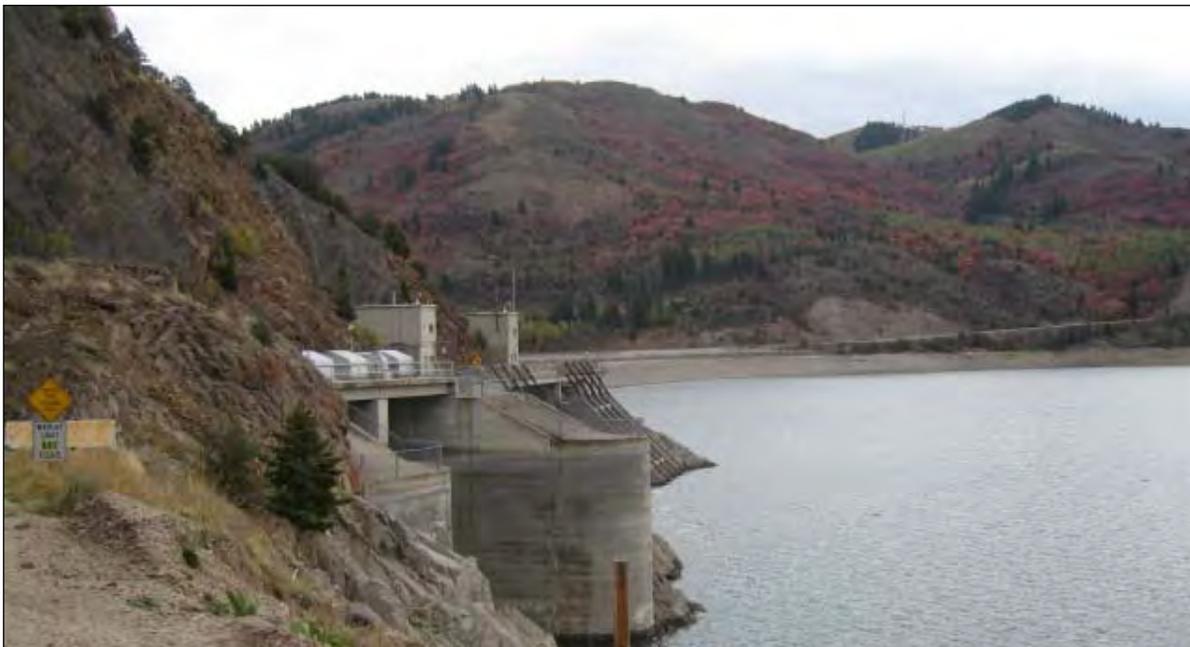


RECLAMATION

Managing Water in the West

Palisades Dam Security Enhancement Project Draft Environmental Assessment

Bonneville County, Idaho



U.S. Department of the Interior
Bureau of Reclamation
Pacific Northwest Region
Snake River Area Office, Boise, Idaho

January 2011

MISSION STATEMENTS

The mission of the Department of the Interior is to protect and provide access to our Nation's natural and cultural heritage and honor our trust responsibilities to Indian tribes and our commitments to island communities.

The mission of the Bureau of Reclamation is to manage, develop, and protect water and related resources in an environmentally and economically sound manner in the interest of the American public.

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Contents

	Page
<i>Chapter 1: Purpose of and Need for Action</i>	<i>1-1</i>
1.1 Authority	1-1
1.2 Proposed Federal Action	1-1
1.3 Purpose and Need for Action	1-1
1.4 Project Location, Background, and History	1-2
1.5 Scoping Summary	1-4
1.6 Summary of Comments	1-4
1.7 Authorizing Actions, Permits, and Licenses	1-6
1.8 Interrelated Projects	1-6
<i>Chapter 2: Description of Alternatives</i>	<i>2-1</i>
2.1 Alternative Development	2-1
2.2 Alternatives Considered in Detail	2-1
2.2.1 Alternative A – No Action Alternative	2-2
2.2.2 Action Alternatives	2-2
2.3 Alternatives Eliminated from Consideration	2-10
2.4 Design and Cost Comparative Analysis of Alternatives	2-12
<i>Chapter 3: Affected Environment and Environmental Consequences</i>	<i>3-1</i>
3.1 Transportation and Access	3-1
3.1.1 Affected Environment.....	3-1
3.1.2 Environmental Consequences	3-6
3.1.3 Mitigation.....	3-9
3.2 Recreation	3-9
3.2.1 Affected Environment.....	3-9
3.2.2 Environmental Consequences	3-10
3.2.3 Mitigation.....	3-11
3.3 Cultural Resources	3-11
3.3.1 Affected Environment.....	3-11
3.3.2 Environmental Consequences	3-12
3.3.3 Mitigation.....	3-12
3.4 Economics	3-13
3.4.1 Affected Environment.....	3-13
3.4.2 Environmental Consequences	3-13

3.4.3	Mitigation.....	3-14
3.5	Environmental Justice	3-14
3.5.1	Affected Environment.....	3-14
3.5.2	Environmental Consequences	3-16
3.5.3	Mitigation.....	3-16
3.6	Indian Trust Assets	3-16
3.6.1	Affected Environment.....	3-16
3.6.2	Environmental Consequences	3-17
3.6.3	Mitigation.....	3-17
3.7	Fish and Wildlife	3-17
3.7.1	Affected Environment.....	3-17
3.7.2	Environmental Consequences	3-18
3.7.3	Mitigation.....	3-19
3.8	Threatened and Endangered Species	3-19
3.8.1	Affected Environment.....	3-19
3.8.2	Environmental Consequences	3-21
3.8.3	Mitigation & Effects Conclusion	3-22
3.9	Soils and Geology	3-23
3.9.1	Affected Environment.....	3-23
3.9.2	Environmental Consequences	3-23
3.9.3	Mitigation.....	3-24
3.10	Water Quality	3-24
3.10.1	Affected Environment	3-24
3.10.2	Environmental Consequences.....	3-26
3.10.3	Mitigation	3-27
3.11	Wetlands and Other Waters of the United States, Riparian Areas, and Floodplains	3-28
3.11.1	Affected Environment	3-28
3.11.2	Environmental Consequences.....	3-30
3.11.3	Mitigation	3-30
3.12	Terrestrial Vegetation and Noxious Weeds	3-31
3.12.1	Affected Environment	3-31
3.12.2	Environmental Consequences.....	3-32
3.12.3	Mitigation	3-33
3.13	Visual Resources.....	3-34
3.13.1	Affected Environment	3-34
3.13.2	Environmental Consequences.....	3-35
3.13.3	Mitigation	3-35

3.14 Cumulative and Indirect Impacts	3-35
Chapter 4: Consultation and Coordination	4-1
4.1 Summary of Public and Agency Involvement	4-1
4.1.1 News Briefs and Other Sources of Project Information.....	4-1
4.1.2 Scoping Letter.....	4-1
4.1.3 Public Open House	4-1
4.2 Agency Consultation and Coordination	4-1
4.3 Tribal Consultation and Coordination	4-2
4.4 Distribution List	4-2
4.4.1 Federal Agencies and Elected Officials	4-2
4.4.2 State and Local Agencies and Officials	4-2
4.4.3 Tribes	4-3
4.4.4 Non-Governmental Organizations	4-3
4.4.5 Individuals and Businesses	4-3
Chapter 5: References	5-1
Chapter 6: List of Preparers	6-1

List of Figures

Figure 1-1. Project Area Map	1-3
Figure 1-2. Photos shows the crest of Palisades Dam from Palisades Reservoir, which has an active capacity of 1.2 million acre-feet	1-2
Figure 1-3. Photo shows the South Fork of the Snake River downstream of Palisades Dam	1-2
Figure 2-1. Alternative B: Widen Dam Crest	2-4
Figure 2.2. Photo shows Palisades Dam Crest from the west, which would be widened under Alternative B Route	2-2
Figure 2-3. Borrow Area and Haul Route	2-5
Figure 2-4. Alternative C: Raise Dam Crest	2-7
Figure 2-5. Alternative D: Downstream Water Crossing	2-8
Figure 2-6. Photo shows potential downstream bridge site looking west	2-6
Figure 2-7. Alignment Options	2-9
Figure 2-8. Alternative E: Median Barrier	2-11
Figure 3-1. Local Road Network	3-4
Figure 3-2. Calamity Landslide Area	3-5
Figure 3-3. Photo shows the end of Forest road 277 (looking west) near the South Fork of the Snake River	3-1
Figure 3-4. Photo shows Forest Road 278, which intersects with Forest Road 277 downstream of Palisades Dam	3-2
Figure 3-5. Photo shows Riverside Campground and day use area looking north (downriver) from the Palisades Dam crest	3-9
Figure 3-6. Photo shows Riverside Campground and day use area	3-10
Figure 3-7. Photo shows Riverside Campground and day use area entrance with signage, looking east	3-11
Figure 3-8. Project Area Wetlands	3-29
Figure 3-9. Photo shows willow patch along the South Fork of the Snake River below the Palisades Dam	3-28
Figure 3-10. Photo shows conifer forest interspersed with shrubby vegetation, looking west from the Palisades Dam	3-31
Figure 3-11. Photo shows view looking upstream at downstream face of the Palisades Dam embankment	3-34
Figure 3-12. Photo shows Riverside Campground and day use area from the top of the Palisades Dam embankment	3-34
Figure 3-13. Photo shows Calamity boat ramp looking from the edge of the Palisades Reservoir.	3-34

List of Tables

Table 1-1. Summary of Comments Received During Scoping	1-5
Table 1-2. Permits or Approvals that May be Required for the Proposed Action	1-6
Table 2-1. Alternatives Considered in Detail	2-1
Table 2-2. Advantages, Disadvantages, Estimated Costs of Palisades Dam Security Enhancement Project	2-12
Table 3-1. Mileage of Roads in Study Area	3-2
Table 3-2. Comparison of Access Route Options	3-8
Table 3-3. Minority Populations in Project Region	3-15
Table 3-4. Beneficial Uses of Water Bodies in the Project Area	3-24
Table 3-5. Summary of National Wetlands Inventory-Mapped Wetlands in the Project Area	3-28
Table 3-6. Estimated Roadside Disturbance Associated with Alternative D	3-33
Table 3-7. Summary of Palisades Dam Security Enhancement Project Impacts and Mitigation Measures by Alternative ...	3-37

Appendices

Appendix A – Palisades Dam Security Enhancement Project Scoping Report

Acronyms and Abbreviations

Bureau of Land Management	BLM
Census County Division	CCD
Clean Water Act	CWA
Code Federal Register	CFR
cooperative weed management area	CWMA
cubic feet per second	cfs
Distinct Population Segment	DPS
Endangered Species Act	ESA
Environmental Assessment	EA
Environmental Impact Statement	EIS
Executive Order	E.O.
Federal Emergency Management Agency	FEMA
feet	ft
finding of no significant impact	FONSI
Flood Insurance Rate Maps	FIRM
forest road	FR
Homeland Security Presidential Directives	HSPD
Idaho Department of Environmental Quality	DEQ
Idaho Department of Fish and Game	IDFG
Idaho Rules of Administrative Procedure of the Attorney General	IDAPA
Idaho Transportation Department	ITD
memorandum of agreement	MOA
memorandum of understanding	MOU
National Environmental Policy Act	NEPA
National Pollutant Discharge Elimination System	NPDES
National Register of Historic Places	NRHP
National Wetlands Inventory	NWI
Public Law	P.L.
American Association of State Highway and Transportation Officials	AASHTO
State Historic Preservation Office	SHPO
Stormwater Pollution Prevention Plan	SWPPP
total maximum daily load	TMDL
Upper Snake River Cooperative Weed Management Area	USRCWMA
U.S. Army Corps of Engineers	USACE
U.S. Bureau of Reclamation	Reclamation
U.S. Code	USC
U.S. Environmental Protection Agency	EPA
U.S. Fish and Wildlife Service	USFWS
U.S. Geological Survey	USGS
U.S. Department of Agriculture Forest Service	USFS

Chapter 1: Purpose of and Need for Action

This draft environmental assessment (EA) evaluates the Palisades Dam Security Enhancement Project proposed by the U.S. Department of the Interior Bureau of Reclamation (Reclamation). Reclamation proposes to correct security vulnerabilities associated with the Palisades Dam, located 7 miles southeast of Irwin, Idaho. This document has been prepared in accordance with the National Environmental Policy Act of 1969 (NEPA) and the Council on Environmental Quality regulations (40 CFR Part 1500).

In response to the attacks of September 11, 2001, Reclamation completed in-depth security assessments of its facilities and a full-scale evaluation of potential vulnerabilities to terrorist attacks at certain facilities. The Federal Safety, Security, and Law Enforcement Office identified vulnerabilities at a number of Reclamation dams, including Palisades Dam. The studies determined that motor vehicles traveling across the crest of Palisades Dam are a security risk and that public safety vulnerabilities associated with an explosion could compromise the structural integrity of the dam and the safety of persons living downstream. An accidental rollover on top of the dam involving a fuel or fertilizer truck could also pose serious risks.

The security enhancement project is divided into two phases. Phase I, completed in 2009, addressed short-term security concerns by installing fixed swing-beam security gates on the dam crest that can be deployed in response to an elevated security event or a direct threat against the dam. Reclamation completed NEPA compliance for Phase I in 2009. Phase II, the focus of this EA, addresses a permanent solution to reduce the vulnerability of the dam.

1.1 Authority

This project is authorized under the Reclamation Act of 1902, the USA Patriot Act of 2001 (P.L. 107 56), Homeland Security Act of 2002 (P.L. 107-296) and directed by Department Manual (Parts 440 446) and several Homeland Security Presidential Directives including (HSPD 7, December 17, 2003), and Executive Orders (E.O. 10450, 10577, 12958, as amended).

1.2 Proposed Federal Action

The proposed Federal action (proposed action) is to remedy security vulnerabilities at Palisades Dam related to motor vehicles using the access road across the crest of the dam.

1.3 Purpose and Need for Action

The purpose of the proposed action is to correct security vulnerabilities at Palisades Dam. Action is needed because the dam is vulnerable to explosives that could be carried by vehicles traveling across the dam crest.

This EA was prepared to assist Reclamation in finalizing a decision on a preferred alternative and to determine whether to issue a finding of no significant impact (FONSI) or a notice of intent to prepare an Environmental Impact Statement (EIS). Environmental analysis is required by NEPA for any Federal action that may have a significant impact on the environment.

NEPA requires Reclamation to explore a reasonable range of alternatives and to analyze the environmental effects of these actions. Several alternatives are evaluated and compared in this document, including a No Action Alternative. This EA examines the impacts of each alternative and considers specific issues of public and Federal concern, including transportation and access, cultural resources, water quality, vegetation, fish and wildlife, threatened and endangered species, noise, recreation, Indian Trust Assets, and cumulative impacts.

1.4 Project Location, Background, and History

The proposed project is located in southeastern Idaho; 55 miles southeast of Idaho Falls and 11 miles west of the Idaho-Wyoming border (see Figure 1-1, page 1-3). The closest city is Irwin, which is 7 miles downstream of the dam. The dam is in Bonneville County, Idaho, although the southern tip of the reservoir extends into Lincoln County, Wyoming.

Palisades Dam is located on the South Fork of the Snake River (see Figures 1-2 and 1-3). Reclamation completed construction of the 270-foot high earthen dam in 1957. The dam has a crest elevation of 5,630 feet above mean sea level, a crest length of 2,100 feet, and a crest width of 40 feet.

The dam is part of Reclamation's Palisades Project, which also includes the reservoir and a power plant. The Palisades Project provides supplemental water supply to approximately 650,000 acres of irrigated land in the Minidoka and Michaud Flats project areas (also administered by Reclamation). The Palisades Project also helps control floods and develops a substantial block of power.

Palisades Dam creates a reservoir of 1,401,000 acre-feet capacity (active 1,200,000 acre-feet). The spillway is a 28-foot-diameter tunnel through the left dam abutment with a capacity of 48,500 cubic feet per second. The outlet works and power inlet structures are controlled by a fixed-wheel gate at the entrances of the inclined shafts leading to 26-foot-diameter tunnels. The outlet tunnel conveys the water to a steel manifold transition section, where the water is released to a stilling basin by regulating gates. At the lower end of the power tunnel, the water may be released to the stilling basin or to four penstocks and conveyed to turbines for power generation. The capacity of the outlet works is 33,000 cubic feet per second (cfs).



Figure 1-2. Photo shows the crest of Palisades Dam from Palisades Reservoir, which has an active capacity of 1.2 million acre-feet.



Figure 1-3. Photo shows the South Fork of the Snake River downstream of Palisades Dam.



C:\BDR\Palisades\map_docs\OverView\Palisades.mxd



Disclaimer: This map is intended for general informational and planning purposes only. The Bureau of Reclamation makes no warranty, expressed or implied, as to the completeness, accuracy, or utility of these data and will in no event be liable for their use beyond the above expressed purpose.

Data Sources: Bureau of Reclamation, Inside Idaho, US Census Bureau, Forest Service, Imagery - ESRI, i-cubed, USDA/FSA, USGS, ALEX, GeoEye, Getmapping, Aerogrid, IGP

Map Date: November 2010

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Figure 1-1. Project Area Map
Palisades Dam Security Enhancement Project

The Palisades Power plant is on the downstream toe of the dam on the west side of the river. This plant initially had a total capacity of 118,750 kilowatts. A 1994 upgrade of all four units increased the capacity to 176,600 kilowatts. The power generated at this facility is used for irrigation pumping requirements on and near the Minidoka Project area.

The road across the crest of Palisades Dam is the primary focus of the security enhancement project. This road carries traffic between U.S. Highway 26 (also known locally as Swan Valley Highway) and seasonal residential and public recreation areas on the west side of the reservoir. During the winter months, typically between December and March (sometimes as late as mid-April), the road across the crest of the dam is closed to vehicle traffic. During this time, the road over the dam becomes part of the groomed snowmobile trail system in the area.

1.5 Scoping Summary

Scoping is an early and open process used to obtain information that helps identify issues and concerns related to the proposed action, the affected public and geographical area, alternatives, and constraints in the NEPA process.

Reclamation first announced the need for measures to address security vulnerabilities at Palisades Dam (and two other dams in Idaho) in a press release on July 16, 2008. Reclamation mailed a scoping letter to local, state, and Federal government representatives and other known stakeholders on September 29, 2009. The local newspaper, The Post Register, also published an article that described the proposed security measure options, announced a public open house (scoping meeting), and described other opportunities for public and agency involvement. The public scoping period began with the open house on October 8, 2009, and closed on November 9, 2009. Reclamation also sponsored an agency scoping meeting on November 12, 2009 in Swan Valley, ID.

To address concerns at Palisade Dam, Reclamation developed four alternatives that it presented at the scoping meeting and to Federal and State agencies; henceforth called action alternatives. These four action alternatives include:

- Raising the dam crest
- Widening the dam crest
- Placing a bridge just downstream of the dam
- Placing a 10-foot-wide median barrier on the dam crest

During the scoping process, agencies and the public were invited to comment on the alternatives and potential impacts of the alternatives. They were also asked to provide additional suggestions regarding subjects that should be addressed in the EA.

Approximately 90 people attended the public scoping meeting.

Representatives of Bonneville County, U.S. Forest Service (USFS), Bureau of Land Management (BLM), and Idaho Department of Fish and Game (IDFG) attended the agency scoping meeting and commented on the project. The U.S. Army Corps of Engineers did not attend the agency scoping meeting but provided comments in a letter.

1.6 Summary of Comments

Reclamation received a total of 16 comments through the scoping meeting, electronic mail, and U.S. mail. Public comment focused on alternatives (those proposed and other possibilities), access to recreation areas and private property, emergency response, and project cost. Most of the public comments reflected a preference for the bridge alternative. Agency representatives also commented on

alternatives, access, emergency response, potential designs, regulatory requirements, agency roles in the process, operation and maintenance costs, and recreation impacts. Table 1-1 summarizes the comments received during scoping. No opposition to the project was expressed by the public or agencies.

Table 1-1. Summary of Comments Received During Scoping

Comment	Number of Times Issue Identified		
	Total Number	Made by Agency or Local Government	Made by Individuals
Maintain a public access route to recreation facilities	1	0	1
Maintain easy access to the Calamity and Bear Creek recreation areas	5	2	3
Provide access for emergency vehicles	5	2	3
Protect structural integrity of the dam	2	0	2
Make improvements to the road in landslide areas	2	0	2

The public involvement process for the project is summarized in Chapter 4, Consultation and Coordination. The scoping report is provided in Appendix A.

1.7 Authorizing Actions, Permits, and Licenses

Table 1-2. Permits or Approvals that May be Required for the Proposed Action lists the agencies, permits, and approvals that may be required to implement the proposed action.

Table 1-2. Permits or Approvals that May be Required for the Proposed Action

Agency/Department	Permit/Approval	Required for
<i>Federal Agencies</i>		
U.S. Army Corps of Engineers	General Permit (Section 404 of Clean Water Act, 33 USC 1341)	Discharge of dredge/fill into waters of the United States, including wetlands
U.S. Environmental Protection Agency	General construction activity stormwater permit (Section 402 of Clean Water Act, 33 USC 1342)	Stormwater discharges associated with construction activity
U.S. Fish and Wildlife Service	Consultation (Section 7 of Endangered Species Act, 16 USC 1531-1544)	Activity that could affect listed species or critical habitat
<i>State Agencies</i>		
Idaho State Historic Preservation Office (SHPO)	Consultation (Section 106 of National Historic Preservation Act, 16 USC 470)	Activity that could affect historic, architectural, archaeological, or cultural characteristics of properties that meet National Register criteria (State Historic Preservation Officer responsible for administration of this Federal act). Note: Also refer to the National Historic Landmarks Program (36 CFR 65).
Idaho Department of Transportation (ITD)	Traffic Control Permit	During construction of each alternative traffic control such as flaggers would be necessary during times when trucks utilize US Highway 26 for hauling fill materials, bridge components, and other construction related items.
Idaho Department of Lands (IDL)	Encroachment Permit	Placement of any new structures or changes to existing structures in navigable waters.
Idaho Department of Water Resources (IDWR)	Stream Alteration Permit (Covered under USACE Permit above)	Discharge of dredge/fill into waters of the United States, including wetlands
Idaho Department of Environmental Quality (IDEQ)	401 Certification	Projects requiring a section 404 Permit.

1.8 Interrelated Projects

As described in Section 1.4 above, the Palisades Project provides a supplemental water supply to about 650,000 acres of irrigated land in the Minidoka and Michaud Flats project areas and is used to generate power to support irrigation pumping requirements on and near the Minidoka Project. Modifications to the Palisades Dam would not affect the operation of the Minidoka and Michaud Flats projects.

Chapter 2: Description of Alternatives

This chapter describes the alternatives being considered for implementation of the Palisades Dam Security Enhancement Project. The No Action Alternative and four action alternatives are described in detail along with a comparative analysis and a summary of alternatives that were eliminated from consideration.

2.1 Alternative Development

Reclamation developed conceptual engineering designs for four action alternatives. Reclamation first evaluated each alternative's ability to meet the project purpose and need. Reclamation then evaluated how each alternative would affect or be affected by the following screening criteria:

- Scheduling
- Design
- Estimated construction costs
- Constructability
- Environmental concerns
- Land acquisition

No new alternatives were identified during the scoping process. Reclamation found that all four of the action alternatives would meet the purpose and need. Because of this and because none of the presented alternatives were screened out when evaluated based on the criteria listed above, Reclamation chose to evaluate all four of the action alternatives, and the No Action Alternative, in this EA.

2.2 Alternatives Considered in Detail

Alternatives that are considered in detail in this EA include a No Action Alternative, as required by NEPA, and the four action alternatives. These alternatives are summarized in Table 2-1.

Table 2-1. Alternatives Considered in Detail

Action Alternative	Location	Effect to Existing Crest Road
Alternative A: No Action	Dam crest	Not Applicable, since does not meet purpose and need
Alternative B: Widen Dam Crest	Dam crest	Remains open
Alternative C: Raise Dam Crest	Dam crest	Remains open
Alternative D: Downstream Bridge	Downstream	Closed
Alternative E: Median Barrier	Dam crest	Remains open

As shown in Table 2-1, three of the action alternatives would affect the dam crest and allow the access road across the dam to remain open. It should be noted for all the alternatives that if the nationwide threat level is elevated to high or if there is a direct threat to the dam; access across the crest of the dam would be discontinued until it is determined safe. Alternative D would construct a bridge downstream of the dam, which would replace the existing access across the dam. Alternative E, Median Barrier, is an interim measure that could, at some point, need modification to provide the same level of security provided by other crest alternatives. These alternatives and the estimated costs of the action alternatives are described in the following sections.

2.2.1 Alternative A – No Action Alternative

Under the No Action Alternative, there would be no changes to the Palisades Dam or access road across the dam and no new alternate route would be constructed. Traffic would continue to cross the dam crest except during high security alerts or if the facility is the target of a direct threat. During high security alert periods the existing gates would be closed to travelers who would normally use the road across the dam to access the west side of the reservoir. Travelers would instead use existing USFS access roads that come into the area from the north and south. To the north, travelers would use USFS 076 access road that starts at a bridge crossing of the Snake River just west of Swan Valley and follows the river upstream. The distance from the river crossing just to the west of Swan Valley to the west side of the dam using U.S. Highway 26 (US-26) is approximately 15.2 miles. The alternate route that follows the river would be 15.5 miles on gravel roads. This detour would increase travel time from approximately half an hour to one hour. The alternate route for travelers coming from the southern end of Palisades Reservoir is approximately 27.6 miles of gravel roads, which is approximately 6 miles longer than the access from US-26/89. The alternate route on gravel roads would increase travel time from approximately half an hour to 1.5 hours.

This alternative does not meet the overall project purpose and need to provide dam security, but is evaluated in detail as required by NEPA.

2.2.2 Action Alternatives

Three of the four action alternatives would restrict access to that part of the crest which may be most vulnerable by raising or widening the dam crest or by installing a protective median barrier. Each of these alternatives would allow continued vehicle traffic across the dam crest. The fourth action alternative would remove traffic from the dam crest altogether by relocating the access road downstream of the dam.

The existing security gates that would be used in the event of a specific threat to the dam would remain in place under any of the alternatives.

2.2.2.1 Alternative B – Widen Dam Crest

Alternative B is shown in Figure 2-1 (page 2-4). Under this alternative, Reclamation would widen the dam crest (see Figure 2-2) by creating a 14-foot-wide bench on the upstream face of the dam, change the slope above the bench from 3:1 to 2:1, and move the centerline of the road upstream 21 feet. Access along the downstream side of the dam would be restricted by installing 4-foot-high Jersey barriers along the existing security fence and along the downstream side of the relocated road. Loose fill would be placed between these barriers.

Widening the dam crest would involve basic embankment design and construction methods.



Figure 2-2. Photo shows Palisades Dam Crest from the west, which would be widened under Alternative B, as shown in Figure 2-1.

The upper portions of the upstream slope would be steepened to 2:1 and the crest width would increase from 40 feet to 58 feet. This alternative could be constructed entirely on Reclamation property. Fill materials required to widen the crest are available from borrow area “M” (Figure 2-3). The haul route would consist of existing roads starting from the borrow source leading toward the powerhouse. From there trucks would enter through a security gate and follow the road around the powerhouse and along the toe of the dam to the east side of the river where they would exit the security area and then pass through the Riverside Campground and day use area to get onto US-26. Trucks would then use a one-mile section of US-26 to access the crest of the dam.

During the four-month construction period (trucks would be hauling materials for approximately 40 days), a permit would be required from the Idaho Transportation Department (ITD) to position flaggers on US-26 to control traffic when trucks would enter and exit the highway. Figure 2-3 (page 2-5) shows the location of the borrow area and the proposed haul route to the crest.

Estimated construction costs for Alternative B are \$4.7 million.

2.2.2.2 Alternative C – Raise Dam Crest

Alternative C is shown in Figure 2-4 (on page 2-7). Under this alternative, Reclamation would raise the dam crest 5 feet.

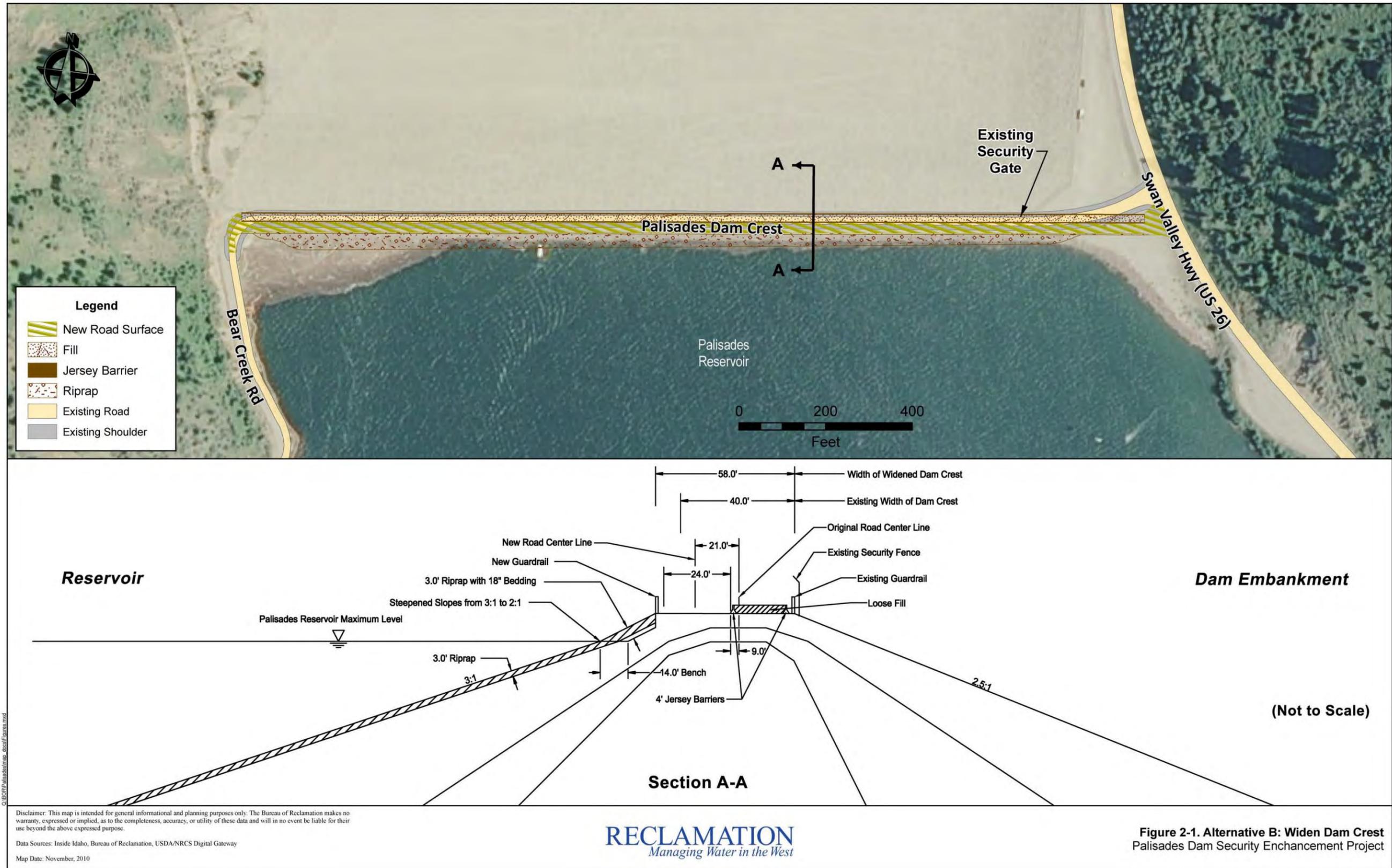
Raising the dam crest would involve basic embankment design and construction methods. The upper portions of the upstream and downstream slopes would be partially excavated and steepened to 2:1 and the crest width would be reduced from 40 feet to 36 feet, with a 24-foot-wide paved road across the top of the dam. This alternative could be constructed entirely on Reclamation property. The fill materials required to raise the crest are available within 2 miles of the dam.

Because the crest would be raised, the modified roadway would transition into the existing Swan Valley Highway (US-26) alignment and grade. Since the raised crest roadway would be higher, the transition to both abutments would be more severe under this alternative than Alternatives B and E.

Fill materials required to raise the crest are available from borrow area “M” (Figure 2-3). The haul route would consist of existing roads starting from the borrow source leading toward the powerhouse. From there trucks would enter through a security gate and follow the road around the powerhouse and along the toe of the dam to the east side of the river, where they would exit the security area and then pass through the Riverside Campground and day use area to access US-26.

Trucks would then use a one-mile section of US-26 to access the crest of the dam. During the four-month construction period (trucks would be hauling materials for approximately 40 days, a permit would be required from ITD to position flaggers on US-26 to control traffic when trucks enter and exit the highway. Figure 2-3 shows the location of the borrow area and the proposed haul route to the dam crest.

Estimated construction costs for Alternative C are \$5.8 million.



2.2.2.3 *Alternative D – Downstream Bridge*

Alternative D is shown in Figure 2-5 (on page 2-8). Under this alternative, Reclamation would permanently close the road that currently runs across the dam crest and reroute traffic to a bridge crossing the South Fork of the Snake River approximately 1,900 feet downstream from the toe of the dam (Figure 2-6 shows the potential bridge site). This alternative would also require construction of short segments of modified unimproved roads to connect each end of the bridge to the existing road network. On the east side, a new segment would be constructed to allow traffic through the Riverside Campground. On the west side, a new modified unimproved road segment would be constructed to connect the proposed bridge to existing USFS Road 076.



Figure 2-6. Photo shows potential downstream bridge site looking west.

The road across the dam crest currently serves as the main access road to Calamity Campground and boat ramp, as well as the main connection to Bear Creek Road (see Figure 2-7, page 2-9). Because the road across the dam will be closed, traffic will be rerouted to other existing USFS roads. Since these other roads do not currently meet the same design standards and provide the same level of service as the route that will be closed, the existing roads will be analyzed and considered for possible future mitigation actions. Reclamation is analyzing two options for road improvements that are 2.9 miles and 4.8 miles in length, respectively. The conceptual alignment options are shown in Figure 2-7 and are discussed in more detail in Chapter 3.

The bridge would be designed in accordance with American Association of State Highway and Transportation Officials (AASHTO) Load and Resistance Factor Design Bridge Design Specifications. The three-span bridge would be 310 feet long, with span lengths of 85 feet, 130 feet, and 85 feet.

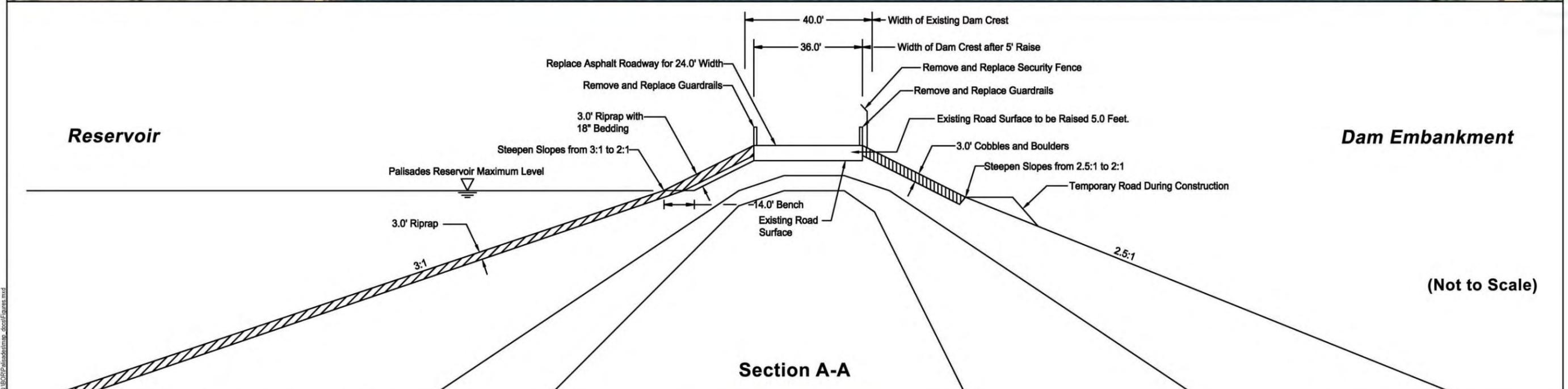
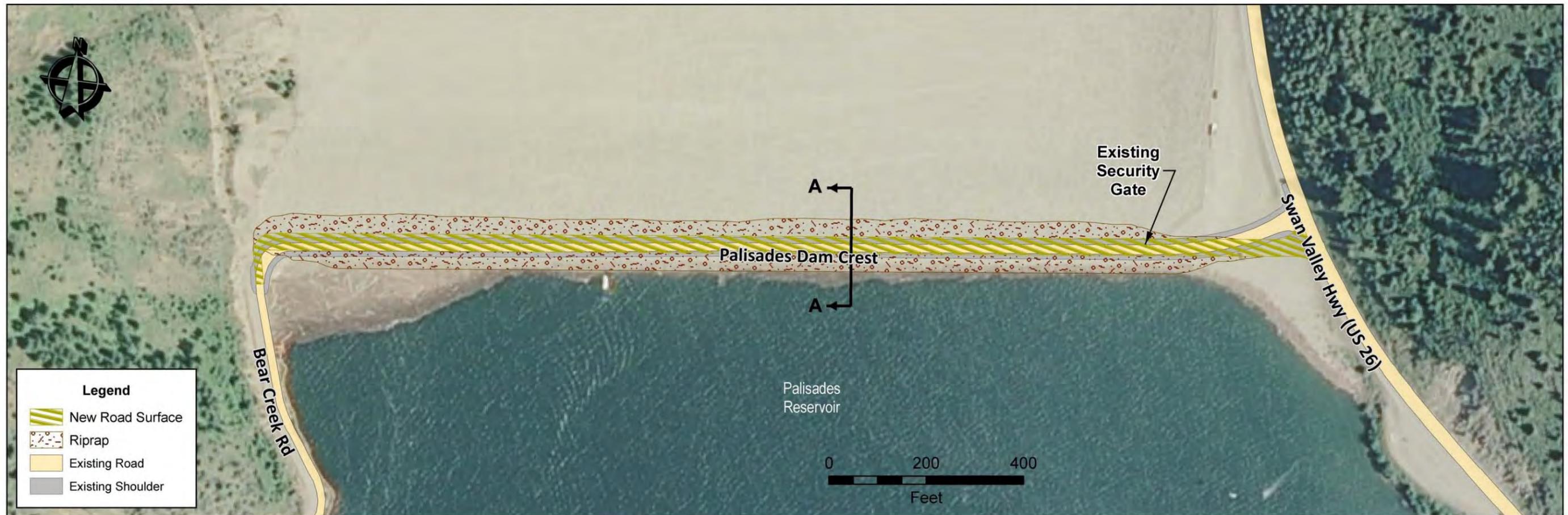
The bridge would be 31 feet wide and provide two 12-foot-wide traffic lanes, 2-foot-wide shoulders on each side, and 1.5-foot-wide safety barriers on each side. The superstructure would consist of precast, prestressed concrete beams for the spans and an 8-inch-thick, cast-in-place concrete deck. As proposed, the spans would be supported by two piers in the river channel and abutments on each bank. The piers and abutments would be supported on drilled shafts. The bridge profile would provide 2 feet of freeboard above the 100-year-flow water surface elevation. The bridge would be designed for live loading, which means that it could be used for all loads that are legal in Idaho without a permit from ITD.

The improved roads would have a gravel surface and would be designed consistent with USFS requirements. Reclamation would work with the USFS to finalize design of the road improvements.

Materials used for bridge construction, including steel, concrete, and precast girders, would be delivered to the bridge site on US-26. Borrow material used for construction of this alternative would consist of gravel, sand, cobbles, and boulders with varying amounts of fines that is available near the bridge site.

Traffic on US-26 would not be restricted during the four-month construction period. The road across the dam crest would remain open to vehicle access until completion of the bridge and access road improvements, and then be closed from that date forward.

Estimated construction costs for the bridge and bridge approaches associated with Alternative D are \$3.7 million. The estimated cost of improvements to the connector roads is approximately \$150,000.



(Not to Scale)

Disclaimer: This map is intended for general informational and planning purposes only. The Bureau of Reclamation makes no warranty, expressed or implied, as to the completeness, accuracy, or utility of these data and will in no event be liable for their use beyond the above expressed purpose.

Data Sources: Inside Idaho, Bureau of Reclamation, USDA/NRCS Digital Gateway

Map Date: November, 2010



Figure 2-4. Alternative C: Raise Dam Crest
Palisades Dam Security Enhancement Project

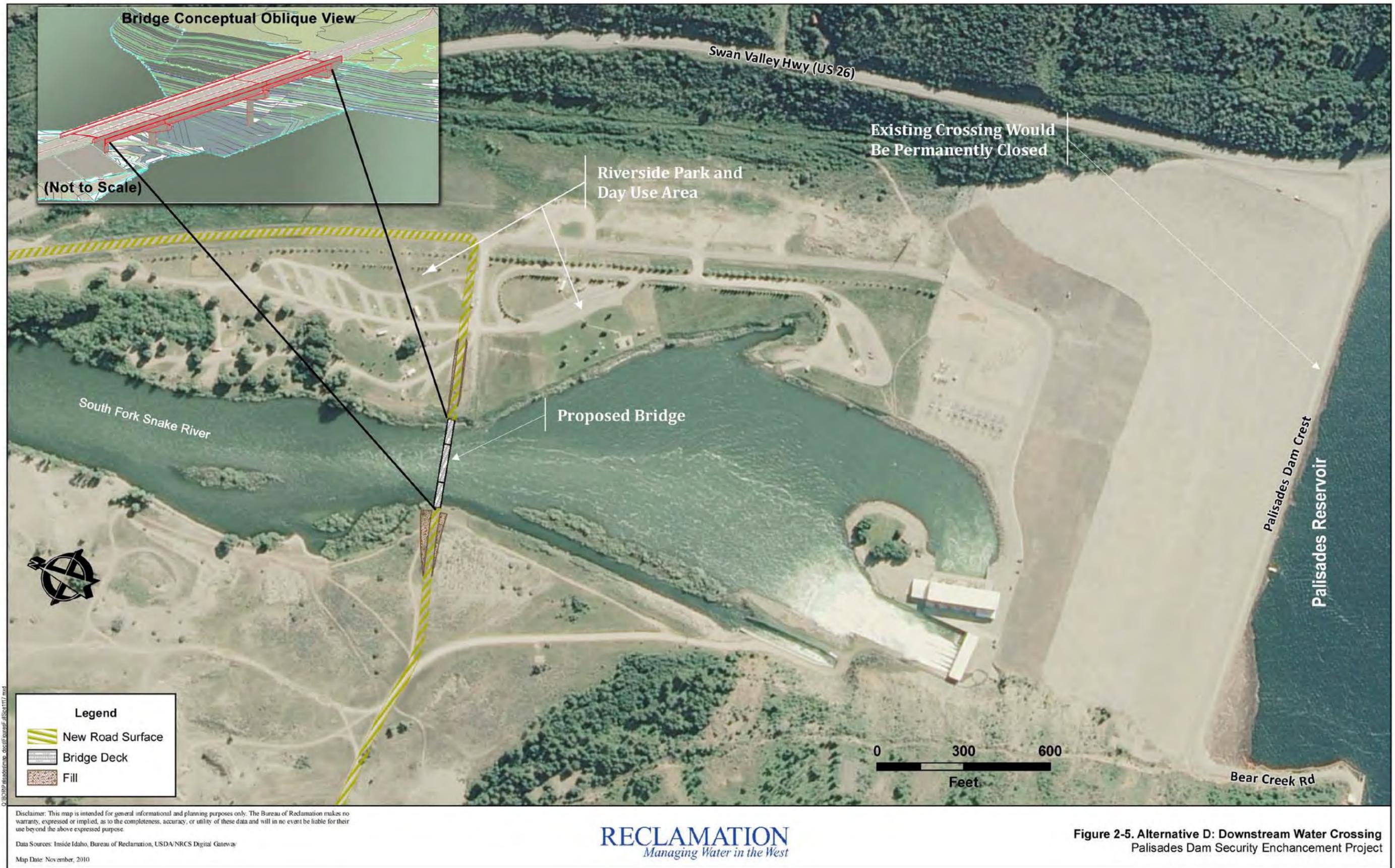
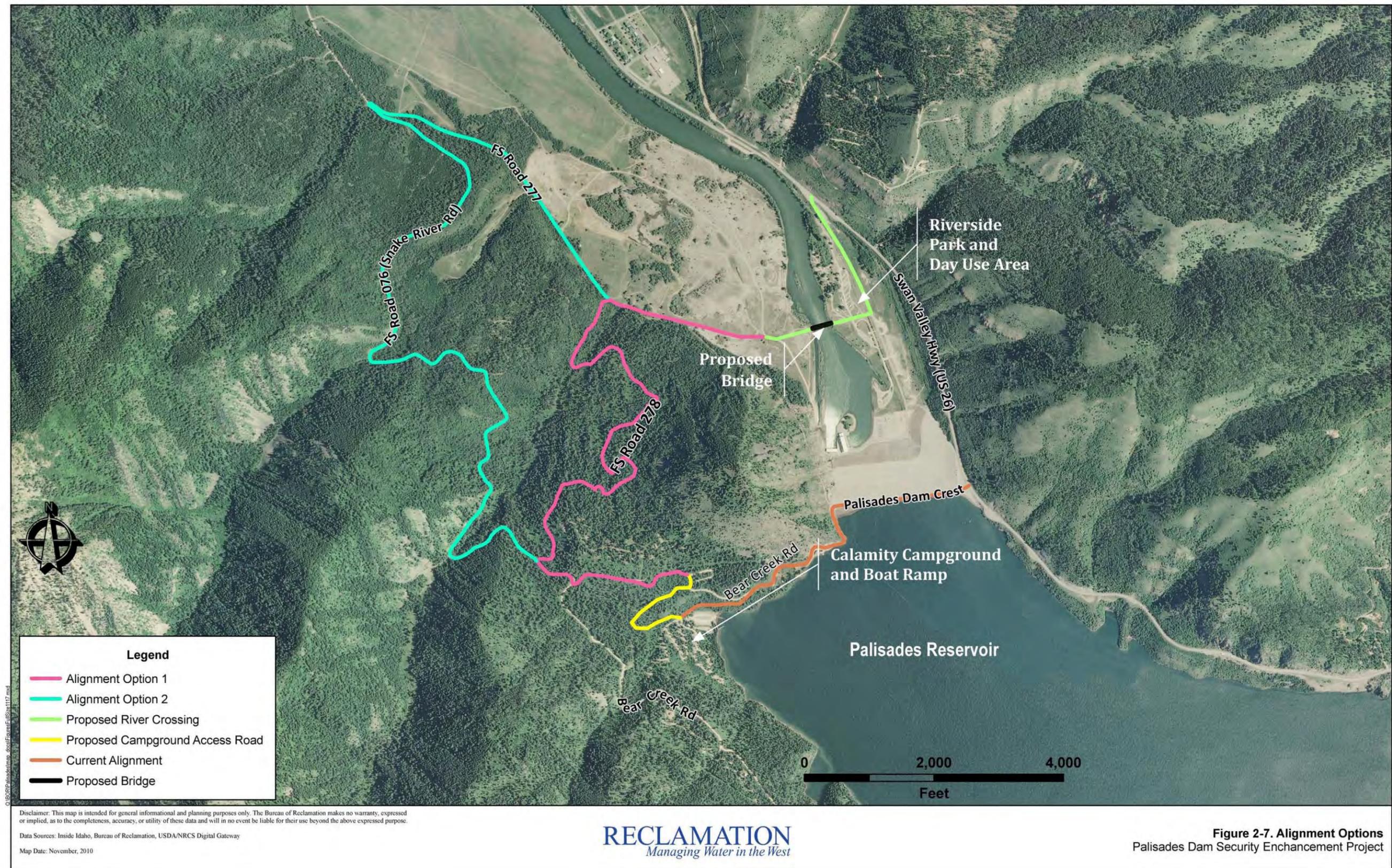


Figure 2-5. Alternative D: Downstream Water Crossing
Palisades Dam Security Enhancement Project



2.2.2.4 Alternative E – Median Barrier

Alternative E is shown in Figure 2-8 (on page 2-11). Under this alternative, Reclamation would construct a median barrier at the center of the dam crest, which would make vehicle access the dam crest difficult. The median would be 10 feet wide and allow 12-foot-wide lanes on each side. The median would consist of 4-foot-high Jersey barriers with loose fill placed between them.

Construction would require moving the existing security fence, instrument enclosures, and downstream guardrail several feet downstream to accommodate a 12-foot-wide lane downstream of the median. This alternative would not provide as great a mitigation accommodation as Alternatives B and C but would provide adequate protection over the existing condition. Alternative E would be constructed entirely on Reclamation property. Fill materials are available within 2 miles of the dam.

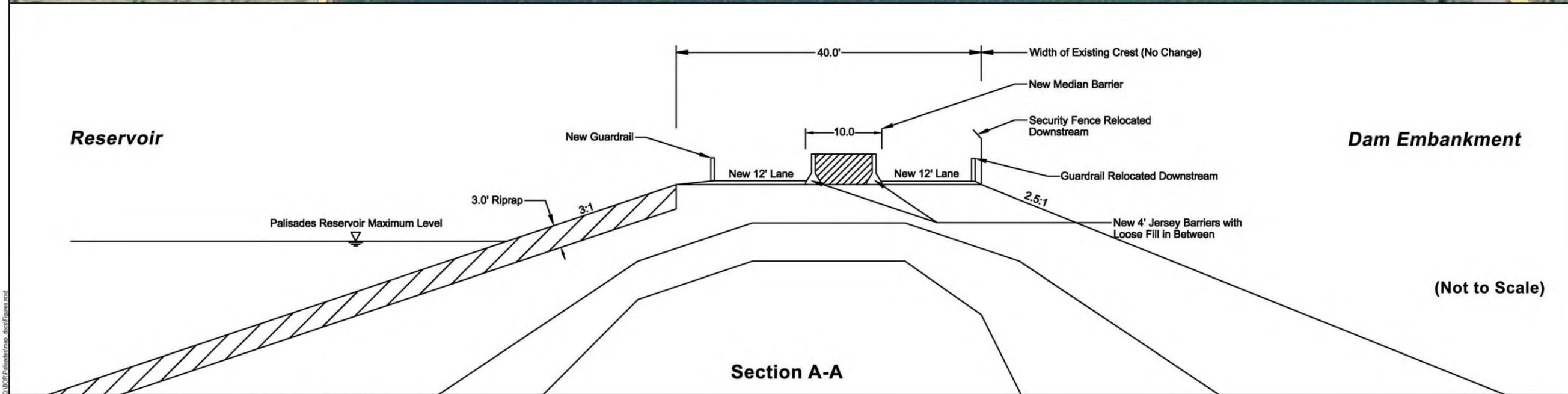
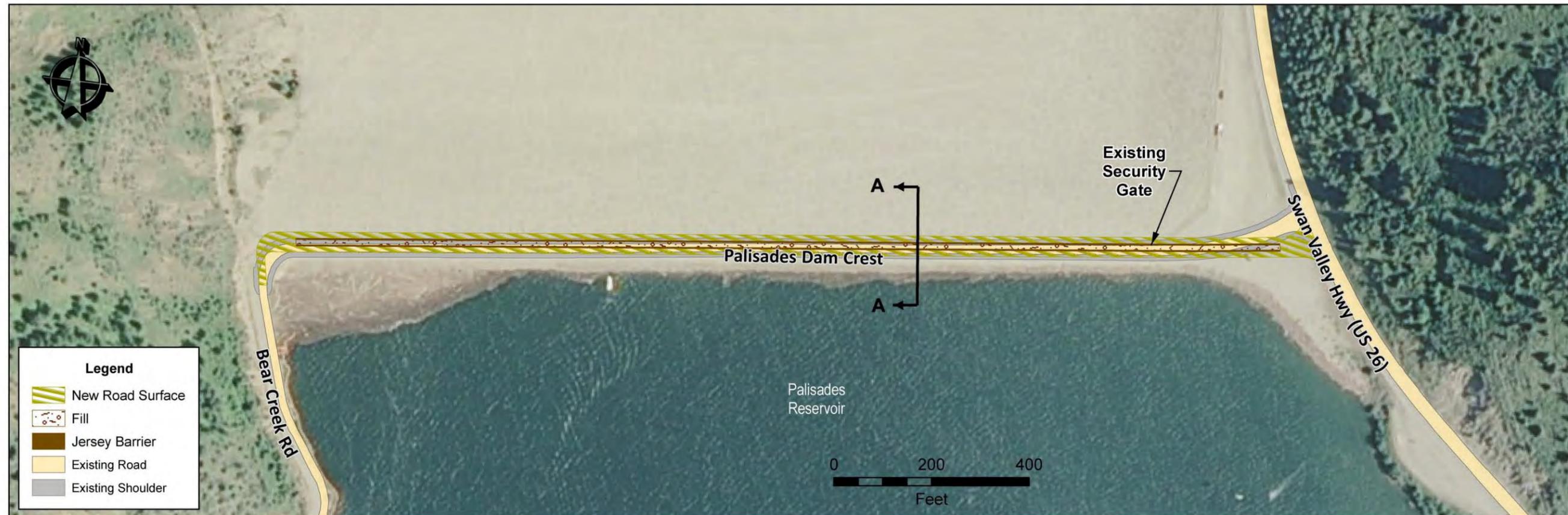
Fill materials required to construct the median barrier are available from borrow area “M” (Figure 2-3). The haul route would consist of existing roads starting from the borrow source leading toward the powerhouse. From there, trucks would enter through a security gate and follow the road around the powerhouse and along the toe of the dam to the east side of the river, where they would exit the security area and then pass through the Riverside Campground and day use area to access US-26. Trucks would then use a one-mile section of US-26 to access the crest of the dam.

During the three-month construction period (trucks would be hauling materials for approximately three days), a permit would be required from ITD to position flaggers on US-26 to control traffic when trucks enter and exit the highway. Figure 2-3 shows the location of the borrow area and the proposed haul route to the crest.

Estimated construction costs for Alternative E are \$2.8 million.

2.3 Alternatives Eliminated from Consideration

As described above, this EA evaluates all of the alternatives that Reclamation identified during the project planning process. No identified alternatives were eliminated from consideration.



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Data Sources: Inside Idaho, Bureau of Reclamation, USDA/NRCS Digital Gateway

Map Date: November, 2010



Figure 2-8. Alternative E: Median Barrier
Palisades Dam Security Enhancement Project

2.4 Design and Cost Comparative Analysis of Alternatives

Table 2-2 compares the advantages, disadvantages, and estimated construction costs of each alternative that is analyzed in detail in this draft EA. The affected environment and environmental consequences associated with each alternative are described in detail in Chapter 3.

Table 2-2. Advantages, Disadvantages, Estimated Costs of Palisades Dam Security Enhancement Project

Alternative	Advantages	Disadvantages	Estimated Construction Cost
Alternative A – No Action	<ul style="list-style-type: none"> None 	<ul style="list-style-type: none"> Doesn't meet purpose and need 	Not applicable
Alternative B – Widen Dam Crest	<ul style="list-style-type: none"> Conventional construction methods 	<ul style="list-style-type: none"> Structural modification to the dam 	\$4.7 million
Alternative C – Raise Dam Crest	<ul style="list-style-type: none"> Conventional construction methods 	<ul style="list-style-type: none"> Structural modification to the dam Most expensive option 	\$4.9 million
Alternative D – Downstream Bridge	<ul style="list-style-type: none"> Removes traffic from dam crest, allows permanent closure of dam Conventional construction methods 	<ul style="list-style-type: none"> Requires construction of bridge approaches and upgrades to 2.9 or 4.8 miles of existing unimproved road 	\$3.7 million for bridge and approaches, which includes \$150,000 for access road
Alternative E – Median Barrier	<ul style="list-style-type: none"> No modification to dam Least expensive option Conventional construction methods 	<ul style="list-style-type: none"> Temporary in nature; would need additional security measures in future Only provides limited protection Does not meet purpose and need 	\$2.8 million

Chapter 3: Affected Environment and Environmental Consequences

This chapter describes existing conditions, environmental consequences, and proposed mitigation for key resources in the project area. This chapter does not contain comprehensive discussions of every resource, but focuses on issues that were identified during scoping or that might be affected by the alternatives being considered. This chapter compares the potential human and environmental effects of the following five alternatives described in Chapter 2:

- Alternative A: No Action
- Alternative B: Widen Dam Crest
- Alternative C: Raise Dam Crest
- Alternative D: Downstream Water Crossing
- Alternative E: Median Barrier

Table 3-7 at the end of this chapter summarizes the potential environmental consequences of each alternative and identifies appropriate mitigation for potential impacts.

3.1 Transportation and Access

3.1.1 Affected Environment

The road network in the general region of Palisades Dam includes the state highway and rural roads described below (see Figure 3-1, Local Road Network, and Figure 2-6, Conceptual Alignment Options; Table 3-1 shows the mileages of the different routes):

- US-26, also known as Swan Valley Highway, a paved two-lane highway that is maintained by ITD.
- Forest Road 076 (also known as Snake River Road) between Swan Valley and Palisades Dam (dam), a gravel road that intersects with Forest Road 277

1.8 miles downstream of the dam. Forest Road 076 begins to the north at US-26 near Swan Valley and generally follows the South Fork of the Snake River to its intersection with Forest Road 277. From this point, Forest Road 076 continues south away from the Snake River and dam and eventually intersects with Forest Road 278 0.5 miles west of the Calamity Campground and boat ramp. Forest Road 076 ends at the dam. Bonneville County maintains Forest Road 076 by agreement with the USFS.



Figure 3-3. Photo shows the end of Forest Road 277 (looking west) near the South Fork of the Snake River.

- Forest Road 277 (see Figure 3-3), a dirt road that follows the west side of the river between the dam and its intersection with Forest Road 076. Forest Road 277 is intersected by Forest Road 278 0.8 mile downstream of the dam. This road is maintained by the USFS.
- Forest Road 278 (see Figure 3-4), a dirt road that begins at its intersection with Forest Road 277 and ends at its intersection with Forest Road 076. This road is maintained by the USFS.
- Forest Road 058, a dirt road that begins at its intersection with Forest Road 076 0.5 mile west of the Calamity Campground and boat ramp and continues south and west around the west side of the reservoir.



Figure 3-4. Photo shows Forest Road 278, which intersects with Forest Road 277 downstream of Palisades Dam.

This road eventually connects with Forest Road 087 near the south end of the reservoir. Forest Road 058 is also known as Bear Creek Road near the dam and Jensen Creek Road where it connects to Forest Road 087. Bonneville County maintains the Bear Creek Road segment of Forest Road 058 by agreement with the USFS.

- Forest Road 087, also known as McCoy Creek Road, a gravel road maintained by the USFS. This road is accessed from US Highway 89 at the south end of the reservoir near the town of Alpine, Wyoming. Forest Road 087 connects with Forest Road 058/Jensen Creek Road west of the reservoir.
- Palisades Dam crest road, a paved and gravel road maintained by Reclamation. This road connects to US-26 on the east and Forest Road 076/Bear Creek Road on the west.

Table 3-1. Mileage of Roads in Study Area

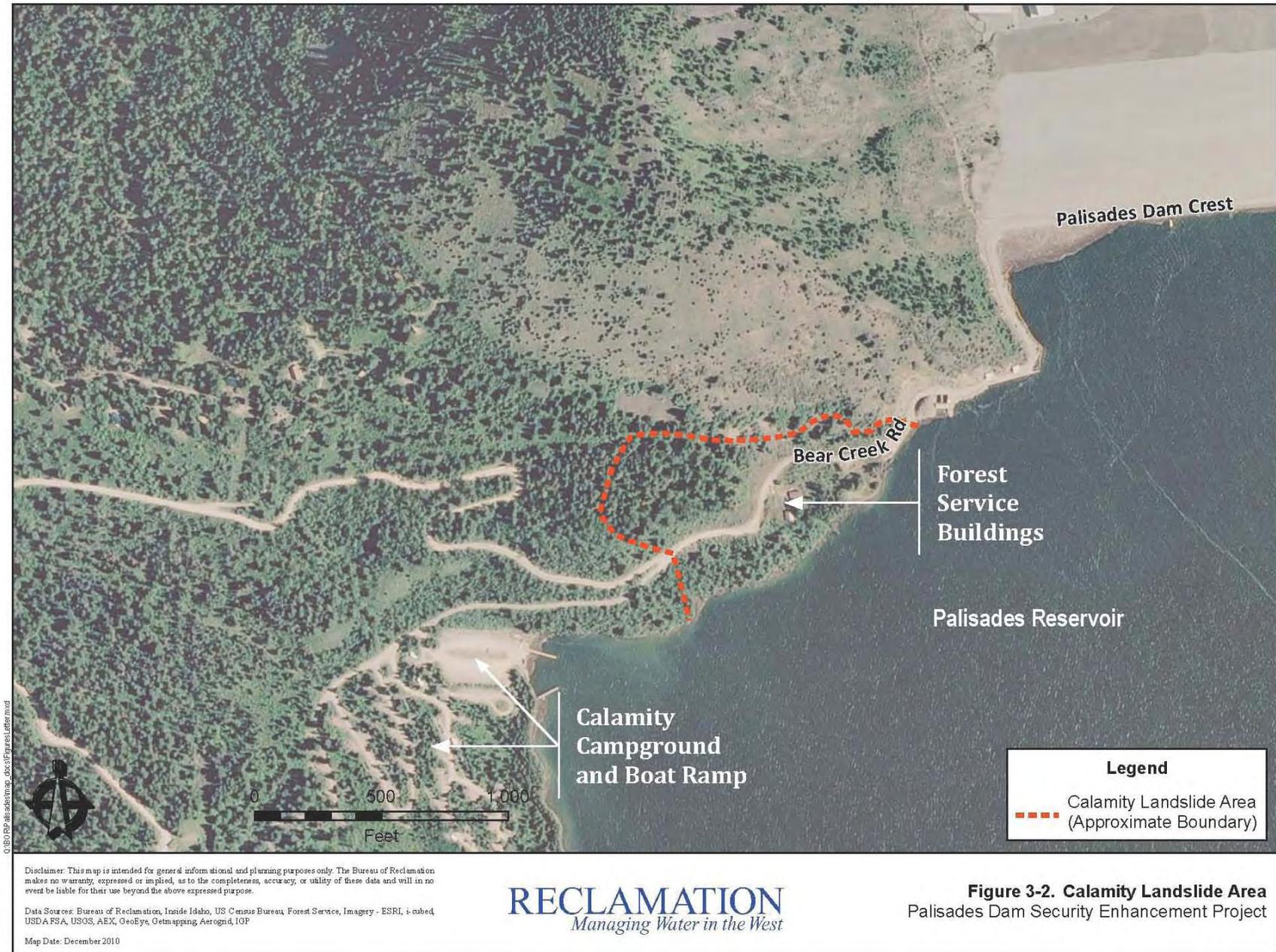
Route	Segment	Length (miles)	Approximate Travel Time
US-26	Swan Valley to Palisades Dam Road (east side of Palisades Dam)	15.2	0.5 hour
Forest Road 076	Swan Valley to west side of Palisades Dam	15.5	1.0 hours
Forest Road 087 and 058	US-89/US-26 to west side of Palisades Dam	27.6	1.5 hours
US-89/US-26	Forest Road 087 to Palisades Dam Road (east side of Palisades Dam)	21.6	0.5 hour

The segment of Bear Creek Road that connects the road across the dam and the Calamity Campground area is affected by an active landslide (Calamity Landslide) located near the left abutment of the dam (see Figure 3-2). First noted in 2007, the USFS continues to monitor the slide, which moved 5 inches between monitoring pins between August 29 and October 1, 2008. A 10-foot-high scarp has appeared approximately 200 feet upslope of Bear Creek Road. Several hundred feet of Bear Creek Road would be destroyed if a catastrophic failure occurred.

The Palisades Dam crest road serves as a connecting route from US-26 to seasonal cabins and Federal recreation areas on the west side of the reservoir. Traffic over the dam crest primarily consists of a mix of local residents, and recreation travelers, as well as Reclamation employees and USFS personnel. A traffic survey conducted in the last week of July 2008, which is assumed to be at or near the peak travel time of the year, found that approximately 403 vehicles per day crossed the crest of the dam (Bonneville County, 2008). As expected, traffic is highest during the weekend with 760 vehicles recorded in one day and lower during the other days of the week (as low as 192 vehicles on one day). During the winter, typically between December and March (sometimes as late as mid-April), the road across the dam crest is closed to vehicle traffic due to snow.

The dam can also be reached via Forest Road 076/Snake River Road from Swan Valley or Forest Roads 087 and 058/Bear Creek Road from US-89 near Alpine, Wyoming. No recent traffic information is available for USFS Roads 058 and 089. Traffic on Forest Road 076, which was counted during the July 2008 traffic survey described above, showed an average of 110 vehicles per day just south of where the road splits into USFS Road 277 and 076 (259 per day on the weekend and as low as 41 on one week day). Some of these vehicles were probably also counted on the road across the dam, so this total is not additive to the crest road traffic total.





3.1.2 Environmental Consequences

3.1.2.1 *Alternative A: No Action*

The No-Action Alternative would not affect the existing transportation network. Traffic would continue to cross the dam crest using the existing access road. The security gates described in Chapter 2 could still be used to close the dam crest to vehicular traffic during a high-security alert or direct threat to the dam. During such high-alert periods, travelers could use Forest Road 076 from US-26 near Swan Valley or Forest Roads 087 and 058 from US-89 near Alpine to access areas on the west side of the reservoir and the west side of the river downstream of the dam.

The distance from the river crossing just to the west of Swan Valley to the west side of the dam using US Highway 26 is 15.2 miles. The alternate route that follows the river would be 15.5 miles on gravel roads. This detour would increase travel time from approximately half an hour to one hour. The alternate route from the southern end of Palisades Reservoir is 27.6 miles on gravel roads, which is 6 miles longer than the access from US-26/89. The alternate route on gravel roads would increase travel time from approximately half an hour to 1.5 hours. Depending on the length of the closure, the additional traffic could result in substantial wear and tear on the existing road system. Under the No-Action Alternative, traffic would continue to travel on the segment of Bear Creek Road that passes through the Calamity Landslide described in Section 3.1.1. If the landslide progresses further or a catastrophic failure occurs, Bear Creek Road may be closed indefinitely or destroyed, making the west side of the reservoir inaccessible via the dam crest.

3.1.2.2 *Alternative B: Widen Dam Crest*

Alternative B includes a temporary road on the downstream side of the crest to accommodate traffic during construction, but would not permanently alter the existing road network.

Fill materials required to widen the crest would be available from borrow area “M” (Figure 2-3). The haul route would consist of existing roads starting from the borrow source leading toward the powerhouse. From there trucks would enter the construction area through a security gate and follow the road around the powerhouse and along the toe of the dam to the east side of the river. At this point the vehicles would exit the security area and then pass through the Riverside Campground and day-use area to access US-26. Trucks would then use one mile of US-26 to access the crest of the dam. During the four-month construction period, trucks would use this route for approximately 40 days, during which construction traffic would be controlled at US-26. Figure 2-3 shows the location of the borrow area and the proposed haul route to the dam crest.

The existing gates used for high security or for closure due to a specific threat would remain in place. Travelers would need to use the detour routes described above for the No-Action Alternative during these closures. The Forest Road 076/Snake River Road route would add approximately 30 minutes and the Forest Road 087/058 route would add approximately 60 minutes. Most traffic would probably use Forest Road 076/Snake River Road since it is shorter and more direct. Depending on the length of the closure, the additional traffic could result in substantial wear and tear on the existing road system. Since the closure would be temporary, it would not be expected to result in any long-term, significant effects on the traveling public. As described in the No Action Alternative above, further progression of the Calamity Landslide or a catastrophic failure could result in closure of Bear Creek Road between the Palisades Dam and Calamity Campground, which means the road across the dam could not be used to access the west side of the reservoir.

3.1.2.3 *Alternative C: Raise Dam Crest*

Like Alternative B, Alternative C would not permanently alter the existing road network. One lane of the road across the dam would remain open during construction and would be subject to traffic control. The borrow area, haul route, and traffic control during construction would be the same as Alternative B. The reconstructed dam road would accommodate the same traffic volume as it did before construction.

As described under Alternative B, the existing gates used for high security or dam closure due to a specific threat would remain in place. Travelers would need to use the detour routes described above for the No Action Alternative during these closures. As described above, the Forest Road 076/Snake River Road route would add approximately 30 minutes and the Forest Road 087/058 route would add about 60 minutes. Most traffic would probably use Forest Road 076/Snake River Road since it is shorter and more direct. Depending on the length of the closure, the additional traffic could result in substantial wear and tear on the existing road system. In this case, Reclamation would need to work with the USFS and Bonneville County to identify appropriate maintenance and repair measures, if needed. Since the closure would be temporary, it would not be expected to result in any long-term, significant effects on the traveling public.

Finally, potential impacts to Bear Creek Road on the west end of the dam associated with the Calamity Landslide would be the same as Alternative B.

3.1.2.4 *Alternative D: Downstream Water Crossing*

Alternative D would change the local road network. Traffic that historically used the dam crest road to access the west side of the dam and reservoir would be permanently rerouted to the new bridge over the Snake River and new connecting access road. The existing road across the dam would be permanently closed to the public and vehicles would cross the bridge downstream of the dam to access the west side of the reservoir.

Because the road across the dam would remain open during construction, no alternative route would be necessary to access the west side of the reservoir and river. The west side of the reservoir would also remain easily accessible if the Calamity Landslide (described in Section 3.1.1) caused the closure or failure of Bear Creek Road.

Using the dam, it is 1.1 miles from US-26 to the Calamity Campground area. Once the new bridge is operational and the dam road is permanently closed, the new route between US-26 and the Calamity Campground area would be either 3.6 miles or 5.5 miles, depending on the access route chosen. The two access route options are as follows (see Figure 2-4):

- **Access Route Option 1** (3.6 miles) would use a short segment of Forest Road 277 (0.5 miles) before intersecting with an unimproved road (Forest Road 278). From this point, travelers would follow Forest Road 278 to its intersection with Forest Road 076/Snake River Road west of the Calamity Campground and boat ramp. Travelers would then use Forest Road 076 to access the west shore of the reservoir near the campground and boat ramp. This route would total 3.6 miles – 2.9 miles from the west end of the new bridge plus the 0.7-mile segment from US-26 to the west side of the bridge. This is 2.5 miles longer than the current route across the dam.
- **Access Route Option 2** (5.5 miles) would use a 1.4 mile segment of Forest Road 277 between the west end of the new bridge to the road's intersection with Forest Road 076/Snake River Road downstream. Travelers would then follow Forest Road 076/Snake River Road to the Calamity Campground area on the west shore of the reservoir. This route would total 5.5 miles – 4.8 miles

from the west end of the new bridge plus the 0.7-mile segment from US-26 to the west side of the bridge. This is 4.4 miles longer than the current route across the dam.

Table 3-2 compares the estimated increase in travel distance for these optional routes based on peak-season data collected in July 2008. While Access Route Option 2 would result in a greater increase in the number of miles traveled per day, both options provide a safe alternative and would allow continued access to the west side of the reservoir.

Table 3-2. Comparison of Access Route Options

Access Route Option	Total Distance (miles) ¹	Increase in Distance (miles) Over Existing ²	Daily Increase in Trip Distance (miles) ³
Option 1: FR 278 to FR 076 to Calamity Campground	3.6	2.5	403 x 2.5 = 1,008
Option 2: FR 076/Snake River Road to Calamity Campground	5.5	4.4	403 x 4.4 = 1,773

¹ Includes 0.7 mile segment from US-26 to west end of new bridge.
² Compares to a total existing distance of 1.1 miles from US-26 to Calamity Campground using the dam road.
³ Based on peak season daily average.

Reclamation would work closely with the USFS to establish a maintenance agreement for the new access roads. As is the case with the road across the crest, the bridge and access roads would be closed to vehicle traffic during the winter due to snow. During this time the access road would become part of the groomed snowmobile trail system in the area. During construction trucks would haul materials for 1.2 miles on the haul route described under Alternative B, but would not have to travel on US-26.

Once the new bridge is complete, this alternative would remove traffic from the segment of Bear Creek Road that travels through the Calamity Landslide. This alternative includes a different route to the Calamity Campground, shown as Conceptual Alignment Options in Figure 2-7. The new access road to the campground area would not be affected if the Calamity Landslide progressed or if a catastrophic failure occurred.

3.1.2.5 *Alternative E: Median Barrier*

Like Alternatives B (Widen Dam Crest) and C (Raise Dam Crest), Alternative E would not permanently alter the existing road network. The borrow area, haul route, and traffic control during construction would be the same as Alternative B. One lane of the road across the dam would remain open during construction, as described for Alternative B.

Like Alternatives B and C, the existing gates used for high security or closure of the dam due to a specific threat would remain in place. Travelers would need to use the detour routes described above for the No Action Alternative during these closures. Forest Road 076/Snake River Road route would add approximately 30 minutes and Forest Road 087/058 route would add approximately 60 minutes. Most traffic would probably use Forest Road 076/Snake River Road since it is shorter and more direct. Depending on the length of the closure, the additional traffic could result in substantial wear and tear on the existing road system. Since the closure would be temporary, it would not be expected to result in any long-term, significant effects on the traveling public.

Finally, potential impacts to Bear Creek Road on the west end of the dam associated with the Calamity Landslide would be the same as Alternative B.

3.1.3 Mitigation

The following measure applies to Alternatives B (Widen Dam Crest), C (Raise Dam Crest), and E (Median Barrier):

- If the road across the Palisades Dam is closed due to a security threat for an extended period of time between April and October, Reclamation would meet with the USFS and Bonneville County to discuss the need for an appropriate maintenance plan due to extra wear and tear on the two alternate routes travelers could use to access the west side of the reservoir. If additional planning is needed, the parties will develop a memorandum of understanding (MOU) that clearly identifies assumptions and responsibilities for maintenance of the alternate routes.

The following measure applies to Alternative D, Downstream Water Crossing:

- Regardless of the access route option chosen, Reclamation will work closely with the USFS to establish an MOU that clearly identifies assumptions and responsibilities for upgrading and maintenance of the access route.

3.2 Recreation

3.2.1 Affected Environment

Recreational uses in the project area include boating, fishing, and other water-related activities on the reservoir, the South Fork of the Snake River, and creeks; picnicking and camping; hiking and mountain biking; snowmobile and all-terrain vehicle use; and dispersed activities such as hunting and bird watching. Reclamation owns and operates the Palisades Project but recreation on the 25-square-mile (16,000-acre) Palisades Reservoir is managed by the USFS as part of the Caribou-Targhee National Forest. The reservoir is 16 miles long, up to 3 miles wide, and has approximately 70 miles of shoreline. The reservoir is a popular year-round fishing destination, and the South Fork of the Snake River is a popular tail-water fishery.



Figure 3-5. Photo shows Riverside Campground and day use area looking north (downriver) from the Palisades Dam crest.

The Palisades Ranger District of the Caribou-Targhee National Forest manages six campgrounds, five picnic areas, and six boat ramps on or near the reservoir. Of these, only the Riverside Campground and Calamity Campground and boat ramp are located near the dam.

Calamity Campground, located 0.5 miles southwest of the dam, consists of 42 primitive camp sites and a boat ramp that is accessed by traveling just over a mile on the Palisades Dam Road from US-26 and on Forest Road 058. This campground is located close to the reservoir and provides favorable access for wildlife viewing, fishing, hiking, mountain biking, and winter sports.

USFS manages the Riverside Campground and day use area, which is 0.5 mile downstream of the dam (see Figures 3-5 and 3-6). This campground has running water and restrooms and some of the 14 sites have recreational vehicle hook-ups. The campground is accessible from US-26. The Palisades Dam Boat Landing is on the South Fork of the Snake River just upstream of the campground. Boaters can launch at this landing and take out at boat ramps downstream. Figure 2-6, Conceptual Alignment Options, shows the locations of recreation sites and their current and proposed access.



Figure 3-6. Photo shows Riverside Campground and day use area.

3.2.2 Environmental Consequences

3.2.2.1 *Alternative A: No-Action*

The No-Action Alternative would not affect recreational use of or access to Palisades Reservoir, the South Fork of the Snake River, or other recreation lands in the area. Recreation facilities on the reservoir and just downstream of the dam would continue to be managed by the USFS. Under the No Action Alternative, convenient recreation access could be affected if the dam crest was closed during a high security alert or if the Calamity Landslide closes Bear Creek Road between the Palisades Dam and Calamity Campground. Travelers could still use Forest Road 076/Snake River Road from US-26 in Swan Valley or Forest Road 087 from US-89 near Alpine, Wyoming, to access recreation sites on the west side of the reservoir (Calamity Campground and associated boat ramp, Tissue Point Boat Ramp) and west side of the river near the dam. Since security related closures would be temporary, they would not have any long-term, substantial effect on access to the reservoir or recreation opportunities around the reservoir and river.

3.2.2.2 *Alternatives That Would Affect the Dam Crest (Alternatives B, C, and E)*

Like the No Action Alternative, Alternatives B (Widen Dam Crest), C (Raise Dam Crest), and E (Median Barrier) would not affect recreational use of or access to Palisades Reservoir, the South Fork of the Snake River, or other recreational lands in the area. Temporary closure of the dam due to high security alerts would require travelers to use Forest Road 076/Snake River Road from US-26 in Swan Valley or Forest Road 087 from US-89 near Alpine, Wyoming, to access recreation sites on the west side of the reservoir (Calamity Campground and associated boat ramp, Tissue Point Boat Ramp) and west side of the river near the dam. Since security related closures would be temporary, they would not have any long-term, substantial effect on access to the reservoir or recreation opportunities around the reservoir and river.

3.2.2.3 *Alternative D: Downstream Water Crossing*

Alternative D would change how people access the west side of Palisades Dam, but would not eliminate convenient access to recreation facilities or opportunities in the project area. People wanting to access recreation areas on the west side of the dam would use the new bridge and one of the access route options described in Section 3.1.2.4 0 above to access the Calamity Point Campground and boat ramp, the Tissue Point boat ramp, and the western shore of the reservoir.

The new route would add between 2.5 miles and 4.4 miles to the access between US-26 and the Calamity Point area. While some users might feel inconvenienced by a different route, they would still be able to access areas on the west side of the reservoir and river for recreation.

Construction of the bridge would affect part of the Riverside Campground. The eastern bridge approach would encroach into the southern end of this site and result in the loss of one day-use site and possibly require the relocation of entrance signage (see Figure 3-7). Because the access road would be close to the campground and picnic area, campers might also feel that the presence of the road negatively affects their recreational experience.



Figure 3-7. Photo shows Riverside Campground and day use area entrance with signage, looking east.

The bridge would provide better access to the west side of the river and the Calamity Point area, which currently requires crossing the dam crest road or using Forest Road 076/Snake River Road from Swan Valley. The boat launch below the dam would be closed during construction, but boats would be able to be launched during normal flows from the boat launch after construction is completed.

The road across the dam would remain open during construction, so access to recreation sites and opportunities on the west shore of the reservoir would not be affected during construction.

3.2.3 Mitigation

No mitigation is proposed for Alternatives A, B, C, or E.

The following measure applies to Alternative D, Downstream Water Crossing:

- Reclamation is evaluating options to mitigate the impacts of the bridge approach to the Riverside Campground. At this time no definitive mitigation action has been proposed.

3.3 Cultural Resources

3.3.1 Affected Environment

The affected cultural resource environment is based on records from Reclamation, the Idaho State Historic Preservation Office (SHPO), historic maps from the United States Geological Survey (USGS), and aerial photographs. The National Register of Historic Places (NRHP) does not include any listings in the project area. The closest resource listed in the NRHP is the Snake River Ranger Station (also known as the Snake River Administrative Site), which is downstream of Palisades Dam in Swan Valley.

In October 2005, SHPO and Reclamation agreed that the Palisades Power Plant was eligible for the NRHP on the basis of its representative 1950s-style power plant architecture. Palisades Dam has had no formal determination of eligibility to date, but Reclamation has been operating under the assumption that it, too, is eligible for reasons of similar period architectural criteria. Consultation with the SHPO to request a formal determination of eligibility will occur at some point in the near future.

A file search of previous cultural resource work conducted in and near the project area indicated that no surveys or sites have been recorded within 1 mile of the project area.

As part of this EA, Reclamation requested information from local Native American groups regarding areas or resources of concern to Native Americans in or near the project area. Reclamation did not receive any responses to its inquiries, so it assumes that the site does not contain any sacred sites or other areas of cultural importance to local tribes. Therefore, sacred Native American sites are not discussed in this EA.

3.3.2 Environmental Consequences

This section combines Alternatives B, C, and E into one section addressing construction on the dam crest. Alternatives A (No Action) and D (Downstream Water Crossing) are discussed separately.

3.3.2.1 Alternative A: No Action

The No Action Alternative involves no change to existing conditions, and therefore would have no adverse effects on cultural resources.

3.3.2.2 Alternatives That Would Affect the Dam Crest (Alternatives B, C, and E)

The exact effects of construction on the dam crest are unknown at this time, since the dam has not yet been recorded in the NRHP and construction plans have not been finalized. However, it can be assumed that widening or raising the dam crest could cause visual effects and affect the integrity of the historic nature of the structure. Construction of a center barrier, while likely to be considered a minor effect, would change the setting, materials, feeling, and association of the dam site.

3.3.2.3 Alternative D: Downstream Water Crossing

This alternative would close the road across the dam crest, which would have an adverse effect on the potentially NRHP-eligible dam site. The crest road has been used since the dam was constructed, and closing it to vehicular use could be considered an adverse effect on the historic property, since it would no longer be used as originally intended. Construction of a downstream bridge and additional access road alignment could also affect cultural resources, but those impacts are unknown at this time. Although there is low potential for cultural resources in this area, it is possible that they may exist and could be negatively affected by construction of a bridge and access roads. A cultural resources survey of the chosen access alignment and bridge construction area would be completed to determine possible effects on cultural resources.

3.3.3 Mitigation

All alternatives except the No Action Alternative would affect the potentially NRHP-eligible Palisades Dam site.

If Reclamation selects Alternative B (Widen Dam Crest), C (Raise Dam Crest), or E (Median Barrier), it will implement the following measure:

- Prior to beginning construction, Reclamation will complete consultations with the Idaho SHPO to determine if the proposed action would adversely affect the Palisades Dam site. If the parties agree that the proposed action would result in adverse effects, they will develop a memorandum of agreement (MOA) detailing how Reclamation will mitigate the expected effect. The MOA might include a requirement to provide additional documentation in the form of preparation of an NRHP nomination or Historic American Engineering form; photography, including digital, black and white slides, or large-format photography; and historic research of the dam, including oral histories of the construction and use of the dam site.

If Reclamation selects Alternative D, it will implement the following measure:

- Prior to beginning construction of the bridge, Reclamation will complete a cultural resources reconnaissance survey of the construction area that will be transmitted to the Idaho SHPO along with a determination of effect. If the proposed action is not likely to adversely affect an NRHP-eligible resource, then no further action is required. If Reclamation and the SHPO find that the proposed action could adversely affect an NRHP-eligible resource, then the parties would develop an MOA to address the potential effects.

3.4 Economics

3.4.1 Affected Environment

The area around Palisades Dam is primarily used for recreation and summer home use. There are no businesses on the west side of the dam. The closest businesses are in or near the City of Irwin, which is 7 miles downstream of the dam. People who use the area generally travel by automobile, which requires spending money on fuel. Some travelers also spend money at businesses such as restaurants, fishing supply shops, and mini-markets in nearby towns (such as Irwin and Swan Valley) as they travel to and from the area.

3.4.2 Environmental Consequences

3.4.2.1 Alternatives That Would Affect the Dam Crest (Alternatives B, C, and E)

Alternatives B (Widen Dam Crest), C (Raise Dam Crest), and E (Median Barrier) would not change transportation patterns and therefore would not result in any long-term economic effects on travelers. High security or dam closures due to a specific threat could temporarily require alternate routes of travel that result in higher fuel costs. Temporary closures could also deter people from traveling to the area, which might have a minor economic effect on nearby communities that depend on tourism for income. However, because the closure would be temporary, this impact is not expected to cause substantial, long-term economic effects.

Construction of any of the build alternatives could result in short-term employment opportunities. If the labor supply is provided locally, construction could result in a temporary economic benefit to local communities.

3.4.2.2 Alternative D: Downstream Water Crossing

Alternative E would change the transportation pattern of people accessing the west side of Palisades Reservoir and require an additional 2.5 to 4.4 miles of travel. Assuming a per-mile cost to operate a vehicle of \$0.50 per mile, people visiting and/or living in summer homes on the west side of the dam would spend between \$1.25 and \$2.20 per trip. People coming to the Palisades Reservoir from outside the immediate area have already made an economic commitment to travel to the area, and an additional trip cost of \$1.25 to \$2.20 per trip is not expected to affect their desire to travel to the area or their travel patterns once they arrive at the reservoir.

As described for the alternatives that would affect the dam crest, construction of any of the build alternatives could result in short-term employment opportunities and a temporary economic benefit to local communities.

3.4.3 Mitigation

No mitigation is proposed.

3.5 Environmental Justice

Executive Order 12898 (Environmental Justice, 59 Federal Register 7629 [1994]) requires Federal agencies to achieve environmental justice by addressing “disproportionately high and adverse human health and environmental effects on minority and low-income populations.” To determine if environmental justice populations are present, the Federal agency examines the demographics of the affected area to determine if minority and/or low-income populations are present. If present, the agency must determine if construction of the proposed action would cause disproportionately high and adverse human health or environmental effects on the populations.

3.5.1 Affected Environment

Because the project area is in a sparsely populated rural area, the 2000 Census provides the most recent detailed information about minorities and income of people living in the area (2010 Census data were not available at the time this EA was written). The following descriptions rely primarily on 2000 Census information but present more updated data where available.

The project area is located in a remote and sparsely populated area in Bonneville County, Idaho where much of the land is owned by the Federal government. The project area does not support any residential dwellings, but there are scattered seasonal and year-round homes along Forest Road 058 and US-26. The City of Irwin (population 183 in 2009 according to U.S. Census Bureau 2010a) is 7 miles downstream of the dam, and areas along US-26 between Irwin and the dam have low-density residential development.

3.5.1.1 Minorities

Table 3-3 summarizes the minority populations of Bonneville County as a whole and the Swan Valley area. For this analysis, minorities include Hispanic white persons, Hispanic and non-Hispanic people who are black or African American, American Indians or Alaskan Natives, Asians, Native Hawaiians or “Other Pacific Islanders,” “Some Other Race,” or “Two or More Races.”

Table 3-3. Minority Populations in Project Region

Description	Swan Valley CCD ¹		Bonneville County	
	Number	% of Total Population	Number	% of Total Population
Total Population	1,160		82,522	
Total White-Only Population	1,118	96	74,461	90
Total Minority Population	42	4	8,061	10
Non-Hispanic Minorities	24	2	2,358	3
Hispanic Minorities	18	2	5,703	7

Source: U.S. Census Bureau 2000a.
¹ CCD is a Census County Division, which is defined by visible features such as mountains and rivers.

More recent Census estimates show that the minority population of Bonneville County increased from 10 percent of the population in 2000 to 14 percent in 2009 (U.S. Census Bureau 2010b). The 2009 estimates did not provide information about the Swan Valley CCD.

The information presented in Table 3-3 shows that the populations of the both the county and Swan Valley CCD are dominated by white, non-Hispanic people. Overall, the county has a greater proportion of minorities than the Swan Valley CCD (U.S. Census Bureau 2000a).

The sparsely populated area around Palisades Dam includes summer homes on the west side of the reservoir and the South Fork of the Snake River near the dam that are generally not permanently occupied. These areas are not densely developed and are mostly used for recreation and not permanent residences. When considered in combination with the information about the distribution of minorities in the area, the available data indicate that there are no minority populations or minority communities in the study area.

3.5.1.2 Low-income Populations

Sample data collected in the 2000 Census shows that 1999 median income was \$41,805 for residents of Bonneville County and \$35,395 for the Swan Valley CCD (U.S. Census Bureau 2000b). Updated information from the Census Bureau lists a 2008 median income of \$52,254 for Bonneville County, or an increase of about 25 percent. Similar data are not available for the Swan Valley CCD or nearby incorporated cities because of their small populations.

The average household size was 2.8 people in Bonneville County and 2.7 in the Swan Valley CCD (U.S. Census Bureau 2000). The U.S. Department of Health and Human Services identified \$13,880 as the poverty level income for three-person households in Idaho in 1999 (Federal Register, Vol. 64, No. 52, March 18, 1999, pp. 13428-13430). The 1999 median incomes of Bonneville County and the Swan Valley CCD were substantially higher than this, but this data did not include the distribution of persons living in poverty in the county or the Swan Valley CCD. The 2000 Census, which provides the most recent information about the actual distribution of poverty, showed that 10 percent of the population was living in poverty in Bonneville County in 1999 and 8 percent in the Swan Valley CCD (U.S. Census Bureau 2000b). The 2000 Census data indicate that there could be some low-income persons living in the project area, but given the low level of residential development in this part of the

county and in the project area, they would be scattered throughout the area and not concentrated in any one location.

3.5.2 Environmental Consequences

The information presented in Section 3.5.1 above indicates that there are no minority or low-income populations in or near the project area. Any impacts associated with the No Action or action alternatives would affect persons of all races and ethnicities and incomes in the same manner and would not result in any disproportionately high and adverse impacts on environmental justice populations.

3.5.3 Mitigation

No mitigation is proposed because there are no environmental justice populations in the project area and therefore no impact on any environmental justice populations.

3.6 Indian Trust Assets

Indian Trust Assets are legal interests in property held in trust by the United States for Indian tribes and individuals. The Secretary of the Interior, acting as trustee, holds many assets in trust for Indian tribes and individuals. Examples of trust assets are lands, minerals, grazing, hunting, fishing, and water rights. While most Indian Trust Assets are on-reservation, they may also be found off-reservation.

The United States has a responsibility to protect and maintain rights reserved by or granted to Indian tribes and Indian individuals by treaties, statutes and executive orders. These are sometimes further interpreted through court decisions and regulations.

3.6.1 Affected Environment

Palisades Reservoir is located in an area historically used by many tribes. The Shoshone-Bannock Tribes, a Federally recognized tribe at the Fort Hall Indian Reservation in southeastern Idaho, has trust assets both on- and off-reservation. The Fort Bridger Treaty was signed and agreed to by the Bannock and Shoshone headman on July 3, 1868. Article 4 of the 1868 treaty states that members of the Shoshone-Bannock Tribes “shall have the right to hunt on the unoccupied lands of the United States.” This has been interpreted to mean unoccupied Federal lands.

The Fort Bridger Treaty for the Shoshone-Bannock has been interpreted in the case of *State of Idaho v. Tinno*, an off-reservation fishing case in Idaho. The Idaho Supreme Court determined that the Shoshone word for “hunt” also included to “fish.” Under *Tinno*, the Court affirmed the tribal members’ right to take fish off-reservation pursuant to the Fort Bridger Treaty (Shoshone-Bannock Tribes 1994).

The Nez Perce are a Federally recognized tribe of the Nez Perce reservation in northern Idaho. The United States and the tribes entered into three treaties (Treaty of 1855, Treaty of 1863, and Treaty of 1868) and one agreement (Agreement of 1893). The rights of the Nez Perce Tribes include the right to hunt, gather and graze livestock on open and unclaimed lands, and fish in all usual and accustomed places (Nez Perce Tribe 1995).

The Northwestern Band of the Shoshone Indians, a Federally recognized tribe without a reservation, has treaty-protected hunting and fishing rights that may be exercised on unoccupied lands within the area acquired by the United States pursuant to the 1868 Fort Bridger Treaty.

The Shoshone-Paiute Tribes are a Federally recognized tribe located at the Duck Valley Reservation in southern Idaho and northern Nevada. The reservation was established by executive orders dated April 16, 1877; May 4, 1886; and July 1, 1910. The Shoshone-Paiute believe the interests of the tribes are also reflected in the Bruneau, Boise, Fort Bridger, Box Elder, Ruby Valley, and other treaties and executive orders that the tribes' ancestors agreed to with the United States.

3.6.2 Environmental Consequences

The No Action Alternative and action alternatives would not affect tribal hunting or fishing in the area and would not impact the storage capacity or power generation at Palisades Dam.

3.6.3 Mitigation

No mitigation is required since the action alternatives would not affect tribal hunting and fishing in the area and none of the alternatives would impact water supply or power generation.

3.7 Fish and Wildlife

3.7.1 Affected Environment

The fish and wildlife habitats of the project area are defined by Palisades Reservoir, the South Fork of the Snake River, and surrounding National Forest land.

Palisades Reservoir covers 16,000 acres at 5,600 feet above mean sea level on the floor of the Grand Valley, which is the northern portion of the Star Valley. The Idaho Department of Fish and Game (IDFG) manages fishing in the reservoir as a “Family Fishing Water” and with general regulations and hatchery supplementation. The reservoir is stocked with cutthroat trout from the Jackson Fish Hatchery. Lake trout and kokanee have been introduced to the reservoir, but only small natural populations have developed. Large fluctuations in water levels (up to 80 vertical feet) may affect these open-water species (IDGF, no date).

Native fish that inhabit the coldwater fishery of the South Fork include mountain whitefish, Yellowstone cutthroat trout, Utah chub, longnose dace, speckled dace, redbside shiner, northern leatherside (formerly known as leatherside chub), Utah sucker, bluehead sucker, mountain sucker, Paiute sculpin, and mottled sculpin. The river also supports several introduced species, including rainbow, brown, and brook trout.

From Palisades Dam to the confluence with the Henry's Fork of the Snake River, the South Fork of the Snake supports a world-renowned fishery and one of the most important Yellowstone cutthroat trout populations in its historical range. Currently, the population of rainbow trout poses the biggest single threat to the long-term persistence of the native cutthroat trout population. Though rainbow trout were a negligible component of the trout population until the late-1980s, angler and electrofishing surveys showed a steady increase in the rainbow trout population until 2003, when they were as abundant as cutthroat trout in the upper reaches of the river. Brown trout offer the opportunity to catch a trophy fish, as demonstrated by the current state record brown trout weighing 26.4 pounds, which was caught from the South Fork of the Snake River (IDGF, no date).

The IDFG has been working with Idaho State University and Reclamation to identify and implement flow regimes that are beneficial to cutthroat trout and detrimental to rainbow trout. Shaping of winter and spring flows to maximize benefits to cutthroat trout is expected to continue and will be refined based on results from annual population surveys. IDFG has a goal to work with Reclamation and Idaho

State University to provide a release from Palisades Dam characterized by a spring maximum to winter minimum flow ratio of 15:1 (IDFG, no date).

The South Fork of the Snake River supports fragmented riparian habitat in the project area. Most of the land along the river in this reach is disturbed and provides limited habitat for common wildlife species and migratory birds. Small (less than 1 acre) patches of low-growing vegetation that could be used by smaller migratory birds are located downstream of the dam. This area has no large cottonwood trees.

National Forest land around the reservoir provides habitat for many terrestrial animal species and migratory birds that are protected under the Migratory Bird Treaty Act. The primary forest types are aspen and Douglas fir, but there are also areas of sagebrush/grass openings, and mixed Douglas fir and lodgepole pine. Much of the National Forest land southwest of the dam is remote and has only a few roads that travel around large tracts of roadless areas (USFS 1997), but there are several dirt and gravel forest roads in and near the dam. Forest roads are described in Section 3.1, Transportation and Access.

In its Forest Plan for the Targhee National Forest (USFS 1997), the USFS identifies a goal to “continue cooperation with other agencies in conducting research and implementing management actions to regenerate cottonwood along the South Fork of the Snake River.” The plan also includes a guideline stating that “Within one mile of the Palisades Reservoir and the South Fork of the Snake River, emphasis will be given to managing old growth Douglas fir, spruce and cottonwood habitats for wildlife species.”

3.7.2 Environmental Consequences

3.7.2.1 *Alternative A: No Action*

Under the No-Action Alternative, no construction would take place and no habitat would be disturbed. Existing, ongoing disturbance to fish and wildlife and their habitats associated with recreational use of the area would continue.

3.7.2.2 *Alternatives B and Alternative E*

Alternatives B (Widen Dam Crest) and E (Median Barrier) would modify the dam crest and would not result in any permanent, long term effects on fish or wildlife habitat in the project area or to forest vegetation. These alternatives would also not result in any construction-related impacts to habitat or vegetation since the road across the dam would remain open during construction and no new roads would need to be constructed.

Terrestrial wildlife in the area might be temporarily disturbed during construction. The types of wildlife that would use areas near the dam are common and most would probably avoid the area during construction.

3.7.2.3 *Alternative C: Raise Dam Crest*

Like Alternatives B and E, Alternative C would modify the crest and not result in any permanent, long-term effects on fish and wildlife habitat in the project area or to forest vegetation. This alternative would require construction of a temporary road on the downstream side of the dam, but since this area does not currently provide habitat suitable for use by most wildlife species, construction and use of the road would not be expected to result in any impacts to wildlife. The road would avoid any impacts to the South Fork of the Snake River, therefore, no fisheries impacts would be expected.

Terrestrial wildlife in the area might be temporarily disturbed during construction. The types of wildlife that would use areas near the dam are common and most would probably avoid the area during construction.

3.7.2.4 Alternative D: Downstream Water Crossing

This alternative would include construction of a new bridge across the South Fork of the Snake River, construction of short segments of new roads for the bridge approaches, and upgrades of existing dirt and gravel roads.

The new three-span bridge would require placement of two piers in the Snake River channel and construction of abutments on each end of the bridge deck. The piers would be constructed using cofferdams so the river channel would not need to be dewatered. The abutments would be constructed using local borrow material (Figure 2-3 in Chapter 2 shows the location of borrow area and haul route).

The areas that would need to be cleared to accommodate the bridge abutments and access roads do not support intact riparian communities or cottonwood habitats; although there is an area of wetland just downstream (see Section 3-11 below for the wetlands discussion). The areas to be cleared are sparsely vegetated and provide marginal habitat for locally-common wildlife species. Much of the area around the bridge site has historically been disturbed during construction of the dam and by ongoing recreational use and is dominated by non-native vegetation.

Installation of the bridge piers would result in permanent effects on the bed of the Snake River. However, these impacts are not expected to affect native fish populations, including cutthroat trout. Individuals occupying the immediate project area will be temporarily displaced during construction activities. This small-scale, temporary displacement is not anticipated to result in adverse effects to native fish populations. Following construction activities, current breaks associated with the piers and rip rap material will provide holding habitat for native fishes.

This alternative would require improvements to existing dirt or gravel forest roads. Roadside clearing would be required along some segments of road, but would not result in the removal of large patches of vegetation, including old growth Douglas fir or spruce. Because existing roads would be used, this activity is not expected to result in significant losses of forest habitat.

3.7.3 Mitigation

No mitigation is required for Alternatives A, B, C, and E since they would not affect fish or wildlife.

The following measure would apply to Alternative D, Downstream Water Crossing:

- Reclamation or its contractors will complete a survey for nesting migratory birds 90 days prior to beginning construction activities in order to identify, and prevent removal of, valuable vegetation. If active nests are found, the nests and adjacent vegetation (up to 20 feet) would be avoided until after the young have fledged. This measure applies to areas along access roads needing to be graded and cleared, as well as the bridge site.

3.8 Threatened and Endangered Species

3.8.1 Affected Environment

According to the state of Idaho and U.S. Fish and Wildlife Service (USFWS), Bonneville County supports three species listed as threatened or endangered and two candidates for listing under the

Endangered Species Act (ESA). The listed species include the threatened Canada lynx (*Lynx canadensis*), the threatened Grizzly bear (*Ursus arctos horribilis*), and the threatened Ute ladies' tresses (*Spiranthes diluvialis*) (Idaho Governor's Office of Species Conservation 2010, USFWS 2010a). The greater sage-grouse (*Centrocercus urophasianus*) and the yellow-billed cuckoo (*Coccyzus americanus*) are currently identified as candidates in Bonneville County (USFWS 2010).

The state and USFWS also identify an experimental nonessential population of the endangered gray wolf (*Canis lupus*) in Bonneville County (Idaho Governor's Office of Species Conservation 2010, USFWS 2010a). Populations of experimental, non-essential species that occur outside of a National Park or National Wildlife Refuge are treated as if they were proposed for listing under the ESA.

Following is a brief description of these species:

Canada Lynx. Generally solitary animals, lynx usually hunt and travel alone, are slightly more active at night than by day, and have complex habitat needs. They require different forest types, including young forests with thick vegetation for hunting snowshoe hares, and older forests with good cover for their dens. Snowshoe hares are the primary prey of lynx; without high densities of snowshoe hares, lynx are unable to sustain populations in spite of a multitude of other prey when snowshoe hare populations are low (USFWS 2010b). USFWS-identified critical habitat for Canada lynx does not extend into Bonneville County, but the USFWS does identify Bonneville County as an area where Canada lynx is known to or believed to occur (USFWS 2010b). A USFS Environmental Impact Statement on its Northern Rockies Lynx Management Direction (USFS 2007) shows occupied lynx habitat around Palisades Reservoir.

Grizzly Bear. Grizzly bear distribution is primarily within, but not limited to, areas identified by the USFWS as recovery zones that include eastern Idaho, southwest Montana, and the Yellowstone area in northwest Wyoming (USFWS 2010c). The grizzly bear is not known to or believed to occur in Bonneville County (USFWS 2010d), but the identified Yellowstone Distinct Population Segment (DPS) includes the area around Palisades Reservoir. The project area is not within identified suitable grizzly bear habitat or the primary conservation area, and is just outside the conservation strategy management area for the DPS (USFWS 2010e).

Ute Ladies'-Tresses. Ute ladies'-tresses is a perennial, terrestrial orchid with 7- to 32-inch stems arising from tuberously thickened roots. The species is characterized by whitish stout flowers and generally blooms from late July through August. This plant grows along riparian edges, gravel bars, old oxbows, high-flow channels, and moist to wet meadows along perennial streams. It typically occurs in stable wetland and seep areas associated with old landscape features within historical floodplains of major rivers and in wetlands and seeps near freshwater lakes or springs. The USFWS identifies Bonneville County as an area where Ute ladies'-tresses is known to or believed to occur, but has not identified critical habitat for this species (USFWS 2010f).

The closest known population and habitat is 9 river miles downstream of the Palisades Dam (BLM 2002) in an area characterized by numerous lower-velocity flows, side channels, oxbows, and riparian wetlands. The South Fork of the Snake River floodplain could provide habitat for Ute ladies'-tresses in or near the project area, but because the reach of the river below the dam contains little riparian or wetland transition areas from the high velocities of the main channel, potential Ute ladies'-tresses habitat is unlikely. However, one small area – under 1 acre – on the west bank approximately 2,300 feet downstream of the dam could contain potential habitat.

Greater Sage-Grouse. IDFG finalized a conservation plan for the greater sage-grouse in 2006 and identified some key habitat in western Bonneville County. The largest grouse in North America, sage-grouse are dependent on large areas of sagebrush and grassland habitats. According to the conservation plan, there is no key sage-grouse habitat in the project area (IDFG 2006a).

Yellow-Billed Cuckoo. Idaho supports limited breeding populations of yellow-billed cuckoo that are part of a DPS occurring west of the crest of the Rocky Mountains from the Canadian border to New Mexico. According to IDFG, this species has historically been a rare summer visitor and breeder in the Snake River Valley. Of the sightings reported by IDFG, none occur in or near the project area (IDFG 2006b). Although the USFWS identifies Bonneville County as an area where yellow-billed cuckoo is known to or believed to occur (USFWS 2010g), the Idaho Comprehensive Wildlife Conservation Strategy does not specifically list any sightings in Bonneville County. Idaho's strategy does generically identify willow/cottonwood forests in the Snake River Valley in Southeastern Idaho as sites of "numerous observations" (IDFG 2006b). However, the project area does not support extensive willow/cottonwood habitats that would be used by the yellow-billed cuckoo.

Gray Wolf. The gray wolf population in Idaho occurs in areas characterized by a mosaic of dry and mesic conifer and subalpine forest as well as grassland and shrub habitats. Populations occur in central and northern Idaho, with some individuals living along the Wyoming-Idaho border (IDFG 2006b). The USFWS identifies Bonneville County as an area where experimental, non-essential populations are known or believed to occur (USFWS 2010a). It is likely the mountainous area surrounding the Palisades Reservoir has some visitation by occasional foraging gray wolves, but currently this area appears to represent the southerly fringe of the Idaho distribution of this species. These visitors could be young adult males that originate from packs in the Yellowstone area.

3.8.2 Environmental Consequences

3.8.2.1 Alternative A: No Action

No construction would occur under the No Action Alternative. Since no land would be disturbed, no listed or candidate species are expected to be affected.

3.8.2.2 Alternatives B, C, and E

Because Alternatives B (Widen Dam Crest), C (Raise Dam Crest), and E (Median Barrier) would not affect any known populations of grizzly bear or identified suitable habitat, they are not expected to affect the protected Yellowstone DPS of the grizzly bear.

The project area is not known to support key greater sage-grouse habitat, so none of these alternatives would affect any populations or habitats of greater sage-grouse.

The project area does not support extensive willow/cottonwood habitat that is favored by the yellow-billed cuckoo. Construction of any of these alternatives would not affect any extensive riparian habitat along the South Fork of the Snake River, so they would not affect the yellow-billed cuckoo or its habitat.

Construction of these alternatives would focus on the dam and not disturb adjacent areas that might support individual Canada lynx or gray wolves. Construction would not affect the potential Ute ladies'-tresses habitat downstream of the dam.

3.8.2.3 Alternative D: Downstream Water Crossing

Alternative D would not affect grizzly bear, greater sage-grouse, or yellow-billed cuckoo for the same reasons as described above under Section 3.8.2.2. These species or their habitat are not present in the project area.

Canada lynx and gray wolf could forage in the area near some of the existing dirt roads that would be improved as part of this alternative. Since this alternative would use existing roads and not require clearing of any forested areas, it would not result in any effects on lynx or wolf habitat. Individual animals could be disturbed during construction, but any effects would be temporary and they would probably avoid active construction areas. This alternative is not expected to result in any significant short-term effects or any long-term effects on Canada lynx or gray wolf.

As described above, the known populations and habitat of Ute ladies'-tresses are 9 miles downstream of the dam. Generally, the reach of the river below the dam is not favorable habitat for this species, so construction of the bridge and its approaches under this alternative is not expected to affect any populations of the Ute ladies'-tresses. However, because the bridge construction site is close to a small area (less than 1 acre) on the west side of the river that could contain potential habitat for this species, Reclamation or its contractors will conduct a survey of this area during the flowering season (late July through early September).

3.8.3 Mitigation & Effects Conclusion

Because Alternatives B, C, and E will have no impacts to threatened or endangered species, as previously discussed, Reclamation concludes that Alternatives B, C, and E will have *no effect* on threatened or endangered species in, or adjacent to, the project area. Therefore, no mitigation is required to implement these three alternatives.

Reclamation has determined that some aspects of Alternative D may possess the potential to adversely affect Ute-ladies'-tresses in the immediate project area. However, Alternative D contains mitigation measures to prevent any adverse effects to Ute-ladies'-tresses, including:

- If construction does not begin before late July or early August 2011, Reclamation or its contractors will conduct a reconnaissance survey for Ute ladies'-tresses in the wetland area approximately 2,300 feet downstream of the dam and on the west side of the South Fork of the Snake River. This survey will be conducted between late July and the end of August 2011. If any plants are found during this survey, Reclamation will coordinate with the USFWS to determine an appropriate course of action that protects the plant yet allows construction to continue.
- If construction begins in 2011 before the flowering period for Ute ladies'-tresses, Reclamation will fence the area of potential habitat to ensure that equipment and people do not encroach into the area. Reclamation can perform a survey of the fenced area during late July/August and remove the fencing if no Ute ladies'-tresses are found. If any plants are found during this survey, Reclamation will coordinate with the USFWS to determine an appropriate course of action that protects the plant, yet allows construction to continue.

Since Ute ladies'-tresses are not known to occur within 9 miles of the project area, and because Reclamation will conduct surveys for Ute ladies'-tresses prior to any construction activities to ensure construction activities will not impact the species, Reclamation has determined that Alternative D will have no effect on threatened or endangered species in, or adjacent to, the project area.

3.9 Soils and Geology

3.9.1 Affected Environment

The project area is located along the South Fork of the Snake River, where it transitions from a narrow canyon surrounded by mountains to Swan Valley, which is a large floodplain. The alluvial deposits, which flank both sides of the Snake River downstream of the dam, are flanked by volcanic deposits, such as rhyolite flows and tuffs, and by sedimentary rock formations that make up the Caribou Range on the south side of the river and the Snake River Range to the north. Fault lines in this area run parallel to the river. The Snake River Fault, which is a normal fault, crosses through the project area on the west side of the dam near the two alignment alternatives for the bridge crossing. The Grand Valley Fault, which runs parallel to the Snake River Fault, is located north of the project area.

The only alternative that would involve construction on natural ground would be Alternative D, which would involve construction of a bridge downstream of the dam and improving existing Forest Service roads on the west side of the Snake River to maintain access to recreation areas on the west side of Palisades Dam. The bridge itself would be located along alluvial material, which consists of gravel and cobbles to a depth of at least 60 inches. The soils within the alignment options, which would be located along the hillside to the west of the bridge, consist of loams ranging from silt to very gravel. The parent material of these soils is alluvium and/or colluvium, loess, and volcanic ash.

3.9.2 Environmental Consequences

3.9.2.1 *Alternative A: No-Action*

No environmental consequences would result from the No Action Alternative. As described in Section 3.1.1, the Calamity Landslide near the west dam abutment area currently has no controls installed and could progress or a catastrophic failure could occur and affect the use of Bear Creek Road.

3.9.2.2 *Alternatives B, C, and E*

Alternatives B (Widen Dam Crest), C (Raise Dam Crest), and E (Median Barrier) would only involve construction along the crest of the dam, which consists of imported structural fill. No native soils or geologic deposits would be affected by these alternatives. As described in Section 3.1.1, the Calamity Landslide could progress or a catastrophic failure could occur and affect the use of Bear Creek Road.

3.9.2.3 *Alternative D: Downstream Water Crossing*

Alternative D, which involves construction of a bridge downstream of Palisades Dam and improving existing USFS roads to maintain access to the west side of the reservoir, would cause minor disturbance of native soils. These roads, currently about 18 to 20 feet wide, would have to be widened to 28 feet. Since the roads already exist, it is not anticipated that soil drainage would be significantly impacted.

The geologic setting and potential for seismic activity would need to be addressed in the design of the bridge. The estimated seismic acceleration at the bridge site is ~10 percent of gravity (equivalent to a magnitude of 5 – 6 on the Richter scale). Based on research into the potential for seismic activity in the area, the bridge design would be based on a seismic event with a 7 percent probability of exceedance in 75 years (this corresponds to a return period of 1,000 years).

This alternative would remove traffic from the segment of Bear Creek Road that passes through the Calamity Landslide. Traffic would be unaffected if the landslide progressed.

3.9.3 Mitigation

No mitigation is required for any of the alternatives since they would not affect soils and geology in the area.

3.10 Water Quality

3.10.1 Affected Environment

Water quality of Palisades Reservoir, the South Fork of the Snake River, and creeks that flow into the reservoir is managed by the State of Idaho under the framework of the Clean Water Act (CWA). Idaho has established water quality standards for specific physical and chemical parameters to provide suitable conditions to support beneficial uses, including irrigation water supply, public water supply, recreation, and aquatic life (DEQ 2009). Table 3-4 summarizes the designated beneficial uses of Palisades Reservoir, the South Fork of the Snake, and Bear Creek.

Table 3-4. Beneficial Uses of Water Bodies in the Project Area

Water Body	Designated Beneficial Uses
Palisades Reservoir and South Fork of the Snake River – Palisades Reservoir Dam to Fall Creek	Cold-water communities, salmonid spawning, primary contact recreation, domestic water supply, special resource water, agricultural and industrial water supply, wildlife habitats, aesthetics
Bear Creek – North Fork of Bear Creek to Palisades Reservoir	Cold-water communities, salmonid spawning, primary contact recreation, domestic water supply, special resource water, agricultural and industrial water supply, wildlife habitats, aesthetics; protected for all recreational uses and the propagation of fish, shellfish, and wildlife, wherever attainable

Section 303(d) of the CWA requires states and tribes to identify water bodies that do not meet water quality standards. States and tribes must publish a list of these impaired waters every 2 years. Idaho's most recent approved 303(d) list is contained in its 2008 Department of Environmental Quality Working Principles and Policies for the 2008 Integrated (303[d]/305[b]) Report (DEQ 2009). The Idaho DEQ is currently working to adopt its 2010 integrated report, but the 2008 report will continue to guide the state's water quality management decisions until the 2010 report is approved by U.S. Environmental Protection Agency (EPA). For lakes, rivers, and streams identified on this list, states and tribes must develop water quality improvement plans known as total maximum daily loads (TMDLs), which establish the amount of a pollutant a water body can carry and still meet water quality standards.

The 2008 Integrated Report places all of the state's waters into one of five categories.

- Category 1 waters are attaining water quality standards and no uses are threatened.
- Category 2 waters are attaining some designated uses, and no uses are threatened, but there is insufficient (or no) data and information available to determine if the remaining uses are attained or threatened.
- Category 3 waters have insufficient data (or no data) and information to enable determining if designated uses are being attained.
- Category 4 waters do not support (or threaten) a standard for one or more designated uses, but they do not require the development of TMDL. This category has the following three subcategories :
 - Category 4a waters have had a TMDL completed and approved by EPA.
 - Category 4b waters have had pollution control requirements placed on them (other than a TMDL) and are reasonably expected to attain the water quality standard in the near future.
 - Category 4c waters do not meet the water quality standard for reasons other than pollution.
- Category 5 waters do not meet (or threaten) applicable water quality standards for one or more designated uses by one or more pollutants. Category 5 water bodies make up the 303(d) list of impaired waters.

According to the 2008 Integrated Report, the EPA approved a TMDL for Bear Creek from the North Fork of Bear Creek to Palisades Reservoir for sedimentation/siltation in 2001. The assessment unit that includes this reach of Bear Creek has since been delisted. Bear Creek is still identified as a Category 5 water for combined biota/habitat bioassessments and is thus considered to be an impaired water body.

The 2008 Integrated Report identifies the South Fork of the Snake River as a Category 4c water because of other flow regime alterations and a Category 5 water because of combined biota/habitat bioassessments and sedimentation/siltation. A TMDL was previously prepared for creeks that are part of the South Fork of the Snake River assessment unit. This reach of the river was not one of the affected water bodies to which the TMDLs apply.

Federal law is reinforced through the state regulations. DEQ has established water quality criteria (IDAPA 58.01.02, Section 200) that identify specific benchmarks that describe the quality of water needed to support beneficial uses. These criteria can be numeric (parameter-specific) or narrative. Numeric criteria are use-specific, while narrative criteria are general, applying to all waters irrespective of use. Idaho's antidegradation policy (IDAPA 58.01.02, Section 05) states that the designated uses and level of water quality necessary to protect those uses must be maintained and protected.

The USFS administers the use of most of the dirt and gravel access roads in the project area. The USFS and State of Idaho have an MOU specifying that the USFS is responsible for implementing nonpoint source pollution control measures during all management activities such as those associated with road maintenance. The USFS also has a policy to maintain or improve water quality.

3.10.2 Environmental Consequences

3.10.2.1 Alternative A: No-Action

The No-Action Alternative would not involve construction so it would not affect water quality of Palisades Reservoir, the South Fork of the Snake River, or Bear Creek.

3.10.2.2 Alternatives B, C, and E

Construction activities associated with Alternatives B (Widen Dam Crest), C (Raise Dam Crest), and E (Median Barrier) would be focused on the Palisades Dam. Because each of these alternatives would disturb at least 1 acre of ground, construction activities would have to comply with the terms and conditions of Idaho's National Pollutant Discharge Elimination System (NPDES; pursuant to Clean Water Act Section 402) general permit for stormwater discharges from construction sites.

This permit outlines provisions construction operators must follow to comply with requirements of the NPDES stormwater regulations. The requirements include preparation of a stormwater pollution prevention plan (SWPPP) that would contain water quality protection best management practices (BMPs) that would be used during construction to ensure that stormwater discharges do not affect the reservoir or the river. Because these alternatives are not near Bear Creek, construction activities would not affect that watercourse.

Alternatives B, C, and E would not directly affect any roads under the jurisdiction of the USFS. However, because Forest Road 076 connects to the road across the dam crest, the BMPs developed as part of the SWPPP would address USFS requirements and policy for protecting water quality.

3.10.2.3 Alternative D: Downstream Water Crossing

Construction of Alternative D would disturb more than 1 acre of ground, so construction activities would have to comply with the terms and conditions of the Idaho's NPDES general permit for stormwater discharges from construction sites described above.

Recognizing the potential for continued or accelerated degradation of the Nation's waters, the U.S. Congress enacted the Clean Water Act, formerly known as the Federal Water Pollution Control Act (33 U.S.C. 1344). The objective of the Clean Water Act is to maintain and restore the chemical, physical, and biological integrity of the waters of the United States. Section 404 of the Clean Water Act authorizes the Secretary of the Army, acting through the Chief of Engineers, to issue permits for the discharge of dredged or fill material into the waters of the United States, including wetlands. An application for permit will need to be completed and submitted to the local USACE office. Reclamation will need to meet the Corps application requirements and obtain either a Nationwide Permit or an individual permit for the Project, prior to construction. This is discussed in greater detail below.

In addition, if Reclamation selects Alternative D, two additional State of Idaho permits will be required prior to the initiation of construction activities. Work in all continuously flowing streams within the State of Idaho requires a Stream Alteration permit from the Idaho Department of Water Resources, unless the work is exempted. This is required by the Stream Channel Protection Act (Title 42, Chapter 38, Idaho Code), which may be obtained from the Idaho Department of Water Resources. All encroachments into lakes and reservoirs within the State of Idaho require a Lake Encroachment permit from the Idaho Department of Lands. This is required by the Idaho Lake Protection Act (Section 58-142 et. Seq., Idaho Code), and may be required for in-channel construction activities below Palisades Dam.

Alternative D includes modifications to existing access roads that are managed by the USFS.

3.10.3 Mitigation

No mitigation is required for these alternatives since Alternatives A, B, C, and E would not affect water quality.

The following measures would apply to Alternative D, Downstream Water Crossing, to ensure coordination with the USFS:

- Reclamation or its contractors will work with representatives of the Caribou-Targhee National Forest during final design of the water crossing access roads that are subject to USFS regulation and policy. This partnership will ensure that the design meets USFS standards and that it complies with USFS water quality policy.
- Reclamation or its contractors will work with representatives of the Caribou-Targhee National Forest to develop a project SWPPP. The SWPPP will meet the requirements of the state's general NPDES permit for stormwater discharges, the terms of the USFS and State of Idaho MOU for nonpoint source pollution control, and USFS policy.
- Reclamation, or its contractors will work with the USACE, Idaho Department of Water Resources and Idaho Department of Lands to comply with the respective regulatory mechanisms and obtain the appropriate permits prior to construction activities.

3.11 Wetlands and Other Waters of the United States, Riparian Areas, and Floodplains

3.11.1 Affected Environment

The project area supports three basic categories of waters that are probably waters of the United States as defined by the CWA: wetlands, perennial stream, and open water. The National Wetlands Inventory (NWI) shows that there are some wetland areas along the South Fork of the Snake River downstream of the dam (see Figure 3-8).

Review of current aerial photography and a site visit to the area confirm that these wetland areas are present and intact. The project team did not verify that the wetland areas are subject to jurisdiction under Section 404 of the CWA, but these areas appear to have the three parameters that are used to define wetlands under the CWA (wetland soils, wetland vegetation, and appropriate hydrology).



Figure 3-9. Photo shows willow patch along the South Fork of the Snake River below the Palisades Dam

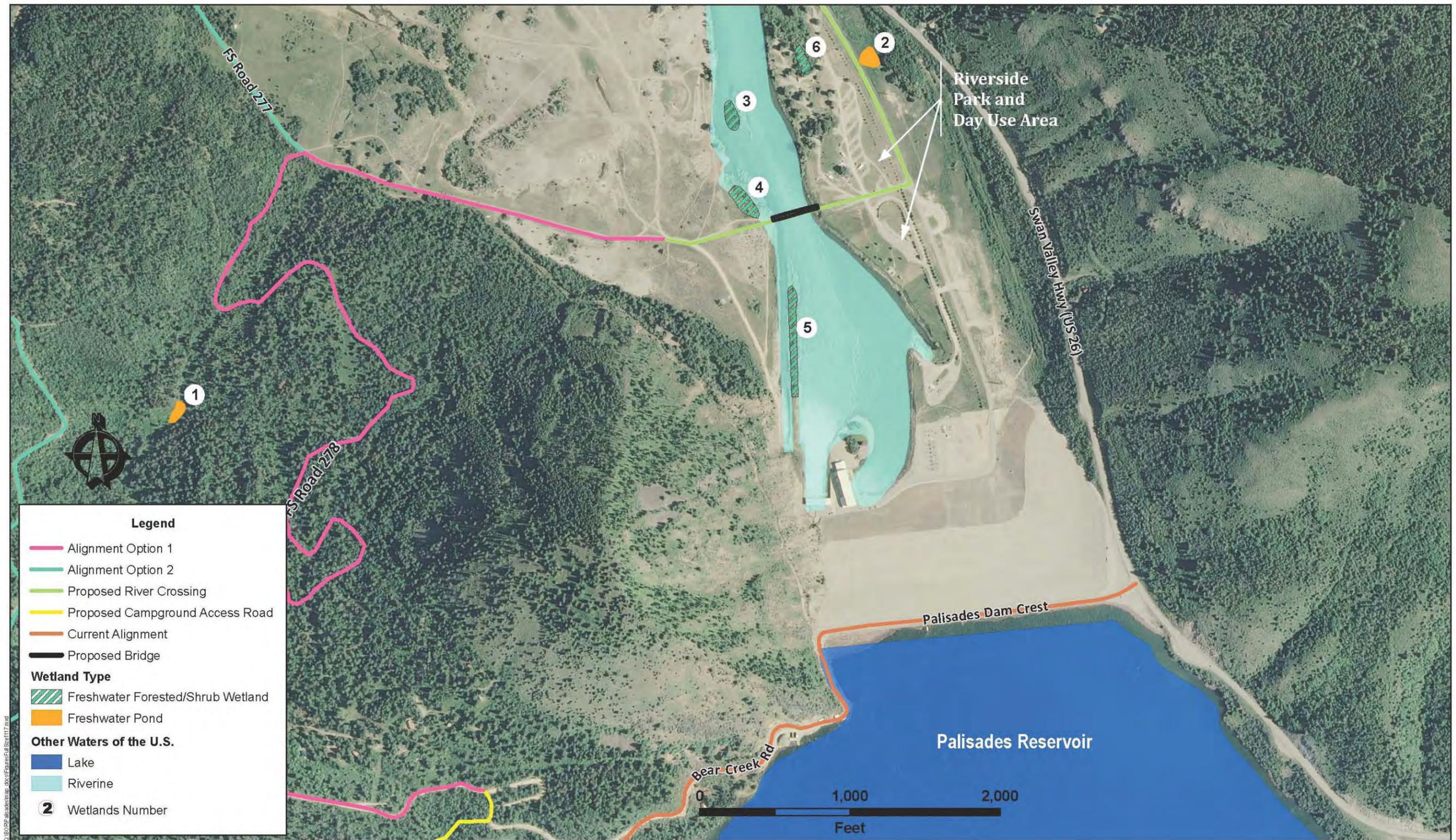
Table 3-5 summarizes the size of the NWI-mapped wetland features in the project area. Perennial streams in the project area include the South Fork of the Snake River and Bear Creek; Palisades Reservoir can be classified as open water. Seasonal streams include Tag Alder Creek, Russel Creek, and Dry Gulch, which are located where the alignments for the bridge alternative are evaluated.

The reach of the South Fork of the Snake River does not support extensive riparian areas. Patches of low-growing riparian vegetation dominated by willow species are present along the river (see Figure 3-9). These areas are fragmented and typically include non-native species. Periodic high flows and human-caused disturbance have probably prevented these areas from increasing in size.

Table 3-5. Summary of National Wetlands Inventory-Mapped Wetlands in the Project Area

Identifier ¹	Wetland Type	Size (acres)
1	Freshwater pond	0.21
2	Freshwater pond	0.32
3	Freshwater Forested/Shrub Wetland	0.33
4	Freshwater Forested/Shrub Wetland	0.50
5	Freshwater Forested/Shrub Wetland	0.82
6	Freshwater Forested/Shrub Wetland	0.26

¹ Identifier matches numbers on Figure 3-8.



Disclaimer: This map is intended for general informational and planning purposes only. The Bureau of Reclamation makes no warranty, expressed or implied, as to the completeness, accuracy, or utility of these data and will in no event be liable for their use beyond the above expressed purpose.
 Data Sources: Inside Idaho, Bureau of Reclamation, USDA/NRCS Digital Gateway, U.S. Fish & Wildlife Service (National Wetlands Inventory)
 Map Date: December, 2010

RECLAMATION
 Managing Water in the West

Note: National Wetlands Inventory (NWI) wetlands shown. These were delineated prior to 1980 and may not match current conditions or current mapping accuracies. Formal wetlands delineation has not been conducted.

Figure 3-8. Project Area Wetlands
 Palisades Dam Security Enhancement Project

The Federal Emergency Management Agency (FEMA) has mapped a Zone A floodplain along the South Fork of the Snake River downstream of the Palisades Dam (FEMA FIRM Community Panel 1600270320 C). Zone A areas are subject to inundation by the 1-percent-annual-chance flood event (100-year flood), which is generally determined using approximate methodologies. Zone A areas do not have assigned base flood elevations or flood depths because detailed hydraulic analyses have not been performed.

Based on the map, the 100-year flood event will be contained by the main channel of the river. The outlet works capacity of Palisades Dam is 33,000 cubic feet per second (cfs). The 100-year flood event was estimated at 53,460 cfs. Flood conditions would only occur when the reservoir is surcharged and water discharges over the spillway. To date, the maximum discharge recorded below Palisades Dam was 40,400 cfs, which occurred June 19, 1997.

3.11.2 Environmental Consequences

3.11.2.1 *Alternative A: No Action*

The No-Action Alternative would not involve construction so it would not affect any waters of the U.S., riparian vegetation, or floodplains.

3.11.2.2 *Alternatives B, C, and E*

Construction of Alternatives B (Widen Dam Crest), C (Raise Dam Crest), and E (Median Barrier) would focus on the dam crest area and would not affect the South Fork of the Snake River, Bear Creek, or wetlands downstream of the dam. Construction activity would be near the Palisades Reservoir but would not directly affect this water body. Construction of any of these alternatives would not require removal of any riparian vegetation.

3.11.2.3 *Alternative D: Downstream Water Crossing*

Alternative D would include construction of a bridge across the South Fork of the Snake River, which would require improving existing USFS roads to maintain adequate access to areas west of the dam and reservoir. The west abutment of the bridge would be constructed near a small Freshwater Forested/Shrub Wetland (identified as Wetland 4 on Figure 3-8). Depending on the exact location of the bridge and its approaches, this 0.50 acre wetland could be impacted by the footprint of the bridge or it could be impacted by nearby construction activities. Construction of bridge abutments and piers would require the discharge of fill material below the ordinary high water line of the river into the lotic wetlands shown on Figure 3-8. Therefore, permits will be required, as previously discussed.

The bridge (see Figure 2-5, Chapter 2) would be designed to provide 2 feet of freeboard (bottom of beams to top of water surface) above the 100-year flow water surface elevation of 5,384 feet above mean sea level. Two 5-foot-diameter piers would be constructed within the stream channel of the river, but would not influence the flow regime to cause flooding upstream or downstream of the bridge. Collection of debris around the piers could reduce the discharge capacity of the Palisades Dam and result in flooding during a high discharge event.

3.11.3 Mitigation

No mitigation is required for Alternatives A, B, C, and E since they would not affect wetland and other waters of the United States, riparian areas, and floodplains.

The following measures would apply to Alternative D, Downstream Water Crossing:

- Reclamation or its contractors will determine the total direct impacts (footprint over portions of a wetland and fill volume) and/or indirect impacts (construction activities) to the river and Wetland 4 (shown in Figure 3-8) that would be caused by construction of the new bridge. Reclamation will obtain a Clean Water Act Section 404 Nationwide Permit from the U.S. Army Corps of Engineers (USACE). If mitigation for permanent wetland impacts is required, Reclamation would prepare a mitigation plan for USACE outlining the appropriate compensation measures and implementation plan.
- Following completion of construction, Bonneville County would conduct regular inspection of the bridge and perform maintenance to prevent the accumulation of debris against the structure.

3.12 Terrestrial Vegetation and Noxious Weeds

3.12.1 Affected Environment

3.12.1.1 Terrestrial Vegetation

The section of the Caribou-Targhee National Forest that surrounds the Palisades Reservoir, called the Caribou Range Mountains subsection, is approximately 60 percent forested and 40 percent nonforested. The primary forest types in the general area are aspen (about 31 percent) and mixed lodgepole and Douglas fir (about 47 percent). Forested areas are interspersed with sagebrush, grass/forb meadows, and shrublands, which provide for good diversity of plant species (see Figure 3-10).

Age class diversity of the forest is limited. About 99 percent of the conifer forests are in mature or older seral stages. Douglas fir is becoming more predominant as it encroaches on stands of lodgepole pine, aspen and shrubs. Most of the shrublands are also in late seral stages (USFS 1997). The area around the Palisades Dam is dominated by Douglas fir with an understory of snowberry (*Symphoricarpos longiflorus*), Oregon grape (*Mahonia repens*), huckleberry (*Vaccinium* sp.) and native grasses.

The South Fork of the Snake River supports some cottonwood stands, most of which are in mature age classes due to lack of disturbance that they need to regenerate. Historic disturbance through flooding has been interrupted since construction of Palisades Dam (USFS 1997). The only large stand of cottonwood trees near the project area is located downstream of the Riverside Campground on the east side of the river. Both river banks in the project area support patches of native willows.

3.12.1.2 Noxious Weeds

The Idaho State Department of Agriculture recognizes several cooperative weed management areas (CWMAs) in Idaho. The project area is in two CWMAs: the Upper Snake CWMA, roughly north of the

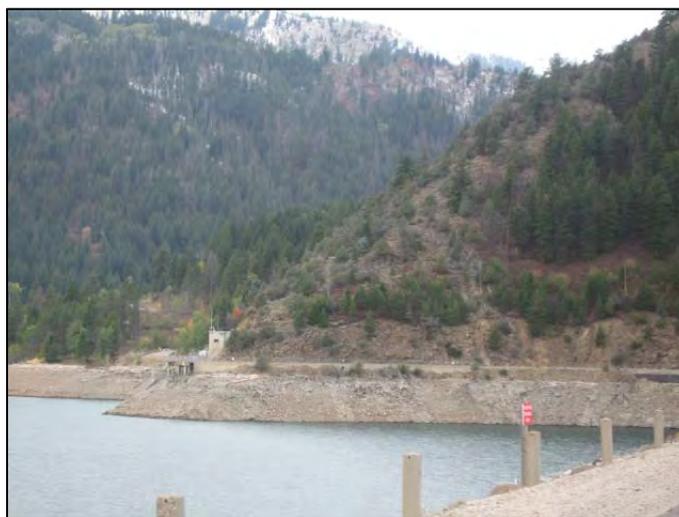


Figure 3-10. Photo shows conifer forest interspersed with shrubby vegetation, looking west from the Palisades Dam.

Palisades Dam, and the Highlands CWMA, south of the dam. CWMA's share funds, equipment, staff, and ideas across jurisdictional boundaries in a coordinated and cooperative weed-fighting strategy.

Noxious weeds of concern in the Upper Snake CWMA include leafy spurge, spotted knapweed, diffuse knapweed, Russian knapweed, Canada thistle, musk thistle, plumeless thistle, hoary cress, dalmation and yellow toadflax, purple loosestrife, dyer's woad, Rush skeletonweed, hound's tongue, and tamarisk (USRCWM, no date). Noxious weeds of concern in the Highlands CWMA include dyer's woad, leafy spurge, perennial pepperweed, yellow toadflax, Canada thistle, musk thistle, hoary cress, hound's tongue, and tamarisk (Highlands CWMA, no date).

Weedy species are present in disturbed areas such as along roadsides, at recreation sites, and at the dam site. The Caribou-Targhee National Forest is currently included in a forest weed-control project (USRCWMA, no date).

3.12.2 Environmental Consequences

3.12.2.1 No Action Alternative

No vegetation would be disturbed under the No-Action Alternative. Existing noxious weed communities would remain and would be subject to management through the CWMA's.

3.12.2.2 Alternatives B, C, and E

Work associated with Alternatives B (Widen Dam Crest), C (Raise Dam Crest), and E (Median Barrier) would be focused on Palisades Dam and would not result in removal of any native vegetation.

3.12.2.3 Alternative D: Downstream Water Crossing

Alternative D would result in minor vegetation disturbance associated with construction of the bridge approach roads and the bridge, and modifications to existing dirt and/or gravel roads.

The bridge approach roads would be constructed in areas that have previously been disturbed and are sparsely vegetated. Although these areas are sparsely vegetated, noxious weed infestations are an annual occurrence; particularly on the west side of the river in the borrow area identified on Figure 2-3. Construction would require removal of non-native grasses such as reed canarygrass (*Phalaris arundinacea*), cheatgrass (*Bromus tectorum*), and forbs, and native shrubs such as willow. Post-construction restoration of disturbed upland areas would include seeding with a weed-free native seed mix.

Roadside areas that would be disturbed to improve the proposed access roads support a combination of native trees, shrubs, forbs, and non-native grasses and forbs. Construction activity along these roads would remove all types of vegetation. The existing roads, which are between 18 and 20 feet wide, would be widened to about 28 feet. Table 3-6 summarizes the expected area of impact associated with construction and modifications to the access road options.

Table 3-6. Estimated Roadside Disturbance Associated with Alternative D

Road Segment	Road Segment Length (miles)	Roadside Area Disturbed (acres) ¹
Option 1: FR 278 to FR 076 to Campground (including bridge approach)	3.6	3.6
Option 1: FR 278 to FR 076 to Campground (excluding bridge approach)	3.0	2.9
Option 2 FR 076/Snake River Road to Campground (including bridge approach)	5.5	5.3
Option 2: FR 076/Snake River Road to Campground (excluding bridge approach)	4.8	4.6

¹ Assumes existing road width is 18 to 20 feet and proposed roads would be two 12-foot wide lanes with 2-foot shoulders (28-foot total width). Disturbed area is then between 8 and 10 feet along the road segment length (no difference if calculated to tenth of an acre).

3.12.3 Mitigation

The following measure applies to all alternatives:

- To ensure that existing populations of noxious weeds do not spread and that new populations are not introduced during construction, Reclamation or its contractors will ensure that equipment brought to the site is free of noxious weed seed, use weed-free straw, and clean all equipment before taking it off site to prevent the spread to other areas.
- Following extraction of materials from the borrow area identified on Figure 2-3, Reclamation will work with Bonneville County Weed Control and Caribou-Targhee National Forest weed control personnel to treat and re-seed the borrow area to prevent or minimize future noxious weed infestations in this area.

The following measures apply to Alternative D, Downstream Water Crossing:

- Post-construction restoration of disturbed upland areas will include seeding with a weed-free, locally-adapted seed mix. Areas around the bridge site and along the river will also be seeded with a weed-free, locally-adapted seed mix and will include plantings of willow cuttings.

3.13 Visual Resources

3.13.1 Affected Environment

The purpose of the visual quality analysis is to identify and document positive and negative visual impacts that may result if one of the project alternatives is implemented. Visual impacts are addressed based on distance zones – foreground, middleground, and background – which are used to describe distance relationships between an observer and visual resources. The distinguishing characteristic that separates these three zones is the relative amount of detail that is normally perceived by viewers.

Most of the landscape near bridges, dams, and roadways is either foreground or middleground. Foreground is the view to a distance of about 1/4 mile (all visual patterns in the foreground are easily seen), and middleground is the view from 1/4 to 3 miles away (line, form and color are easily seen, but the texture of visual objects is not perceptible).

3.13.1.1 General Landscape Character

Generally, the existing landscape is significantly disturbed throughout the project area (see Figures 3-11 to 3-13). Distinct alterations in the viewshed include the dam embankment across the Snake River, a powerhouse and operations offices at the base of the dam, US Highway 26, Riverside Campground and day use area, Calamity Campground and boat ramp, Tissue Point boat ramp, a borrow area and borrow piles used by Reclamation for its maintenance operations, existing forest access roads, and summer homes.



Figure 3-11. Photo shows view looking upstream at downstream face of the Palisades Dam embankment.



Figure 3-12. Photo shows Riverside Campground and day use area from the top of the Palisades Dam embankment.



Figure 3-13 Photo shows Calamity boat ramp looking from edge of the Palisades Reservoir.

3.13.2 Environmental Consequences

3.13.2.1 *Alternative A: No Action*

Alternative A would not affect any views of or from the project area. Users of the road would continue to experience the same landscape views and the road across the dam crest would remain open except during a high security alert or temporary closure of the dam due to a specific threat.

3.13.2.2 *Alternatives B, C, and E*

Under Alternatives B (Widen Dam Crest), C (Raise Dam Crest), and E (Median Barrier) work would be confined to the existing dam crest, resulting in minor short-term visual impacts during the construction period. Views from the dam crest would remain the same following construction. Construction impacts would include a short-term increase in dust in the project area, visual contrasts of construction equipment working on the dam crest and hauling borrow materials from the borrow area downstream of the dam, and short-term land disturbance in the borrow area.

3.13.2.3 *Alternative D: Downstream Water Crossing*

Alternative D includes construction of a new bridge across the South Fork of the Snake River downstream of the dam. Two sets of bridge piers would be constructed in the river. Travelers along US-26 would see the bridge structure in the foreground and middleground distance zones. The bridge would be visible in the foreground from Riverside Campground and day use area and for people fishing along the banks of the Snake River below the dam.

3.13.3 Mitigation

No mitigation would be necessary for alternatives A, B, C, and E since they would not adversely affect the overall visual quality.

The following measures apply to Alternative D, Downstream Water Crossing:

- Establish vegetation on cut-and-fill slopes to reduce color and texture contrasts.
- Establish riparian vegetation in areas adjacent to the bridge to match existing vegetation patterns and provide horizontal and vertical diversity.
- Establish vegetation along roads connecting to the bridge to match adjacent vegetation.
- Control noxious weeds and re-seed the borrow area identified in Figure 2-3.
- Paint bridge components to match the surrounding environment.

3.14 Cumulative and Indirect Impacts

NEPA regulations define cumulative impacts as impacts that result from “the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (Federal or non-Federal) or person undertakes such actions.”

At this time the magnitude of future modifications and associated impacts and mitigation are unknown. The alternatives presented in this EA are developed to address security vulnerabilities along the dam crest.

Alternative D, which includes construction of a bridge downstream of Palisades Dam, would result in incremental impacts to recreation areas and nearby USFS roads. It also could have cumulative impacts as traffic to the west side of the river and reservoir shifts from the dam crest to a new road alignment that will intersect the Riverside Campground and day use area and continue along the alignments described in Section 2.2.2.3. Any potential future recreational development on the west side of the reservoir could result in additional noise and dust along the new alignments, which would be necessary to maintain access to the west side of the reservoir.

People may also change their preferred camping location or access the reservoir using a different boat ramp to avoid traveling on gravel roads, which could shift plans for additional recreational opportunities or improvements to the east side of the reservoir. Future residential development, including summer homes on the west side of the reservoir, is expected. However, it is unknown whether development of this area will result in cumulative impacts in the reasonably foreseeable future since the scope, timing, and details of development and severity of impacts are unknown and unquantifiable at this time.

NOTE: Table 3-7 on the following pages summarizes Palisades Dam Security Enhancement Project impacts and mitigation measures by alternative.

Table 3-7. Summary of Palisades Dam Security Enhancement Project Impacts and Mitigation Measures by Alternative

Subject	Alternative B: Widen Dam Crest	Alternative C: Raise Dam Crest	Alternative D: Downstream Water Crossing	Alternative E: Median Barrier
Transportation and Access				
IMPACTS	The reconstructed dam road would accommodate the same amount of traffic as it did before construction. Temporary traffic delays during construction, but access to the west side of the dam would be maintained.	Same as Alternative B.	The construction of a bridge downstream of the dam would require access routes that would increase travel distances and would therefore result in increased maintenance requirements to the local road system	Same as Alternative B.
MITIGATION	Reclamation will coordinate with Bonneville County and USFS to determine an appropriate maintenance plan if the road across the Palisades Dam is closed as a result of a security threat for an extended period of time to ensure roads are properly maintained to mitigate the additional wear and tear to local alternate roads.	Same as Alternative B.	Reclamation would work closely with the USFS to establish a maintenance agreement for the new access roads.	Same as Alternative B.
Recreation				
IMPACTS	Temporary closures of the road across the crest of Palisades Dam as a result of high security alerts continue to be possible, which would require recreationists to use detours to gain access to recreation sites on the west side of the dam.	Same as Alternative B.	Access under this option to recreation sites on the west side of the reservoir would increase by 2.5 to 4.4 miles. The eastern bridge approach would encroach into the southern end of a recreational site and result in the loss of one day use site and possibly require the relocation of entrance signage.	Same as Alternative B.

Subject	Alternative B: Widen Dam Crest	Alternative C: Raise Dam Crest	Alternative D: Downstream Water Crossing	Alternative E: Median Barrier
MITIGATION	None proposed	None proposed.	Reclamation is evaluating mitigation options for the impact to the day use site. No definitive mitigation has been proposed.	None proposed.
Cultural Resources				
IMPACTS	Could cause visual effects as well as effects on the integrity of the historic nature of the structure.	Same as Alternative B.	Same as Alternative B.	Could change the setting, materials, and feeling and association of the informally NRHP-eligible dam site.
MITIGATION	Prior to beginning construction, Reclamation will complete consultation with the Idaho SHPO to determine if the proposed action would adversely affect the Palisades Dam site. If the parties agree that the proposed action would result in adverse effects, then they will develop an MOA that provides detail on how Reclamation will mitigate the expected effect. The MOA might include a requirement to provide additional documentation in the form of preparation of an NRHP nomination, Historic American Engineering form, photography and historic research of the dam.	Same as Alternative B.	Prior to beginning construction, Reclamation will complete a cultural resources reconnaissance survey of the construction area. The results of this survey would be transmitted to the Idaho SHPO along with a determination of effect. If the proposed action is not likely to adversely affect an NRHP-eligible resource, then no further action is required. If Reclamation and the SHPO find that the proposed action could adversely affect an NRHP-eligible resource, then the parties would develop an MOA to address the potential effects.	Same as Alternative B.
Economics				
IMPACTS	Construction of any of the build alternatives could result in short-term employment opportunities. If the labor supply is provided locally, construction could result in a temporary economic benefit to local communities.	Same as Alternative B.	Same as Alternative B. Plus: Increased travel distance would result in additional but minor trip costs.	Same as Alternative B.

Subject	Alternative B: Widen Dam Crest	Alternative C: Raise Dam Crest	Alternative D: Downstream Water Crossing	Alternative E: Median Barrier
MITIGATION	None proposed.	None proposed.	None proposed.	None proposed.
Environmental Justice				
IMPACTS	Any impacts associated with the No Action or action alternatives would affect persons of all races and ethnicities and incomes in the same manner and would not result in any disproportionately high and adverse impacts on environmental justice populations.	Same as Alternative B.	Same as Alternative B.	Same as Alternative B.
Indian Trust Assets				
IMPACTS	The proposed action alternatives would not affect tribal hunting or fishing in the area and would not impact the storage capacity or power generation at Palisades Dam.	Same as Alternative B.	Same as Alternative B.	Same as Alternative B.
MITIGATION	None proposed.	None proposed.	None proposed.	None proposed.
Fish and Wildlife				
IMPACTS	Terrestrial wildlife in the area might be temporarily disturbed during construction. The types of wildlife that would use areas near the dam are common and most would probably avoid the area during construction.	Same as Alternative B.	Temporary impacts to fish and wildlife are expected during construction of the bridge abutments, piers, and improvements to the access road. Minimal permanent habitat impact associated with widening the access roads and the footprint of the bridge.	Same as Alternative B.

Subject	Alternative B: Widen Dam Crest	Alternative C: Raise Dam Crest	Alternative D: Downstream Water Crossing	Alternative E: Median Barrier
MITIGATION	None proposed.	None proposed.	Reclamation or its contractors will complete a survey for nesting migratory birds no sooner than 90 days before the start of any disturbance activity. This measure applies to areas along such access roads that would need to be cleared. If active nests are found, the nests and adjacent vegetation up to 20 feet away would be avoided until after the young have fledged.	None proposed.
Threatened and endangered Species				
IMPACTS	Construction would focus on the dam and not disturb adjacent areas that might support any threatened or endangered species.	Same as Alternative B.	Potential impacts to Ute ladies'-tresses in the small wetland area on the west side of the river near the abutment of the proposed bridge.	Same as Alternative B.
MITIGATION	None proposed.	None proposed.	Reclamation or its contractor will conduct a survey of the wetland area during the flowering season to determine Ute ladies'-tresses presence. If found, Reclamation will work with USFWS to determine appropriate measures to ensure no effect to the species.	None proposed.
Soils and Geology				
IMPACTS	None identified	None identified	Seismic activity could have impacts to the proposed bridge.	None identified
MITIGATION	None proposed.	None proposed.	Bridge would be designed according to standard seismic requirements.	None proposed.

Subject	Alternative B: Widen Dam Crest	Alternative C: Raise Dam Crest	Alternative D: Downstream Water Crossing	Alternative E: Median Barrier
Water Quality				
IMPACTS	Impacts to water quality could occur during construction, which will be focused on the crest of the dam.	Same as Alternative B.	Impacts to water quality could occur during construction of the bridge and widening access roads.	Same as Alternative B.
MITIGATION	Since construction activities will disturb at least 1 acre of ground, construction operators must comply with regulations. This would require the implementation of a project SWPPP and its associated BMPs.	Same as Alternative B.	Same as Alternative B. PLUS: Reclamation should coordinate with the USFS to ensure the design for widening the access roads meets USFS requirements.	Same as Alternative B.
Wetlands and Other Waters of the United States, Riparian Areas, and Floodplains				
IMPACTS	None identified	None identified	Construction of the west bridge abutment could impact a small adjacent wetland and will require the discharge of fill material below the ordinary high-water mark in the Snake River. Wetland habitat will be impacted by the footprint of the bridge and construction activities.	None identified
MITIGATION	None proposed.	None proposed.	Reclamation or its contractors would determine the total direct and indirect adverse impact to the wetland and river. A Section 404 permit would be filed with the USACE and mitigation opportunities would be explored.	None proposed.

Subject	Alternative B: Widen Dam Crest	Alternative C: Raise Dam Crest	Alternative D: Downstream Water Crossing	Alternative E: Median Barrier
Terrestrial Vegetation and Noxious Weed				
IMPACTS	Potential spread of noxious weeds by introducing them with heavy equipment brought on site.	Same as Alternative B.	Potential spread of noxious weeds by introducing them with heavy equipment brought on site or spreading existing weeds that may exist in the area.	Same as Alternative B.
MITIGATION	Reclamation or its contractors would ensure that equipment brought to the site is free of noxious weed seed, would use weed-free straw, and would clean all equipment before taking it off site to prevent the spread to other areas.	Same as Alternative B.	Same as Alternative B. PLUS: Post-construction restoration of disturbed upland areas will include seeding with a weed-free native seed mix. Areas around the bridge site and along the river would also be seeded with a weed-free native seed mix and include some plantings of cottonwood and willow cuttings.	Same as Alternative B.
Visual Resources				
IMPACTS	Would not affect the overall quality of	Same as Alternative B.		Same as Alternative B.
MITIGATION	None proposed.	None proposed.	Establish vegetation on cut-and-fill slopes to reduce color and texture contrasts. Establish riparian vegetation in areas adjacent to the bridge to blend with existing vegetation patterns and provide horizontal and vertical diversity. Establish vegetation along roads connecting to the bridge to blend with adjacent vegetation. Treat noxious weed and re-seed borrow area	None proposed.

Subject	Alternative B: Widen Dam Crest	Alternative C: Raise Dam Crest	Alternative D: Downstream Water Crossing	Alternative E: Median Barrier
Cumulative and Indirect Impacts				
IMPACTS	None identified	None identified	None identified	None identified
MITIGATION	None proposed.	None proposed.	None proposed.	None proposed.

Chapter 4: Consultation and Coordination

4.1 Summary of Public and Agency Involvement

4.1.1 News Briefs and Other Sources of Project Information

Reclamation first announced security vulnerabilities and the need for security mitigation at Palisades Dam in a news release on July 16, 2008. In this news release, Reclamation identified potential security threats that could jeopardize the dam's safety. Reclamation published a news release announcing the public scoping open house on its website on October 1, 2009 (Reclamation 2009a) and distributed the news release to local news providers. A PowerPoint presentation given at the public scoping meeting was published on the website on October 8, 2009 (Reclamation 2009b). Finally, Reclamation's website contains additional information about the proposed security enhancements at dams in Idaho, including Palisades Dam (Reclamation 2010).

Following the October 1, 2009, news release, an article was published in local newspapers, including the Idaho Falls Post Register, describing the need for security measures, announcing the public open house, and providing information about other opportunities for public and agency involvement.

Reclamation typically issues news releases when environmental documents are available for review and comment. Such news releases are published on Reclamation's website.

4.1.2 Scoping Letter

Reclamation mailed a scoping letter introducing the Palisades Dam Security Enhancement Project and requesting input on September 29, 2009, to the local public, Federal, state and local government officials and other known and potential stakeholders. The scoping letter provides basic project information and asks for comments.

4.1.3 Public Open House

Reclamation hosted a public open house from 7:00 to 9:00 PM on October 8, 2009, at the Swan Valley High School in the community of Irwin, Idaho. In addition to the public representatives for the Bonneville County Sheriff's Office, the local Fire Department, Senator Crapo and Senator Risch were present. Details of the meeting are described in Section 1.5 and in Appendix A.

4.2 Agency Consultation and Coordination

Reclamation provided notification of the project to local, state, and Federal agencies through the scoping letter described in Section 4.1.2. In addition, agencies were invited to the public meeting (Section 4.1.3) to learn about the project and to provide input.

Reclamation hosted an agency scoping meeting at the U.S. Forest Service Palisades Ranger District of the Caribou-Targhee National Forest on November 12, 2009, in Idaho Falls. Attendees included representatives from the Ranger District, Bonneville County, Department of Interior Bureau of Land Management (BLM), Idaho Department of Fish and Game (IDFG), and staff from Reclamation and HDR Engineering. Sven Berg from the Idaho Falls *Post Register* also attended the agency meeting.

Palisades Dam is not listed on the National Register of Historic Places (NRHP), nor has the dam site been recorded. However, discussions between the Bureau of Reclamation (BOR) and the Idaho State Historic Preservation Office (SHPO) indicate that the Palisades Dam is a site that would be considered eligible to the NRHP.

4.3 Tribal Consultation and Coordination

As part of this EA, Reclamation requested information from local Native American groups regarding areas or resources of concern to Native Americans in or near the project area. Reclamation did not receive any responses to its inquiries, so it assumes that the site does not contain any sacred sites or other areas of cultural importance to local tribes. Therefore, sacred Native American sites are not considered to be a key resource and are not discussed in this EA.

4.4 Distribution List

A copy of this draft EA was mailed to the following agencies, tribes, organizations and individuals:

4.4.1 Federal Agencies and Elected Officials

- U.S. Fish and Wildlife Service, Snake River Fish and Wildlife Office
- U.S. Environmental Protection Agency, Idaho Operations Office
- U.S. Army Corps of Engineers, Boise Outreach
- U.S. Army Corps of Engineers, Walla Walla District
- Bureau of Land Management, Idaho State Office, Boise
- U.S. Forest Service, Caribou-Targhee National Forest National Forest, Headquarters Office
- U.S. Forest Service, Caribou-Targhee National Forest National Forest, Palisades Ranger District
- Bureau of Indian Affairs, Fort Hall Agency
- Bureau of Homeland Security
- Bonneville Power Administration
- U.S. Senator Mike Crapo
- U.S. Senator Jim Risch
- U.S. Representative Raúl Labrador
- U.S. Representative Mike Simpson

4.4.2 State and Local Agencies and Officials

- Idaho Department of Fish and Game, Directors Office, Upper Snake Region
- Idaho State Historic Preservation Office
- Governor Butch Otter
- State Senator Dean Mortimer
- State Senator Bart Davis
- State Representative Janice McGeachin
- State Representative Erik Simpson
- State Representative Jeff Thompson

- State Representative Russ Mathews
- Bonneville County Commissioners
- Bonneville County Sheriff's Office
- Bonneville Highway District
- Bonneville County Disaster Services
- Mayor of Irwin, Idaho
- Mayor of Swan Valley, Idaho

4.4.3 Tribes

- Shoshone Bannock Tribes
- Northwestern Shoshone Tribe

4.4.4 Non-Governmental Organizations

- Idaho Conservation League
- Idaho Rivers United
- Idaho Wildlife Federation
- Trout Unlimited, Idaho Office
- Fly Fishers of Idaho
- Snake River Cutthroats, Federation of Fly Fishers
- Snake River Audubon Society, Idaho Falls

4.4.5 Individuals and Businesses

Reclamation provided copies of this document to people who requested a copy. The document is also available on Reclamation's web site at http://www.usbr.gov/pn/programs/srao_misc/security/ and can be accessed and downloaded by anyone wishing to have a copy. People who do not have internet access can call John Tiedeman at 208-378-5034 and request a copy or send a request for a copy to Reclamation at:

USDI Bureau of Reclamation
Upper Snake Office
1359 Hansen Ave
Burley, ID 83318-1821

Chapter 5: References

Advanced Hydrologic Prediction Service

-----2010. Snake River near Irwin. <http://water.weather.gov/>. Accessed November 22, 2010

[BLM] Bureau of Land Management

-----2002. Ute Ladies Tresses (*Spiranthes diluvialis*) in Idaho: 1999 and 2000 Status Reports. Technical Bulletin No. 02-1.

[BOR] Bureau of Reclamation

-----2009a. News release announcing scoping open house. Bureau of Reclamation, Pacific Northwest Region webpage (<http://www.usbr.gov/newsroom/newsrelease/detail.cfm?RecordID=30241>). Accessed November 22, 2010.

-----2009b. PowerPoint presentation of the proposed project alternatives from the October 8 scoping open house. Available on the Reclamation website (http://www.usbr.gov/pn/programs/srao_misc/security/palisades/ppt-scopingmtg.pdf). Accessed November 22, 2010.

-----2010a. Enhanced Security Measures at Three Dams in Idaho. Bureau of Reclamation, Pacific Northwest Region webpage (http://www.usbr.gov/pn/programs/srao_misc/security/index.html). Accessed November 22, 2010.

-----2010b. Palisades Dam. [http://www.usbr.gov/projects/Facility.jsp?fac_Name=Palisades Dam](http://www.usbr.gov/projects/Facility.jsp?fac_Name=Palisades%20Dam). Accessed November 22, 2010.

[DEQ] Idaho Department of Environmental Quality

-----2009. Department of Environmental Quality Working Principles and Policies for the 2008 Integrated (303[d]/305[b]) Report. May 22.

[EPA] U.S. Environmental Protection Agency

-----2010. Light-Duty Automotive Technology, Carbon Dioxide Emissions, and Fuel Economy Trends: 1975 Through 2010. November.

[Highlands CWMA] Highlands Cooperative Weed Management Area

-----ND. 2009 End of Year Report.

Idaho Fish and Game

-----ND. Fisheries Management Plan, 2007-2012.

-----2006a. Conservation Plan for the Greater Sage-Grouse in Idaho. July.

-----2006b. Idaho Comprehensive Wildlife Conservation Strategy.

Idaho Governor's Office of Species Conservation

-----2010. List of threatened and endangered species in Idaho. Species.idaho.gov/thr_endgr.html. Accessed November 8, 2010.

Idaho State University

-----2010. Geologic Atlas - Bonneville County.
<http://imnh.isu.edu/digitalatlas/counties/geomaps/geomap.htm>. Accessed November 22, 2010.

Nez Perce Tribe. 1995. Ensuring our Future, Honoring our Past.

Partridge, F.L, K. Frank, and C. Warren. 2001. Threatened and Endangered Species Report. Project E-21-1. Section 6, Endangered Species Act, May 2001. IDFG-01-20.

Shoshone-Bannock Tribes. 1994. Treaty Right Seminar, Pocatello, Idaho, May 18-20. The Shoshone-Bannock Tribes Treaty Rights Seminar Planning Committee.

Taylor, D.W. 2003. Introduction to Physidae (Gastropoda: Hygrophiila); biogeography, classification, morphology. *Revista de Biologia Tropical (International Journal of Tropical Biology and Conservation)*, 51, supplement 1: 1-287.

U.S. Census Bureau

-----2000a. 2000 Census, Summary File 1. Tables P3, P8, and P17.

-----2000b. 2000 Census, Summary File 3. Tables P53 and P87.

-----2008. State and County QuickFacts. Last Revised: Tuesday, 17-Nov-2009. 2006-2008 American Community Survey 3-Year Estimates; Selected Social, Economic, Housing, and Demographic Characteristics in the United States: 2006-2008.

-----2010a. Annual Estimates of the Resident Population for Incorporated Places in Idaho: April 1, 2000 to July 1, 2009 (SUB-EST2009-04-16) (Table 4.). Released June 2010 by the Population Division.

-----2010b. State and County QuickFacts for Bonneville County. 2008. Data derived from Population Estimates, Census of Population and Housing, Small Area Income and Poverty Estimates, State and County Housing Unit Estimates, County Business Patterns, Nonemployer Statistics, Economic Census, Survey of Business Owners, Building Permits, Consolidated Federal Funds Report. Last Revised: Monday, 16-Aug-2010 08:48:52 EDT.

[USDA] U.S. Department of Agriculture

-----2010. NRCS Web Soil Service. <http://websoilsurvey.nrcs.usda.gov/app/WebSoilSurvey.aspx>. Accessed November 22, 2010.

U.S. Energy Administration Information

-----2010. Average gasoline prices for the Rocky Mountain area of the U.S. on November 22, 2010. <http://tonto.eia.doe.gov/oog/info/gdu/gasdiesel.asp>. Accessed November 24, 2010.

[USFS] U.S. Forest Service

-----1997. Revised Forest Plan, Targhee National Forest.

-----2007. Final Environmental Impact Statement, Northern Rockies Lynx Management Direction. March.

[USFWS] U.S. Fish and Wildlife Service

-----2010. Bonneville County, Idaho listed species.
<http://www.fws.gov/idaho/species/IdahoSpeciesList.pdf>. Accessed November 2010.

- 2010a. Gray wolf species profile.
Ecos.fws.gov/speciesprofile/profile/speciesprofile.action?scode=A00D.
Accessed November 8, 2010.
- 2010b. Species profile of the Canada lynx.
<http://ecos.fws.gov/speciesProfile/profile/speciesProfile.action?scode=A073>.
Accessed January 15, 2010.
- 2010c. Grizzly bear recovery information. www.fws.gov/mountain-prairie/species/mammals/grizzly/. Accessed November 8, 2010.
- 2010d. Grizzly bear species profile.
Ecos.fws.gov/speciesprofile/profile/speciesprofile.action?scode=A001.
Accessed November 8, 2010.
- 2010e. Grizzly bear recovery information for the Yellowstone Distinct Population Segment.
www.fws.gov/mountain-prairie/species/mammals/grizzly/yellowstone.htm.
Accessed November 8, 2010.
- 2010f Ute ladies' -tresses species profile.
Ecos.fws.gov/speciesprofile/profile/speciesprofile.action?scode=Q2WA.
Accessed November 8, 2010.
- 2010g. Yellow-billed cuckoo species profile.
Ecos.fws.gov/speciesprofile/profile/speciesprofile.action?scode=B06R.
Accessed November 8, 2010.
- [USGS] U.S. Geological Survey
- 2010. Peak Streamflow for the National USGS 13032500 Snake River near Irwin, Idaho.
<http://nwis.waterdata.usgs.gov/>. Accessed November 22, 2010.
- [USRCWMA] Upper Snake River Cooperative Weed Management Area
- ND. 2009 End of Year Report.

Chapter 6: List of Preparers

Name	Background	Responsibility
Bureau of Reclamation		
Robert L Boyer (Hap)	Resource Manager	Project Manager, Senior Review
Jerry Gregg	Agricultural Engineer	Manager Snake River Area Office
Jenny Huang	Archeologist	Cultural Resources
Ryan Newman	Biology	NEPA Manager, Burley Field Office
John Tiedeman	Biological Sciences	Activity Manager
Lisa Wuttke, PE	Civil Engineer	Contracting Officer's Representative
HDR Engineering, Inc.		
Diane Holloran	GIS Specialist	GIS Mapping and Figures
Lou Krug, PE	Civil Engineer	USFS Alternative Road Design
Susan Lee	Planner	Chapter 3 – Affected Environment and Environmental Consequences, Author
Michael Murray, PhD	Soil Scientist, NEPA	Review
Manuel Rauhut, PE	Environmental Engineer	Chapter 1 – Purpose and Need for Action Chapter 2 – Description of Alternatives Chapter 3 – Affected environment and Environmental Consequences, co-author
Thomas Spiker, PE	Civil Engineer	USFS Alternative Road Design
Lesley Thode	English, Communications	Editing, Word processing
Christine Whittaker, RLA	Landscape Architect	EA Project Manager, Coordinator, QC Review
Menzel Higgins Communications		
Tom Menzel	Communications and Journalism	Technical Writing and Editor
Sagebrush Consultants		
Michael Polk	Archaeologist	Cultural Resources
USDA Forest Service		
Ron Dickmore	Forestry	Coordination, USFS Road System
Wes Stumbo, PE	Civil Engineer	Targhee National Forest Engineer

Appendix A:
Palisades Dam Security Enhancement Project Scoping Report

Palisades Dam Security Enhancement Project Scoping Report

Background

This report summarizes results of the scoping process for the Palisades security enhancement project proposed by the Bureau of Reclamation (Reclamation) to address security vulnerabilities at the Palisades Dam in Bonneville County, Idaho. Comments summarized in this report are a result of the scoping process defined in the National Environmental Policy Act (NEPA) as “an early and open process for determining the scope of issues to be addressed and for identifying the significant issues related to a proposed action.”

The purpose of scoping is to obtain information that helps identify important issues, the affected public and geographical area, a range of alternatives, and potential constraints in the NEPA process. Reclamation will use this information to help evaluate the impacts of the proposed action for the Palisades Dam Security Enhancement Project in an Environmental Assessment (EA) required under NEPA.

Reclamation first announced security vulnerabilities and the need for mitigation at the Palisades Dam and two other Reclamation embankment dams in Idaho in a news release on July 16, 2008. To address security concerns, Reclamation has developed four potential alternatives that will be studied as part of the Palisades Dam Embankment Security Enhancement Project. The proposed security measures include raising the dam crest, widening the dam crest, placing a water crossing just downstream of the dam, and, as an interim alternative, placing a 10-foot-wide median barrier on the existing dam crest road. This proposed barrier would prevent vehicle access to the middle section of the dam crest while allowing continued two-way traffic across the dam. Disruption to traffic crossing the dam during construction would be minimal under the dam crest alternatives.

Summary of Public Input

Public input is a key component of the Palisades Dam Security Enhancement Project. Details of the scoping process, comments received, and recommendations are described below. This report and the information presented at the open house are posted on Reclamation’s Pacific Northwest Region’s website at: http://www.usbr.gov/pn/programs/srao_misc/security/.

1. Public and Agency Notification

A scoping letter introducing the Palisades Dam Security Enhancement Project and requesting input was mailed in October 2009 to the local public, Federal, state and local government officials and other known and potential stakeholders. A newspaper article was published in local newspapers, including The Post Register, describing the proposed security measures and announcing a public open house and other opportunities for public and agency involvement.

2. Public Open House

Reclamation hosted a public open house from 7 to 9 on October 8, 2009 at the Swan Valley High School in the community of Irwin, Idaho, to provide information about the project and gather public input on the alternatives being considered. The open house was attended by 85 to 90 people, including local residents,

government officials, and agency representatives. Comment forms were provided to attendees to submit at the open house, mail to Reclamation, or email to Reclamations’ project manager.

Reclamation began the open house with a presentation on the purpose and scope of the project, as well as defining issues such as funding, ongoing studies, and the NEPA process. During the meeting, concerns were expressed about continued access for area recreation activities and emergency response vehicles.

3. Written Comments

Comments were accepted via mail and email during the 30-day public comment period after the open house. Reclamation received 16 written comments – seven from agencies or local governments and nine from individuals. The issues and concerns expressed in each letter or email were summarized and combined into the common themes summarized below.

Comment Summary	Total No. of Times Issue Identified	Agency or Local Government	Individuals
Transportation- related			
Maintain an easy public access route to recreation facilities	1	0	1
Maintain easy access to the Calamity and Bear Creek recreation areas.	5	2	3
Provide easy access for emergency vehicles.	5	2	3
Alternatives-related			
Consider a bridge-crossing at the Irwin site, downstream from the dam	7	2	5
Protect structural integrity of dam	2	0	2
Make improvements to the road in the “slide areas”	2	0	2
Miscellaneous			
“Close the road as soon as possible to prevent a terrorist attack	2	0	1

4. Public Comment Summary

Several common themes were identified in comments received from the public. The most frequent comment suggested installing a bridge below the dam at the Irwin site to provide easy access for recreation activities and create a crossing for emergency vehicles. Several comments, including one from a fire commissioner, said installing a bridge may actually reduce emergency vehicle response times.

The U.S. Army Corps of Engineers noted that the proposed alternatives of raising the dam crest, widening the dam crest, and placing a water crossing downstream of the dam may require a Section 404 Clean Water Act permit because they will discharge fill material below the ordinary high-water mark of Palisades Reservoir, South Fork of the Snake River and/or adjacent wetland.

Several comments suggested a design that would prevent a terrorist attack and strengthen the integrity of the dam.

5. Agency Meeting

An agency meeting was held at 10:00 am, November 12, 2009 at the Palisades Ranger District Office in Idaho Falls. Attendees included representatives from Bonneville County, United States Department of Agriculture Forest Service (USFS), Department of Interior Bureau of Land Management (BLM), Idaho Department of Fish and Game (IDFG), and staff from Reclamation and HDR Engineering. Sven Berg from the Idaho Falls Post Register also attended the agency meeting.

Reclamation presented information on the project purpose, history, alternatives being considered, and the NEPA process. The meeting attendees were given an opportunity to ask questions and provide comments. Reclamation has provided responses to many of the questions. The comments and questions from the agency meeting, along with responses from Reclamation (in parentheses), are summarized below:

Bonneville County Comments

- Closure of the access at bottom of dam has affected recreation access compared to when this road was open.
- Have the Irwin Bridge issues brought up at the public meeting been considered? (Preliminarily, yes. Reclamation will review this option but may not have authority to construct a bridge at this off-site location).
- Bonneville County has background information on Irwin Bridge siting. Bonneville County did an informal siting analysis.
- What would the travel width on the new bridge be? (Right now, Reclamation is considering a 40-foot-wide bridge).
- Travel width is a concern for cattle trucks and cement trucks. (Reclamation has relayed this information to the design engineers who say the width and loading currently being considered should be able to accommodate any such loads).
- Whose land is the bridge approach on? (The land is located on Reclamation withdrawn land from the Forest Service).
- Have turn lanes on the highway been considered? (This needs to be discussed further and addressed).
- The comparative analysis in the handout doesn't look at all of the issues associated with the alternatives. (All identified issues will be addressed in the EA).
- Will access to summer homes be considered? (Yes)
- Closure of bottom road has affected recreation access. (Noted)
- Can operation and maintenance (O&M) costs be considered in the evaluation of all alternatives? (Reclamation will review these costs).
- Consider O&M costs for the Irwin Bridge location. (If this becomes a viable option, such costs would be considered).
- Will there still be boat access? (Yes, boat ramp access will be provided).

USFS Comments

- Will the road be closed to 4-wheelers, snowmobiles, horses, pedestrians, bicyclists? (No)
- Would there be snow-grooming during red-alert periods. (No)
- Has Reclamation identified a preferred alternative at this point? (Not at this point in the NEPA process. Identification of the preferred alternative will be made by the area manager).
- How do the present alternatives being considered prevent dam vulnerability? (The alternatives address access to the dam crest, which is where the vulnerability has been identified).

- Will the bridge have a clear span or a pier in the river? (It will likely have a pier, but the engineering design has not been completed yet).
- What will the bridge weight limit be? (Currently Reclamation is designing for 60 tons).
- Have the following issues been considered: recreation activities; access to boat ramp; access to the campground; and impacts on USFS lands? (Recreation issues will be addressed under each alternative evaluated in the EA).
- USFS may want to be a cooperating agency on the environmental assessment.
- Would load limits be the same under the dam crest alternatives? (Yes, even though the embankment alternatives generally do not have a load limit. The current limit signage is for the left side concrete facilities).
- Have other access issues associated with the new bridge been considered, such as the turns to access the boat ramp? (This issue will be evaluated under the alternatives analysis).
- How will Reclamation provide off-site mitigation? (Reclamation's authority to provide mitigation is limited. Reclamation will explore opportunities with the USFS).
- USFS maps show the area below the embankment as USFS lands managed for recreation.
- The Reclamation operations zone is a USFS withdrawal.
- Campsite impacts – gravel flats. (Reclamation has no recreation authority).
- Consider traffic impacts on campgrounds and recreation. (Noted)
- Forest Service Management Plan – Act of 1958 should be addressed. (Noted)

BLM Comments

- Does the 5-foot crest raise change the impoundment area? (No, storage quantities would not change under any of the alternatives).
- What is Reclamation doing with comments received at the scoping meeting in Swan Valley, i.e. Irwin – location of bridge for emergency access? (Reclamation will review any existing information they receive from stakeholders, but to date they have not received any formal request or information; otherwise comments received from the public will be considered in the draft EA).
- Has Reclamation considered hydraulics and scour at the proposed bridge location? (Concerns related to scour are limited since the bridge location is immediately downstream of a controlled outlet structure).
- Does Reclamation have concern about a boat coming into the bottom of the dam? (No, the only concern is the dam crest).

IDFG Comments

- Under the list of advantages and disadvantages, no advantages are listed for the No Action Alternative. The cost savings of not constructing one of the action alternatives should be listed as an advantage under No Action. (The No Action Alternative does not meet the project purpose and need; and when considered with the potential loss of life and property would in fact show a significant disadvantage).

6. Recommendations Forward (Next Steps)

While no comments opposed the purpose of the project, comments received from the public suggest that additional alternatives should be explored, including siting the downstream water crossing near Irwin. Bonneville County said they have completed a bridge siting study for a potential Irwin Bridge. This

available information should be reviewed to determine the viability of this location and whether Reclamation has authority to construct a bridge this far from the dam.

The USFS asked to be a cooperating agency on the EA. A memorandum of understanding will need to be drafted to implement this request.

The comments and recommendations in this report will be used to help evaluate the impacts of the proposed action and alternatives for the Palisades Dam Security Enhancements Project in an EA that will be completed in 2010.

7. List of Comments from Individuals

Hasty and Grace Arnold, October, 2009

- Essential to consider a design that would mitigate both a possible terrorist attack and strengthen the structure of the dam.

Robert McKim, Wyoming State Legislature, October, 2009

- Most viable option is the river crossing downstream.

Terry Kimbro, October, 2009

- Consider a bridge in Irwin to reduce emergency response times.

John Fry, October, 2009

- Maintain easy access to the area on the west side of the dam.

Larry and Trillis Fleming, October, 2009

- Consider a bridge below the dam, preferably at Irwin.
- Would like to see the road improved and shortened for access to the Calamity Point campground.

Tom Dent, October, 2009

- Prefer a bridge crossing the river with the dam closed to vehicles.
- A bridge crossing would be advantageous for emergency needs and would only add minimal mileage to recreation areas.

James Joyner, U.S. Army Corps of Engineers, October, 2009

- Several of the proposed measures would require a Section 404 Permit.

Diane Kingman, October, 2009

- Close the road across the dam as soon as possible.
- Protect the integrity of the dam and allow for construction, recreational, residential and emergency vehicles to the other side of the South Fork of the Snake River.

Jerry Freeburne, Calamity Water User's Association, October, 2009

- Request that if the dam is closed permanently, a bridge be constructed to give access to residents and campers in the Calamity/Bear Creek areas.

Paul Hill, October, 2009

- Unable to see the proposed action on the website
- Concerned that public access to the Calamity area would be reduced.

R. Jay and Deidre Taylor, October, 2009

- Support placing a water crossing just downstream of the dam.

Jim Anseth, October, 2009

- The security enhancements are a waste of tax dollars.

Robert Stallman, October, 2009

- An explanation was not given as to why the “No Action” Alternative was not viable.
- Expending federal dollars beyond those already spent on gates and security cameras does not appear to be justified.
- The cost of the bridge alternative is about half the cost of other alternatives, which does not seem reasonable.
- The bridge alternative does not address upgrading the existing Forest Service road, which would not be able to handle the increased traffic.

8. References

U.S. Federal Register. The National Environmental Policy Act of 1969, as amended.

(Pub. L. 91-190, 42 U.S.C. 4321-4347, January 1, 1970, as amended by Pub. L. 94-52, July 3, 1975, Pub. L. 94-83, August 9, 1975, and Pub. L. 97-258, § 4(b), Sept. 13, 1982)