and general development for the next 15 years. The GMP calls for reestablishing Bonneville cutthroat trout into selected streams on the east side of the park.

Great Basin National Park Bonneville Cutthroat Trout Reintroduction and Recreational Fisheries Management Plan, Great Basin National Park (1999)

Fisheries management in GRBA focuses on two main issues: reintroduction of BCT back into its native range and recreational fishing for the visiting public. The plan identifies Snake Creek as one of the reintroduction locations. This plan was written following an EA and FONSI, signed 11/10/1999, with the preferred alternative: “The reintroduction of Bonneville Cutthroat trout into approximately 18 miles of historic but vacant stream habitat within GRBA and 3 miles of stream habitat on adjacent public lands administered by the Humboldt National Forest and the Bureau of Land Management, while continuing to manage all other streams within the historic range for nonnative salmonid recreational fisheries.”

Range-wide Conservation Agreement and Strategy for Bonneville Cutthroat Trout (2000)

The NPS entered into a Conservation Agreement, with a primary goal to ensure the long-term existence of Bonneville cutthroat trout within its historic range, by coordinating conservation efforts among states, tribal governments, Federal management agencies, and other involved parties. The authority is Federal and State law, as applicable, including, but not limited to Section 2(c)(2) of the Endangered Species Act of 1973, as amended, which states that “the policy of Congress is that Federal agencies shall cooperate with State and local agencies to resolve water resource issues in concert with conservation of endangered species” (Lentsch et al. 2000).

1.5 ISSUES AND IMPACT TOPICS

1.5.1 Scoping

Scoping is an effort to involve agencies and the public in determining issues to be given detailed analysis in the environmental assessment and eliminate issues not requiring detailed analysis. Scoping seeks to obtain early input from any interested stakeholder and any agency with jurisdiction by law or expertise. A scoping letter (Appendix A) and press release (Appendix B) initiating scoping and describing the proposed action were issued on December 29, 2011. The project was noticed on the NPS Planning, Environment and Public Comment (PEPC) website. Comments were solicited during a public scoping period that ended on January 31, 2012. Internal scoping involved an interdisciplinary team of NPS staff who determined potential issues and impact topics. Additional details of the scoping process can be found in the Consultation and Coordination chapter of this EA.

During scoping, five public comments were received, three from local residents, one from a representative from the Great Basin Chapter of Trout Unlimited, and one from an individual from Texas. These comments expressed the following issues and concerns about the project:

- * Impact of fish barrier on water rights
- * Desire to restore entire aquatic ecosystem by removing non-native fish from entire drainage
- * Improving current barrier at pipeline intake location
- * Recreational fisheries
- * Disturbance to streambank

1.5.2 Issues and Impact Topics Identified for Further Analysis

Based on scoping, the following issues and impact topics were identified and retained for further analysis:

Impact Topic	Impact Topic Issue
Soils	How would installing a fish barrier impact soil, stream banks and streambeds? How would a temporary access route to build the fish barrier impact soils?
Streamflow Characteristics	How would installing a fish barrier with a four-foot drop change streamflow characteristics?
Species of special concern and their habitat	How would a fish barrier impact native BCT and native springsnails from invasive species or disease? How would a fish barrier impact habitat for these species?
Introduce Non-native Aquatic Species	How would a fish barrier limit the spread of non-native species of concern including non-native trout (brook, brown, and rainbow), New Zealand mud snails, whirling disease, and other aquatic invasives into the park?
Long-term Management of Resources	What would be the effects of a fish barrier to long-term management of native aquatic species in the park?
Conservation Agreement and Conservation Strategy for Bonneville Cutthroat Trout in the State of Nevada	How does the fish barrier support and uphold the goals, objectives and tasks laid forth in the NV BCT CA/CS?

1.5.3 Impact Topics Considered but Dismissed

Impact topics are dismissed from further evaluation in this environmental assessment for one or more of the following reasons:

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

Rationale for dismissing specific topics from further consideration is given below.

Air quality. Air quality is of critical importance to visitor enjoyment, human health, scenic vistas, and preservation of natural systems. Great Basin National Park is a class II park, meaning that it has less stringent air quality parameters than a class I area. Equipment exhaust could have impacts of short duration and are considered to be negligible. Therefore, the impact topic of air quality has been dismissed.

Floodplains. Executive Order 11988 *Floodplain Management* requires all federal agencies to avoid construction within the 100-year floodplain unless no other practicable alternative exists. The National Park Service under *Management Policies 2006* and Director's Order 77-2 *Floodplain Management* will strive to preserve floodplain values and minimize hazardous floodplain conditions. According to Director's Order 77-2 *Floodplain Management*, certain construction within a 100-year floodplain requires preparation of a Statement of Findings for floodplains. The proposed fish barrier is located within the stream channel and does not extend out onto the floodplain, thus the topic of floodplains has been dismissed.

Wetlands. Executive Order 11990 *Protection of Wetlands* requires federal agencies to avoid, where possible, adversely impacting wetlands. Further, Section 404 of the Clean Water Act authorizes the U.S. Army Corps of Engineers to prohibit or regulate, through a permitting process, discharge or dredged or fill material or excavation within waters of the United States. National Park Service policies for wetlands as stated in *Management Policies 2006* and Director's Order 77-1 *Wetlands Protection*, strive to prevent the loss or degradation of wetlands and to preserve and enhance the natural and beneficial values of wetlands. In accordance with DO 77-1 *Wetlands Protection*, actions that have the potential to adversely impact wetlands must be addressed in a Statement of Findings for wetlands. This action would not occur in a wetland area, thus the topic of wetlands has been dismissed.

Water rights. This project would not change any water rights along Snake Creek. Water in the creek would continue to flow in the channel, although with a fish barrier it would cascade four feet. Behind the fish barrier, the space would be filled in naturally, so there would be no impoundment. Due to all these reasons, the topic of water rights has been dismissed.

Water quantity. This project would not change the water quantity in Snake Creek, as the creek

water would simply flow over the fish barrier and continue downstream in the stream channel. Thus the topic of water quantity has been dismissed, although information relating to this topic can be found in Streamflow Characteristics, which is analyzed in this document.

Water quality. Most water quality parameters, such as pH, conductivity, and temperature are not likely to be affected by installation of a fish barrier. Turbidity could be affected for a small amount of time, and design features would make any changes in water quality negligible. Thus the impact topic of water quality has been dismissed.

Wilderness. There are no Designated, Recommended, Proposed, Study, or Potential Wilderness classifications assigned to areas within Great Basin National Park. However, the Park GMP designates the predominant portion of the Park outside of the rural and modern management zones as Suitable for Wilderness. According to NPS policy, such areas are to be managed in the same manner as wilderness. No actions under any of the alternatives considered would take place outside of the rural zone, and the topic of wilderness has been dismissed.

Archaeological Resources. Park archaeologists have examined the proposed project area and have not found archaeological resources present. Thus the impact topic of archaeological resources has been dismissed.

Historic structures. Section 106 of the NHPA and NPS policy require that the effects of NPS actions on properties eligible for or listed in the National Register of Historic Places (NRHP) be considered and that appropriate steps be taken to avoid, minimize, or mitigate these effects. A review of the records for existing structures in the project area indicate that no historic structures, buildings, or objects would be affected by this project, thus this impact topic has been dismissed.

Cultural landscapes. A cultural landscape is a reflection of human adaptation and use of natural resources. It is expressed in the way land is used and organized, patterns of settlement, systems of circulation, and the types of structures that are built (NPS 1998b:87). Use and settlement patterns in the project area and surrounding area are indicated by cultural features including existing roads and abandoned minor two-track roads, and isolated artifacts. The known cultural features and uses in the area are not currently determined significant as a cultural landscape resource.

Ethnographic resources. Ethnographic resources are comprised of features of the landscape that are linked by members of a contemporary community to their traditional ways of life. A traditional cultural property is an ethnographic resource that is eligible for listing on the NRHP. There are no known ethnographic resources within the areas of the proposed project; therefore this impact topic has been dismissed.

Museum collections. Museum collections would only be affected by the proposed research actions if mitigation for cultural resources included collecting. If collecting is required, the expected quantity of items is considered to be negligible, thus this impact topic has been dismissed.

Introduce non-native terrestrial species. The Park's GMP states that non-native plant species

will be eradicated and controlled if they threaten to spread or compete with park resources. NPS *Management Policies 2006* (Section 4.4.4) state that “Exotic species will not be allowed to displace native species if displacement can be prevented.” All exotic plant species can decrease the diversity and resilience of native communities, affect site productivity, and affect hydrologic functioning of a watershed. Heavy equipment would be needed to construct the fish barrier and has the potential to introduce non-native species. Non-native species (primarily cheatgrass) already exists at the site. Mitigation measures would be taken to reduce the non-native species at the site, thus non-native species would be negligible for this project; therefore this impact topic has been dismissed.

Prime and Unique Farmlands. In August 1980, the CEQ directed that federal agencies must assess the effects of their actions on farmland soils classified by the U.S. Department of Agriculture's Natural Resources Conservation Service (NRCS) as prime or unique. According to NRCS, there are no soils in Great Basin National Park classified as prime and unique farmlands. Therefore, the topic of prime and unique farmlands was dismissed as an impact topic in this document.

Environmental Justice. Executive Order 12898 and the Environmental Protection Agency's Environmental Justice Guidance (1998) require that actions would not have disproportionate health or environmental effects on minorities or low-income populations or communities. The actions proposed in this analysis do not do that, therefore, the impact topic of environmental justice has been dismissed.

Wild and Scenic River. The Park's GMP did not recommend or consider any stream system within the boundaries of GRBA for Wild & Scenic River status. Therefore, the impact topic of wild and scenic river has been dismissed.

Soundscapes. In accordance with NPS *Management Policies 2006* and Director's Order 47: *Sound Preservation and Noise Management*, an important part of the NPS mission is preservation of natural soundscapes associated with national parks. Natural soundscapes exist in the absence of human-caused sound. The natural ambient soundscape is the aggregate of all the natural sounds that occur in national parks, together with the physical capacity for transmitting natural sounds. Natural sounds occur within and beyond the range of sound that humans can perceive and can be transmitted through air, water, or solid materials. The frequency, magnitude, and duration of human-caused sound considered acceptable varies among national park system units, as well as potentially throughout each national park, being generally greater in developed areas and less in undeveloped areas. Construction noise is expected to be temporary and negligible, thus the impact topic of soundscapes has been dismissed.

Land Use. None of the alternatives would affect present or future national park land use or the use of surrounding lands. The proposed action would not change or affect current or future use of the proposed project area. Therefore, land use has been dismissed from further analysis in this environmental assessment.

Recreation and visitor experience. The proposed fish barrier would not change recreation opportunities for visitors. It would be located in an area off the road, and thus not generally seen

by park visitors. A few visitors might notice construction of a fish barrier, but their activities would not be hampered by it, thus the impact topic of recreation and visitor experience has been dismissed.

Park Operations. This project would not affect park operations, as it would occur in a part of the park with low visitation. Therefore, the impact topic of park operations has been dismissed.

Socioeconomics. The fish barrier project is considered a small-scale project with a small budget. Thus it would have negligible impacts on local businesses and thus the impact topic of socioeconomics has been dismissed.

Climate Change. Climate change may potentially be the greatest environmental challenge relative to natural resource management in national parks. The NPS has a fiduciary responsibility to protect natural and cultural resources unimpaired for future generations, which could be negatively affected. In response to the potential effects related to climate change (September 14, 2009), Secretary of the Interior Ken Salazar signed Secretarial Order No. 3289: *Addressing the Impacts of Climate Change on America's Water, Land, and Other Natural and Cultural Resources*. This secretarial order established as priorities the development of environmentally responsible renewable energy on U.S. public lands, and the protection of cultural and natural resources from the potential effects of climate change. In addition, the secretarial order established a framework through which Department of the Interior (DOI) bureaus will coordinate climate change science and resource management strategies to address climate change. President Barack Obama signed Executive Order 13514, "*Federal Leadership in Environmental, Energy, and Economic Performance*" on October 5, 2009. This executive order requires federal agencies to measure, manage, and reduce greenhouse gas emissions toward agency-defined targets. Subsequently, the DOI and NPS recommend that all national park system units consider climate change during the NEPA planning process.

There would be no measureable effects on climate change with the proposed actions; the proposed actions are consistent with section 1.4.7.1 of *NPS Management Policies 2006* (NPS 2006). The proposed actions would not result in any unacceptable impacts. Within the life of this project, weather changes are not expected which could affect the efficacy of the project. Therefore, climate change has been dismissed from further analysis in this environmental assessment.

1.6 PERMITS AND APPROVALS NEEDED TO IMPLEMENT PROJECT

Section 404 of the Clean Water Act (CWA) regulates the discharge of dredged, excavated, or fill material in wetlands, streams, rivers, and other U.S. waters. The U.S. Army Corps of Engineers (USACE) is the federal agency authorized to issue Section 404 permits or Nationwide permits for certain activities conducted in wetlands or other U.S. waters. Since the Proposed Action would require construction of a structure directly across a stream, this activity will require a General Permit from the Reno office of the USACE. Because the proposed action would be taken for Aquatic Habitat Restoration, Establishment, and Enhancement, the project qualifies for a Nationwide 27 permit. General Permits are issued for a specific region and type of activity by the local regulatory office. These activities are minor in scope and must result in no more than minimal adverse impacts both cumulatively and individually. In addition, Section 401 of the CWA requires State water quality certification or waiver of certification prior to issuance of either a Section 404 permit or a Nationwide 27 permit, thus concurrent application submittal is required for both the Army Corps and Nevada Division of Environmental Protection (NDEP).

The park is currently in consultation with both the USACE and NDEP for these permits.

2.0 ALTERNATIVES

2.1 INTRODUCTION

The alternatives section describes the no-action alternative and the action alternative for the Snake Creek Fish Barrier. Additional alternatives considered and dismissed from detailed analysis are discussed in section 2.5. A summary table comparing the environmental consequences of the no-action and action alternative is presented in Table 2 in section 2.6.

2.2 ALTERNATIVE A – NO ACTION ALTERNATIVE

Alternative A, the No Action Alternative, would continue park operations as normal and would not construct a fish barrier on Snake Creek near the park boundary. The structure at the pipeline inlet, approximately 9.0 km (5.6 mi) west of the park boundary, above which BCT were reintroduced, would continue to serve as an assumed fish barrier. This is an assumed barrier, since it was not designed as a fish barrier and non-native trout have been detected upstream. This structure is the current pipeline intake, which is located approximately 9.0 km (5.6 mi) from the park boundary. The pipeline moves water over a karst section of streambed, where water is lost (Elliott et al. 2004). The pipeline intake consists of a 1-m (3-ft) wide box the width of the stream (approximately 2 m (6 ft) across), and 1.3 m (5 ft) high. During spring runoff, the streamflow exceeds the pipeline capacity, and the overflow runs across the box and down into the stream channel.

2.3 ALTERNATIVE B – PROPOSED ACTION

Alternative B, the Proposed Action, would install a fish barrier on Snake Creek (Figure 2) to prevent the upstream movement of non-native fish species, aquatic invasive species, and of aquatic diseases. The proposed fish barrier would consist of a structure placed across the channel of Snake Creek approximately 100 m (300 ft) upstream of the park boundary (Figure 3).

The stream channel at high water is only about 3m (10 ft) wide with defined stable banks on both sides (Figure 4). The proposed location is in an ephemeral section of stream with no stream flow typically from early October to mid-April. The approximate UTM coordinates (plus or minus 3 m) for the barrier are: Z11 N 0748462 E, 4311643 N.

Fish Barrier Construction

The overflow structure would be composed of a reinforced concrete wall including wing walls that would extend into the existing stream bank and a concrete downstream apron. The design and construction would be to make the fish barrier capable of withstanding high water events, including a 100-year flood event. The total height of the structure above the existing streambed would be about 1.5 m (5 ft). The length of the structure across the stream would be about 3 m (10 ft). The wing walls above the existing ground surface would range from approximately 0 to 1 m (0 to 3 ft) depending on the height of the structure and the elevation of the ground surface. Anchor bars would be drilled and cemented into existing banks and streambed to ensure the structure is securely stabilized in the channel. A center notch would be constructed in the dam face to ensure base flows achieve a full 1.2 m (4 ft) drop and focus outfall on the downstream apron only.

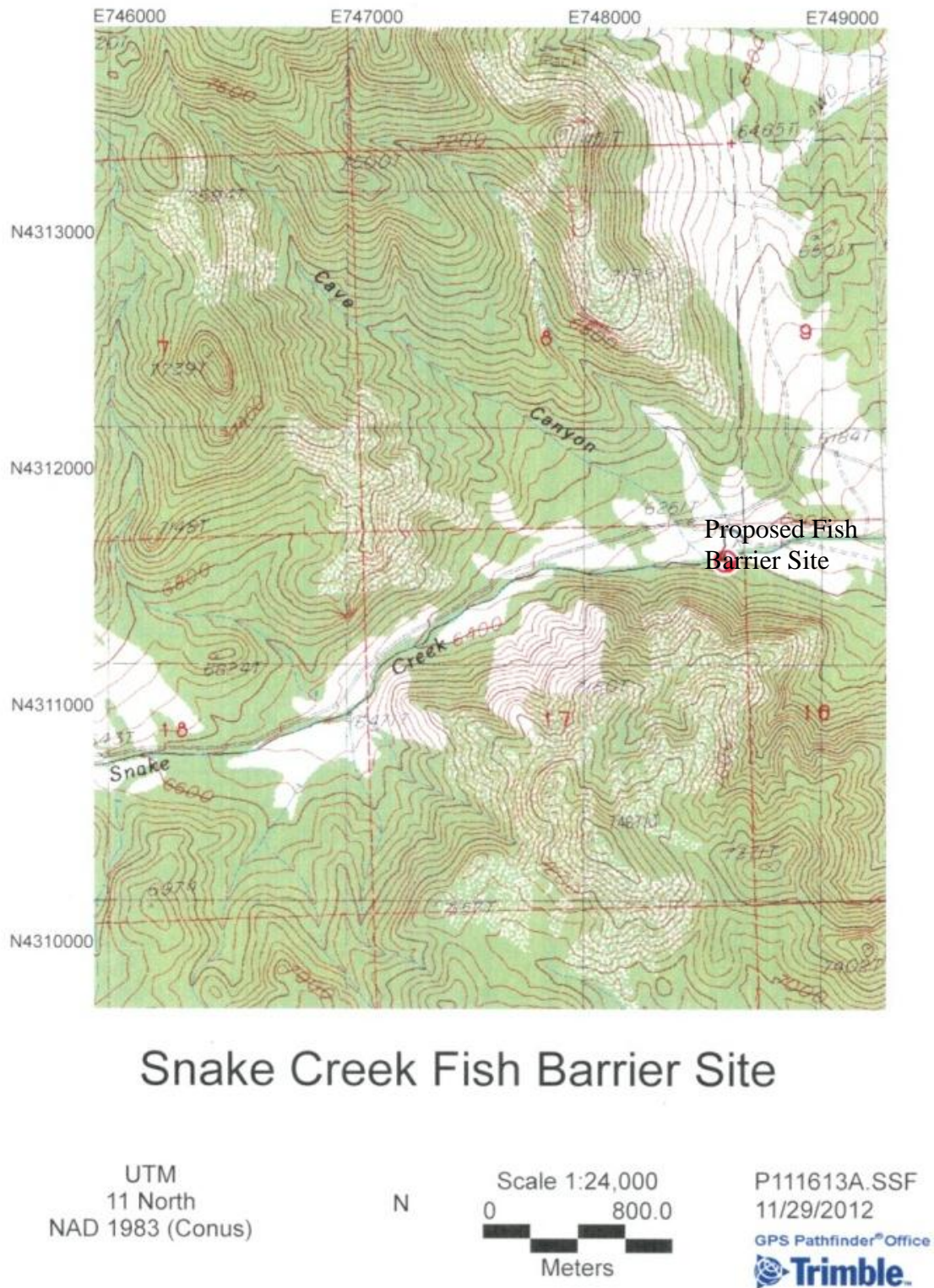


Figure 2. Map of proposed fish barrier site on Snake Creek, Great Basin National Park.

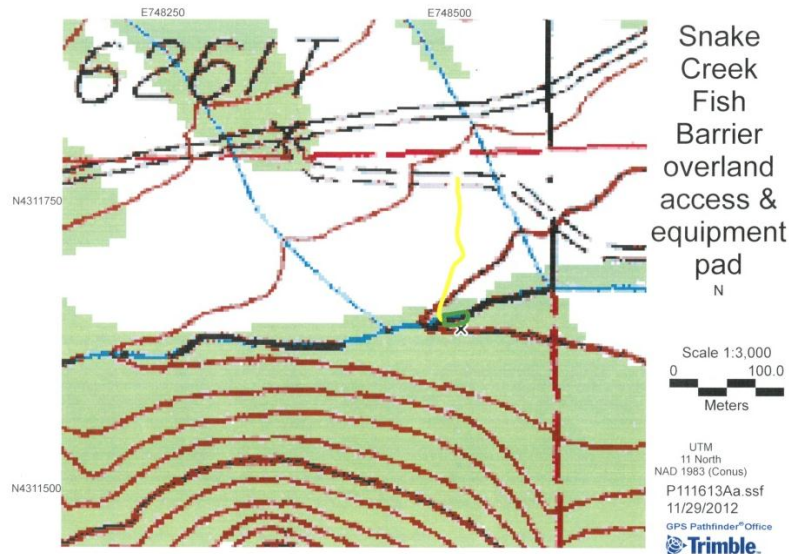


Figure 3. Map of close-up view of proposed fish barrier site on Snake Creek, Great Basin National Park.



Figure 4. Photo of the proposed fish barrier site, which would be constructed approximately 1 m upstream from the 2m rod.

The splash pad or apron located immediately below the barrier crest is necessary to eliminate the potential for a scour pool to develop that could facilitate fish-leaping attempts over the barrier. In addition, the slope of the splash pad would ensure shallow depths and high velocities immediately downstream of the barrier, making it difficult for fish to reach the face of the barrier. The pad would also prevent development of a scour pool that could undermine the dam structure. Riprap would be used to protect the channel and abutments from erosion along the

apron edges at the ends of the overflow structure. An estimated 10 m³ (13 yd³) of concrete would be required to construct the fish barrier and apron structures.

All necessary NDEP and USACE permits would be obtained prior to construction.

Site Access and Construction Staging

There are no roads currently accessing the proposed site.

A temporary access route about 135 m (450 ft) in length and a maximum of 5 m (15 ft) wide would be created from the Snake Creek road to the site, with park staff clearly marking the access route to be created. At the end of the access route, a small construction site (12 x 18 m (40 ft x 60 ft)) would be needed for machinery and temporary storage (Figure 5). Some vegetation and brush would have to be removed to facilitate the temporary construction access route to the site. Throughout all stages of the project, precautions would be taken to minimize disturbances whenever possible.



Figure 5. Photo of part of the proposed staging area.

Construction Timing and Duration

The proposed site is located in an ephemeral section of stream with stream flows subsurfacing usually by early October. Construction would be planned for late October/early November in the dry stream bed.

The project would take less than three weeks to complete. Work would begin each day no earlier than sunrise and would stop no later than sunset.

Contractor Use Areas and Construction Equipment

Heavy machinery required for construction would likely include an excavator, skid-steer, dump truck, concrete truck, single direction plate compactor, and generator. Only mission critical equipment, supplies and trucks would be allowed in the 12 x 18 m (40 x 60 ft) designated staging area next to the stream. All non-essential equipment, supplies and trucks would be parked on the Snake Creek road. At no time should there be more than the excavator, skid-steer and dump truck or cement truck in the temporary staging area.

Site Restoration

The contractor will be responsible for the restoration of any areas disturbed during construction including the stream banks, physical stream bed, riparian areas, temporary construction staging area, and temporary access route. All areas will be raked out as the excavator backs out and compacted areas will be ripped with the bucket. The final re-vegetating and seeding of the disturbed area will be performed by park staff and overseen by the Natural Resource Program Lead and the Vegetation Biological Science Technician. The Cultural Resource team will be notified in the event any artifacts are discovered during restoration. Site restoration is expected to take less than one week.

2.4 MITIGATIONS

Mitigation measures are specific actions designed to reduce, minimize, or eliminate impacts of alternatives and to protect GRBA resources and visitors. These mitigations are described in Table 1.

2.5 ALTERNATIVES AND ACTIONS CONSIDERED BUT DISMISSED

One scoping comment asked the park to restore the entire drainage (from the headwaters to the valley bottom in Utah) to native fish. Although the park finds this a commendable idea, it is beyond the scope of this project and the jurisdiction of the park. In addition, it is not feasible due to the presence of the NDOW Spring Creek Rearing Station, approximately 2.3 km (1.4 mi) downstream of the park boundary and next to Snake Creek. The rearing station raises rainbow trout and escaped rainbow trout enter Snake Creek, thus this action is dismissed.

Another scoping comment suggested improving the structure at the pipeline inlet to make it a more effective fish barrier. Improving the de facto fish barrier does not meet the purpose and need of the project, which is to prevent non-native species and diseases from entering the park. In addition, this location is above the springsnail locations on Snake Creek, so this alternative would not protect these populations.

Park staff and consultants investigated one site for the fish barrier right at the park boundary, but found it to be unfeasible due to streambanks being too steep. In addition, it did not have a work area that would allow access to the stream bottom without causing major disturbance to the stream banks. Thus this site was dismissed.

Another site near the first campsite in the park was also investigated. At this site, the streambanks were not steep enough to make an effective fish barrier. In addition, it is at a site of perennial water flow and over 600 m (600 yd) into the park, thus it would protect less habitat for native species, making it unfeasible. Due to the unfeasibility, this alternative site was dismissed.

Table 1. Mitigations for the Proposed Action.

Resources Area	Mitigation	Responsible Party
General Considerations	Prior to beginning the project, all equipment and vehicles will be thoroughly pressure washed to remove foreign soil and vegetative matter; this will minimize potential that non-native plants are introduced to the project area.	Weed Program Manager
General Considerations	A resource advisor from NPS will be on site to monitor the transport of equipment into and out of the project area. This will ensure that the equipment follows the designated route to the project site and that there is no undue impact to resources on the ground.	Compliance Staff
General Considerations	Equipment will be inspected daily to ensure there are no leaks of petroleum products or other hazardous materials.	Compliance Staff
General Considerations	Following the completion of the project, all portions of the route used to transport equipment that are not part of a public road system will be sufficiently restored to prevent unauthorized use.	Chief of Natural Resources
General Considerations	In the event of inadvertent discovery of human remains in or near the project area at any time during the project construction or restoration, work will stop immediately and the Cultural Resource Program Manager and Superintendent will be notified immediately. The project will not resume until authorized by the Cultural Resource Program Manager. If cultural artifacts are identified during ground disturbing activity the Cultural Staff will be notified and care will be taken to avoid damage or destruction.	Cultural Resource Staff
General Considerations	All equipment, boots, and waders entering streams should be properly decontaminated to prevent introduction of whirling disease and other diseases, parasites, and non-native species into the stream. Only clean, disinfected boots, waders and other equipment will be allowed into the streams. All mud and debris should be rinsed from boots and equipment and will be sprayed with a 10% chlorine solution and allowed to dry prior to entry into creeks.	Fisheries Biologist
Soils	Access route will be clearly marked to prevent unnecessary compaction of soils and increased disturbance footprint. Following completion of the project erosion controls will be installed on the temporary access route and construction pad and these areas will be restored and revegetated as appropriate.	Geologist

2.6 IMPACT SUMMARY

A summary of the impacts to each topic are shown for each alternative in Table 2. These impacts are described in more detail in Chapter 3.

Table 2. Summary of environmental consequences for each alternative.

Impact Topic	Alternative A-No Action	Alternative B-Proposed Action
Geological resources (Soils)	Adverse, minor, long-term, localized effects due to cumulative impacts from erosion and compaction of existing two-track roads by vehicle use.	Adverse, minor, short- and long-term, localized impacts to soils along access route and construction pad resulting from compaction; and adverse, minor, short-term, localized impacts to stream banks resulting from excavation disturbance
Streamflow Characteristics	Adverse, minor, long-term, localized impacts due to cumulative impacts from recreation, maintenance, and other activities.	Adverse, minor, short and long-term, localized impacts to streamflow during and immediately after construction of the barrier.
Species of Special Concern and Their Habitat	Adverse, moderate, long-term, localized impacts to BCT and springsnails due to continued continuity with lower stream channel that may allow the invasion of non-native species and diseases.	Beneficial, moderate, long-term, localized impacts to BCT and springsnails due to a barrier to non-native species and diseases.
Introduce Non-native Species	Adverse, moderate, long-term, localized impacts to BCT and springsnails due to continued continuity with lower stream channel that may allow the invasion of non-native species and diseases.	Beneficial, moderate, long-term, localized impacts to BCT and springsnails due to a barrier to non-native species and diseases.
Long-term Management of Resources	Adverse, minor, long-term, localized impacts to long-term management of resources due to continued continuity with lower stream channel that may allow the invasion of non-native species and diseases.	Beneficial, minor, long-term, localized impacts to long-term management of resources due to a barrier to non-native species and diseases.
CA/CS for BCT in the State of Nevada	Adverse, moderate, long-term, and localized effects due to not upholding the CA/CS.	Beneficial, moderate, long-term, and localized effects due to upholding the CA/CS.

2.7 ENVIRONMENTALLY PREFERRED ALTERNATIVE

The CEQ Regulations implementing NEPA and the NPS NEPA guidelines require that “the alternative or alternatives which were considered to be environmentally preferable” be identified (Council on Environmental Quality Regulations, Section 1505.2). Ordinarily, this means the alternative that causes the least damage to the biological and physical environment; it also means the alternative that best protects, preserves, and enhances historic, cultural, and natural resources.

The Council on Environmental Quality defines the environmentally preferred alternative as “...the alternative that will promote the national environmental policy as expressed in the National Environmental Policy Act’s §101.” Section 101 of the National Environmental Policy Act states that “... it is the continuing responsibility of the Federal Government to ... (1) fulfill the responsibilities of each generation as trustee of the environment for succeeding generations; (2) assure for all Americans safe, healthful, productive, and aesthetically and culturally pleasing surroundings; (3) attain the widest range of beneficial uses of the environment without degradation, risk to health or safety, or other undesirable and unintended consequences; (4) preserve important historic, cultural, and natural aspects of our national heritage, and maintain, wherever possible, an environment which supports diversity, and variety of individual choice; (5) achieve a balance between population and resource use which will permit high standards of living and a wide sharing of life’s amenities; and (6) enhance the quality of renewable resources and approach the maximum attainable recycling of depletable resources.”

The National Park Service has determined that the environmentally preferred alternative for this project is Alternative B, the Proposed Action due to its protection of park resources from the invasion of non-natives fishes and aquatic invasive species into Snake Creek within the park. The Environmentally Preferred Alternative also benefits the implementation of the CA/CS for BCT.

3.0 AFFECTED ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES

3.1 INTRODUCTION

This chapter provides a description of the Affected Environment for a resource based on the issues identified followed by an evaluation of the Environmental Consequences of the alternatives. The resource descriptions provided in this chapter serve as a baseline with which to compare the potential effects of the management actions considered in this EA. The Environmental Consequences portion of each impact topic analyzes both beneficial and adverse impacts that could result from implementing any of the alternatives described in Chapter 2: Alternatives.

The analysis includes a summary of laws and policies relevant to each impact topic, definitions of impact thresholds (negligible, minor, moderate, and major), methods used to analyze impacts, and the analysis methods used for determining cumulative effects. As required by the CEQ, a summary of the environmental consequences of each alternative is provided (Table 2 in Chapter 2: Alternatives).

3.1.1 General Methods for Analyzing Impacts

The NPS based the impact analyses and conclusions on scientific literature; information and insights provided by NPS experts, other agencies, and the public; and best professional judgment.

For each impact topic, impacts are defined in terms of thresholds of effect, context, intensity, duration, and timing. Impacts and cumulative effects are discussed in each impact topic. Definitions of intensity levels vary by impact topic. Where it is not specifically stated otherwise under each impact topic, the following definitions apply.

Under each impact topic is a brief description of relevant components of existing conditions and information for determining the effects of implementing each alternative. The effects are based on the following factors:

Type: Whether the impact would be beneficial or adverse.

Intensity: Identify the intensity of the effect as negligible, minor, moderate, or major. Intensity is defined individually for each impact topic.

Duration: Duration of impact is analyzed independently for each resource. Depending on the resource, impacts may last for the construction period, a single year, or other time period. For purposes of this analysis, impact duration is described as short- or long-term as defined for each resource.

- *Short-term* impacts are temporary, transitional, or construction-related impacts associated with project activities.
- *Long-term* impacts are typically those effects that would last several years or more or would be permanent.

- Context:* Context is the setting within which an impact would occur.
- *Local impacts* would generally occur within the immediate vicinity of the proposed project.
 - *Regional impacts* would occur on surrounding lands and/or in adjacent communities.
- Impact:* The following types of impact must be considered and examined for any park proposal and alternatives.
- *Direct Impact:* effects are caused by an action and occur at the same time and place as the action.
 - *Indirect Impacts:* effects are caused by the action and occur later or farther away, but are still reasonably foreseeable.
 - *Cumulative Impacts:* effects of the alternatives in conjunction with past, present, or reasonably foreseeable future actions.

3.1.2 Thresholds for Impact Analysis

The intensity and duration of effects vary by resource; therefore, the definitions for each impact topic are described separately for each impact topic. These definitions were formulated through the review of existing laws, policies, and guidelines; and with assistance from park and region NPS staff and other resource specialists.

3.1.3 Cumulative Impacts Analysis

The CEQ regulations for implementing NEPA requires the assessment of cumulative impacts in the decision-making process for federal actions. A cumulative impact is described in the Council on Environmental Quality, Regulation 1508.7, as follows:

A “cumulative impact” is 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. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time.

Cumulative impacts are considered for both the No Action and Action Alternatives. Cumulative impacts were determined by combining the effects of the alternative with other past, present, and reasonably foreseeable future actions with the effects of the alternatives. Park staff determined the projects that may have cumulative impacts with the fish barrier project (Table 3).

Table 3. Actions that may have cumulative impacts to the Snake Creek Fish Barrier project.

Action	Description	Resources Potentially Affected
Past Projects		
Antimycin treatment of Snake Creek & restoration of BCT	In 2002, Upper Snake Creek, upstream of the pipeline intake, was treated with antimycin to remove the non-native brook trout. Subsequently, BCT were restored to that section of creek in 2005 and 2008 (Baker et al. 2008).	Species of Special Concern
SNAKE CREEK Pipeline	In the 1960s, a 5-km (3-mi) long pipeline was installed in Snake Creek to bypass a section of stream underlain by carbonate rock. This resulted in 5 km (3 mi) of streambed being dry during low flows, with the water moved into the lower portion of Snake Creek (Van Hoesen 2002).	Soils/ Streamflow Characteristics/ Long-term Management of Resources
Past and Present Projects		
Recreational Camping	Dispersed campsites are located throughout the Snake Creek drainage. Some of these sites are adjacent to the creek, and it is evident that activities have displaced some of the riparian vegetation, affecting streambank stability.	Streamflow Characteristics/ Non-native Species
Road maintenance	Road maintenance over the years has included adding roadbase, creating drainage channels, cleaning up after flash floods, and grading the road. Because the Snake Creek road is adjacent to Snake Creek for long portions of its length, road maintenance could affect the creek.	Streamflow Characteristics
Future Projects		
SNWA Groundwater Development Project	Approximately 75-93 groundwater production wells in Spring Valley along with accompanying infrastructure, are proposed for development. The produced water would be exported to Southern Nevada. This action is currently being analyzed by the BLM in an EIS (BLM 2012). Models in the EIS show that the Snake Creek watershed, near the park boundary, would be affected in about 200 years. Due to the long lag time, this project is mentioned here but not analyzed in the following analyses.	Streamflow Characteristics/ Species of Special Concern

3.1.4 Geographic Analysis Area

The geographic area for the analysis of impact related to this project encompasses the fish barrier sites and the associated construction areas (Figure 4). This is at approximately 2000 m (6,200 ft) elevation, located in sagebrush-steppe, with scattered trees. The primary vegetation consists of big sagebrush (*Artemisia tridentata tridentata*), pinyon pine (*Pinus monophylla*), and Utah juniper (*Juniperus osteosperma*). The riparian corridor in the project area spreads 1-2 m (3-6 ft)

on either side of the creek and consists primarily of cottonwood (*Populus angustifolia*), red-osier dogwood (*Cornus sericea*), and Woods' rose (*Rosa woodsii*).

3.2 AFFECTED ENVIRONMENT AND ANALYSIS OF ALTERNATIVES

3.2.1 Soils

Affected Environment

Great Basin National Park lies in the Basin and Range Geologic Province. Bedrock in the immediate project area is limestone and shale from various formations of the Pogonip Group of Ordovician age. These rock formations are known to contain paleontological resources, however no outcrops of these rocks occur in the immediate vicinity of the project area. No outstanding or unusual geologic features or landforms are present nearby.

Soils in the immediate project area consist primarily of alluvial fill underlain by limestone or shale bedrock. Two soil types occur in the immediate project area: the Borvant extremely gravelly loam and the Ripcon-Bigwash-Glideski association. The Borvant is a shallow calcareous loam derived as alluvial and colluvial fans resulting from weathering upland rock outcrops and bedrock. This soil type experiences very high rates of runoff. The overland access route to the fish barrier site crosses Borvant soils. Within the park the Ripcon-Bigwash-Glideski association occurs only along the banks of the lower Snake Creek drainage and consists mainly of alluvium derived from a variety of rock types including limestone, dolomite, quartzite, and granite. This soil association is primarily depositional along streambanks and experiences medium rates of runoff. This soil association occurs at the immediate fish barrier construction site.

Regulatory Framework

NPS *Management Policies 2006* states, "The Park Service will preserve and protect geologic resources as integral components of park natural systems. As used here, the term "geologic resources" includes both geologic features and geologic processes. The Service will (1) assess the impacts of natural processes and human activities on geologic resources; (2) maintain and restore the integrity of existing geologic resources; (3) integrate geologic resource management into Service operations and planning; and (4) interpret geologic resources for park visitors."

NPS *Management Policies 2006* (Section 4.8.2.4) states that the Service will actively seek to preserve the soils resources of parks, and to prevent, to the extent possible, the unnatural erosion, physical removal or contamination of the soil.

The GMP prescribes that prior to any development activities, soil suitability for development must be assessed.

Impact Criteria and Thresholds

The area of consideration for this topic is the project area. Defining potential impacts from management actions is based on professional judgment and experience with similar actions. The thresholds of change for the intensity of an impact are defined as follows:

Impact Intensity	Intensity Description
Negligible	The effects to soils would be below or at the lower levels of detection. Any effects on productivity or erosion potential would be slight.
Minor	An action's effects on soils would be detectable. It would change the soil profile in a relatively small area and it would not appreciably increase the potential for erosion of additional soil beyond that which naturally occurs. If mitigation were needed to offset adverse effects, it would be relatively simple to implement and would likely be successful.
Moderate	An 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 additional soil. Changes to localized ecological processes would be of limited extent. Mitigation measures would probably be necessary to offset adverse effects and would likely be successful.
Major	An action would result in a change in the potential for erosion to remove large quantities of additional soil, 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.

The thresholds of change for the duration of an impact on soils are defined as follows:

Short-term: Recovers in one to three years or less.

Long-term: Takes more than three years to recover.

Impacts of Alternative A- No Action

Impacts Analysis

No action would be taken in this alternative; therefore there would be no impacts to soil resources.

Cumulative Impacts

Previous human use in the project area has resulted in a few pre-existing two track dirt roads in the project area that are occasionally used by staff to access a water monitoring site at the park boundary and that see rare use by park visitors. Soils in these tracks are already somewhat compacted and are being eroded at a very slow rate. There are no reasonably foreseeable impacts in the area from other planned projects. Cumulative impacts under the no-action alternative would continue to be adverse, minor, long-term and localized.

Conclusion

The fish barrier would not be built under Alternative A-No Action, and no impacts would occur to geological resources in the project area. The current two-track road network in the area would

continue to suffer adverse, minor, long-term, localized effects from erosion and compaction of existing two-track roads by vehicle use.

Impacts of Alternative B- Proposed Action

Impacts Analysis

The proposed action would require transport of machinery, equipment, and construction materials across undisturbed soils between the Snake Creek Road and the fish barrier construction site. Also, a natural terrace adjacent to the fish barrier site would be used as a platform for equipment to park and work, and as a materials staging area. Therefore, an unimproved access route about 5 m wide x 135 m (15 ft x 450 ft) long would experience compaction of native soils, along with an area of about 40 m² (400 ft²) on the terrace. This access route would have to cross a small incised drainage and there may be a need to install a temporary culvert and add some fill in order for equipment to cross safely. Access route would be clearly marked to prevent unnecessary compaction of soils and increased disturbance footprint. Following completion of the project erosion controls would be installed on the temporary access route and construction pad and these areas would be restored and revegetated as appropriate. Impacts to soils would be adverse, minor, short-term, and localized.

Additionally, construction of the fish barrier would require excavations into soils in the stream banks to effectively stabilize the structure and produce an adverse, minor, short term, localized effect to soils immediately surrounding the dam structure.

Cumulative Impacts

Previous human use in the project area has resulted in a few pre-existing two track dirt roads as noted above in Cumulative Effects from the No-Action Alternative. Soils in these tracks are already somewhat compacted and are being eroded at a very slow rate. The overland access route, construction pad, and bank excavations required for this alternative would increase the impacted area somewhat, but the cumulative effects would not exceed minor. There are no reasonably foreseeable impacts in the area from other planned projects. Cumulative impacts under the no-action alternative would continue to be adverse, minor, long-term and localized.

Conclusion

Under Alternative B, the proposed action, there would be adverse, minor, short- and long-term, localized effects to soil resources.

3.2.2 Streamflow Characteristics

Affected Environment

Snake Creek is located on the east side of the South Snake Range and contains about 18 km (11 mi) of stream within Great Basin National Park and a catchment area of nearly 53 km² (20 mi²). Snake Creek near the park boundary is a second order stream, with an average annual streamflow ranging from 1.05 cfs to 16.17 cfs between the years 2003-2009 (Table 4) (Elliott et al., 2006 and Dave Prudic, pers. comm., 2012). The stream experiences its highest flows in May and June

(Figure 6). During most years, the stream at the gage station goes dry at the end of September or in October and starts flowing again in April. Years of and following high water years may have year-round flow.

Snake Creek in the vicinity of the park boundary has been designated as an Alluvial-Fan Influenced Valley (Frissell and Liss 1993). The valley segment classification of Alluvial-Fan-Influenced Valley states that characteristics include streams tightly hemmed in or partially dammed by laterally encroaching alluvial tributary fans. The valley width is >50 m, with floodplains common but variable in width and downstream extent. A complex mosaic of incised fans, floodplain, and terrace landforms is present. The geology is quaternary alluvium, and surface hydrology is variable with most reaches steady. Others tend toward net gain. Springs and seeps are common but highly clustered. The channel pattern is sinuous or anabranching, occasionally straight, and channel shifts are common. The channel substrate is gravelly and sandy alluvium. The banks are unstable.

Table 4. Mean annual streamflow for the continual-recording gage Snake Creek at the Great Basin National Park boundary near Baker, NV (gage station 10243232).

Year	Mean Annual Streamflow (cfs)
2003	1.39
2004	1.05
2005	16.17
2006	4.78
2007	1.15
2008	1.05
2009	1.84

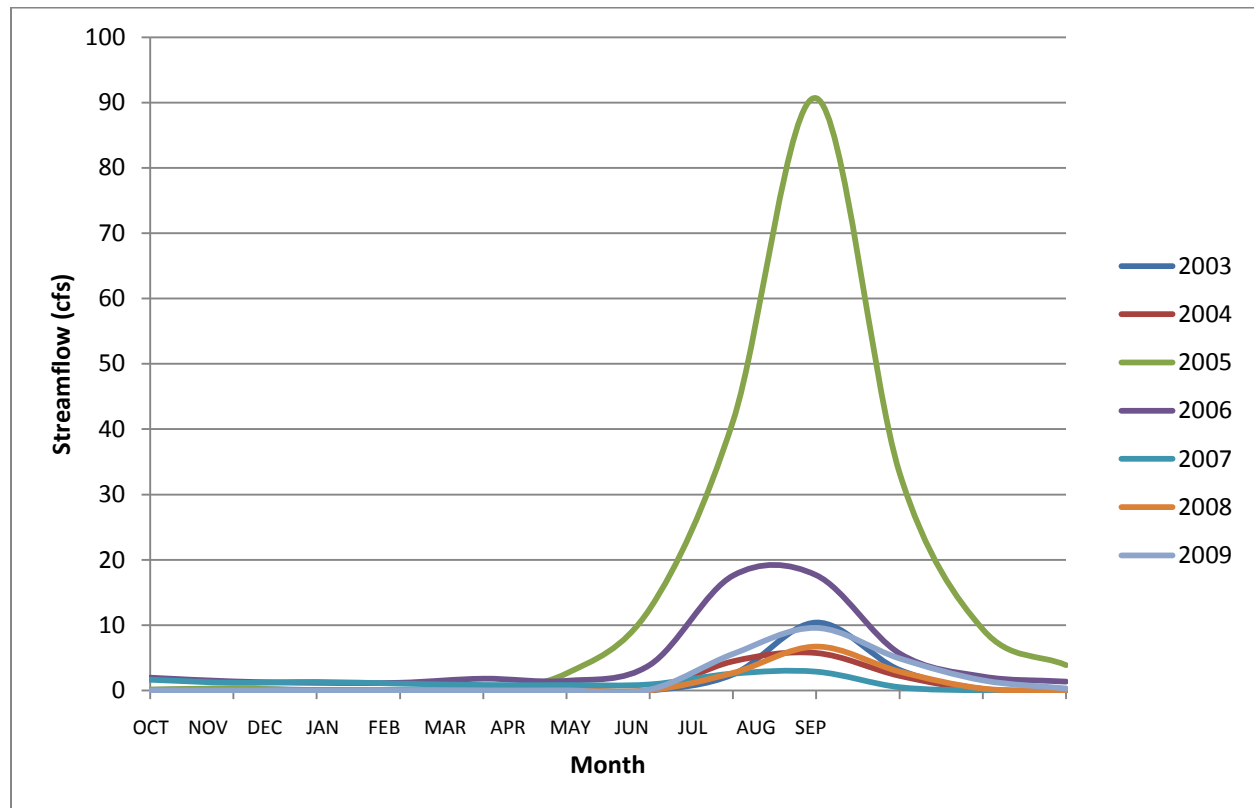


Figure 6. Graph of mean monthly streamflow for the continual-recording gage station Snake Creek at the Great Basin National Park boundary, near Baker, NV (gage station 10243232).

Physical habitat data

Physical habitat surveys in the area of the proposed fish creek barrier have been conducted in 2005 using Environmental Protection Agency (EPA) protocols (Barbour et al. 1999) and in 2010 using GAWS protocols (Overton et al. 1997). Both surveys evaluated various parameters to determine a condition score.

Using the EPA protocols, the three lower stations below the pipeline outlet on Snake Creek range in elevation from 1938 m (6,320 ft) to 1995 m (6,550 ft). The dirt access road is located directly adjacent to the creek channel in this area of the stream encroaching into the riparian zone. The average assessment score for the three stations below the pipeline was 161, which was equivalent to a Good score. These reaches received suboptimal condition ratings (out of an optimal-suboptimal-marginal-poor rating system) for embeddedness, bank stability, vegetative protection, and the velocity/depth regime (Horner 2006).

Cobble was the dominant substrate component for all surveyed reaches along Snake Creek, accounting for 65% of the substrate material. There were smaller areas of boulder, gravel, and sand, but no areas of bedrock, clay, or silt were documented. Riffles accounted for the majority of the stream morphology (over 70%), and pools accounted for only about five percent. The average pool to riffle ratio was 0.1 (Horner 2006).

In 2010, park staff conducted a General Aquatic Wildlife System (GAWS) habitat survey at eleven locations along Snake Creek. The site nearest the fish barrier received a habitat condition index score of 68.6, placing it in the Good category, which was the highest-scoring category possible.

Regulatory Framework

The NPS's authorities for protection of water resources can be found in:

- The NPS *Management Policies 2006* (4.6.6), which states:

“The Service will manage streams to protect stream processes that create habitat features such as floodplains, riparian systems, woody debris accumulations, terraces, gravel bars, riffles, and pools. Stream processes include flooding, stream migration, and associated erosion and deposition. The Service will protect watershed and stream features primarily by avoiding impacts on watershed and riparian vegetation and by allowing natural fluvial processes to proceed unimpeded. When conflicts between infrastructure (such as bridges and pipeline crossings) and stream processes are unavoidable, NPS managers will first consider relocating or redesigning facilities rather than manipulating streams. Where stream manipulation is unavoidable, managers will use techniques that are visually nonobtrusive and that protect natural processes to the greatest extent practicable.”

Impact Criteria and Thresholds

The following definitions of impact intensity are used in the analysis of effects on streamflow characteristics:

Impact Intensity	Intensity Description
Negligible	The action would not create measurable impacts. Changes to streamflow characteristics would not be noticeable.
Minor	The action would create a slight measurable change in impacts, such as a small amount of streambank erosion or slight change in stream substrate. The change would be small and localized and of little consequence. Mitigation to offset adverse effects could be required and would be effective.
Moderate	The action would cause detectable impacts, such as a moderate part of the streambank eroding or a moderate change in stream substrate. The change would be measurable and of consequence to the resource but more localized. Mitigation to offset adverse effects could be extensive, but would likely be successful.
Major	The action would cause significant changes in streamflow and/or cause erosion of streambanks to the extent that the stream channel would become channelized. Key-ecosystem processes may be permanently altered.

The thresholds of change for the duration of an impact on water quality are defined as follows:

Short-term: Recovers in one to three years or less.

Long-term: Takes more than three years to recover.

Impacts of Alternative A- No Action

Impact Analysis

Under the No Action alternative, the fish barrier would not be built, and streamflow characteristics would not change.

Cumulative Impacts

The Snake Creek pipeline, dispersed camping in riparian areas, and road maintenance have had adverse, minor, long-term, and localized impacts to the streamflow characteristics in the area of the fish barrier.

Conclusion

Under the No Action alternative, the impacts to streamflow characteristics would be adverse, minor, long-term, and localized due to cumulative impacts.

Impacts of Alternative B- Proposed Action

Impact Analysis

Under the proposed action, a fish barrier with a 1.2 m (4-ft) drop would be constructed across Snake Creek near the park boundary. Due to the high sediment load carried in Snake Creek and

the large number of times that park staff have had to dig out the pressure transducer at the park boundary, it is expected that the area behind the fish barrier would fill in with sand and gravel during the first high flow event. The water would simply flow over the fish barrier and continue downstream. During this initial sediment fill-in period, it is expected that water would pool behind the fish barrier, as it does behind large boulders found in other places in the stream. The stream would continue to flow as before, albeit with a 1.2 m (4-ft) drop at the fish barrier. Water would not be removed from the stream channel. Construction of the fish barrier could cause slight erosion of the banks during installation due to loosening of soil, but the design features of the proposed action would keep erosion to a minimum, especially as installation would be done during no flow. Following installation, erosion is not expected to be any greater than previously.

Cumulative Impacts

The Snake Creek pipeline, dispersed camping in riparian areas, and road maintenance have had adverse, minor, long-term, and localized impacts to the streamflow characteristics in the area of the fish barrier.

Conclusion

This alternative is expected to result in adverse, minor, short- and long-term, and localized impacts to streamflow characteristics.

3.2.3 Species of Special Concern and Their Habitat

Affected Environment

Great Basin National Park supports a wide variety of wildlife species. Those that occur in the project area that have been designated as species of special concern are Bonneville cutthroat trout and Toquerville springsnails (*Pyrgulopsis kolobensis*).

BCT is listed as a species of management concern at GRBA and a species protected under Nevada Revised Statute (NRS) 501(sensitive status) in the state of Nevada. BCT have been petitioned twice for listing as threatened under the Endangered Species Act. As a signatory to the NV CA/CS (2006) and the *Rangewide Conservation Agreement and Strategy for Bonneville Cutthroat Trout* (Lentsch et al. 2000), the Park is committed to taking measures to restore and protect BCT within Park waters. The Agreement was a consideration in the decision not to list the BCT under the ESA.

Bonneville cutthroat trout are the only native salmonid to east-central Nevada and to Great Basin National Park. BCT require relatively cool, well-oxygenated water and the presence of clean, well-sorted gravels with minimal fine sediments for successful spawning (Kershner 1995). Both terrestrial and aquatic invertebrates are important food items for stream-dwelling BCT (May et al. 1978). There are numerous threats to BCT. These include hybridization and/or competition with non-native salmonids, degradation of habitat, diseases and aquatic invasive species.

BCT surveys in 2010 included 11 survey sites along Snake Creek. Each site was sampled with a Smith Root LR-24 backpack electrofisher using a 50 meter (160 ft) three-pass depletion method with blocknets. The surveys found BCT currently occupying 4.0 km (2.5 mi) of the 6.4 km (4.0 mi) of trout habitat in Upper Snake Creek. BCT density was estimated at an average of 117 BCT

per mile, with the uppermost distribution at 2530 m (8,300 ft).

Springsnails (*P. kolobensis*) are known to occur in three springs that are adjacent or in Snake Creek. They are not found anywhere else in the park. *Pyrgulopsis* is a genus of very small, totally aquatic gastropod snails with gills and an operculum. The shells are less than 6 mm in length, and have a whorled, elongated conic spire. Springsnails are extremely sensitive to water quality, and are only found in places with perennial water that has stable temperatures, water chemistry, and flow regime (Herschler 1999).

Regulatory Framework

NPS *Management Policies 2006* direct parks to maintain all components and process of naturally evolving ecosystems, including abundance, diversity and ecological integrity of plants and animals. Conservation is to be predominant in conflicts between resources/values with other uses.

Additionally, the *Management Policies 2006* and Director's Order 77 *Natural Resources Management Guidelines* require the NPS to examine the impacts of projects on federally listed species and state-listed sensitive species.

The *Conservation Agreement and Conservation Strategy for Bonneville cutthroat trout in the state of Nevada* (2006) states that the group will manage for a minimum of 14 conservation populations of BCT in Nevada (5 in the park) and explore opportunities for further expansion of BCT. It also states that the signatories will eliminate the threats to BCT in Nevada that may warrant listing as a threatened or endangered species under the Endangered Species Act.

Impact Criteria and Thresholds

The following definitions of impact intensity are used in the analysis of effects on species of special concern:

Impact Intensity	Intensity Description
Negligible	No species of special concern would be affected, or the action would affect an individual of a species of special concern or its critical habitat, but the change would be so small that it would not be of any measurable or perceptible consequence to the protected individual or its population.
Minor	The action would result in detectable impacts on an individual(s) of a species of special concern or its critical habitat, but the action would not be expected to result in substantial population fluctuations and would not be expected to have any measurable effects on species, habitats, or the natural processes sustaining them.
Moderate	The action would result in detectable impacts on individuals or a population of a species of special concern, its critical habitat, or the natural processes sustaining them. Key ecosystem processes may experience disruptions that may result in population or habitat condition fluctuations that would be outside of the range of natural variability but would return to natural conditions.

Major	Individuals or a population of a species of special concern, its critical habitat, or the natural processes sustaining them would be measurably affected, including mortality for special status individuals. Key ecosystem processes might be permanently altered, resulting in long-term changes in population numbers or permanently modifying critical habitat.
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The thresholds of change for the duration of an impact on species of special concern are defined as follows:

Short-term: Recovers in one to three years or less.

Long-term: Takes more than three years to recover.

Impacts of Alternative A- No Action

Impact Analysis

The No Action Alternative would not change current conditions. About 9.0 km (5.6 mi) of Snake Creek within Great Basin National Park (the portion of Snake Creek below the pipeline inlet, which serves as the current fish barrier) would be connected with 8.7 km (5.4 mi) of Snake Creek outside the Park. Without the placement of a barrier near the park boundary there would be no impediment to non-native fish migrating upstream. This could result in the spread of diseases to and increased competition with native BCT and potentially compromise future efforts to effectively manage for a viable, disease-free population of native fishes. This is not consistent with recovery plans. Three springsnail populations could be more susceptible to the upstream advance of non-native species and diseases. The loss of springsnail populations could lead to listing of this species under the ESA. This alternative would result in adverse, moderate, long-term, localized effects to species of special concern and their habitats.

Cumulative Impacts

The past antimycin project to restore Bonneville cutthroat trout in Upper Snake Creek created beneficial, moderate, long-term, and localized effects to species of special concern. However, brook trout were found in 2009 in Upper Snake Creek, highlighting the need to increase efforts to restore BCT populations.

Conclusion

The No Action Alternative would result in adverse, moderate, long-term, localized effects to species of special concern and their habitat.

Impacts of Alternative B-Proposed Action

Impacts Analysis

The proposed project would create a fish barrier that could help stop or slow the spread of diseases that might affect BCT or springsnails. Over 17.7 km (11.0 mi) of stream habitat would be protected, including 4.0 km (2.5 mi) that are currently inhabited by BCT. In addition, the installation of a fish barrier allows for the possibility of future efforts to effectively manage for a viable, disease-free population of native fishes. BCT would have reduced competition with non-native trout for food and habitat. In addition, three springsnail populations could be better

protected from the upstream advance of non-native species and diseases. This action would have a beneficial, moderate, long-term, localized effect to species of special concern and their habitat.

Cumulative Impacts

The past antimycin project to restore Bonneville cutthroat trout in Upper Snake Creek created beneficial, moderate, long-term, and localized effects to species of special concern. However, brook trout were found in 2009 in Upper Snake Creek, highlighting the need to increase efforts to restore BCT populations.

Conclusion

The Proposed Action would have a beneficial, moderate, long-term, localized effect to species of special concern and their habitat.

3.2.4 Non-native Aquatic Species

Affected Environment

All exotic species can decrease the diversity and resilience of native communities, affect site productivity, and affect hydrologic functioning of a watershed.

Non-native aquatic species of particular interest include non-native fish, especially brown trout, rainbow trout, and brook trout. Brown trout are found in the lower section of Snake Creek, from an elevation of about 2180 m (7140 ft) and lower. They are highly competitive with BCT. Rainbow trout are currently being raised at the Spring Creek Rearing Station, which discharges into Snake Creek 2.3 km (1.4 mi) below the park boundary. A 2006 NPS survey conducted at the second designated campsite upstream from the Park boundary along Snake Creek encountered 100 brown trout in a 100 meter (328 ft) three pass depletion population survey, for an estimate of 1,610 brown trout per mile. The average length was 186 mm (7.3 in) excluding young-of-year.

Whirling disease is caused by the *Myxobolus cerebralis* parasite effecting fish like salmon, trout and other similar species. The disease usually causes neurological damage to young fish causing the effected fish to "whirl" in a corkscrew pattern. This makes it difficult for the fish to feed, makes them easier prey, and decreases their survival rate. The diseases causes significant damage to the fishing industry, with some estimates in the 100s of millions dollars per year in lost revenue (<http://www.whirling-disease.org/>).

The parasite *Myxobolus cerebralis* has been detected in just to the west of Great Basin National Park (Figure 7). It has not yet been detected in Snake Valley, where Snake Creek is located.

New Zealand mudsnails (*Potamopyrgus antipodarum*; Figure 8) are another non-native aquatic organism of concern. New Zealand mudsnail populations consist mostly of asexually reproducing females that are born with developing embryos in their reproductive system. This species can be found in all types of aquatic habitats from eutrophic mud bottom ponds to clear rocky streams. It can tolerate a wide range of water temperatures (except freezing), salinity, and turbidity in clean as well as degraded waters. They feed on dead and dying plant and animal material, algae, and bacteria. Its tolerance of a broad range of ecological factors make the possibility of further spread likely. In moist conditions, this snail can withstand short periods of

desiccation (Richards et al. 2004).

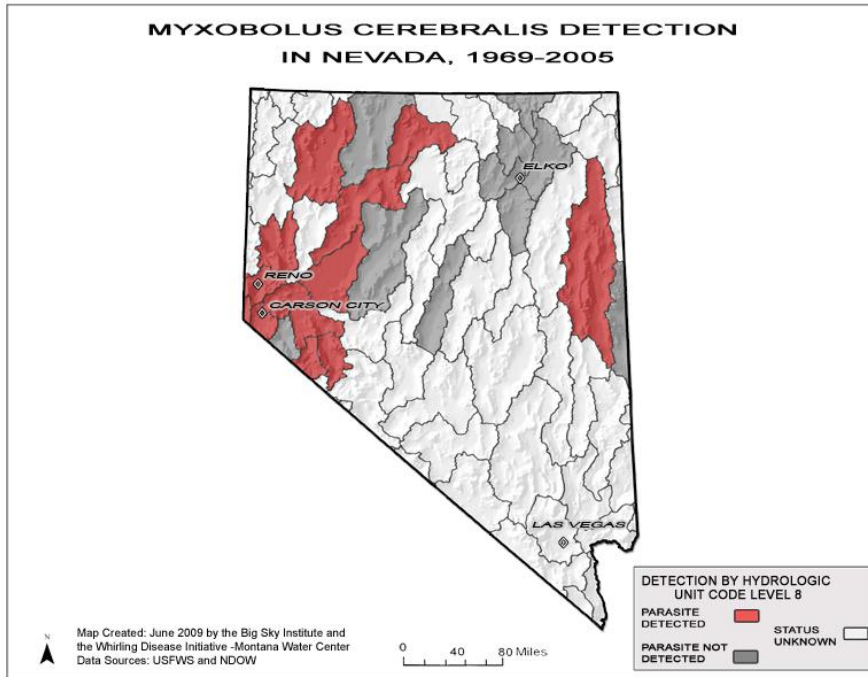


Figure 7. Map of *Myxobolus cerebralis* presence in Nevada.



Figure 8. Photo of New Zealand mudsnails. USGS photo.

Regulatory Framework

NPS *Management Policies 2006* directs parks to maintain all components and process of naturally evolving ecosystems, including abundance, diversity and ecological integrity of plants and animals. Conservation is to be predominant in conflicts between resources/values with other uses. In addition, in 4.4.4, the *Policies* state: “Exotic species will not be allowed to displace native species if displacement can be prevented.”

Impact Criteria and Thresholds

The following definitions of impact intensity are used in the analysis of effects on non-native species:

Impact Intensity	Intensity Description
Negligible	Impacts would not be measurable. Additional non-native species would not be noticeable.
Minor	A small amount of non-native species would appear in the project area and upstream of the fish barrier. The change would be small and localized and of little consequence. Mitigation to offset adverse effects could be required and would be effective.
Moderate	Non-native species would appear over a relatively large portion of the project area and upstream of the fish barrier. The change would be measurable and of consequence to the species or resource but more localized. Mitigation to offset adverse effects could be extensive, but would likely be successful.
Major	The action would have a considerable effect on native populations and affect a relatively large area in the park. The change would be measurable and result in a severely adverse or large beneficial impact, and possible permanent consequence, upon the species or resource. Mitigation measures to offset the adverse effects would be required, extensive, and success of the mitigation would not be guaranteed.

The thresholds of change for the duration of an impact on non-native species are defined as follows:

Short-term: Recovers in one to three years or less.

Long-term: Takes more than three years to recover.

Impacts of Alternative A- No Action

Impact Analysis

If this Snake Creek Fish Barrier project is not completed, non-native aquatic species and diseases would be able to enter 9.0 km (5.6 mi) of park waters, creating an adverse, moderate, long-term, localized effect.

Cumulative Impacts

Recreational camping could have effects on non-native aquatic species, particularly if the campers are anglers who are using unauthorized bait or have not properly cleaned their fishing gear. Most anglers do follow state and park rules, thus any impacts would most likely not be measureable. However, it would take just one angler to have major impacts. The most likely cumulative impacts are expected to be adverse, negligible, long-term, and localized.

Conclusion

The No Action Alternative would result in adverse, moderate, long-term, localized impacts to BCT and springsnails due to their continued continuity with lower Snake Creek. This continuity may allow the invasion of non-native species and diseases.

Impacts of Alternative B- Proposed Action

Impact Analysis

The proposed project actions would help keep non-native aquatic species from entering the park. The fish barrier would be constructed in such a way that non-native fish, including those that may have whirling disease, as well as New Zealand mud snails and other aquatic invasives, would not be able to continue upstream into park waters. All equipment, boots, and waders entering streams should be properly decontaminated to prevent introduction of whirling disease and other diseases, parasites, and non-native species into the stream. Only clean, disinfected boots, waders and other equipment will be allowed into the streams. All mud and debris should be rinsed from boots and equipment and will be sprayed with a 10% chlorine solution and allowed to dry prior to entry into creeks. This alternative would be a beneficial, moderate, long-term, localized impact.

Cumulative Impacts

Recreational camping could have effects on non-native aquatic species, particularly if the campers are anglers who are using unauthorized bait or have not properly cleaned their fishing gear. Most anglers do follow state and park rules, thus any impacts would most likely not be measureable. However, it would take just one angler to have major impacts. The most likely cumulative impacts are expected to be adverse, negligible, long-term, and localized.

Conclusion

The Proposed Action is expected to have beneficial, moderate, and long-term impacts for aquatic native species.

3.2.5 Long-term Management of Resources

Affected Environment

The GMP states that the NPS “would reestablish Bonneville cutthroat trout into selected streams on the east side of the park.” The Park’s Fisheries Management Plan (Williams et al. 1999) clarified that statement, identifying Snake Creek as a main location for BCT restoration. In 2002, the park removed non-native brook trout from the upper portions of Snake Creek. In 2005, BCT were reintroduced, thus meeting this mandate.

Furthermore, the NPS was a signatory to the *Conservation Agreement and Conservation Strategy for Bonneville Cutthroat Trout in the State of Nevada* (2006). This NV CA/CS aims to prevent the listing of BCT under the Endangered Species Act (ESA). The first objective of the NV CA/CS is the restoration of a minimum of 14 conservation populations including a core population, 10 reintroduced populations, and 3 populations outside the historic range. The second objective is to eliminate the threats to BCT that may warrant listing as a threatened or endangered species under the ESA. As a signatory to the NV CA/CS, Great Basin National Park is committed to protecting and eliminating treats to the Snake Creek populations as one of the 14 populations in the State of Nevada, thereby managing resources for the long-term.

Regulatory Framework

NPS *Management Policies 2006* (4.4.1) states in its General Principles for Managing Biological Resources that the Service will successfully maintain native plants and animals by

- preserving and restoring the natural abundances, diversities, dynamics, distributions, habitats, and behaviors of native plant and animal populations and the communities and ecosystems in which they occur;
- restoring native plant and animal populations in parks when they have been extirpated by past human-caused actions; and
- minimizing human impacts on native plants, animals, populations, communities, and ecosystems, and the processes that sustain them.

Impact Criteria and Thresholds

The following definitions of impact intensity are used in the analysis of effects on sustainability:

Impact Intensity	Intensity Description
Negligible	The action would not have any measurable or perceptible impacts to the long-term management of resources.
Minor	The action would result in detectable impacts on an individual, but the action would not be expected to result in measurable effects on species populations, habitats, or the natural processes sustaining them.
Moderate	The action would result in detectable impacts on individuals or a population of a species of special concern, its critical habitat, or the natural processes sustaining them. Long-term management of resources may be challenged, but mitigations would be expected to be effective.
Major	Key ecosystem processes might be permanently altered, resulting in long-term changes in population numbers or permanently modifying critical habitat.

Impacts of Alternative A- No Action

Impact Analysis

Under the No Action Alternative, long-term management of resources in Snake Creek within 9.0 km (5.6 mi) of the park will not be protected from the invasion of non-native species and diseases. This would be contrary to the GMP, the fisheries management plan, and the Nevada CA/CS. This would be an adverse, moderate, long-term, localized effect.

Cumulative Impacts

None

Conclusion

The No Action Alternative would result in adverse, moderate, long-term, localized impacts to the long-term management of resources.

Impacts of Alternative B- Proposed Action

Impact Analysis

Under the Proposed Action, non-native aquatic species and diseases would be stopped by a structure that would be engineered to last for decades. This would meet the guiding principles for the park and honor the Nevada CA/CS, to which the NPS is a signatory. This alternative would result in beneficial, minor, long-term, localized impacts to long-term management of resources.

Cumulative Impacts

None

Conclusion

This alternative is expected to result in beneficial, minor, long-term, localized impacts to long-term management of resources.

3.2.6 Conservation Agreement and Conservation Strategy for Bonneville Cutthroat Trout in the State of Nevada

Affected Environment

Great Basin National Park is a signatory of the 2006 *Conservation Agreement and Conservation Strategy for Bonneville Cutthroat Trout in the State of Nevada* along with NDOW, Humboldt-Toiyabe National Forest, USFWS and BLM. The signing of the NV CA/CS was an instrumental factor in the decision by the USFWS to preclude listing of the Bonneville cutthroat trout under the ESA.

The goal of the Agreement is to ensure the long-term existence of BCT within its historic range in Nevada by coordinating conservation efforts with multiple agencies. The first objective states that the group will manage for a minimum of 14 conservation populations of BCT in Nevada (5 in the park) and explore opportunities for further expansion of BCT. The second objective states that the group will eliminate the threats to BCT in Nevada that may warrant listing as a Threatened or Endangered species under the Endangered Species Act.

Snake Creek is highlighted in the potential threats to BCT in Nevada because of competition and potential for hybridization along with stochastic events and socio-political pressure. The control of undesirable fish populations with the use of fish barriers is specifically noted in this agreement.

Regulatory framework

The NPS *Management Policies 2006* section 5.3.3 states that parks will seek to establish mutually beneficial agreements with interested groups to facilitate collaborative research, consultation, park planning, training, and cooperative management approaches with respect to park cultural resources and culturally important natural resources.

Impact Criteria and Thresholds

The following definitions of impact intensity are used in the analysis of effects on the

Conservation Agreement and Conservation Strategy for Bonneville Cutthroat Trout in the State of Nevada:

Impact Intensity	Intensity Description
Negligible	Impacts would not be measurable. Additional non-native species would not be noticeable.
Minor	The action would be restricted to a portion of one watershed. For example, a small number of BCT could be moved within an already-occupied section of stream to augment or extend the distribution; or a small area of the stream would become uninhabitable for BCT. The change would be small and localized and of little consequence. Mitigation to offset adverse effects could be required and would be effective.
Moderate	The action would affect an entire watershed. For example, BCT would be restored on a watershed level where they have been compromised; or all the BCT in a watershed would be at risk. The change would be measurable and of consequence to the species or resource. Mitigation to offset adverse effects could be extensive, but would likely be successful.
Major	The action would affect multiple watersheds. For example, renovation of the largest watersheds in the park including protection with the use of a fish barrier, chemical treatment of the stream to remove non-native fishes and reintroduction to all watersheds on the east side of GRBA; or loss of habitat for BCT in multiple watersheds.

The thresholds of change for the duration of an impact on Conservation Agreement and Conservation Strategy for Bonneville Cutthroat Trout in the State of Nevada are defined as follows:

Short-term: Recovers in one to three years or less.

Long-term: Takes more than three years to recover.

Impacts of Alternative A- No Action

Impact analysis

No action would be taken in this alternative; therefore the NV CA/CS would not be upheld. Not upholding the NV CA/CS would set a precedent in the park and would hinder future reintroduction efforts. It could cause the USFWS to revisit the decision to preclude BCT from listing and possibly reconsider the listing of BCT under the ESA, which would put an extreme burden on private land owners. Effects of the No Action Alternative would be adverse, moderate, long-term, and localized.

Cumulative impacts

Recreational camping could have effects on upholding the NV CA/CS, particularly if the campers are anglers who are using unauthorized bait or have not properly cleaned their fishing gear. Most anglers do follow state and park rules, thus any impacts would most likely not be measureable. However, it would take just one angler to have major impacts. The most likely cumulative impacts are expected to be adverse, negligible, long-term, and localized.

Conclusion

Not upholding the NV CA/CS would result in adverse, moderate, long-term, and localized effects.

Impacts of Alternative B- Proposed Action

Impact analysis

The proposed project would take actions to aid the preservation and protection of BCT. It would also secure another population of BCT in the State of Nevada by upholding the goals and objectives of the Conservation Agreement and Conservation Strategy for Bonneville Cutthroat Trout in the State of Nevada. Alternative B-Proposed Action would have beneficial, moderate, long-term, localized effects on the NV CA/CS.

Cumulative impacts

Recreational camping could have effects on upholding the NV CA/CS, particularly if the campers are anglers who are using unauthorized bait or have not properly cleaned their fishing gear. Most anglers do follow state and park rules, thus any impacts would most likely not be measureable. However, it would take just one angler to have major impacts. The most likely cumulative impacts are expected to be adverse, negligible, long-term, and localized.

Conclusion

The Snake Creek Fish Barrier project is expected to have beneficial, moderate, long-term, localized impacts for the CA/CS for Bonneville Cutthroat Trout in the State of Nevada.

4.0 CONSULTATION AND COORDINATION

4.1 SCOPING

Internal Scoping

Internal scoping was held from November 17, 2011 to December 15, 2011. It defined the purpose and need, identified potential actions to address the need, determined what the likely issues and impact topics would be, and identified the relationship, if any, of the proposed action to other planning efforts at the Park.

Public Involvement

Public scoping was conducted by mailing out letters (Appendix C) to individuals and groups on the Park's NEPA mailing list on December 29, 2011. A press release (Appendix D) was issued on December 29, 2011, and *The Ely Times* published it on January 13, 2012. The project was also noticed on the park's Facebook page and Twitter feed. Five comments were received.

4.2 CONSULTATION

Advisory Council on Historic Preservation and Nevada State Historic Preservation Officer

The undertakings described in this document are subject to Section 106 of the National Historic Preservation Act, as amended in 1992 (16 USC Section 470 et seq.). Park Cultural Resource Staff inventoried the project area and did not find any cultural resources present. Therefore consultation with the Nevada State Historic Preservation Office was not needed.

Tribes

On December 29, 2011, a scoping notice was sent to all consulting Tribes. This includes the Ely Shoshone Tribe, Kanosh Band of Southern Paiute Tribe, Confederated Tribes of the Goshute Reservation, Kaibab Paiute Tribe, and the Southern Paiute Tribe of Utah. The scoping letter informed the tribes of the proposed Snake Creek Fish Barrier Project in GRBA. No responses were received.

U.S. Fish and Wildlife Service (USFWS)

No state or federally listed or candidate species are found in the project area, thus no consultation was needed with the USFWS.

U.S. Army Corps of Engineers

Consultation with the USACE was initiated November 19, 2012.

Nevada Department of Environmental Protection (NDEP)

Consultation with the NDEP was initiated November 20, 2012.

4.3 LIST OF PREPARERS AND CONTRIBUTORS

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Andy Ferguson, Superintendent
Bryan Hamilton, Wildlife Biologist
Betsy Duncan-Clark, Chief of Interpretation
Patrick Mingus, Vegetation Coordinator

4.4 LIST OF EA RECIPIENTS

The following is a list of agencies and entities that will receive a notice of availability or a copy of the environmental assessment. A complete list of names on the NPS mailing list for this project is in the project file and is available from the Park.

Tribes

Battle Mountain Band Council
Cedar City Band of Paiutes
Confederated Tribe of the Goshute Council
Duckwater Shoshone Tribe
Elko Band Council
Ely Shoshone Tribe
Goshute Business Council
Kaibab Paiute Tribe
Las Vegas Paiute Tribe
Moapa Band of Paiutes
Paiute Indian Tribe of Utah
Shivwits Band of Paiutes
Skull Valley Band of Goshutes
Southern Paiute Consortium
Southern Paiute Tribe, Indian Peaks Band
Southern Paiute Tribe of Utah
South Fork Band Council
Wells Band Council
Yomba Shoshone Tribe

Federal Agencies

Bureau of Land Management, Ely District Office
BLM Nevada State Office
BLM Utah State Office
Death Valley National Park
Dixie National Forest
Lake Mead National Recreation Area
Natural Resources Conservation Service, Ely Service Center
Paranaghat National Wildlife Refuge
Ruby Lake National Wildlife Refuge
U.S. Fish and Wildlife Service, Reno Office
U.S. Forest Service, Ely District
U.S. Post Office, Baker
U.S. Post Office, Garrison
Zion National Park

Elected Officials

U.S. Senator Harry Reid
U.S. Senator Dean Heller
U.S. Senator Orrin Hatch
U.S. Senator Jim Matheson
U.S. Senator Mike Lee
U.S. Representative Shelley Berkley
U.S. Representative Mark Amodei
U.S. Representative Jon Porter
U.S. Representative Joe Heck
U.S. Representative Jason Chaffetz
U.S. Representative Rob Bishop
Nevada State Representative Pete Goicoechea
Nevada State Senator Dean Rhoads
Utah State Representative Bill Wright
Utah State Senator Casey Anderson
County Commissioners for White Pine County, Eureka County, Nye County, Iron County, Elko County, Millard County, Lincoln County, and Beaver County
Mayors of Ely, Delta, Elko, Milford, Cedar City

State Agencies

Cathedral Gorge State Park
Desert Research Institute
Ely State Museum
Nevada Department of Wildlife
Nevada State Department of Conservation and Natural Resources
State Historic Preservation Officer

Regional, County, and Municipal Agencies

Baker Citizens Advisory Board

Great Basin Bird Observatory
Great Basin Water Network
Trout Unlimited-Great Basin Chapter
White Pine County Chamber of Commerce
White Pine County Economic Diversification Council
White Pine County Sheriff's Office

Organizations

American Land Conservancy
The Conservation Fund
Eastern Nevada Landscape Coalition
Ely State Museum
Great Basin Chapter of Trout Unlimited
Great Basin National Heritage Area
Great Basin National Park Foundation
Great Basin Water Network
Leave No Trace
National Park Trust
National Parks Conservation Association
Nevada Archeological Association
Nevada Land Conservancy
Nevada Rock Art Foundation
Preserve Nevada
State Historic Preservation Office, Nevada
Toiyabe Chapter of the Sierra Club

Libraries

The following is a list of libraries and public venues where the public can access this EA and review the document onsite.

EskDale Center
Great Basin Visitor Center, Great Basin National Park
Lehman Caves Visitor Center, Great Basin National Park
White Pine County Library, Ely, Nevada

There will be a 30-day comment period on the EA. Comments may be submitted online at: <http://parkplanning.nps.gov/hydrogeologic>, or in writing to the following address:

Planning
Great Basin National Park
100 Great Basin National Park
Baker, NV 89311

5.0 REFERENCES

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APPENDICES

Appendix A: Scoping Letter



United States Department of the Interior

NATIONAL PARK SERVICE
Great Basin National Park
Baker, Nevada 89311-9701

IN REPLY REFER TO:
N16(GRBA)

December 29, 2011

Dear Interested Party:

Great Basin National Park is currently seeking issues and comments for a proposed fish barrier on Snake Creek. Your issues and comments will assist in developing alternatives to the proposed action presented below and help in conducting an environmental analysis consistent with the National Environmental Policy Act (NEPA).

The proposed action consists of constructing a fish barrier on the lower portion of Snake Creek, approximately 100 meters (326 ft.) upstream of the park boundary. The proposed fish barrier is intended to prevent the upstream invasion of non-native fishes and aquatic invasive species into portions of Snake Creek occupied by a species of management concern, Bonneville cutthroat trout.

Preliminary issues developed by park staff include the effects to and impacts on: species of special concern, geological resources, streamflow characteristics, introduction of non-native plants, and long term management of resources.

Information is also available on the National Park Service Planning, Environment & Public Comment (PEPC) website at: <http://parkplanning.nps.gov/fishbarrier>. This website provides access to current National Park Service plans, environmental impact analyses, and related documents on public review. Comments may be submitted through the PEPC website.

Mailed comments will also be accepted. Please submit comments no later than January 31, 2012, to Attn: Planning, 100 Great Basin National Park, Baker, NV, 89311. If you would like to be added to the park's NEPA mailing list (or email list), please contact Beth_Cristobal@nps.gov or call 775-234-7331 x264.

Sincerely,

Andrew J. Ferguson
Superintendent

Great Basin National Park
Snake Creek Fish Barrier Project/Environmental Assessment

Appendix B: Press Release

GBNP requests comments for proposed fish barrier - The Ely Times: News

GBNP requests comments for proposed fish barrier

Posted: Friday, January 13, 2012 8:00 am

Great Basin National Park is currently seeking issues and comments for a proposed fish barrier on Snake Creek. Your issues and comments will assist in developing alternatives to the proposed action presented below and help in conducting an environmental analysis consistent with the National Environmental Policy Act (NEPA).

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Posted in **News** on Friday, January 13, 2012 8:00 am. www.elynews.com

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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.

NPS 611/101091 March 2010

United States Department of the Interior □ National Park Service