BIOLOGICAL ASSESSMENT
for
BIRDS, MAMMALS, AND FISH
in the
UPPER SALMON RIVER AT CHALLIS PROJECT
CHALLIS, IDAHO
May 28, 2003

PREPARED BY \signed\ DATE 5/28/2003
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TABLE OF CONTENTS

I.	Introduction	1
II.	Consultation to Date	1
III.	Description of the Proposed Project	2
	a. Project Location	2
	b. Project Purpose	2
	c. Project Authority	4
	d. General Project Information	4
	1) In-Water Construction Window	4
	2) Culvert Design	7
	3) Construction Process (Initial & Continuing Construction and Long-Term Maintenance	7
	4) Project Considerations for Managed Grazing	10
	5) Description of Project Sites	11
	1. Highway 93 Bridge	11
	2. Dunfee Slough	15
	3. One Mile Island	19
	4. Hot Springs	21
	5. Pennal Gulch	34
IV.	Existing Environment	46
	A. General Description of the Project Area	46
	1. Water Quality	48
	2. Topography	49
	3. Vegetation	49
	4. Bed load Action	50
	B. Description of Threatened, Endangered & Candidate Species	50
	1. Bald Eagle	50
	2. Bull Trout	53
	3. Canada Lynx	56

TABLE OF CONTENTS
(Continued)

4. Gray Wolf 58

5. Yellow-billed Cuckoo 59

6. Sockeye Salmon 61

7. Snake River Spring/Summer Chinook Salmon 62

8. Snake River Steelhead 69

V. Effects of the Proposed Projects, By Project Site and Species 71

A. Bald Eagle 71
- A.1. Highway 93 Bridge Property 72
- A.2. Dunfee Slough Property 73
- A.3. One Mile Island Property 75
- A.4. Hot Springs Property 76
- A.5. Pennal Gulch Property 79
- A.6. Bald Eagle Cumulative Effects Analysis 81

B. Bull Trout 81
- B.1. Highway 93 Bridge Property 82
- B.2. Dunfee Slough Property 83
- B.3. One Mile Island Property 85
- B.4. Hot Springs Property 87
- B.5. Pennal Gulch Property 89
- B.6. Bull Trout Cumulative Effects Analysis 91

C. Canada Lynx 92
- C.1. Highway 93 Bridge Property 92
- C.2. Dunfee Slough Property 93
- C.3. One Mile Island Property 95
- C.4. Hot Springs Property 96
- C.5. Pennal Gulch Property 97
- C.6. Canada Lynx Cumulative Effects Analysis 99

TABLE OF CONTENTS
(Continued)

D. Gray Wolf 100
- D.1. Highway 93 Bridge Property 100
- D.2. Dunfee Slough Property 102
- D.3. One Mile Island Property 103
- D.4. Hot Springs Property 104
- D.5. Pennal Gulch Property 105
- D.6. Gray Wolf Cumulative Effects Analysis 107

E. Yellow-billed cuckoo 108
- E.1. Highway 93 Bridge Property 108
- E.2. Dunfee Slough Property 110
- E.3. One Mile Island Property 111
- E.4. Hot Springs Property 113
- E.5. Pennal Gulch Property 115
- E.6. Yellow-billed Cuckoo Cumulative Effects Analysis 117

F. Sockeye Salmon 118
- F.1. Highway 93 Bridge Property 118
- F.2. Dunfee Slough Property 121
- F.3. One Mile Island Property 123
- F.4. Hot Springs Property 124
- F.5. Pennal Gulch Property 126
- F.6. Sockeye Salmon Cumulative Effects Analysis 129

G. Snake River Spring/Summer Chinook Salmon & Steelhead 130
- G.1. Highway 93 Bridge Property 131
- G.2. Dunfee Slough Property 136
- G.3. One Mile Island Property 140
- G.4. Hot Springs Property 143
- G.5. Pennal Gulch Property 150
- G.6. Spring/Summer Chinook Cumulative Effects Analysis 154

TABLE OF CONTENTS
(Continued)

VI. Determination of Affect Matrix by Species 156

Bull Trout Matrices
- Highway 93 Bridge Site Matrix 161
- Dunfee Slough Site Matrix 168
- One Mile Island Site Matrix 174
- Hot Springs Site Matrix 179
- Pennal Gulch Site Matrix 190

Bald Eagle, Canada Lynx, Gray Wolf, Yellow-billed Cuckoo
- Matrix for All Five Sites 197

Sockeye Salmon Matrices
- Highway 93 Bridge Site Matrix 202
- Dunfee Slough Site Matrix 208
- One Mile Island Site Matrix 210
- Hot Springs Site Matrix 215
- Pennal Gulch Site Matrix 221

Snake River Spring/Summer Chinook Salmon & Steelhead Matrices
- Highway 93 Bridge Site Matrix 227
- Dunfee Slough Site Matrix 237
- One Mile Island Site Matrix 247
- Hot Springs Site Matrix 255
- Pennal Gulch Site Matrix 268

VII. Mitigating Measures and Monitoring (Recommendations) 282

VIII. Literature Cited 284

I. INTRODUCTION

The purpose of this Biological Assessment is to document analysis of the potential effects of the Upper Salmon River at Challis Project (USRC) area (also known as the 12 Mile reach) on the following bird, mammal, and fish species and their habitat. The work is authorized under Section 206 of the Water Resources Development Act of 1996, for restoration of degraded aquatic ecosystem structure, function and dynamic processes to a less degraded, more natural condition. The species covered by this biological assessment are:

Bald Eagle (*Haliaeetus leucocephalus)*	Threatened
Bull Trout (*Salvelinus confluentus)*	Threatened
Canada Lynx (*Lynx canadensis)*	Threatened
Gray Wolf (*Canus lupus)*	Experimental, Non- essential population
Sockeye Salmon (*Oncorhynchus nerka)*	Endangered
Spring/summer chinook salmon (*Oncorhynchus tshawytscha)*	Threatened
Snake River steelhead (*Oncorhynchus mykiss)*	Threatened
Yellow-billed cuckoo (Coccyzus americanus)	Candidate species

The above list includes United States Department of Interior Fish and Wildlife Service (FWS) threatened and endangered species, and candidate species, and National Marine Fisheries Service listed species (February 27, 2003).

Pursuant to Sections 7 (a) (2) and 7 (c) of the Endangered Species Act, and the Magnuson-Stevens Fisheries Conservation and Management Act, we request [FWS concurrence/NOAA Fisheries review and formal consultation] on the following projects within the Upper Salmon River at Challis Project Area near Challis, Idaho. This biological assessment meets legal requirements set forth under Section 7 of the Endangered Species Act of 1973, as amended and implementing regulations [19 U.S.C. 1536 (c), 50 CFR 402.12 (f) and 402.14 (c)].

II. CONSULTATION TO DATE

The FWS and NOAA Fisheries (formerly National Marine Fisheries Service, NMFS) were initially contacted in June 2002 to obtain a current list of threatened, endangered, and proposed candidate species that may be present along the Salmon River in the USRC area. The most recent list is dated February 27, 2003 for the FWS, and December 4, 2002 for NOAA, and is available for review at the Walla Walla District Office. Laura Hanlon and Janna Brimmer, Fishery Biologists from the NOAA Fisheries office in Salmon, Idaho, have been on several technical team field trips and meetings for the USRC. They have provided general guidelines and suggestions on the preparation of this biological assessment (BA). To aid in the NOAA evaluation of the USRC, they also provided the Corps with a copy of the "Determination of Affect Matrix for Naturally Reproducing Snake River Basin Steelhead". The Corps also worked with John Johnson, NOAA Fisheries Engineer from the Portland, Oregon Office in designing culvert orifices and other structures.

Chris Witt, Fish and Wildlife Biologist from the FWS Office in Chubbuck, Idaho, has provided professional contacts and information sources concerning threatened or endangered species near the Salmon River near Challis, Idaho. Carol Evans of the Chubbuck, Idaho FWS office has offered advice on the preparation of the biological assessment. No other consultation has occurred at this time.

III. DESCRIPTION OF THE PROPOSED PROJECT

a) Project Location: The proposed project is within the Round Valley reach of the Upper Salmon River in Custer County, between Highway 93 bridge 2.5 miles southeast of Challis, Idaho, and Bruno's bridge approximately 4 miles northeast of Challis. The City of Challis is located in the central part of Idaho (**Plate 1)** and is about 5,300 feet elevation above sea level. The "12 Mile" project name is taken from the approximate length of the river between the two bridges mentioned above. The north end of this project area on the Upper Salmon River is located approximately 9 miles upstream from the confluence with the Pahsimeroi River. The project work would be located in Township 14 North, Range 19 East, Sections 11, 14, 23, 25, 26, 35 and T13N R19E Sections 3 and 10, Challis and Bradbury Flat quadrangles. Vicinity maps are shown on **Plate 2**.

b) Project Purpose: The purpose of this project is to:
1) Restore the riparian function of the floodplain and river habitat where possible, and
2) Restore the geomorphic function of the channel where possible, which generally means a channel with more stable, vegetated banks and more diverse in-stream habitat.

The stream and habitat improvement measures proposed for the project would help to increase overall fish production in the Upper Salmon River drainage. To accomplish this purpose, the project would employ management techniques identified in the Bonneville Power Administration (BPA) Watershed Management Program EIS, July 1997. The project would specifically benefit Endangered Species Act listed steelhead, and to a lesser extent, Chinook salmon, by improving a variety of vital habitat components necessary for salmonid survival in this reach of the Upper Salmon River drainage. These measures would also improve the overall functioning of the local ecosystem by reconnecting areas to the floodplain that were previously cut-off, which would improve the habitat conditions for a wide variety of aquatic and terrestrial species.

The reestablishment and re-creation of side channel habitat holds some of the most significant and cost-effective potential for enhancing salmonid habitat in the 12-mile reach. One of the most serious salmonid environmental limiting factors is high water temperature in the late summer/early fall. By employing commonly used and accepted stream restoration techniques, as outlined in BPA 1997, we believe that we can provide high quality rearing areas, areas of refuge for adults and juveniles, and potential suitable spawning habitat. Some of the side channels would benefit from constant temperature springs as their source, which would not only provide benefits in summer, but could also provide temperature benefit in winter as well. In addition, the project would be able to provide shade over these side channels through planting, reestablishment and protection of riparian vegetation and by eliminating or intensively managing grazing along the channel banks. In some areas, the project would also be eliminating or creating improvements at existing fish passage barriers. Allowing river flows back into these previously blocked side channels would mimic more closely a naturally functioning floodplain, which brings with it a whole host of environmental benefits to both aquatic and terrestrial species of fish, wildlife and plants.

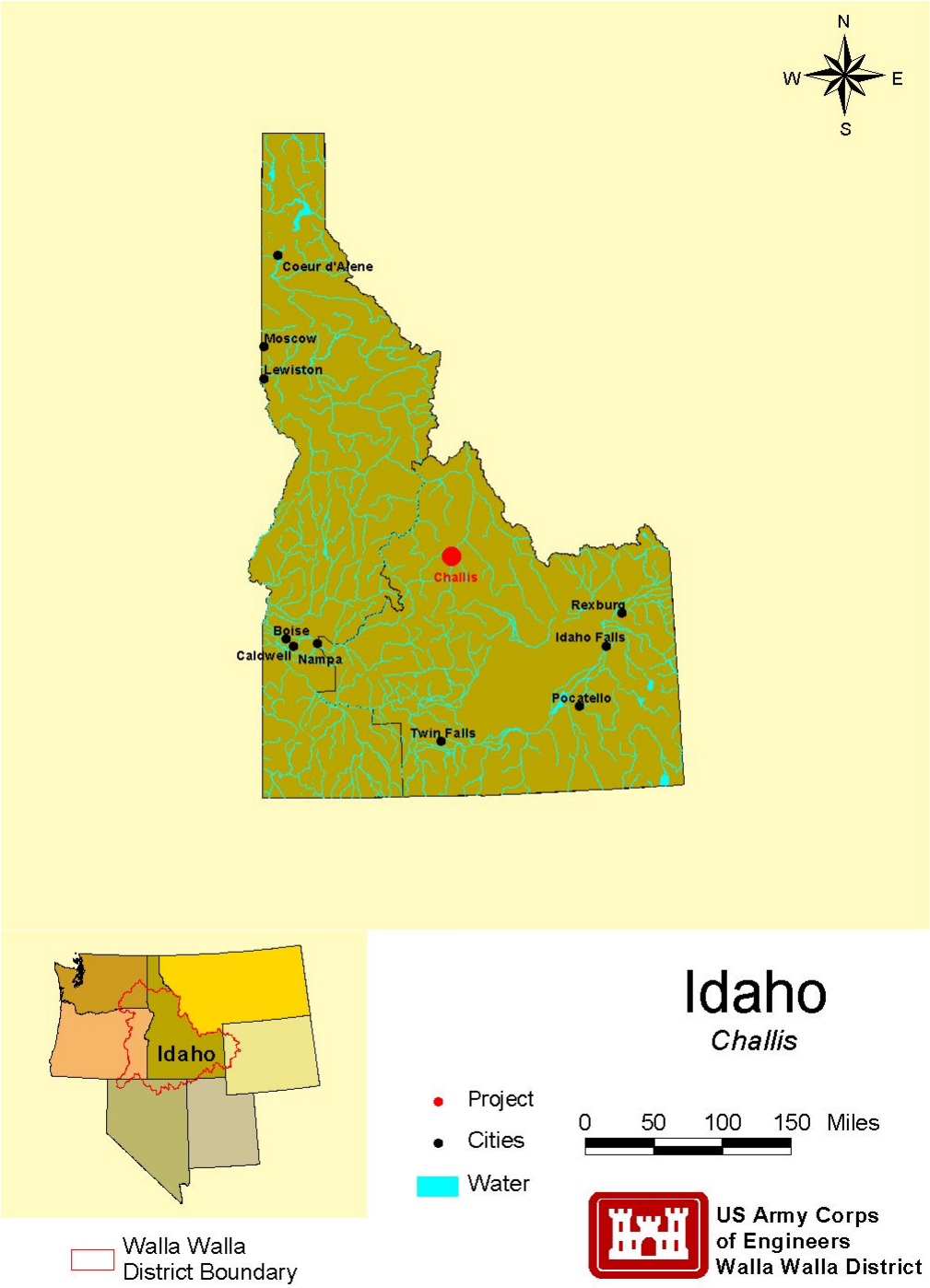


Plate 1- Vicinity Maps

Bioengineering techniques, using rock, logs, and vegetation plantings, would be utilized to the extent practicable to restore salmonid habitat quality, reduce unnatural bank erosion, restore natural channel function and associated aquatic and riparian biological processes.

c) Project Authority: The USRC is authorized under Section 206 of the Water Resources Development Act of 1996. The primary objective of a Section 206 project is the restoration of degraded aquatic ecosystem structure, function and dynamic processes to a less degraded, more natural condition. The project is a joint venture between the Corps of Engineers and Custer County Soil and Water Conservation District.

There are currently 5 proposed project sites are shown on **Plate 3**.

d) General Project Information:

There are currently five proposed project sites, identified by the nearest landmark, and listed in order from upstream to downstream: Highway 93 Bridge, Dunfee Slough, One Mile Island, The Hot Springs site, and Pennal Gulch. The sites are shown on **Plate 3**. The 12 mile reach of the Salmon River from the Highway 93 bridge south of Challis, Idaho to Bruno's Bridge north of Challis is dominantly affected by past channel alteration work such as rip rapping, dikes, irrigation water diversion, construction of homes on the floodplain, and livestock grazing. Other activities occurring upstream, in addition to those mentioned, include mining, timber harvesting and construction of roads. These activities have indirect and cumulative effects downstream along the entire length of the river.
The projects would improve floodplain functions, stream stabilization, and water quality by:

- adding culverts or weirs to create secondary channel habitat,
- adding barbs and willow plantings for bank erosion protection,
- lowering existing dikes or adding culverts or weirs to increase flood frequency,
- fencing with conservation easements that provide managed grazing or vegetative plantings and excluded grazing to improve riparian habitat.

1) In-Water Construction Window:
In-water construction would begin as early as September 1 and finish by March 1 in side channels and sloughs (such as the Dunfee Slough and the Pennal Gulch slough).

- On th Hot Springs site, in the western spring channel that originates on the southern landowner's property, as well as sloughs and existing side channels.
- In the east and west channels of Challis Hot Springs Creek above the storage pond outlet on the northern landowner's property, the work would proceed from September 1 through March 1. Salvage operations would move any salmonids that may be present in these channels.

In the mainstem, in-water construction would begin on September 1 and finish by January 15, and:

- In locations where a turbidity curtain cannot be used, in-water construction in the mainstem would be begin on September 1 and cease January 15.
- In locations where a turbidity curtain can be used, in-water construction would begin on September 1 and cease March 1.

In dry channels, such as the Highway 93 Bridge and the old channel at the Hot Springs site, work in the channel could proceed at any time of year. Opening the ends of the dry channel to allow river water to flow through them would occur during the September 1 through January 15 work window.

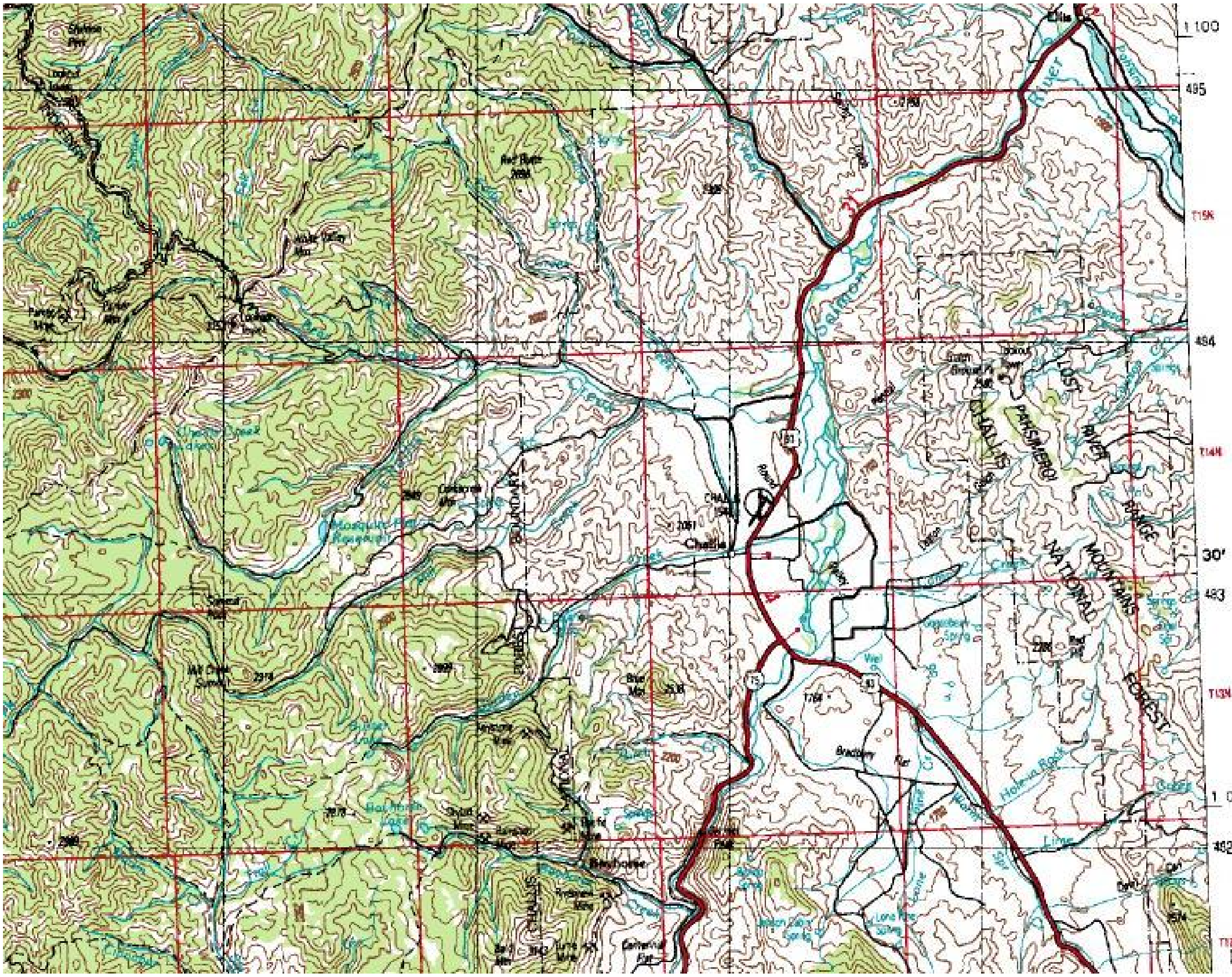


Plate 2 - Vicinity Quad Map
(note: topographic elevations are in meters)

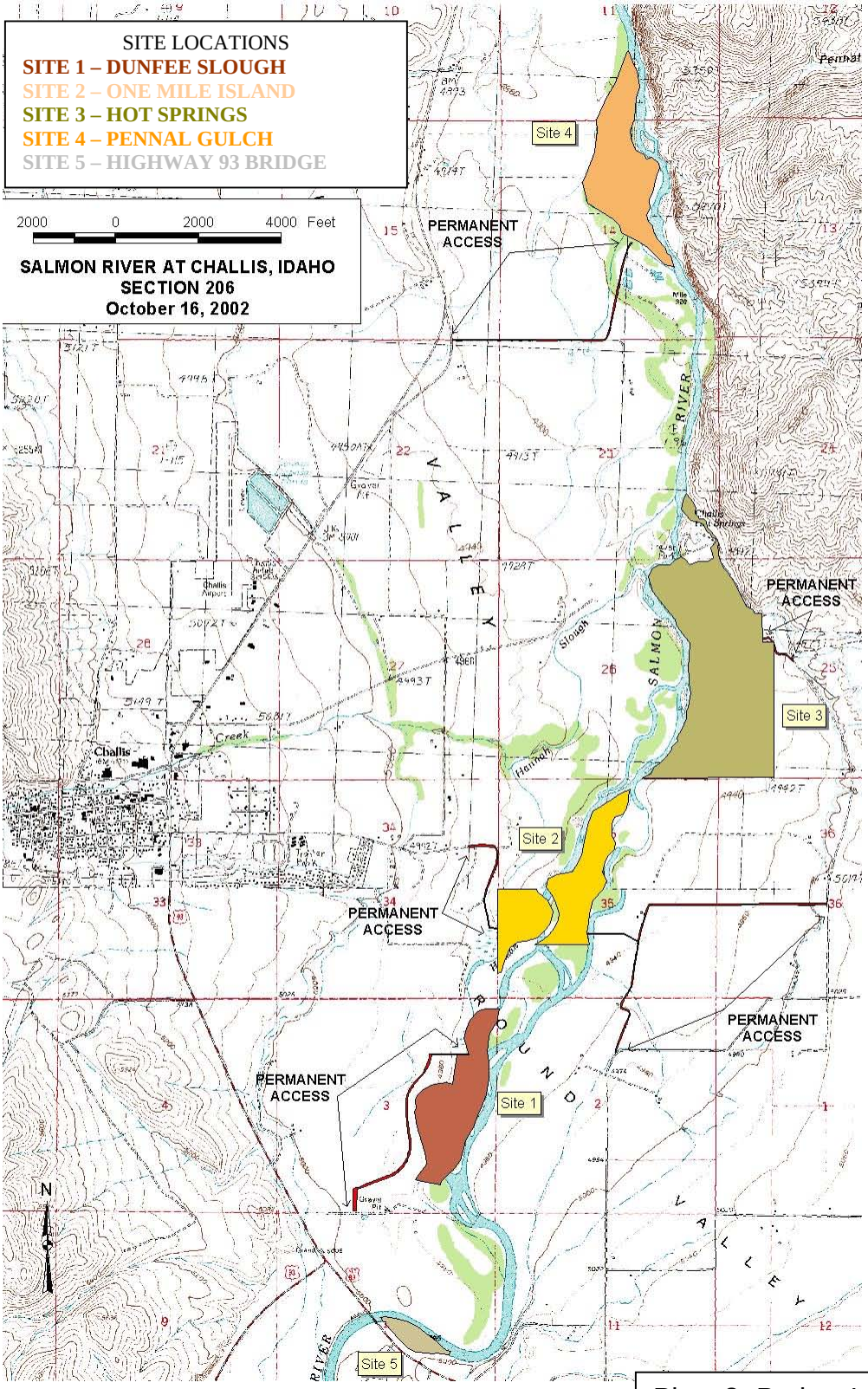
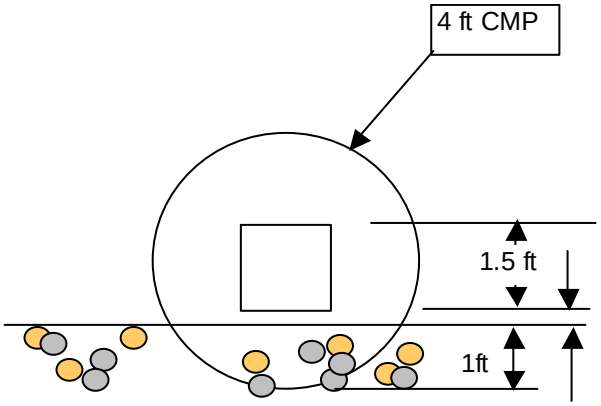


Plate 3- Project Locator Map

2) Culvert Design: Where the project would be reconnecting an old abandoned channel back to the main channel, maximum discharges would be limited through the channel to 35 cubic feet per second (cfs) because the landowners are afraid of damage to their property if we allow flows higher than 35 cfs. The requirement by the landowner set up a conflict in the design of the intake. The Idaho Department of Water Resources has indicated that if a gate is used on the entrance to the side channel then a water right would be required. As a result, the Corps is proposing to use culverts to limit the inflow to some of the side channels that will control the amount of inflow but do not require a water right. This type of culvert is proposed for the Dunfee Slough, One Mile Island, and Pennal Gulch sites. However, the NOAA has criteria for fish passage that apply to culverts (Guidance for Salmonid Passage at Stream Crossings by the NMFS-Southwest Region) that requires passage during the migration period for certain high flow events and includes requirements that the entrance and exit of the culvert not be submerged. Since the migration period is when most flood events occur, there is potential for a large range of river stages (from 8 to 11-ft). Using a culvert size that would not be submerged for more than 10% of the time would result in such large culverts that there would be several hundred cfs of discharge though the culvert during high flows. Since the landowners were unwilling to participate in a project that would use culverts that meet the NOAA guidelines, the Corps worked with John Johnson, the NOAA engineer, to design a culvert intake that would only allow 35 cfs during the 50-year event. This design uses a 4 ft diameter culvert with an orifice at the entrance. The orifice is 1.5 ft x 1.5 ft in size (see figure below). Mr. Johnson also asked that the orifice edges be framed with 1-inch wide molding to avoid a sharp edge. The Corps would be following all the guidance requirements for culverts installed in side channels remote from the entrance at the river. For culverts at the side channel entrance, the Corps would be using the design described above.



3) Construction Process:

The Project consists of initial construction at each site, follow-up or continuing construction that would occur over several years and long term maintenance of the constructed structure.

Initial Construction - The initial construction work for the project would be phased over several years as real estate agreements are accomplished with the private landowners. The goal for each site would be to reach near completion during one construction season. Separate sites would be constructed during separate seasons.

Continuing Construction - This follow-up work will consist of adaptive management related adjustments to the original design. The adaptive management construction work is construction that is needed to adjust the design to accommodate the complex stream and ecosystem response to the constructed project. These construction activities are expected to be required during the two-year period following the initial construction season. Examples of the types of continuing construction include, but are not limited to:

- Adjustments to the barb and sill structures to ensure that scour pool habitat develops. This could involve repositioning individual stones that comprise the structures.
- Adjustments to the invert elevation of culverts located at the inlet to the secondary channel to ensure adequate flow during the late summer but avoid drawing in excessive quantities of sediment. This could involve excavation and reinstallation of the culvert.
- Adjustment to the cross section and alignment of secondary channels to accommodate the secondary channel's response to the channel initially constructed. This applies to all secondary channels, but the response of the Hot Springs channel to the spring flows with potentially large pulses of irrigation water is of particular concern. This potentially involves removal of sediment deposits, channel realignment, and replanting of vegetation to protect banks from erosion. This may also include changes to levee heights and width.
- Modification of gravel dam/riffle structures to ensure fish passage and pond depth. This potentially involves reshaping the weir crest of the dam, adding to or removing dam material, changing the slope of the gravel riffle section, and adding large cobble material to ensure stability. This would be limited to the Hot Springs site.
- Adjust high flow channels to avoid fish stranding and prevent damage to adjacent road sections because of high flow channel response to peak flows. This could involve excavation and filling to adjust channel sections, planting for erosion protection, and adjustments to the roadway armor at roadway overflow sections.

In addition to making adjustments in response to complex system changes, some design and construction deficiency correction is expected. This work may vary over a wide range but potential examples include:

- replacing/adding to erosion protection at culvert exits,
- replacing broken or failed boulders in stone structures,
- replacement of trees/plantings that have died over the previous year,
- weir and diversion structure modifications, etc.

- **Long-Term Maintenance Activities** - maintenance activities performed by the sponsor will extend beyond the initial construction and follow-up adaptive management actions. These maintenance actions include:
  - Removal of deposition from channels and blockages of channel entrances (approximately 5-yr intervals, subject to magnitude of flood events)
  - Replace/reposition stones in the entrance rock sill structures (approximately 20-yr intervals, subject to magnitude of flood events)
  - Clean cobble beds to remove and/or replace cobbles (approximately 5-yr intervals)
  - Fence repair every year. Some fence may need reconstructing in 10 years.
  - Weir board replacement (approximately 3-yr intervals)
  - Treatment wetlands vegetative mat removal to maintain freeboard (approximately 15-yr intervals)
  - Treatment wetlands sediment basin deposition removal (annual removal)

- Structural repair of weir, diversion structure, and fish irrigation barrier (major repair or replacement estimated at 30 to 50-yr intervals)

The construction process would vary from one site to the next. In situations where the work is on a side channel and there is little ground water inflow to the channel (most of the flow is from irrigation inflow or from the new connection to the main channel) then irrigation inflow will be routed around the construction area. Pumps and hoses will be used so there is no flow through the construction work site that would carry sediment down stream. In situations where the work is on a side channel and ground water flows into the channel in significant quantities, then a 100 ft to 400 ft reach (size depends on quantity of inflow, etc.) will be coffer dammed off and flow will be pumped from upstream of the work area to a location downstream of the work area. Pumps will be equipped with screens meeting NMFS requirements (size for approach velocity of 0.4 fps at 3" from screen face). In some instances, building the cofferdam and removing the cofferdam is expected to generate more sediment than would be generated by the construction activity itself. In those instances, no cofferdam will be constructed and flows will not be pumped around the work area. Specific examples of work that will generate less sediment than the coffer dam construction and removal are: 1) the placement of gravel fill to form dams that will pond water to a depth of three feet and, 2) deepening of the thalweg in the spring channel to a depth of 1 ft to allow passage. A turbidity curtain would be used in these situations. Other similar situations are anticipated.

Work would begin at the upstream end and proceed to the downstream end so that fine sediment will be less likely to be accumulated. Direct work in the main river channel, side channel and removal or installation of coffer dams would be limited to less than 4-hrs per day in order to limit the releases of sediment to the spring or river channel. Work on the main channel of the Salmon River would consist primarily of excavating entrance connections to a side channel that would be constructed. Where river velocities will allow it, turbidity curtains will be used to contain the sediment generated by the excavation of the entrance of a new channel. Some sediment would be released when the turbidity curtain is removed after construction of the entrance is completed. In other situations, the velocities in the main channel will be too high to allow the use of the turbidity curtain. In those situations, the in-water work will be limited to 4-hrs each day.

When excavation occurs in an area that could potentially have fish, for example a deepening of the thalweg in the spring channel on the southern landowners property, then the in-water work will proceed in a slow manner that would allow the fish to escape the work area. For example, when digging the existing thalweg deeper, the excavator will slowly press down into the bed of the stream and scoop up the material. Then the excavator bucket is filled with material to be removed, the arm will be raised to a height of a foot or two above the water surface. The bucket will be rotated slowly to pour out any water on top of the solid material. This will allow any fish inadvertently scooped up to escape. This process of slowly excavating the bed material and pouring out the water has proven successful for the Oregon Department of Fish and Wildlife on their stream restoration projects. Where work is accomplished within sections that are cut off by a cofferdam, pumping will lower the water level within the cofferdam. The fish that are trapped within the cofferdam would be exposed and captured as the water level drops by a team equipped with dip nets that will temporarily hold the fish in buckets of fresh water for a period not to exceed 5 minutes. The fish would then be transferred and released upstream of the cofferdam. This process has been applied at several stream restoration projects in Oregon with minimal adverse

affect on the fish. The advantage of this process is that it ensures the fish are removed from the work area before construction begins and avoids the mortality that often accompanies electro-fishing. Any State and Endangered Species Act permits would be secured before handling any fish or working with equipment in the water or on the shore.

Based on past similar work (East Birch Creek, Oregon, 2001 – 2002), the primary mechanism of mortality is anticipated to be the result of salvage efforts during dewatering. Direct mortality from the in-water construction is anticipated to be secondary to the salvage. The Birch Creek project displayed a total mortality of less than 1.5 salmonids per 1000 ft of channel length averaged over the entire channel. An example for the USRC would be: The in-water work on the Hot Springs site, has a total length of approximately 11,000 feet. The Corp's best estimate indicates that mortality would be approximately 17 salmonids for this work.

Where irrigation flows enter side channels developed by the project, the irrigation inflow would be screened to prevent fish passage by one of two methods. Where the irrigation ditch has a steep gradient, the passage would be blocked using a structure with a minimum of a 3-ft drop through a comb or grating (called a "drop box") placed on a concrete pad at the base to prevent formation of a jump pool. Where the irrigation ditch gradient is shallow, fish screens consistent with designs used by the Idaho Department of Fish and Game would be used. The method used would depend on specific site inspections that would take place just before project implementation. For simplification and to reduce confusion, only the term "fish screens" will be used in this biological assessment when describing barriers or screens on different projects. It should be understood that if the project proceeds, fish screens OR drop boxes may be used where irrigation flows enter side channels or the river.

4) Project Consideration for Managed Grazing

The project plan is for the Government to acquire an easement for all the rights to the property and the landowner would no longer have the right to graze the easement area. After several years, when the riparian area has recovered, then the Sponsor could negotiate with the landowner to allow grazing of areas that would not be degraded by a specified level of grazing. In return, the project would receive some type of benefit, such as irrigation or weed control. At any time, the grazing could be discontinued by the Sponsor and revert back to the original easement condition.

Some easement areas, such as the corridor immediately adjacent to the stream, are intended to be grazing excluded areas. But, other areas that are more remote might be considered for grazing. These more remote areas, are generally higher above the water table, and may be significantly improved by irrigation. The easement does not allow activities that harm the project objectives. But, the sponsor can allow activities that are consistent with the project objectives to benefit salmonid species and considered to cause no harm. The Grazing Management Plan (GMP) establishes a process for determining the condition of the riparian area and for evaluating when grazing results have caused harm. The GMP defines the process for overall management, decision-making about grazing limits, and public record requirements. It also describes quantitative survey procedures and establishes the objectives for the riparian areas to benefit salmonid species**.** GMP's would be developed and administered by the Sponsor in association with an interdisciplinary panel of interagency representatives.

5) Description of Project Sites

The project boundaries and design detail for each site are shown on aerial photography from May 22, 2000 that was used as a background for the figures to provide points of reference and general features to assist in developing the restoration design.

Highway 93 Bridge (Site 5)

An aerial photo of the project site and proposed project actions is shown in **Plate 4** (river flow is from left to right). The project is located from about RM 324.7 to 324.9 in T13N R19E S10 (Bradbury Flat quadrangle). The project would construct a rock-lined entrance at the upstream end of an existing side channel in order to provide main stem reconnection while preventing the main stem from recapturing the side channel.

At the upstream end, approximately 1,100-feet of channel would consist of new excavation connecting old, existing, channel sections to form a new contiguous channel. (**See Plate 5**)The amount of existing channel in this reach that can be utilized is relatively small, approximately 5 to 20% of the proposed length because the existing channel is discontinuous and some of the existing segments appear in locations that may not now be suitable for a desirable alignment.

The downstream portion of the proposed channel is approximately 700 feet in length. The alignment shown in **Plate 4** is approximate and would be determined in the field based upon the most suitable of several existing, old channels. The existing channel segments in this portion of the proposed channel are relatively continuous and would require less new channel construction. Approximately 10 to 20% of the downstream portion of the proposed channel would require new channel construction. Significant clearing of heavy debris that blocks the channel in the existing channel would be required. (**See Plate 6**).

A sill formed by large boulders will extend from the riverbank out into the riverbed. The length of this sill will vary depending on river bed topography because the sill needs to extend to an elevation that matches the channel entrance elevation on the upstream side and to the toe of the bank on the downstream side. The estimated length is 80 to 120 feet. The sill will be formed by a continuous line of boulders that will have a top surface elevation on the upstream side that is approximately 0.3 feet above the riverbed elevation. On the downstream side of the boulder sill, it will be flush with the ground line of the riverbank. At locations further into the excavation of the river bank, both the upstream and down stream sills will taper up with the bank line until a maximum height above the thalweg of two feet is reached. The boulder sill will be imbedded in a minimum of four feet below the riverbed to avoid undermining by scour. The riverbed armoring adjacent to the sill that is disturbed during construction will be replaced to protect the riverbed from scour. The sill will provide a narrower channel entrance to the new channel that should keep water velocities higher and help reduce deposition of sediment at the entrance of the channel, facilitating long-term maintenance.

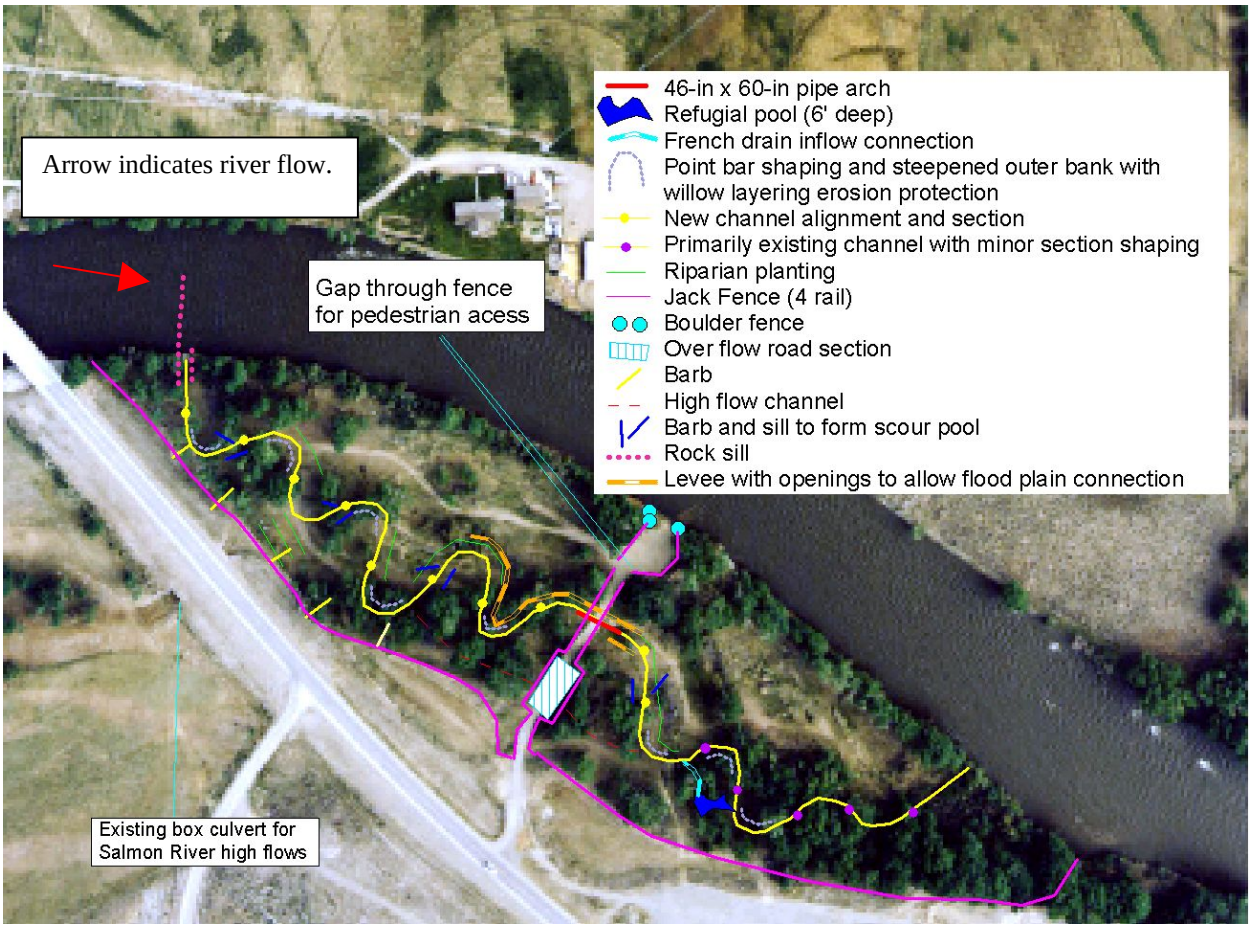


Plate 4. Highway 93 Bridge project site.

Plate 5. Area in the vicinity of the upstream end of the old channel on the Highway 93 Bridge site that would be reopened and realigned.

Plate 6. Area in the vicinity of the downstream end of the old channel on the Highway 93 Bridge site that would be reopened and realigned.

The upstream part of the sill that extends out into the Salmon River would cause some shear stress that will help reduce deposition that could block the side channel entrance. This will not entirely prevent blockage of the side channel, but it should reduce the rate of blockage and the frequency of maintenance.

A secondary high flow side channel would be constructed south of and connected to the new side channel. It would be approximately 500 feet long. A 75 to 100-foot long hardened section would be added to the access road where this channel crosses the road. This would provide for over-bank flow when flood flows exceed the capacity of the culvert in the new side channel. Consequently, access to the boat launch ramp would be cut off during flood events. A 48-inch diameter culvert, approximately 30 feet long, would be installed under the access road to allow vehicle access to the boat launch ramp during normal channel flow. This culvert would carry the high flows from the high flow channel during 1 ½ to 3-year high water events.

Near the east end of the new side channel a refuge pool will be constructed. The pool would be 6 feet deep and may provide over-wintering refuge for fish. Since the river feeds this channel, there is the potential that the channel could freeze. The pool would be deep enough to not freeze solid. In addition, a French drain will feed water from a higher elevation in the channel into the pool so that there will be some flow of water through the pool.

Approximately 500 feet of levee would be added near the middle of the new side channel. The levee would maintain proper channel bank height and bank full width in areas where past gravel mining operations have excavated large holes and altered the topography. The levee will have small openings through it that will allow some water to escape and fill these low areas. The leaky levee design should allow proper stream flow function and allow good flood plain connection that will facilitate robust riparian vegetation. The levee would not be in contact with the water in the side channel.

Some barbs and sills that will be added to the side channel will form scour pools. The meander bends will be constructed similar to natural streams with the point bars having relatively flat slopes and the outside banks of the bends having steep slopes. This will provide opportunities for under-cut banks and better in-stream habitat for fish. To protect the steep outer banks until vegetation is established, the project would use willow plantings and other erosion protection on these steep banks.

Riparian planting would occur in three locations along approximately 500 to 600 feet of stream bank. Additionally, the area downstream of the existing box culvert under Highway 93 would be vegetated to reduce erosion from the culvert's discharge.

A wooden jack fence (i.e. A-frame upright posts with rails on one leg of the frame) would be constructed 500 to 600 feet along each side of the boat ramp access road and along the edge of the riparian woodland. The fence would prevent vehicle access to approximately 15 acres of BLM property, which has been degraded by the use of all-terrain vehicles and borrow excavation. A short boulder fence would be installed on each side of the road where the chain fence meets the riverbank.
From 3 to 10 rock barbs would be installed where the Highway 93 embankment is close enough to the channel to be threatened by future flood events and potential migration of the channel.

The majority of the work would be completed in a dry channel. The entrance structure that would divert water for the new channel would be constructed last. The diversion would create a "first-flush" sediment affect, which should taper off quickly after water is introduced. Depending on the river flow condition at the time of construction, a turbidity curtain may be used to minimize sediment release. If water level and velocity result in poor containment performance, then in-water construction would be limited to 4 hours per day where the construction generates turbidity in excess of the turbidity limit at the discharge location into the main stem.

Construction access to the site would be by way of the boat ramp access road from Highway 93. Existing trails created by ATVs crisscross the project area. Construction vehicles would generally follow these existing barren pathways. In locations where the channel does not follow existing roads, traffic would be held to a minimum to minimize disturbance of the surface soil and vegetation. Equipment parking, stockpiles, and other staging would be located about 500 to 1000 feet from the river, within disturbed areas created by prior use. Any excess materials generated would be used to fill holes left by previous gravel borrow operations and filled to an elevation no higher than the adjacent ground line. Hauling plants, fencing, rock, and other materials would require approximately 110 to 215 truck trips during the construction at the site. From 4 to 10 trees larger than 2 inches in diameter may be removed during site construction. None of these trees would be cut along the main channel of the Salmon River.

Dunfee Slough (Site 1)

An aerial photo of the project site and proposed project actions is shown in **Plate 7** (river flow is from top to bottom of the photo). The project is located from about RM 322.7 to 324.7 in T13N R19E S3 (Bradbury Flat quadrangle). The project would install a 40 foot-log, 48-inch culvert with a 1½-foot orifice in the upstream end in order to provide main stem reconnection with an old side channel. The orifice edges would be framed with molding one foot wide to cover the sharp edges of the metal. Approximately 100 to 250 feet of new channel would be excavated to connect the main river channel with an existing series of ponds and channels. These ponds and channels are presently connected at the downstream end to the main stem of the Salmon River. This habitat consists of approximately 2,000 feet of constructed channels and ponds, with approximately 1,500 feet of natural slough. The construction of the new channel connection and any required deepening of the ponds would generate between 1,500 and 2,500 cubic yards of material. The excess material would be disposed of onsite and outside of the 100-year floodplain.

Dams that are two to four feet in height form the existing ponds. (**SeePlate 8, 9,10 & 11)**. Approximately 40 to 60 acres of flood plain area around the ponds would be planted with riparian vegetation. Field adjustments would be made to the elevations of the existing spillways to allow low flows through the system of existing ponds. These "adjustments" would consist of rearranging the existing boulders to facilitate fish passage.

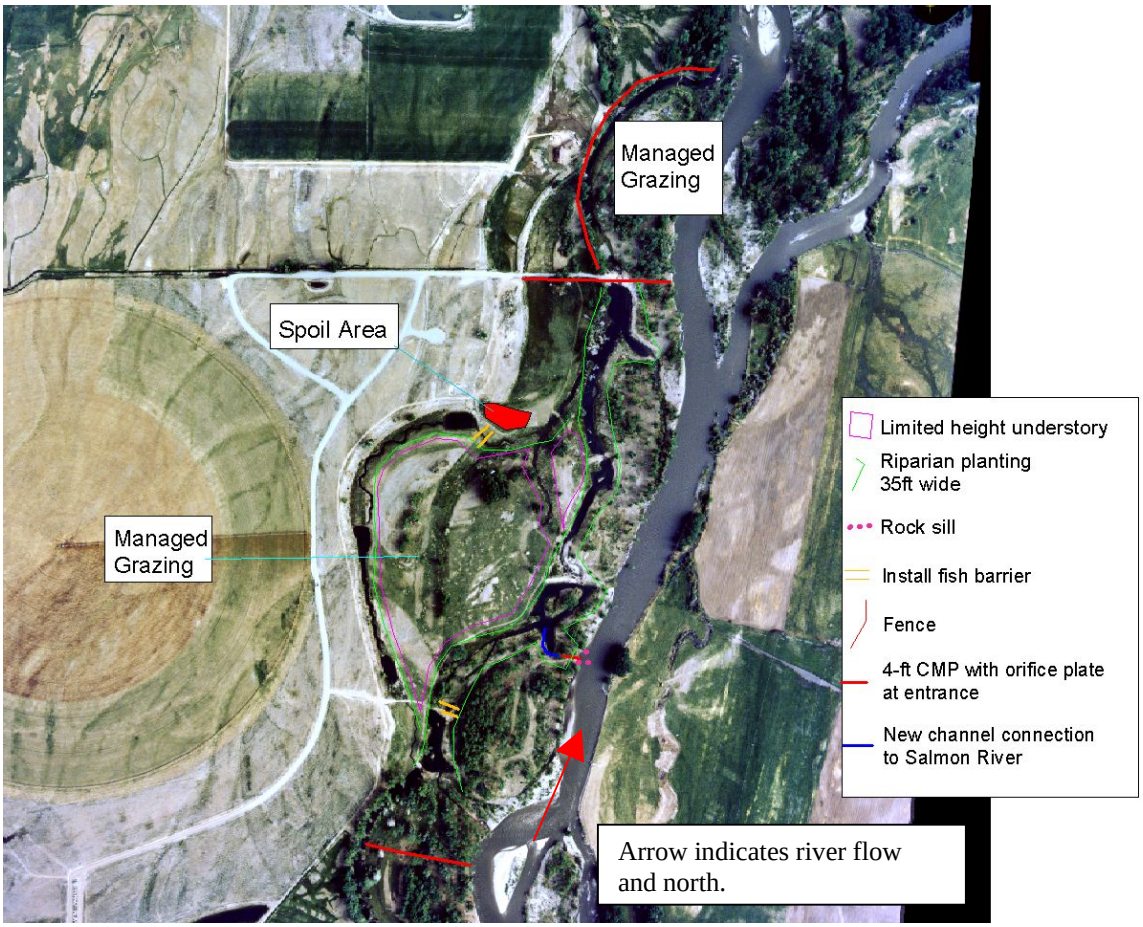


Plate 7. Dunfee Slough project site.

The ponds would be deepened to ensure perennial flows between the ponds, the existing side channel/slough, and the new side channel. The pools behind the spillways would remain a minimum of 3 feet deep.

Large woody debris would be placed in the ponds for cover, depending on the availability of downed trees within the property boundary.

A sill formed by large boulders will extend from the riverbank out into the riverbed about 50 to 80 feet at the upstream end. The design and installation of this sill is the same as the sill described for the Highway 93 Bridge project site on page 11.

About 900 feet of jack fence would be constructed at the north and south boundaries of the Dunfee Slough property, and another 1250 feet of fence around the edge of the existing side channel/slough to provide a managed grazing area of 70 to 100 acres.

Livestock currently graze on the property and the managed grazing easement is expected to improve water quality. The managed grazing easement would control the timing and grazing duration, in order to allow vegetation recovery, which would provide an improved function of the riparian zone along the watercourse. The easement would likely entail the elimination of any grazing for the first 3-4 years to

allow for riparian habitat recovery.

Two fish screens would be installed in order to prevent fish from entering the irrigation system further up the channel.

Irrigation flows into the existing side channel would be diverted or managed to reduce flows into the construction areas. Flows from springs would be diverted and/or pumped to other channels or to the main channel.

Construction access to the site would be from the nearby owner's residential road, which is located just off Highway 93 Alternate and Highway 93. Existing trails created by the landowners crisscross the project area. Construction vehicles would generally follow these existing trails. In locations where the channel does not follow existing roads, traffic would be held to a minimum to minimize disturbance of the surface soil and vegetation. Equipment parking, stockpiles, and other staging areas would be located within disturbed areas currently used by the landowner for similar purposes. These areas are 400 to 800 feet from the side channel and river. Hauling plants, fencing material and footer rock material would require approximately 15 to 30 truck trips during the construction at the site. Approximately 4 to 10 trees larger than 2 inches in diameter would be removed in the course of the construction work.

Plate 8. Dunfee Slough. One of the series of ponds formed by small dams with rock spillways.

Plate 9. Dunfee Slough. The area from center-photo, where the small logs are located, is a shallow spillway dam forming the pond to the left side of the photo. Spillways similar to this would be modified to provide better fish passage and improve rearing habitat. Note the lack of trees in the riparian area behind the pond. There is another side channel near the lone cottonwood in the background.

Plate 10. Dunfee Slough. Another rock spillway that forms a pond to the left of this photo. This spillway would require much more rearranging of the boulders in order to provide fish passage

Plate 11. Dunfee Slough. Dry pond in winter due to irrigation water being turned off. The 200 to 400 feet of new channel would connect this and other ponds into a perennial side channel/slough.

One Mile Island (Site 2)

An aerial photo of the project site and proposed project actions is shown in **Plate 12**. The project is located from about RM 322.5 to 323.5 in T14N R19E S35. At the upstream end of the project site, a post and wire fence would be constructed for a length of approximately 3,000 feet to provide a grazing exclusion area of approximately 30 acres. Both banks of the existing side channel, totaling about 1900 feet, would be planted to establish the riparian buffer zone. The landowner currently fords the east channel to access the island. Livestock do not graze the island. The construction for the project would use these existing fords.

There are three locations on the west side of the island, from 1,200 to 1,700 total linear feet, where the bank slope would be graded between 1 foot vertical rise on 1.5 to 3 feet horizontal run (about a 30% slope) and willow layering would be planted to provide bank protection between existing fish barbs. There are two locations on the east side of the island and one on the west side, from 1,000 to 1,500 total linear feet, where logs and willow layering would be placed to provide bank protection.

The flows directly impinge on the bank with relatively high velocity and it is unlikely that silt curtains would be effective in confining sediment during in-water work. Consequently, the most likely construction methodology would be to limit the in-water work to four hours per day to minimize sediment release during in-water construction of the footer rock and willow layering.

Construction access to the site on the west side of the main channel would be from a series of private roads which connect into the grid streets in Challis. The access to the island would be from the west bank and would be from the nearby owner's residential road, which connects to local county roads, to Challis Hot Springs Road and eventually, to Highway 93 Alternative. Existing barren pathways would be used for access within the site. Fording the river, at several locations currently used by the landowner, would provide access to the island. The construction materials area and office would be located about 400 to 500 feet from the river in areas previously used by the landowner for staging and

equipment parking. Grading the bank slope would not create any excess material. The material removed from grading the banks would be distributed on One Mile Island. Hauling plants, fencing material and footer rock material would require approximately 25 to 85 truck trips during the construction at the site. Approximately 2 to 5 trees larger than 2-inch diameter would be removed in the course of the construction work. **(See Plate 13**)

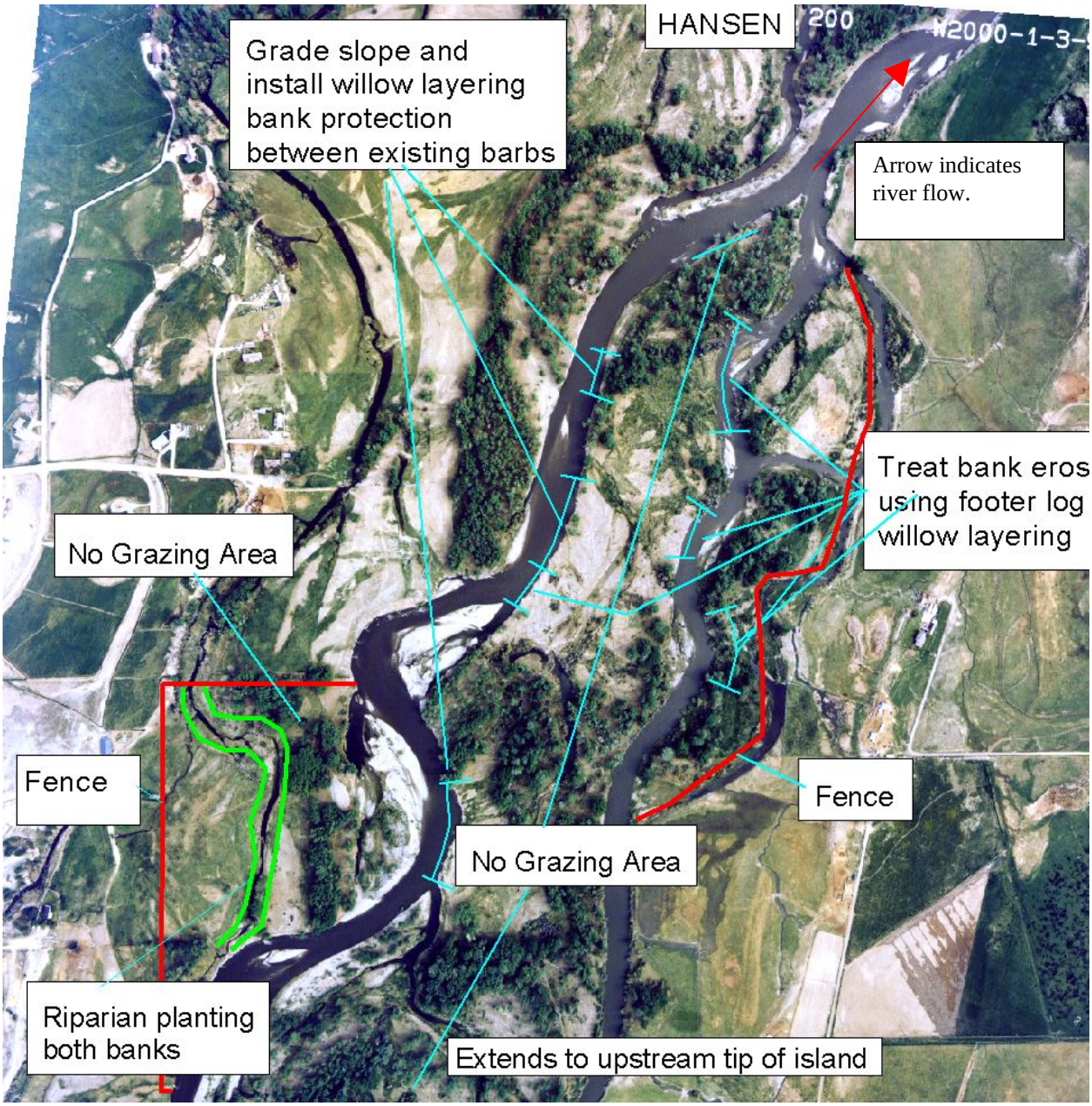


Plate 12. One Mile Island project site.

Plate 13. One Mile Island project site. Looking at the island across the western channel of the river. The banks between the rock barbs would be graded back and planted with trees.

Hot Springs Site (3)

The Southern Property.
An aerial photo of the southern landowners' project site and proposed project actions is shown in **Plate 14**. The project is located from about RM 320.9 to 321.3 in T14N R19E S23, 25 and 26 (Challis quadrangle).

On the east channel of Challis Hot Springs Creek, the project would construct a gravel dam and riffle in two locations to create 3-foot deep pools. The bottom of the gravel dams would be of material that contained sufficient fines to restrict flows through the gravel dam. The gravel in the top 12 inches of the dams would not have any fines in order to allow full flow over and through the dam. An existing culvert near the hay storage yard would be replaced with a 46-inch by 60-inch pipe arch, approximately 20 to 30 feet in length, in order to improve fish passage. (**See Plates 15 and 16)** Cobble beds would be installed in two locations to provide protection for small fish from herons. A fish barrier would be installed at the mouth of a ditch where excess irrigation water enters the Challis Hot Springs Creek channel next to a hay storage yard. Above and below the culvert next to the hay storage yard, the vertical banks on both sides of the creek channel would be excavated to provide 10-foot wide flood prone benches.

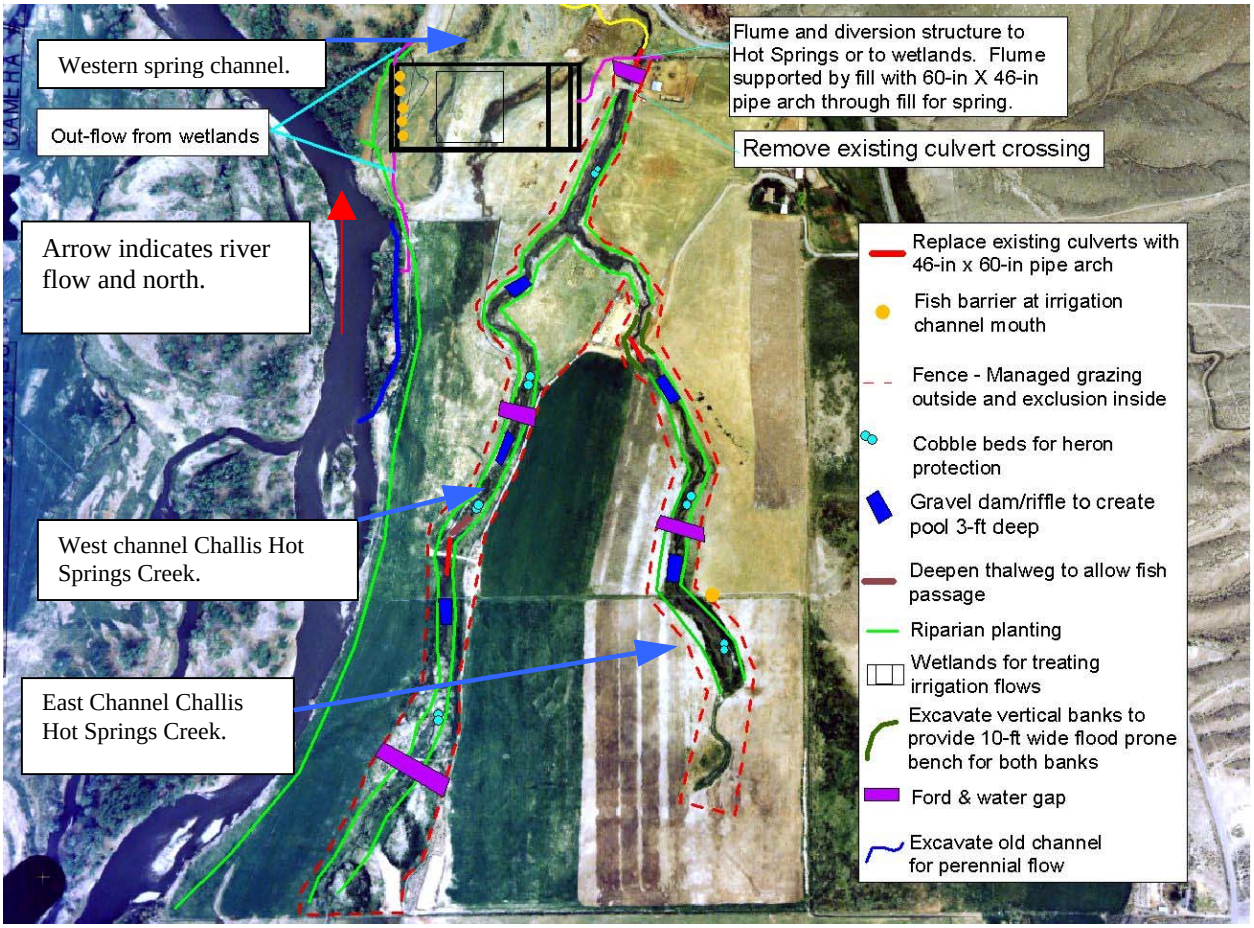


Plate 14. Challis Hot Springs project site, south landowner.

On the west channel of the creek, gravel dams and riffles similar to those described for the east channel of the creek, would be constructed in three locations to create 3-foot deep pools. An existing culvert near the mid point of this channel would be replaced with a 46-inch by 60-inch pipe arch in order to improve fish passage. To improve fish passage the thalweg would be excavated and deepened downstream from the arch. Cobble beds would be installed in three locations to provide protection for small fish from herons. **(See Plate 17)**

Plate 15. Looking down the east channel of Challis Hot Springs Creek near the hay storage yard. A larger culvert would be installed immediately upstream from where this photo was taken. This is also the location where 300 feet of bank would be excavated to produce a flood-prone bench. Trees and shrubs would also be planted here. The irrigation pipe that would have fish screens installed is barely visible (arrow).

Plate 16. Looking south on the east channel of Challis Hot Springs Creek upstream from the hay storage yard. this part of the creek channel would have two cobble beds and two gravel dam/pools constructed here, plus a fence along both sides of the channel and a water gap.

On the main channel of the creek, another existing culvert near the horse barn, adjacent to the north and south landowners' property boundary, would be replaced with a 46-inch by 60-inch pipe arch in order to improve fish passage. (**See Plate 18)** A cobble bed would also be installed in the main channel to provide protection for small fish from herons.

The cobble material placed in the cobble beds would be relatively clean material and turbidity generated during installation is anticipated to be relatively minor and of short duration. The installation of the culverts and flume, fish barrier, and thalweg deepening would be planned so that it would be expeditious and associated turbidity would be of short duration. The gravel material placed would have less than 10% passing the 200-sieve (i.e. a screen with 200 wires per inch) to minimize the turbidity generated during placement.

A post and wire fence would be constructed along the east, west and main channels on the southern property, and continue down the west side of the main channel on the northern property to where the Challis Hot Springs Road crosses the creek. The fence would be about 25 to 75 feet from the bank of the creek channels for a length of approximately 16,600 feet to provide a grazing exclusion area of approximately 25 to 40 acres. The area inside the fence would be planted with native shrubs and trees in order to develop a riparian buffer zone. Currently the livestock on the southern property have direct access to the entire length of the stream. Four hardened water gaps would be constructed to reduce the sediment created by livestock watering. One in the east channel, two in the west channel and one near the horse barn at the north/south property boundary.

Approximately 4,000 linear feet along the main stem of the Salmon River would be planted with native plants in order to improve the riparian habitat. (**See Plate 19)** The area between the fence and the river is approximately 30 to 50 acres and would be a managed grazing area. Livestock currently graze the property and the managed grazing easement is expected to improve water quality. The managed grazing easement would control the timing and grazing duration, in order to allow vegetation recovery, which would provide an improved riparian zone function for the watercourse. Near the north end of this riparian planting area, about 600 feet of an old side channel along the river would be excavated to reestablish perennial flows. This new side channel would provide additional rearing habitat for juvenile salmonids.

A new wetland would be constructed near the north boundary. The wetland would hold diverted irrigation water in order to trap sediment and keep warmer irrigation water out of Challis Hot Springs Creek. This wetland may actually function as a "semi-wetland" because it may be drawn down or dried up during the winter when irrigation flows are turned off. However, this "semi-wetland" will be referred to simply as 'the wetland' for the remainder of this BA.

The wetland would be approximately 6 acres in total size. About 2 acres would be open water wetlands and the remaining 4 acres would be emergent wetlands. The wetland would eliminate about 200 to 400 feet of the upper end of the west spring channel.

Plate 17. Looking down the west channel of Challis Hot Springs Creek. A 46” pipe arch would replace the 18-inch culvert that is just out of the photo in the lower right corner. The thalweg would be deepened just below this point to improve rearing habitat and passage. Cobble beds and gravel dams/pools would be installed above and below this point. The fence would be built on both sides of this channel.

Plate 18. Looking upstream at the main channel of Challis Hot Springs Creek at the culvert near the horse barn (arrow). A water gap would be below the culvert and the fence. The ditch outflow is on the far side of the fence in the foreground. The flume and pipe arch would be constructed just downstream of the wooden fence.

The west spring channel starts on the southern landowners' property and flows into the main channel of Challis Hot Springs Creek at the culvert where Challis Hot Springs Road crosses the creek. **(See Plates 20 and 21)** The wetland would be divided into several cells for sediment deposition with each having raised areas for emergent vegetation, deep-water areas for deep-water types of plants, and intake and outflow structures.

A flume and diversion gate structure would be constructed at the inflow of an irrigation ditch next to the boundary of the Stark and Hammond properties. **(See Plate 18)** The flume would be supported by fill over a 46-inch by 60-inch pipe arch through which the channel of Challis Hot Springs Creek would flow. The flume and diversion structure would divert irrigation water into the new wetlands or into Challis Hot Springs Creek, depending on the temperature and sediment in the irrigation water. If the temperature or sediment load of the irrigation water would appear to adversely affect the spring, then flows would be diverted to the wetlands. The flume and diversion structure would be constructed to prevent fish passage into the wetland and up the irrigation ditch inflow.

In the spring of the year or during thunderstorms, the excess irrigation water contains significant sediment. During these events, the irrigation inflow would be diverted through the flume and into the wetland. The size of the new wetland would provide about a 5-day retention time for average irrigation flows from the flume. The cooled water from the wetlands would discharge through two newly constructed channels, one that would flow into the river main stem and the other into a ditch on the northern landowners' property for irrigating his land. At other times of the year, when the sediment load and turbidity of the irrigation flow is insignificant, the irrigation flow may be allowed to join with the spring water flow in Challis Hot Springs Creek to augment those flows.

A large fish screen would be needed at the mouth of the new channel where it flows into the river to accommodate maximum flows out of the wetland. The Corps has chosen to use five smaller fish screens positioned at the outflow gates from the wetland. These five screens would prevent fish from entering the wetland. Fish would have access to the channel from the river to the wetland. The channel would be sloped toward the river in order to avoid stranding fish when irrigation flow out of the wetland was turned off.

Plate 19. Looking downstream along the Salmon River on the south landowners' property. Approximately 4000 feet of this bank would be planted with trees.

Plate 20. Looking up the west spring channel that starts on the southern landowners' property. The new wetland would cut off the upper 200 or 400 feet of this channel. the main channel of Challis Hot Springs Cr. merges with the western channel in the center of this photo. Photo was taken on the road crossing the culvert in Plate 21.

Plate 21. Looking upstream on the main channel of Challis Hot Springs Cr. at the end of the culvert near the northern landowners' house. This culvert is not considered a fish barrier and would not be replaced.

The project sponsor or another entity assigned by sub-agreement, would be responsible for managing and directing the excess irrigation return. The operation parameter would likely evolve over time based on observed conditions and consideration for the balance between the competing goals of preventing turbid water from entering the natural spring and providing the maximum flow to the natural spring. Additionally, temperature data may decide what is needed to limit the amount of irrigation water entering the natural spring in order to avoid creating a thermal barrier downstream from the cooler spring upstream.

Whenever possible, turbidity curtains would be placed downstream of the in-water work sites along Challis Hot Springs Creek to catch as much of the sediment as possible. Another method that would be used to reduce sediment effects on juvenile salmonids would be to pump flows from above the in-water work sites around them and back into the creek channel below the work or into the new wetland. As an added precaution, individuals specified by NOAA and or IDFG would monitor the in-water work sites in order to salvage any juvenile or adult fish that were stranded or endangered by the work. These people would be trained to NOAA/IDFG specifications in handling salmonids.

Construction access to the southern site would be from their land and northern landowner's residential road, which is located off Challis Hot Springs Road. Construction locations would be accessed using existing barren pathways and open areas. The material storage area and construction office would be located from 500 to 1000 feet from the creek and Salmon River, within existing areas used by the owner for equipment storage. Material removed to create the flood prone banks would be redistributed on site. Hauling plants, fencing material, and cobble material would require approximately 80 to 160 truck trips (for the southern and northern property combined) during the construction at the site. Up to three trees larger than 2 inches in diameter would be removed during site construction.

During construction activities in and along the channels on Starks' property, the flows in Challis Hot Springs Creek would be diverted around the construction sites using pumps, or diverted into the new wetland area.

<u>The Northern Property</u>
An aerial photo of the northern project site and proposed project actions is shown in **Plate 22**.

A new channel would be excavated directly from the hot spring overflow to the main stem of the river. This would allow rerouting of the geothermal spring to separate it from the cold-water in Challis Hot Springs Creek. There would be a control gate to route the geothermal flow to either the main stem of the river or the creek. The University of Idaho is collecting data to determine the effect of the geothermal discharge on spring flow from Challis Hot Springs Creek during both summer and winter months. The decision on where and when the geothermal flows should be rerouted would also be based on the results of this research effort. The project sponsor, or another entity assigned by sub agreement, would be responsible for managing and directing the geothermal flow.

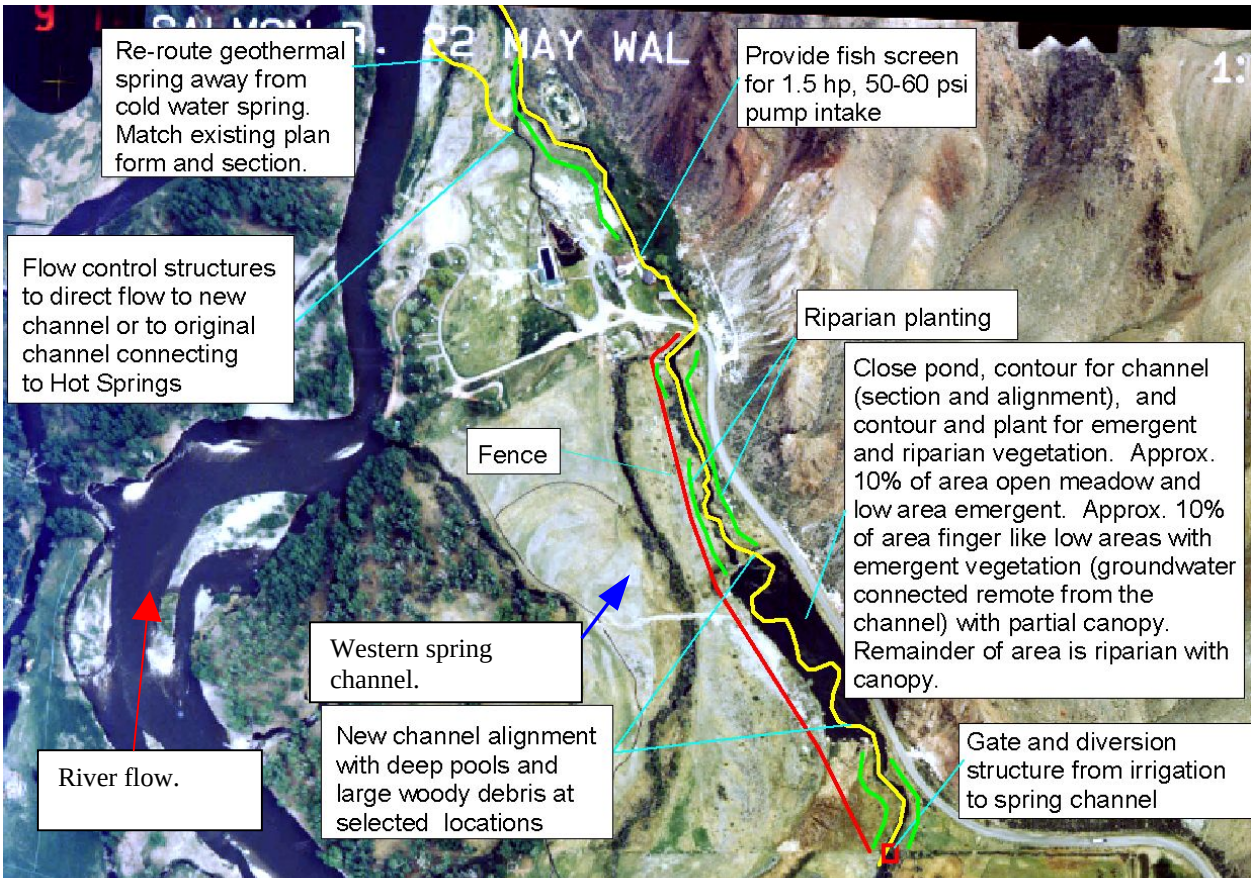


Plate 22. Challis Hot Springs project site, northern landowner.

A water pump intake screen next to the Hammond home would be modified to add a fish screen.

An existing pond on the Hammond property was built in the 1920's as a storage and recreation pond.

(**See Plates 23 and 24)** It has filled with an estimated 40,000 cubic yards of sediment since 1977. The outlet from the pond is a concrete structure with a 3-foot drop to the creek channel. This presents a passage barrier to juvenile and adult salmonids. (**See Plates 25 and 26)** Solar heat collected by the pond during the summer raises the water temperature of the inflow from Challis Hot Springs Creek on Starks' property approximately 10 degrees from approximately 58 degrees Fahrenheit at the upstream end of the pond to 69 degrees Fahrenheit at the downstream end of the pond. These measurements were taken when the excess irrigation water was not flowing into the spring channel above the pond. Therefore, the water temperature coming out of the pond during irrigation inflow may be different than when only water from the spring channel is flowing into the pond.

Plate 23. The existing pond on the north landowners' property, looking upstream toward the irrigation inflow. Note the shallow water, emergent vegetation and lack of riparian shrub/tree cover.

Plate 24. A view looking west, toward the river, at the existing pond (middle ground – right). The irrigation ditch that flows into the creek runs inside the fence in the middle ground next to the road. The diversion flume and pipe arch would be in the vicinity of the large bush to the left of the bend in the road.

The pond would be drained and a new channel would be constructed and contoured through the present pond site. The new channel would be approximately 1,500 feet long. The concrete structure at the downstream end of the pond would be removed and the channel would connect to the existing main channel of Challis Hot Springs Creek. (**See Plate 27)**

The new channel would have a more natural alignment and cross-section, and include riffles and pools. The overall width of the new channel would be much less than the existing pond, which is about 80 to 90 feet and eventually, a riparian canopy should be able to span the new channel and result in minimal solar heating of the new reach. The new channel would support high quality wetland vegetation for approximately 5 to 10 feet on each side of the channel.

Whenever possible, turbidity curtains would be placed downstream of the in-water work sites on the northern property along Challis Hot Springs Creek to catch as much of the sediment as possible. Another method that would be used to reduce sediment effects on juvenile salmonids would be to pump flows from above the in-water work sites around them and back into the creek channel below the work or into the new wetland. As an added precaution, individuals specified by NOAA and/or IDFG would monitor the in-water work sites in order to salvage any juvenile or adult fish that were stranded or endangered by the work. These people would be trained to NOAA/IDFG specifications in handling salmonids.

The vegetation in the existing pond is of minimal quality (includes water cress, pond weed and a small amount of duck weed in the open water portion of the pond and nettles and forbs at the banks) and covers an area of 104,000 square feet. (**See Plates 23, 24 & 26)**

Plate 25. Looking up the main channel of Challis Hot Springs Cr. at the concrete outflow barrier on the existing pond on the north landowners' property.

Plate 26. Looking downstream at the concrete outflow barrier on the pond mentioned in Plate 25.

Plate 27. Looking downstream on the main channel of Challis Hot Springs Cr. from the top of the concrete outflow structure. Note lack of woody vegetation. The stream bank would be planted with trees and shrubs.

By forming a new channel through the existing pond, the pond inlet would remain connected to Challis Hot Springs Creek but not to the irrigation inflows. The effect of lowering the water table would be minor. Perennial and annual grasses, forbs, thistles, stinging nettle, and a few small bushes that are common to dry habitats in central Idaho characterize the existing vegetation around the pond. A "bench" would be formed along the new channel that is 6 inches to 1.5 feet above the water surface (at the time of construction). The bench area would vary in width from 5 to 40 feet and is expected to support grasses and sedges and perhaps some willow at the higher locations. The remainder of the pond area would be contoured to create upland areas, which would support scrub-shrub vegetation such as willow, alder in the lower areas and cottonwood at the higher elevation. The upland bench area would extend up to 75 feet from the new pond edge.

Riparian vegetation that is more diverse would replace the pondweed in the open water portion of the existing pond. It is expected that the margins along the current channel above the pond would be flooded creating shallow high quality wetland habitat (1 to 2 feet deep; 3 to 5 feet wide on each side; approx 7,500 sq. ft.). The loss of approx. 104,000 sq. ft. of low and impaired quality wet lands compared to the creation of approximately 51,500 sq. ft. of high quality wetlands is considered a net improvement.

During construction of the new channel through the old pond, the flows would be diverted around the construction sites using pumps, or diverted into the constructed wetland area.

Construction access to the northern landowners' site would be from their property and from the southern landowners' residential road, which is located off Challis Hot Springs Road. Existing trails and roads would be used for access without constructing of new roads. The material storage area and construction office would be located 500 to 1000 feet from the creek and river, within areas currently used by the owner for staging and equipment parking. Material removed to flatten the eroded banks would be redistributed on site. Hauling plants, fencing and intake and outlet structures material for the created wetland would require approximately 80 to 160 truck trips during the construction at the site. Approximately 4 to 10 trees larger than 2-inch diameter would be removed in the course of the construction work.

Pennal Gulch (Site 4)

An aerial photo of the project site and proposed project actions is shown in **Plate 28**. The project is located from about RM 318.8 to 319.8 in T14N R19E S11 and S14 (Challis quadrangle). The project would breach an existing levee and install a 46-inch by 60-inch pipe arch to control inflow. **(see Plate 29)** The velocities through the pipe-arch require that the bottom of the outlet be lined with rock to avoid severe scour that could undermine the culvert and result in failure during large flood events. A sill formed by large boulders will extend from the riverbank out into the riverbed from 50 to 80 feet. The rock sill would be near the breech in the levee and would help direct flows into the new side channel and help reduce deposition of material at the entrance of the channel. The design and installation of this sill is virtually identical to the sill described for the Highway 93 Bridge project site on page 11.

Between 1,300 and 1,700 feet of new channel would be excavated along the edge of an existing wetland. (**See Plate 30)** A levee would be built between the wetland and the new channel to allow a 1-½ year event to flow over it. The channel would be built along the edge of the wetland because there is not enough space between the wetland and a stand of mature trees to build the channel without damaging the roots of the trees, and possibly killing them.

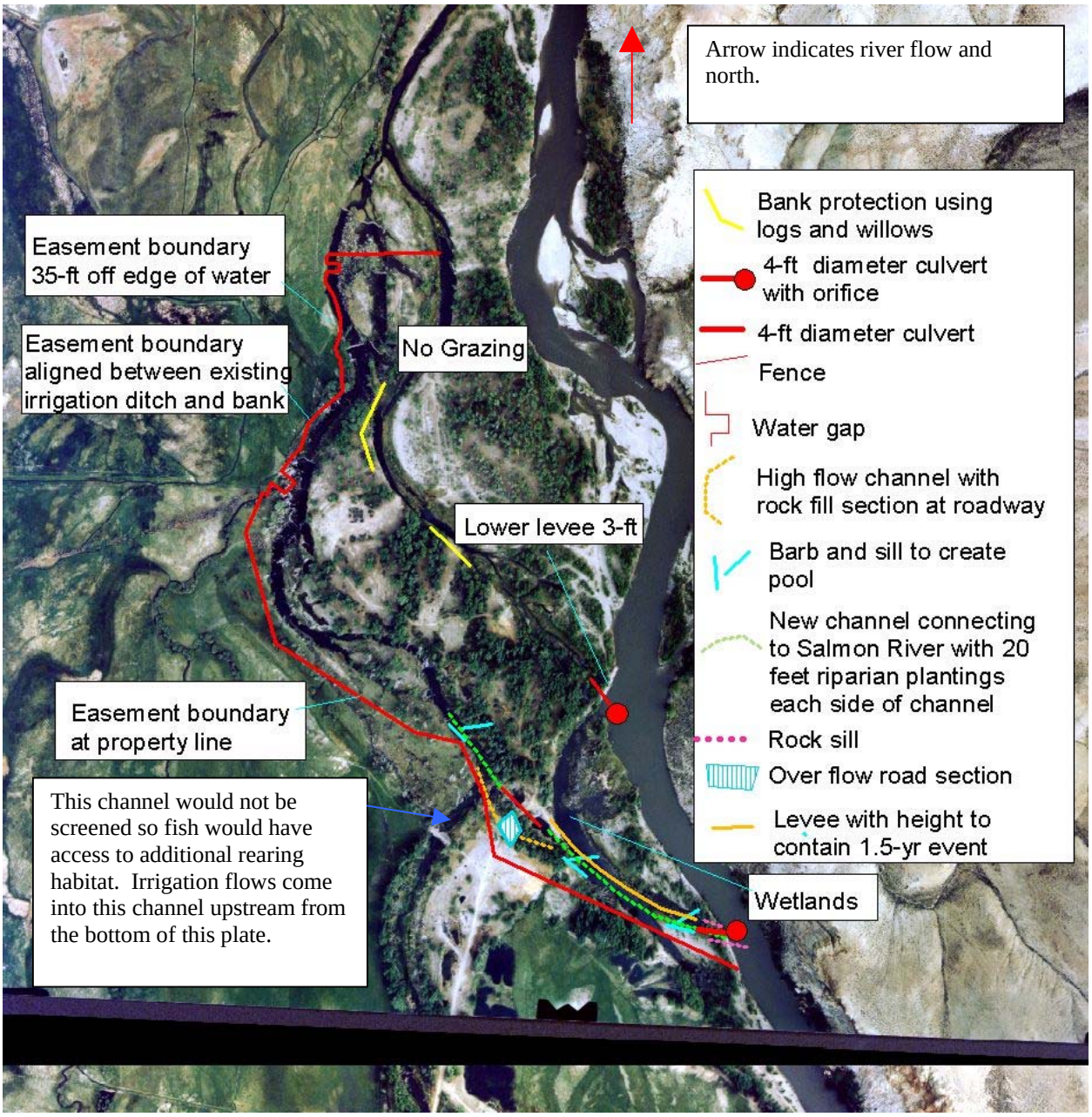


Plate 28. Pennal Gulch project site.

Plate 29. Pennal Gulch. Looking down the Salmon River from the top of the levee that would be breeched. Near this point a 48" culvert with a 1 ½ foot orifice would be installed. The new channel would be to the left and the rock sill into the river would be to the right. The wetland begins about 100 feet beyond the left side of this photo.

Plate 30. The Existing wetlands on the Pennal Gulch site. The levee that would be breeched is in the center background near the shorter trees. The new side channel and levee would be along the right edge of the wetland and the taller trees. The culvert to connect the new channel to the existing side channel/slough would be immediately behind and to the right of this photo.

The levee would allow connection with the wetland while maintaining the integrity and stability of the new channel. This side channel would carry perennial flows.

The excavated channel width is relatively narrow to minimize the surface area and potential for solar warming. Where room is available without undue removal of trees, a bench will be provided at an elevation slightly above the 1.5-year event. This bench already exists in some instances and provides a surface that is close to the water table for robust riparian growth. The width of the bench would vary greatly depending on proximity to existing trees. Large woody debris would be anchored into the side of the channel to provide cover where suitable material is available for salvage. The constraints on horizontal alignment (proximity to property boundary and the wetlands) and on vertical alignment (existing elevation of Salmon River thalweg at the entrance location) reduce the opportunities to provide habitat features, especially meander bends, pools, and riffles. To compensate for the lack of riffles and pools, the design would include two barbs that would direct flow against the opposite bank, which would be protected by a sill formed of large boulders for bank protection. This combination of barb and sill is expected to create a deep scour pool and deposit the scoured material downstream to form a riffle.

A 48-inch diameter culvert, approximately 20 -30 feet long, would be installed in the new side channel to connect it to an existing slough/side channel, and would provide vehicle access across the culvert. A high flow channel would be constructed around the culvert for flows greater than the 1 to 3 year event. Where this channel crosses the road, a rock fill section would be constructed, which would minimize damage to the road by the floodwaters. For approximately 800-ft downstream of the culvert, some channel excavation would be required to transition from the culvert thalweg to the natural channel thalweg. A third barb and sill would be installed approximately 500 feet downstream of the culvert to provide a pool though this reach.

The proposed new side channel connection would intersect with a network of relic channels that currently flow with spring water year round and excess irrigation water that flows during the irrigation season. **(See Plates 31, 32, & 33)** The irrigation inflow points are remote from the side channel and are not easily distinguished from the springs. Isolating this network of inflowing water at its' confluence with the side channel by installing a fish screen or fish barrier will remove a relatively large area that is potentially valuable as rearing habitat. The IDFG has requested that a fish screen not be installed because it would isolate an upstream segment that generally has year-round flow. (Personal comm. Tom Curet, IDFG, 2002) This segment is supported by a combination of irrigation, spring, and/or ground water. The general thinking is that the habitat benefit from the additional unscreened stream segment outweighs the risk of fish being trapped further upstream where the irrigation system feeds in. Other issues that have been raised are that a fish barrier is not feasible at this location due to insufficient elevation change, and a fish screen here would require higher-than-average maintenance.

A 48-inch culvert, approximately 40 feet long, would be installed through the Sportsman Access levee. The levee would be reduced in height by approximately 3 feet for a distance of approximately 100 feet. This would provide increased floodplain connection behind the levee by overtopping the lowered surface, and thus increase the flooding frequency to about every 2 to 5 years, creating an intermittent channel flow. **(See Plate 34 and 35)** The channel old side channel downstream of the new culvert has two areas of bank erosion from past flood events. Logs anchored with rock and banks planted with willow plantings would be used to stabilize about 350 feet of the bank in these locations.

Plate 31. Pennal Gulch. Looking downstream at the confluence of two channels. The channel on the right would be connected to the new side channel around the wetland. The culvert connecting the new side channel to the channel/slough on the right of this photo would go under the Sportsman's Access road about 150 feet behind the lower, right corner of the photo. The channel to the left comes from a network of relic channels/sloughs that currently flow with spring water year round and excess irrigation water during the spring and summer. From this confluence downstream about 800 feet the channel/slough would be excavated to transition the culvert thalweg to the natural channel thalweg. A set of barbs would be constructed about 500 feet downstream from this spot to form pools.

Plate 32. Looking down the eastern side channel/slough on the Pennal Gulch site. If the levee at the Sportsman's Access was lowered, and an old side channel reopened, the water from 1 ½ to 3-year events would flow into this channel 300 to 400 feet upstream from this point.

Plate 33. Looking at the confluence of the eastern channel (left) and the western channel at the Pennal Gulch site. The left channel would be connected to the lowered levee at the Sportsman's Access. The right channel would be connected to the new channel around the wetland. The main channel flows into the Salmon River about 700 to 800 feet to the right of this photo.

A post and wire fence would be constructed for a length of approximately 7,000 feet to provide a grazing exclusion area of approximately 81 acres. Three water gaps would be constructed to provide for stock watering.

The flows directly impinge on the levee with relatively high velocity and it is unlikely that silt curtains would be effective. Consequently, the most likely construction methodology would be to limit the in-water work to the 4 hour per day window to minimize sediment release during in-water construction of the rock-lined inlet, log and willow bank protection, install culverts, and reconnection to the main stem.

Construction access to the site would be from the existing Sportsman's Access road off Highway 93. Temporary travel pathways, approximately 3,000 feet long, may need to be constructed within the site to connect various construction points. These roads would be re-vegetated to the landowners' satisfaction. Construction equipment would be parked along the existing road in widened areas that currently serve vehicle parking and are more than 500 to 1500 feet from the river and side channel. In addition, culverts and other miscellaneous construction materials would be staged in existing parking areas and existing widened areas along the road. Rock material removed to lower the existing levee would be placed on the backside of the levee to reduce the grade from the top of the levee and avoid forming a plunge pool behind the levee when it is overtopped. Removal of excavated material to connect to the main channel and route the side channel around the existing wetlands would require between 250 and 800 truckloads. The excess material from excavation would be placed to fill abandoned borrow pits located on the property, approximately 1000 ft from the channel excavation area. Hauling plants and fencing material and rock-anchoring material would require approximately 45 to 85 total truck trips from off-site. Approximately 5 to 10 trees larger than 2 inches in diameter may be removed to construct the site.

Plate 34. Looking at the top of the levee that would be lowered at the Sportsman's Access on the Pennal Gulch site. The proposed 48" culvert would come through the levee to the right of this road and flow would primarily follow old channel/flood plain depressions shown in Plate 35.

Plate 35. Pennal Gulch. The old channel and flood plain depressions (center of photo) that would carry the flows from the culvert in the lowered levee at the Sportsman's Access.

Site-specific projects are listed for quick reference by the project site and landowner in Tables 1 through 5.

Table 1. Summary of projects that are proposed for the Highway 93 Bridge within the 12 Mile reach.

Proposed Work & Purpose	**Number of Locations**	**Approximate Size/Improvement**
Excavate & reconnect old side channel to the river, with point bars & willow layering.	1	1,800 ft.
Install a rock sill at the upstream end of the new side channel to reduce deposition of transported materials in the river.	1	100 -120 ft.
French drain inflow from side channel to a refuge pool.	1	75 ft. 50 ft. x 100 ft.
Install barbs and sills to create scour pools	4	50 ft. each
Point bar shaping on outer banks of the new side channel with willow plantings for bank protection.	5	500 – 700 ft. total
Construct a levee with openings to allow flood plain connection along the new side channel.	1	500 - 700 ft.
Install 46-inch by 60-inch pipe-arch under the access road.	1	30 - 40 ft.
Build hardened section of access road to handle over bank flow in the high flow channel when flows exceed capacity of the culvert.	1	100 ft.
Construct a high flow channel off of the new side channel.	1	500 ft.
Boulder fence with metal posts to control vehicle access on either side of boat ramp road.	1	100 ft.
Build a jack fence along the fill slope of Highway 93 and along the edge of the riparian woodland and down the boat access road.	1	2000 to 2300 feet
Plant trees & shrubs along the side channel, and below the box culvert under Highway 93.	3	600 ft. total
Install rock barbs on the highway 93 embankment for protection from future floods.	1	3-10
Mature trees may be cut during construction; none would be cut next to the river.	unknown	4 - 10 trees

Table 2. Summary of projects that are proposed for the Dunfee Slough property along the Salmon River within the 12 Mile reach.

Proposed Work & Purpose	**Number of Locations**	**Approximate Size/Improvement**
Rock sill to control deposition into the side channel; - construct a channel to connect the river with an existing side channel/pond/slough, and - deepen ponds and channels between them.	1 1 2 - 5	50 - 80 ft. 200 - 400 ft. 300 – 700 ft. total (1500 – 2500 cu.yds. of material removed)
Install a 48 inch culvert at side channel entrance with a 1-½ ft. orifice plate to control flow.	1	20 - 40 ft.
Rearrange existing pond spillway rock; fish passage.	4	75 ft. ea.
Install fish barriers on western side channel/pond complex	2	n/a
Plant trees and shrubs to improve side channel rearing habitat.	4	40 – 60 acres total
Build wire fence at the north and south property lines, and along the northern section of the side channel; protect riparian vegetation & improve rearing habitat.	1 1	1250 – 1500 ft. 1000 – 1200 ft.
Mature trees may be cut during construction; none would be cut next to the river.	unknown	4 - 10 trees

Table 3. Summary of projects that are proposed for the One Mile Island property within the 12 Mile reach.

Proposed Work & Purpose	**Number of Locations**	**Approximate Size/Improvement**
Plant trees & shrubs along existing side channel; rearing habitat.	2 (both banks)	1900 ft. total
Grade slope of vertical river bank between existing barbs on One-Mile Island along the east bank of the river; install logs at the foot of the bank & plant willows.	6	3200 – 3800 ft. total
Wire or log fence; protect side channel rearing habitat, or main channel, grazing excluded.	1	3000 - 3500 ft.
Mature trees may be cut during construction; none would be cut next to the river.	unknown	up to 7 trees

Table 4. Summary of projects that are proposed for the Challis Hot Spring property within the 12 Mile reach. The property owner is designated by an 'S' for southern and an 'N' for northern in the "No. of Sites" column. The information is separated into the three channels of Challis Hot Springs Creek, the east, west & main channels, and a western spring channel that originates from a spring on the southern property and merges with the main creek channel about 1000 feet downstream from the existing pond outlet.

Proposed Work & Purpose	**No. of Locations**	**Approximate Size/Improvemt.**
East channel: Gravel dam/riffles to form jump pools. - cobble beds for juvenile cover from predators. - Replace culvert near hay yard with 46" x 60" pipe arch for fish passage. - fish screen at mouth of ditch. - Excavate vertical banks to create overflow bench on both banks.	2 - S 2 - S 1 – S 1 - S 1- S	100 ft. each 200 ft. each 30 – 40 ft. n/a 300 ft.
West channel: Deepen thalweg, rearing habitat & predator protection. - Gravel dam & riffles to form jump pools. - Replace existing culvert & replace with 46" x 60" pipe arch - cobble beds for juvenile cover from predators.	1-S 3-S 1-S 3-S	200 ft. 100 ft. each 30 - 40 ft. 200 ft. each
Main channel: Excavate new channel to route the hot spring overflow out of Challis Hot Springs Cr. & directly into the river. - Install flume & diversion structure to divert irrigation runoff into Challis Hot Springs Cr. or into the new wetland. - Install a 46" x 60" pipe arch to convey the flow of Hot Springs Cr. under the irrigation flume. - Install fish screen on residential irrigation inlet. - Close & drain the existing pond and excavate a new channel for Challis Hot Springs Creek.	1-N 1-S 1-S 1-N 1-N	700 ft. 40 – 50 ft. 30 - 40 ft. n/a 1500 – 1800 ft.
Western spring channel: Grade & excavate new wetland; remove sediment from irrigation runoff & create semi-wetland habitat.	1-S	6 ac.
Construct channel from the wetland to the river to take cooled water back into the Salmon River on Starks land. - Install 5 fish screens on weirs at the head of the outlet channel to the river	1-S 5-S	400 ft. n/a
Projects on Both Properties & Along the River		
- Construct wire fence along east, west and main channels of Challis Hot Springs Creek to protect riparian habitat for rearing. - construct 4 water gaps in fence for stock watering.	1-S & N 4 - S	15,000 – 17,000 ft. 50 – 75 ft. each
Excavate an old side channel along the Salmon River to reestablish perennial flows: rearing habitat.	1-S	700 – 800 ft.
Plant trees & shrubs; - along east, west, & main channels of Challis Hot Springs Cr., & the new wetland; rearing habitat. - Plant along main channel of the Salmon River to improve riparian habitat.	S & N 1 -S	12,000 - 14,000 ft. 4000 ft.
Mature trees may be cut during construction; none would be cut next to the river.	unknown	7 - 10 trees

Table 5. Summary of projects that are proposed for the Pennal Gulch property within the 12 Mile reach.

Proposed Work & Purpose	**Number of Locations**	**Approximate Size/Improvemt.**
Wire fence to exclude cattle from wetland & rearing habitat.	1	7000 ft.
Construct water gaps in the fence for livestock grazing from the other side of the fence.	3	100 ft. each
Plant willow & trees along the side channel & place cottonwood logs for bank protection.	1	350 ft.
- Breech the levee about 700 ft. upstream from the Sportsman's Access and; - install a 48" culvert with a 1-½ foot orifice to carry flows to a new side channel. - Construct rock sill in river at the entrance of the breeched levee & culvert to direct flows to the new side channel & reduce deposition of material at the entrance to the channel.	1 1 1	50 - 100 ft. 50 – 75 ft. 50 – 80 ft.
- Construct new channel from the breeched levee around the edge of an existing wetland and connect with an existing slough. - Build levee 1.5 ft. high between new channel & wetland to protect wetland.	1 1	1700 - 1900 ft. 600 - 800 ft.
- Construct barbs and sills in the new channel to protect the banks and form riffles and pools for rearing habitat.	3	150 - 200 ft. total
- Lower the levee at the Sportsman's Access by 3 feet to reconnect the floodplain.	1	30 – 50 ft.
- Insert a 48-inch culvert with 1 ½ foot orifice in the lowered levee at Sportsman's Access then; - excavate down the old side channel below this culvert to make a natural transition from the river to the old side channel.	1 1	20 – 30 ft. 800 – 900 ft.
- Put anchor logs on the bank of the old side channel downstream from the lowered levee at the Sportsman's Access; plant banks with willow for bank protection.	1	300 – 500 ft.
- Install a 48" culvert on Sportsman's Access road to connect the new side channel around the wetland to the existing slough & relic channels for fish passage.	1	40 – 50 ft.
Construct a high flow channel with rock fill section on the road into the Sportsman's Access.	1	80 ft.
Construct temporary roads between work sites.	1-3	3000 - 4000 ft. total
Mature trees may be cut during construction; none would be cut next to the river.	unknown	5 - 10 trees

IV. EXISTING ENVIRONMENT

A. GENERAL DESCRIPTION OF THE PROJECT AREA

In 1997, landowners and members of the Custer County Watershed Group, and representatives from various state and federal agencies and the private sector met in Challis, Idaho to begin work on a coordinated plan to stabilize a 12 mile stretch of the Salmon River. This reach of the river, as well as the town of Challis, lie within an area known as Round Valley.

This biological assessment covers a reach of the Salmon River that is designated as "Critical Habitat" for listed Snake River chinook and sockeye salmon. The exact same reach had been designated as critical habitat for Snake River steelhead until April 30, 2002 when the U.S. District Court for the District of Columbia approved a NMFS consent decree withdrawing critical habitat designation for 19 salmon and steelhead populations on the West Coast, including Snake River steelhead. However, this biological assessment will analyze the impacts on Snake River steelhead from the USRC as if this reach of the Salmon River remained designated as critical habitat for steelhead.

On November 14, 2002, the U.S. Fish and Wildlife Service (FWS) released the proposed list of critical habitat for bull trout in the Columbia River Basin. The USRC reach is included in the proposed critical habitat, as well as Morgan, Challis, and Garden Creeks, which are tributaries that flow into the Salmon within the 12-mile reach. The publication date for the critical habitat proposal will follow public meetings held in January 2003 and a subsequent 60-day public comment period. This biological assessment will analyze the impacts on bull trout from the USRC as if the Salmon River and the previously mentioned tributaries were eventually listed as critical habitat.

One of the goals of the proposed environmental restoration work would be to meet specific habitat needs of these listed species. Chinook salmon use the Round Valley reach of the Salmon River as a holding area for adults and a rearing area for juveniles with a small amount of spawning occurring. Steelhead use the area as a holding area for adults, and a rearing area for juveniles. Professional judgment and observations by local biologists indicate that some spawning occurs in the 12 Mile reach, all by hatchery steelhead. (Personal communication, Tom Curet, IDFG, Nov. 2002). Bull trout may pass through the area seasonally or may use the river for over-wintering.

The area being evaluated for this project is at the lower end of the Upper Salmon River hydrologic unit. This is the subdivision name assigned to this portion of the Salmon River basin by the US Geological Survey (USGS), the agency responsible for gauging and compiling stream flow data nationwide. The Upper Salmon Sub basin is within the Columbia River Basin hydrologic region. The Upper Salmon River hydrologic unit extends from the headwaters to its confluence with the Pahsimeroi River.

Stream flow regimes are typical of central Idaho mountain streams with peak flows in late spring to early summer from snowmelt runoff. Low flow occurs in late summer through the winter. There is substantial variability from year to year due to fluctuating precipitation and temperatures.

The floodplain of the Upper Salmon River itself is broad as compared to the canyon lands in the lower Salmon River further downstream. Pastureland and irrigated agriculture exists on the river's floodplain throughout the lower reaches of the sub basin, such as in the vicinity of the USRC in Round Valley at Challis.

The Idaho Department of Environmental Quality used several gauging stations located throughout the sub basin to gather flow data. A gage located on the Salmon River near Bayhorse Creek (about 8 miles south of Round Valley) recorded average flows of 1490 cfs, minimum flow was 855 cfs, and maximum flows were 2470 cfs. Another gage on the Salmon River above the Pahsimeroi River read average annual flows of 1595 cfs, minimum flows of 935, and maximum flows were 2600 cfs. The data years for these figures were unknown. (IDEQ, Feb. 2001). The peak flows measured at the gage located near the town of Salmon in 1996 and 1997 were16,000cfs and 15,900 cfs, respectively. The estimated peak discharge at the town of Challis was 14,700 cfs and 14,350 cfs, for the same years. These 1996 and 1997 flows were estimated to be 20-year events. (Personal comm. Scott King, University of Idaho).

The land within the USRC area has been developed for livestock ranching and irrigated agricultural use. This practice resulted in crowding of the stream to one side of Round Valley to make more room for the fields. These changes probably occurred early in the 20th century. Additionally, residents upstream of and within the project area have constructed numerous flood-fighting structures (i.e. dikes, gravel removal from the channel bed, etc.) to protect the structures on their properties.

Based on site observations and air photo interpretation, the Corps biologist for this analysis believes that the alignment of the channel has been grossly altered due to development and to reduce flooding. Excessive grazing and removal of brush and trees (e.g. willows, cottonwood and aspen) from the riparian zone has reduced native woody species by an estimated 25% of their original coverage and midday shade by an estimated 10% of the wetted channel. Approximately 85% of the main channel is oriented in a north/south direction, which allows only a small portion of the river to be shaded during the hottest part of the day. About 60% of the east and west banks of the river is open, with only grass, shrubs or gravel bars along the water. Approximately 40% of the 12 Mile reach has mature trees along the shoreline.

The change in alignment, loss of stabilizing riparian vegetation and sediment load from upstream has caused instability in the channel with roughly 70% of the banks showing evidence of active erosion. The channel that has developed under these conditions lacks the distribution of riffle and pool habitat that is preferred for salmonid rearing (roughly 50% of each). The existing Upper Salmon River is largely run (glide) habitat with a small amount of riffle habitat and only 5-10 square meters of high quality pool habitat in the proposed restoration reach. The changes in alignment and geomorphic character (i.e. increased width to depth ratio) along with irrigation withdrawals has resulted in sections of the channel being without adequate surface flow in some sections during the irrigation season. The channel is devoid of large wood and there is little potential for future recruitment due to lack of existing riparian vegetation. Large wood that enters the river may be removed by landowners to prevent possible flooding of their property or by rafting guides that remove the trees as hazards. High water events also move much of the large wood that falls into the river. The homogeneous nature of the channel results in little in- stream diversity and little in-stream cover (less than 5%).

1. Water Quality

The Upper Salmon water quality is relatively high. Degradation from sedimentation and high concentrations of nutrients and metals has occurred in some streams, particularly in watersheds that have been affected by improper road construction and location, past mining activities and improper livestock grazing (State of Idaho, 1999). Water quality in the Salmon River corridor was included in the Idaho Department of Environmental Quality 303(d) list in 1998 as containing pollutants of sediment and temperature from Redfish Lake Creek downstream to the East Fork Salmon River. References that included the 12 Mile reach were not found. (Dept. of Environmental Quality [DEQ], 2001). Major streams that flow into the Salmon River within the USRC area include Morgan Creek, Challis Creek, and Garden Creek from the west and Pennal Gulch from the east.

Tributaries to Challis Creek within the National Forest boundaries were considered good to excellent quality in an aquatic habitat survey completed by the Forest Service in 1993. However, Challis Creek above the Forest boundary was identified as poor quality with elevated bed load sediment, poorly defined channels, and excessive erosion and sedimentation. Water quality in Challis Creek from the Forest boundary to the Salmon River was included in the Idaho Department of Environmental Quality 303 (d) list in 1998 as containing pollutants of sediment, nutrient, and flow alteration. (Dept. of Environmental Quality, 2001).

Garden Creek has no perennial tributaries. It flows directly into the city of Challis, and is the municipal water supply for the city. On topographic maps, Garden Creek appears to terminate at Hanna Slough and does not directly intercept the Salmon River. Water quality in Garden Creek from the Forest Boundary to the Salmon River was included in the Idaho Department of Environmental Quality 303(d) list in 1998 as containing pollutants of sediment and nutrients.

Morgan Creek is a typical central Idaho mountain stream dominated by a snowmelt runoff regime. According to the Forest Service and BLM, every stream in the Morgan Creek sub-watershed has some amount of bank erosion. Numerous unscreened diversions have been in place since the late 1800's. During the irrigation season, (i.e. March 15 through November 15) Morgan Creek is sometimes dewatered before it reaches the Salmon River. (Dept. of Environmental Quality, 2001).

Daily average water temperatures in the Salmon River within the USRC area reach seasonal highs around mid to late July. From this time through about the first week of September, average daily water temperatures range from about 15 degrees C (59 F) to about 23 degrees C (74 F). (**See Plate 36)**

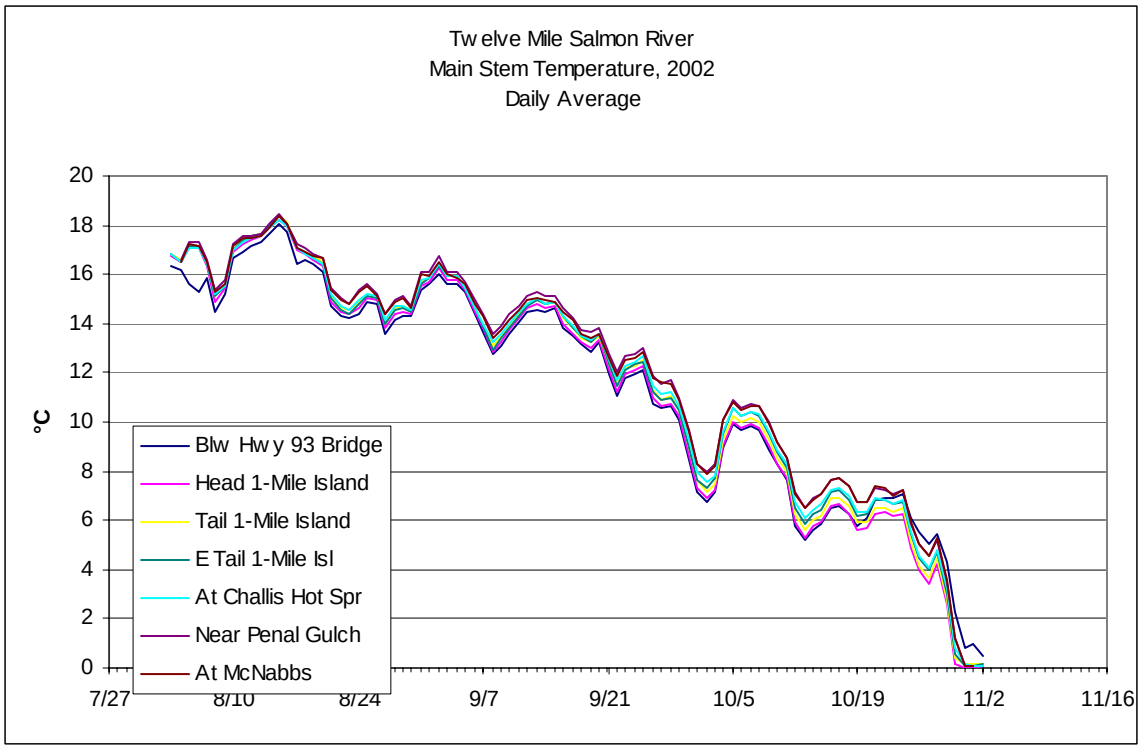


Plate 36. Average daily water temperature for the main stem Salmon River in the USRC area. (Scott King, University of Idaho, 2002)

2. Topography

The topography of the Upper Salmon River Basin includes high elevation alpine peaks, steep mountains, rolling foothills, and river valleys and floodplains. Lands in the low elevation non-glaciated foothills have been shaped by faulting and folding and have been further modified by fluvial and colluvial processes. From its confluence with the East Fork Salmon River, the main Salmon River flows north across dissected foothills and terraces until it enters the Round Valley near Challis. Round Valley is a large open valley about 7 miles long and 3 to 4 miles wide. Numerous wetlands and large expanses of floodplain characterize the valley.

3. Vegetation

Historically, shrubs and small trees dominated the USRC area riparian vegetation, in association with a rich assemblage of herbaceous species. Based on observations within an enclosure at the lower end of the project area and at other undisturbed riparian areas in the project vicinity, the major riparian shrub species were a variety of willows. The most abundant species are Booth's willow, Geyer's willow, and Drummond's willow. Other native shrubs contributing to the diversity and structure of the woody vegetation included speckled alder, red-osier dogwood, whiplash willow, and black twinberry. Many of the grasses and sedges persisting today were certainly part of the original vegetation, but their original diversity and extent have been altered by the agricultural practices and the hydrologic changes that have occurred.

Mature cottonwood, aspen, dogwood, and willow characterize the riparian area along the USRC. There are very few trees and shrubs in the seedling through co-dominant age classes. In some cases species composition, age class diversity, and plant vigor, have declined due to disturbed riparian soils, and changes in hydrology mostly from past mining, the presence of roads in the riparian zone, development of private land and over-grazing by livestock (Dept. of Environmental Quality, 2001). The Upper Salmon Sub-basin Assessment reported, "the Salmon River has been altered by human use and the attempt to control it". This occurs in the low gradient reaches in Round Valley and Stanley Basin. The extensive channelization, dikes, and riprap have resulted in a loss of stream side vegetation and the ability to inundate the floodplain." (Dept. of Environmental Quality, 2001). As a result, fisheries habitat has been degraded. Water temperature is a major limiting factor for native salmonids, and especially for bull trout in the main stem Salmon River. Improved shrub and tree densities along the river could help keep the river cooler in the mid-summer. Wider, more dense stands of riparian woodland may also help reduce icing in winter by reducing wind and increasing ambient temperatures. Summer water temperatures and winter ice are both limiting factors to fish rearing in the main river. (DEQ, 2001; State of Idaho, 1999)

4. Bed load Action

Most of the Upper Salmon River is a transport system. The Stanley Basin and Round Valley are the most important response reaches because they are the largest and because of the large floodplains associated with these reaches. The Salmon River channel in the 12 Mile reach has a gentle slope and high sinuosity and a moderate to high width-to-depth ratio. This stretch of the river is slightly to moderately entrenched.

B. DESCRIPTION OF THREATENED, ENDANGERED & CANDIDATE SPECIES

1. **Bald Eagle**

The bald eagle was listed by the US Fish and Wildlife Service (FWS) as a federally endangered species in 1978. On July 12, 1995, this species was reclassified to Threatened status in the lower 48 states. It was proposed for de-listing on July 6, 1999. The species' status will be re-evaluated at the end of the five-year monitoring period identified in the U.S. Fish and Wildlife Service's Final Rule for de-listing the species, as published in the Federal Register. The bald eagles' status may also be re-evaluated if there is a change in the species' status under the ESA during this period (for example, if the FWS initiated re-listing due to information gathered from monitoring).

Bald eagles would continue to be protected under the Migratory Bird Treaty Act of 1918 and the Bald and Golden Eagle Protection Act. Measures currently being taken to minimize disturbance at nesting sites should be maintained in future management for this species. The FWS is currently preparing a de-listing monitoring plan.

Critical habitat is not currently mapped or proposed for bald eagle in the USRC Area along the Salmon River. Bald eagle habitat (nesting or winter) occurs throughout Idaho, including the Salmon River. The Bureau of Land Management (BLM) conducts annual surveys and monitors bald eagle use of the Salmon River in the USRC Area. They have not established any bald eagle

management areas within this project area. There are no bald eagles currently nesting in this area, and there are not any historic records of nests. The BLM has records of nesting osprey in this area so there are suitable nest sites available for bald eagles. The BLM estimates a winter population of bald eagles in the Challis area of approximately 30 birds. A dead animal pit north of Challis that is used by the county highway department to dispose of road-killed animals is believed to be one of the primary attractions for these birds. There are no specific roost sites identified. (personal communication, Jerry Gregson, BLM 2002).

Nesting territories are normally associated with lakes, reservoirs, rivers or large streams (Lehman 1979). Bald eagle nests are usually located in uneven-aged (multi-storied) stands with old growth components (Anthony et al. 1982). Most nests in Idaho are located in predominantly coniferous stands or well-developed riparian habitats. Factors such as relative tree height, diameter, species, position on the surrounding topography, distance from water, and distance from disturbance also appear to influence nest site selection (Grubb 1976, Lehman et al. 1980).

Trees selected for nesting are characteristically one of the largest in the stand or at least co-dominant with the over-story. Nest trees usually provide an unobstructed view of the associated water body and are often prominently located on the topography. Live, mature trees with deformed tops are occasionally selected for nesting.

Bald eagles often construct several nests within a territory and alternate between them from year to year. Up to five alternative nests may be constructed within a single territory (U. S. Fish and Wildlife Service 1986).

Snags, trees with exposed lateral limbs, or trees with dead tops are often present in nesting territories and are used for perching or as points of access to and from the nest. Such trees also provide vantage points from which territories can be guarded and defended.

Breeding is initiated as early as January 1 via courtship, pair bonding, and territory establishment, and normally ends approximately August 31, when the fledglings are no longer attached to the immediate nest site. This period may vary with local conditions. Incubation may begin in late February to mid-March, with the nestling period extending to as late as the end of June. From June through August, the fledglings remain restricted to the nest until they are able to move around within their environment.

Effective breeding area management should avoid a flight response, which is typically induced by disturbance at 200 to 300 m. In their study of breeding bald eagle responses to human activities, recommend a no activity primary zone of 500 to 600 m from nest sites, followed by a secondary zone of 1000 to 1200 m.(Grubb et al. 1992)

Wintering habitat in the USRC area appears to be associated with an animal dump that is located outside Challis where road-killed animals are deposited. Two winter habitat characteristics appear to play a significant role in habitat selection in the cold months: diurnal perches and communal night roost areas. Perches are normally located in close proximity to a food source. Most tree perches selected by eagles provide a good view of the surrounding area, often utilizing the highest perch sites available (USDI Fish and Wildlife Service 1986).

Habitat requirements for communal night roosting are different from those for diurnal perching. Communal roosts are invariably near a rich food resource. In forest stands that are uneven-aged, communal roosts have at least a remnant of old-growth forest components (Anthony et al. 1982). Most communal winter roosts used by bald eagles throughout the recovery areas offer considerably more protection from the weather than diurnal habitat. Keister and Anthony (1983) found that bald eagles used old-growth forest stands as far as 9.6 miles from the food source in the Klamath Basin of California**.** Diurnal perches are used during foraging; these usually have a good view of the surrounding area and are often the highest perch sites available (Stalmaster 1976). The riparian habitat along the Salmon River in the USRC Area offers very little protection from the weather.

The most common food sources for bald eagle in the Intermountain region are fish, waterfowl, jackrabbits, and various types of carrion (USDI Fish and Wildlife Service 1986).

Bald Eagle Inventories and Surveys: The Challis Resource Area, Bureau of Land Management, has conducted midwinter bald eagle counts annually since the early 1970's. (The general boundary of the Challis Resource Area is north to Hat Creek, 12 miles north of Bruno's Bridge; south two miles south of Mackay, 54 miles south of Challis; west two miles west of Thompson Creek; and east to the Lemhi Range on the east side of the Pahsemeroi Valley, over 35 miles east of the Salmon River.) The eagle surveys concentrate on major streams such as the Salmon, Lemhi and Pahsemeroi Rivers.

As many as 60 bald eagles have been counted along the Salmon and Pahsimeroi rivers during peak years. Cottonwood riparian areas along the rivers provide winter roost sites and hunting perches. In 1986, two adult pairs were observed leaving the river at dusk . They used two different conifer sites at higher elevations above the river. One adult pair and two immature birds were also observed going to roost in a cottonwood stand on the river. Other than these observations, roost sites have not been formally inventoried or documented. No bald eagle nesting occurs in the Challis Resource Area (RA), but apparently, suitable nesting habitat and nest trees are present. An active bald eagle nest site is present downstream on the Salmon River approximately 60 miles north of the resource area boundary. (BLM 1998).

2. **Bull Trout**

The US Fish and Wildlife Service published a final rule listing the bull trout in the Columbia River Distinct Population Segment as a threatened species under the Endangered Species Act. This ruling became final on July 10, 1998 (63 FR 31647).

The central Idaho mountains are core areas for remaining bull trout populations. Their distribution is patchy even when population numbers are strong and habitat is good (DEQ, 2001). Resident,

fluvial (larger rivers), and adfluvial (lakes) are the three life history forms that bull trout populations may exhibit in Idaho. Resident forms generally spend their entire lifecycle in small headwater streams such as Challis Creek, while fluvial fish spend a portion of their lives in the main stem and migrate to headwater streams to spawn. Adfluvial populations spawn in headwater streams and migrate to lakes or reservoirs for winter. Seasonal movements may range up to 300 km as migratory fish move from spawning and rearing areas into over-winter habitat in downstream reaches of large basins. Both forms are believed to exist together in some areas, but migratory fish may dominate populations where corridors and sub adult rearing areas are in good condition (Rieman and McIntyre 1993). Bull trout in the Salmon River use resident, migratory and fluvial life history strategies.

Challis Creek, a tributary in the USRC reach of the Salmon River, has a population of bull trout. The fish are present but there is no other information. A fluvial population has likely been eliminated due to irrigation practices and a migratory population is unlikely. Brook trout are present and hybridization is occurring in Challis Creek (State of Idaho, 1999).

Morgan Creek, another tributary in the 12 mile reach, flows into the Salmon River about 10 miles north of the town of Challis. Morgan Creek does not have bull trout in it but one of the tributaries, West Fork Morgan Creek, does have bull trout. It is not clear why bull trout are not present in Morgan Creek. The habitat is good and brook trout are present. There is limited potential for a fluvial bull trout population because brook trout inhabit the sub watershed. Morgan Creek is seasonally disconnected from the Salmon River with diversions that alter flow regimes. (State of Idaho, 1999).

Bayhorse Creek is located about 10 miles south of the town of Challis. It does not flow into the Salmon River within the 12-mile reach but bull trout that reside in Bayhorse Creek could utilize the 12-mile project reach during the winter. The condition of Bayhorse Creek is generally very good to excellent with regard to aquatic habitat. Bull trout are known to inhabit the stream but population size and condition is unknown. (State of Idaho, 1999).

Bull trout occupy a variety of stream habitats that may be increasingly fragmented by human-related disturbances, including introductions of non-native fishes, habitat degradation, migration barriers and altered disturbance regimes.

Preferred spawning habitat typically consists of low gradient stream reaches with loose, clean gravel, but spawning has been documented in steeper reaches where substrate is suitable and other habitat features are present. Spawning bull trout move into natal tributaries beginning in August and spawn in mid-to late September and October (Tom Curet, IDFG, personal comm.) Bull trout seek areas with cold water temperatures for spawning. Spawning substrate consists mostly of loosely compacted gravel and cobble. Preferred spawning sites normally include runs and tail-out areas of pools with water depth of 0.7 ft. to 2.6 ft. Substrate size and level of embeddedness are important factors influencing egg survival to emergence. When fines exceed 30 percent, egg fry survival decreases dramatically (State of Idaho, 1999).

Eggs hatch in winter or early spring after 100 to 145 days incubation. Fry remain in the gravel for another 65 to 90 days until yolk sac absorption is complete; parr marks develop and actual feeding

begins while fry are still in the gravel. Fry emerge from gravel in early spring, usually April (State of Idaho, 1999).

Juvenile bull trout live near the stream bottom for the first two years of life using slow water within swift stream reaches. Unembedded cobble, boulders, and dispersed woody debris are common forms of cover (State of Idaho, 1999).

In streams, all bull trout life stages are associated with various forms of cover, including large woody debris, undercut stream banks, boulders, and pools. Cover provides important rearing, foraging and resting habitat, and protection from predators (State of Idaho, 1999).

Water temperature is an important and inflexible habitat requirement for bull trout. Influence on bull trout distribution has not been completely defined. Even though bull trout may move throughout whole river basins seasonally, spawning and juvenile rearing appear to be limited to the coldest streams or stream reaches. Temperatures above 59° F are thought to limit distribution. While optimum temperatures for rearing bull trout are reported to be 44° to 47° F, bull trout rearing habitat during summer months was linked to elevation, with higher elevations correlating to cooler stream temperatures. (See Plate 36, Average daily temperatures in the main stem Salmon River). Goetz (in State of Idaho, 1999) did not find juvenile bull trout in water temperatures above 54° F. Bull trout spawn when water temperatures are near 46° F. Survival of bull trout eggs varies with water temperature. They reported that 0-20%, 60-90%, and 80-95% of the bull trout eggs from British Columbia survived to hatching in water temperatures of 46° – 50° F, 43 degrees F, and 36° –39° F, respectively. Weaver and White (1985) found that 39° – 43° F was needed for egg development for Montana bull trout (State of Idaho, 1999).

A literature review by Rieman and McIntyre (in State of Idaho, 1999) found most bull trout mature between 5 and 7 years of age while resident fish appear to mature at age 3 or 4. Length frequency data from the Little Lost River suggest that fluvial bull trout probably spend one or two years in headwater streams before moving into the main stem of the Salmon River. Juvenile bull trout may migrate during the summer or fall of their second or third growing season (State of Idaho, 1999).

Key Factors Influencing the Current Status of Bull Trout

Threats to bull trout in this sub basin include channelization, dikes, riprap and resultant loss of stream side vegetation and floodplain in low elevation reaches, and stream corridor roads, historic mining, and timber harvesting and their effects on sedimentation and water temperatures (DEQ, Feb. 2001).

Angling is a factor influencing the current status of bull trout. Bull trout may be vulnerable to over-harvest (State of Idaho, 1999).

Watershed disruption is a second factor that has played a role in the decline of bull trout. Changes in or disruptions of watershed processes are likely to influence characteristics of stream channels and are likely to influence the dynamics and persistence of bull trout populations. Bull trout have been more strongly associated with pristine or only lightly disturbed Rieman and McIntyre, 1993).

Patterns of stream flow and the frequency of extreme flow events that influence substrates are anticipated to be important factors in population dynamics. With over-winter incubation and a close tie to the substrate, embryos and juveniles may be particularly vulnerable to flooding and channel scour associated with the rain-on-snow events common in some parts of the range within the belt geography of northern Idaho and northwestern Montana. Channel dewatering tied to low flows and bed aggradations has also blocked access for spawning fish resulting in year class failures (Rieman and McIntyre, 1993).

Introduced species are a third factor influencing bull trout. Some introduced species such as kokanee may benefit bull trout by providing forage. Others such as brown, brook, and lake trout are thought to have depressed or replaced bull trout populations. Brook trout are seen as an important problem and may progressively displace bull trout through hybridization and higher reproductive potential. Introduced species may pose greater risks to native species where habitat disturbance has occurred (Rieman and McIntyre, 1993).

Isolation and fragmentation are the fourth factor likely to influence the status of bull trout. Historically bull trout populations were well connected throughout the Columbia Basin. Habitat available to bull trout has been fragmented, and in many cases, populations have been isolated entirely. Irrigation diversions, culverts, and degraded main stem habitats have eliminated or seriously depressed migratory life histories effectively isolating resident populations in headwater tributaries. Introduced species such as brook trout may displace bull trout in lower stream reaches further reducing the habitat available in many remaining headwater areas. Loss of suitable habitat through watershed disturbance may also increase the distance between good or refuge habitats and strong populations thus reducing the likelihood of effective dispersal (Rieman and McIntyre, 1993).

Bull Trout Inventories and Surveys

Recent sampling (1999) associated with Idaho Department of Environmental Quality (DEQ) large river Beneficial Use Reconnaissance Project (BURP) collected fish in the main stem Salmon River near the town of Clayton, and at the mouth of the Pahsimeroi River near Challis. They found rainbow trout and chinook salmon, but no bull trout (DEQ, 2001).

Fish surveys have revealed numerous chinook and steelhead, but very few bull trout within the Upper Salmon River (DEQ, 2001).

Within the BLM Challis Resource Area, various agencies have conducted fisheries surveys and inventories that have delineated current and historical distribution of bull trout. From 1993 through 1995, the fisheries staff of the Challis Resource Area conducted extensive surveys of streams to determine the distribution of fish species within the resource area, with special emphasis on chinook salmon and bull trout. Historic survey data was also obtained from IDFG. Thirty-nine (39) streams are currently known to contain populations of bull trout in the resource area. These include most perennial streams, which are historically accessible to migrating fish and display the habitat quality required to sustain a bull trout population (BLM, 1998).

3. **Canada Lynx**

Canada lynx (*Lynx canadensis)* were listed as threatened on March 24, 2000, Federal Register Volume 65, No. 58). This member of the cat family is distinguished by a short body, long legs, large padded feet and ears tipped with a tuft of long hair. Lynx are medium-sized cats, specialized predators that are highly dependent on showshoe hares (*Lepus americanus)* for food.

The lynx' geographic distribution, habitat selection, foraging behavior, reproductive capacity and population density are affected by the distribution and abundance of the snowshoe hare. Hares seek dense conifer thickets to feed on woody seedlings and saplings and to escape predators and extreme cold; lynx frequent these habitats in search of prey (Forest Service & Bureau of Land Management [FS & BLM], 1999). Lynx also prey on grouse, flying squirrel, ground squirrel, beaver, mice, voles, fish, ungulates as carrion and occasionally prey, and red squirrels (Ruediger, et al. 2000)

Their long legs and large feet make lynx highly adapted for hunting in the soft deep snow where snowshoe hares spend the winter. Lynx inhabit primarily the boreal, sub-boreal, and western montane forests of North America (Ruediger, et al. 2000) . Its range extends south into the northern portions of the western mountains in the contiguous U.S., where environmental conditions at high elevations support boreal forest habitats similar to those found in northern regions of Canada and Alaska. Lynx are generally found in coniferous forest habitats above 4,500 feet in elevation. They typically occur where low topographical relief creates continuous forest communities of varying stand ages. Lynx habitat primarily consists of two structurally different forest types: early successional forests where prey availability, especially snowshoe hare, is usually high, and late-successional forests which provide cover for denning and kittens (FS & BLM, 1999). Intermediate successional stages may serve as travel cover for lynx, and help provide connectivity within a forested landscape. These travel areas fill in the gaps between foraging and denning habitats within a landscape. Early successional forests, where snowshoe hares are abundant, are favored by lynx for hunting. These areas result from fires, timber harvest, wind throw and disease. Lynx habitats in the Rocky Mountains of the western U.S. are islands of coniferous forest surrounded by shrub-steppe habitats, but the nature of lynx movements between these habitats is poorly understood. Lynx have been documented using shrub-steppe habitats that were near snowshoe hare habitats (within approximately 40 km[25 miles]) during jackrabbit population highs) and when seasonally preying on Wyoming ground squirrels. Although cover is important to lynx when searching for food, lynx often hunt along edges. Lynx have been observed (via snow tracking) to avoid large openings, either natural or created, during daily movements within their home range (Ruediger et al. 2000). The boundary of the River of No Return Wilderness (i.e. boreal forest habitat) is about 15 miles west of the project area. About 8 to 9 miles of this distance is open sage/grass habitat except for riparian zones.

Habitat components necessary to support lynx include forests with large woody debris, such as downed logs, stumps, and windfalls, to provide denning sites with security and thermal cover for kittens. Stand structure appears to be of more importance than forest cover type, and denning habitat must be available throughout the home range. Den sites also require minimal human

disturbance, close proximity to foraging habitat, and must be at least one hectare (2.47 acres) in size. (FS & BLM, 1999).

Home range sizes of lynx are quite variable. In north central Washington, biologists reported average home range sizes to be 15 square miles for 2 females and 27 square miles for 5 males. Much larger home ranges of 147 and 92 square miles for males and females, respectively, were found in southern British Columbia. In Montana, four female home range sizes averaged 17 square miles. Based on previous studies, the mean home range sizes of females in southern boreal forests are more than twice as large as female home ranges in the taiga, regardless of hare densities (Ruediger et al. 1999).

There are no lynx reports (sightings, trapping reports, or other documentation) specific to BLM public lands within the Challis RA, which includes the USRC. Lynx are known to occur on the Salmon-Challis National Forest (BLM, 1998). Historic records indicate that lynx were fairly well distributed in the mountainous regions north and east of the Snake River in Idaho (Ruediger et al. 1994).

Lynx Inventories and Surveys

The public lands in the Challis Resource Area of the BLM, including Round Valley, are located within the range of Canada lynx in Idaho, but to date no specific inventories or studies of Canada lynx habitat have been conducted within the Challis RA.

The broad, open sagebrush-steppe habitats that occur throughout most of the Challis RA probably pose significant barriers to lynx movements. Roloff (1995) suggests that the wide sagebrush-steppe valleys that lie on both sides of the Lemhi and Lost River Mountain ranges (much of which is public land within the boundaries of the Challis RA) effectively isolate any lynx populations that may be present in these mountain ranges (BLM, 1998)

4. **Gray Wolf**

The gray wolf was first listed as “Endangered”, on March 11, 1967 (32 FR, 4001). Although listed elsewhere as endangered, wolves in central Idaho are classified as “experimental, non-essential” (Federal Register, page 60266, Vol. 59, No. 224, November 22, 1994). In January, 1995, gray wolves from Canada were reintroduced to the Frank Church River-of-No-Return Wilderness Area within 60 air miles of the Challis BLM Resource Area (about 75 to 80 miles from Round Valley) in an attempt to establish an experimental population. Additional wolves were released in 1996. Individual wolves wander in and out of the relocation area and are known to use public lands in the Challis Resource Area, of the Bureau of Land Management, on an occasional basis. Numerous probable sightings of gray wolves have been documented on National Forest lands adjacent to the Challis Resource Area (BLM, 1998). According to recent surveys by the US Fish and Wildlife Service, there are about 141 wolves in central Idaho (FWS, 2002).

The coloration of wolves varies greatly from snow white to coal black and all the intermediate degrees of cream, gray and brown. A large male wolf may measure over 2 m in total length and

stand almost one meter tall at the shoulders. Their weight can vary from 26 to 80 kg. The largest wolves are found in northwestern Canada. (State of Idaho, 2002)

The wolf has a well-developed social hierarchy. The pack leader is usually the largest and strongest dog and is followed in rank by younger or senile males, then the leader's mate, the other females, and finally the pups in order of strength. All members of the pack accept responsibility for the young, and care for other adult's pups, if both parents are hunting.

Wolves use a wide range of habitats, from grasslands to coniferous forests to alpine regions. Habitat characteristics that wolves are usually associated with in the mountains of Idaho and western Montana are boreal and coniferous forests at higher elevations, as well as open brushy areas. Wolves travel large distances in search of prey often using home ranges greater than 100 square miles. They feed primarily on ungulates with small mammals as alternate prey. Wolf habitat is often evaluated upon abundance of prey species, degree of conflict with humans, and suitable and secluded den and rendezvous sites (BPA, 1999).

Wolves breed in late January through April and pups are born after a 63 –day gestation period (late March through May). Mesic meadows, with dense vegetation and forested borders are favorite denning and rendezvous sites. Ungulate calving/fawning areas are particularly popular. Beaver-occupied riparian areas, situated far from human activities, may be important summer hunting grounds. Wolves are highly sensitive to human activity near denning sites (BPA, 1999). The FWS monitored individual wolves and wolf packs in the Central Idaho Wolf Recovery Area in 2001. Packs were located in Moyer Basin, Jureano Mountain, Twin Peaks, Whitehawk Mountain, and Wildhorse, all within 60 air miles of Challis, Idaho (Rocky Mt. Wolf Recovery 2001 Annual Report). There are no known documented wolf packs that use the Challis valley (i.e. Round Valley) as their home range. The Nez Perce Tribe Gray Wolf Recovery Team has been able to document current and past wolf activity in the forested public lands surrounding Round Valley. There have been several lone wolves moving through the Challis area in the recent past. During the winter, there have been wolves moving through the foothills along the western breaks of the Salmon River from the town of Challis, south to the town of Stanley. In addition, to the south and east of Challis, wolf activity has been documented on both sides of Willow Summit along Highway I-93. The recovery team has received numerous reports in the Darling Creek and Challis Creek areas, just outside the town in the sagebrush foothills. They have not been able to confirm these reports to date, although it is feasible that wolves occasionally move through this country (personal communication, Curt Mack, 2002).

Gray Wolf Inventories and Surveys

Past efforts to document gray wolves on BLM and Forest Service lands in the Challis area have primarily consisted of Forest Service or BLM biologists' follow-up investigations of reported wolf sightings or wolf sign. Reports of wolves that turn out to be domestic dogs or coyotes are common. Numerous probable sightings of gray wolves have been documented on National Forest lands above the Challis RA and Round Valley. Before the release of wolves in the Frank Church River-or-No-Return wilderness in early 1995, recorded sightings were infrequent and widely scattered, based on review of Idaho Natural Heritage Data Base records. Radio tracking of wolves transplanted in 1995 confirms that the animals have wandered across the sagebrush-steppe BLM

lands on occasion. No formal inventories or habitat surveys specific to wolves have been conducted by the BLM on their lands in and around Round Valley (BLM, 1998).

5. **Yellow-billed Cuckoo**

The yellow-billed cuckoo (*Coccyzus americanus)* was accorded candidate status by the FWS on July 25, 2001. The Fish & Wildlife Service determined that the Distinct Population Segment of the yellow-billed cuckoo in the western continental United States was warranted but precluded by higher listing priorities in the Federal Register (143 FR 38611-38626). The yellow-billed cuckoo currently holds no legal status under the Endangered Species Act. The FWS determined that the western yellow-billed cuckoo distinct population segment was warranted for listing, but was precluded by other higher priority listing actions. The FWS is concerned about their population status and suggest that this species and their habitat be considered during project planning and review.

The yellow-billed cuckoo is a secretive, robin-sized bird that in the western United States breeds in willow and cottonwood forests along rivers and streams. The bird's most notable features are a long, boldly-patterned black –and-white tail, and an elongated and down-curved bill, which is yellow on the bottom. Its plumage is grayish-brown above and white below. Adults have narrow, yellow eye rings. It has a zygodactyl foot, in which two toes point forwards and two toes point backwards. The bird primarily eats large insects including caterpillars and cicadas as well as the occasional small frog or lizard. Yellow-billed cuckoos are migratory. Yellow-billed cuckoos usually lay two or three eggs, with development of their young occurring very rapidly. It takes 17 days on average from egg laying to fledging of young. (FWS website, 2001). Although many species of cuckoos are brood parasites (laying their eggs in other birds' nests), the yellow-billed cuckoo usually builds its own nest and raises its own young (ODFW website, 2002).

The yellow-billed cuckoo historically bred throughout much of North America. West of the Continental divide, the species historically occurred from southern British Columbia, Canada, to northwestern Mexico. In recent years, the species' distribution in the West has shrunk considerably. (FWS website, 2001). While the cuckoo is still relatively common east of the crest of the Rocky Mountains, biologists estimate that more than 90 percent of the bird's riparian habitat in the west has been lost or degraded. The decline in distribution and abundance of yellow-billed cuckoo throughout the western states is believed to be due to conversion of riparian habitat to agriculture, grazing, competition from non-native plants, such as tamarisk (salt cedar), river management including altered flow and sediment regime, and flood control practices such as channelization and bank protection. (FWS website , 2001).

There are known occurrences of yellow-billed cuckoos in Idaho in Ada, Jefferson, Madison, Elmore, and Owyhee Counties (IDFG website, 2002). The USRC is in Custer County. In northern and central Idaho, the FWS has only four records of yellow-billed cuckoo over the last century. In southwestern Idaho, the yellow-billed cuckoo has been considered a rare, sometimes erratic, visitor and breeder in the Snake River valley. Less than 15 sightings have been recorded in this area during the past 25 years. The yellow-billed cuckoo could easily become extirpated from the state in the near future (FWS website, 2001).

In California, Laymon and Halterman, concluded that sites greater than 200 acres in extent and wider than 1950 feet were optimal (occupancy near 100 percent on sites 200 acres or larger). Yellow-billed cuckoo occupancy was 58.8 percent on sites of 101 to 200 acres and wider than 650 feet. Sites that were 50 to 100 acres in extent and 325 to 650 feet in width were marginal (9.5 percent occupancy), and sites less than 38 acres in extent and less than 325 feet in width were unsuitable. During a four-year study on the Sacramento River, Halterman found that habitat patch area, the extent of habitat in a 5 mile section of river, and presence of low woody vegetation were the most important variables in explaining the distribution of cuckoos. These variables combined explained 46 percent of the variation observed in the distribution of breeding pairs (The Nature Conservancy, 1999).

Microhabitat requirements are also important. Nesting groves at the South Fork Kern River were characterized by higher canopy closure, higher foliage volume, intermediate basal area, and intermediate tree height when compared to random sites. Sites with less than 40 percent canopy closure are unsuitable, those with 40 to 65 percent are marginal to suitable, and those with greater than 65 percent are optimal. Simulation modeling demonstrates that populations of fewer than 10 pairs are very unstable and always become extinct in a short period; a minimum number of 25 pairs in a subpopulation with interchange to other subpopulation should be reasonably safe from extinction by stochastic events. Habitat protection, particularly western riparian systems, is a priority on breeding and non-breeding grounds (The Nature Conservancy, 1999).

Yellow-billed cuckoo Inventories and Surveys

The BLM has not surveyed specifically for the yellow-billed cuckoo but there is one confirmed sighting on BLM land within the USRC area. A single bird was observed during the breeding season near Pennal Gulch. There have not been any surveys specifically for yellow-billed cuckoo in the USRC area. A wildlife biologist from the Corps has made four reconnaissance trips to the project area in 2001 and 2002, during September, May, July and late August. During these visits he determined that some of the habitat within the USRC project area is suitable for these birds. There were no yellow-billed cuckoos observed during any of these visits.

6. **Sockeye Salmon**

Snake River sockeye salmon were listed as endangered by NMFS in November 20, 1991, under the Endangered Species Act. Sockeye salmon are distributed throughout the western United States and Canada, historically inhabiting streams from northern California to Arctic Alaska. Snake River sockeye salmon have declined dramatically in recent years. Currently, only Redfish Lake supports a remnant anadromous run. Since 1990, only 16 adult sockeye salmon have returned to Redfish Lake Creek. Access to inland streams, lakes and the Pacific Ocean is essential for completion of life histories of all stocks. The stock found in the upper Salmon River, which spawns and rears in Redfish Lake near Stanley, Idaho, and in other lakes in the vicinity, must migrate the length of the Salmon River, much of the lower Snake River and several hundred miles of the Columbia River before accessing the ocean for completion of its maturity phase. Sockeye adults enter the Columbia River in June or July. Those that survive reach their spawning destination at Redfish Lake in August. They take four to eight weeks preparing to spawn, which

occurs in October. Sockeye salmon migrate through Round Valley some time from July through the first part of August, using the main stem Salmon River only. Juvenile sockeye migrate to the ocean from April through June, after spending one to three years in lakes. No spawning or rearing occurs in waters within Round Valley or the tributaries that flow into the Salmon River within the valley. Wild populations are virtually non-existent at this time. The single sockeye salmon stock is being artificially sustained by hatchery supplementation at the Sawtooth Hatchery near Stanley, Idaho. Annual wild stock escapements have been less than 10 for the past decade, with escapements of zero in several of those years. (BLM, 1998).

Habitat requirements for this species include (a) unimpeded migration, including access to spawning lakes and rearing streams, and (b) clean, cool water and appropriate size spawning substrates free of sediment. Streamside cover is essential for maintaining appropriate water temperatures, maintaining large and small woody debris and ensuring that sediment remains near natural levels. An important factor is lake habitat productivity and quality. A near natural habitat quality is required to maintain these stocks.

Critical habitat for sockeye, designated by NMFS in 1993, included five lakes (Redfish, Stanley, Alturas, Pettit, and Yellowbelly) in the Sawtooth National Recreation Area, and all of their connecting tributaries, including the main stem Salmon River (DEQ, 2001).

Sockeye Salmon Inventories and Surveys

Inventories and/or surveys for sockeye salmon are not conducted in the Salmon River near Round Valley because sockeye are only found as migrants within the main Salmon River.

7. **Snake River Spring/Summer Chinook Salmon**

Snake River spring/summer chinook salmon (*Oncorhynchus tshawytscha)* were listed as a threatened species by the National Marine Fisheries Service in April 1992. Chinook salmon use the main stem of the Salmon River in Round Valley as a migration path, for rearing, and infrequently as a spawing area. Aerial redd counts that were completed by IDF&G in 1999, 2000, and 2001 between the Highway 93 bridge just south of Challis to the mouth of the Pahsimeroi River recorded zero to 2 redds per year (Highway 93 bridge to Pahsimeroi River, 1999 – 2 redd, 2000 – 0 redds, 2001 – 0 redds) (Personal communication, Tom Curet, IDFG).

Few stocks of chinook salmon in the Salmon River drainage continue to have pristine spawning and rearing habitat. Irrigation, mining, commercial fishing and dams in the lower Snake and Columbia River have contributed to the decline in returns of anadromous fish to the Salmon River. Habitat degradation by livestock, mining, road building, logging, agriculture diversions and return flows have also contributed significantly to reductions in chinook stocks. Idaho Fish and Game redd counts conducted in the main Salmon River over the last thirty years indicate a declining trend. Populations of spring/summer chinook in the Salmon sub-basin have declined drastically and steadily since about 1960. This holds true despite substantial capacities of watersheds within the sub-basin to produce natural smolts and significant hatchery augmentation of many populations.

The total number of spring and summer chinook redds counted by IDFG in survey areas ranged

from 11,704 in 1957 to 166 in 1995. Chinook redds counted in all of the sub-basin's monitored spawning areas have averaged only 1,044 since 1980, compared to an average 6,524 before 1970 (IDEQ, 2001).

In the mid-1900s, the Salmon Sub basin produced an estimated 39% of the spring chinook and 45% of the summer chinook salmon that returned as adults to the mouth of the Columbia River. Natural escapements approached 100,000 spring and summer chinook from 1955 to 1960, with total escapements declining to an average of about 49,300 (average of 29,300 spring chinook salmon and 20,000 summer chinook salmon) during the 1960's. Smolt production within the Salmon sub-basin is estimated to have ranged from about 1.5 million to 3.4 million fish between 1964 and 1970. The Salmon River Sub-basin Summary team estimated the parr carrying capacity of the upper Salmon River basin to be approximately 2.6 million spring chinook, and 1.2 million summer chinook. This summary identified 36 miles of suitable spawning and rearing habitat in excellent condition within the upper Salmon River hydrologic unit (which includes the USRC); 157 miles in good condition, 162 miles in fair condition, and 34 miles in poor condition (Salmon Sub basin Summary, 2001).

Chinook Salmon Life Cycle in the Upper Salmon River

Most chinook salmon leave the ocean and begin their migration upstream between four and six years of age. The migration begins in January, with the chinook adults arriving in the Upper Salmon River from May through July. The majority of spring run chinook enter the Columbia River in March and April. Most chinook salmon begin to arrive in the Upper Salmon River in late July and August. The adults "stage" near where they will eventually spawn, using deep pools and log jams in the main channel. The water depth in pools will generally be 5 feet or more with variable water velocities. Examples of this type of habitat within the USRC is the pools formed below barbs or adjacent to riprap and bedrock banks, such as the pool shown in **Plate 37** near Hannah Slough. Beginning in late July through late August, the fish move into the smaller tributaries to begin spawning. Spawning occurs within the main Salmon River through late September.

Suitable spawning substrate that ranges in size from 2 inches to 3 inches in diameter is the most commonly used in the Salmon River from Round Valley up to Stanley. Gradation ranges from 1 inch to 4 inches, and the substrate must be stable to avoid shifting and damaging the eggs. However, much of the substrate in this reach of the Salmon River is larger, in the range of 6 inches or more. **(See Plate 38)** Preferred water depth for spawning is generally less than 36 inches and more than 20 inches. Many of the spawning redds are found in the tail of a pool and occasionally within long runs, with a water velocity of more than 3 ft./sec. Optimum water temperature ranges from 42 degrees F to 51 degrees, with the upper limit of 60.8 degrees. (See Plate 36). A rare example of a chinook redd within the USRC is the graded sediment bars that form behind some of the barbs and the tail pools near the end of some of the islands. **(See Plate 39)** The typical conditions in the 12 Mile reach where limited chinook spawning has occurred are in very gradual tail-out pools with oversized cobbles that are often choked with sediment.

Plate 37. Looking downstream along Hannah Slough reach. Note the barbs on the left bank that provide holding pool habitat for chinook salmon and steelhead.

Plate 38. An example of the large, unsuitable spawning substrate that is found in the USRC reach of the Salmon River.

Plate 39. A rare example of suitable chinook salmon and steelhead spawning habitat in the USRC reach of the Salmon River. This is showing a graded sediment bar at the downstream end of a small island.

Chinook fry emerge from the gravel in March and rear for approximately one year. During their first summer, fry and parr from the Upper Salmon River basin rear in their natal streams and the main river. During the fall, they begin migrating to the lower reaches of the main Salmon River for over-wintering. Optimum water temperatures range from 53 degrees F to 60 degrees, with an upper limit of 77 degrees for short time periods. Side channels and slack water areas provide optimum rearing conditions and typically provide a variety of habitat features that offer protection for the juvenile fish from predators. Heron, otters and kingfishers are probably the primary terrestrial predators on fry and parr in the USRC reach. Larger fish such as the northern pike minnow and large rainbow trout are probably the primary fish predators on fry and parr. Cover features in the main channel that the fry use are the spaces between cobble and boulders, and fallen trees along the bank. Chinook fry and parr generally use water that is less than 4 feet deep.

During the spring and summer, juvenile fish are primarily concentrated in back water areas such as side channels and in the main channel near the edge where velocities are lower. During the winter, the fish move to deeper water in the main channel and shelter in the interstitial spaces in the substrate of the channel bed, consequently, sediment free substrate is important. The side channels provide important places for both rearing and refuge during flood events. Good examples of side channel habitat in the USRC are the Hannah Sloughs and the slough near the Sportsman's Access on the Pennal Gulch property. More common rearing habitat within the USRC is shallow pools around two feet deep with low water velocities.

Generally, chinook smolt leave the area in their second year of life, and spend two, three or four years in the ocean. The exception to this is the jack salmon (99% male population) that spend only one year in the ocean before returning. Smolt move to the faster portions of the river and begin their seaward migration in the spring of the year, from February through May. They travel mainly at night, probably to avoid predators. Water depths vary and a channel free of obstructions

is the main feature necessary for migration.

Chinook Salmon Inventories and Surveys

Virtually every stream available to spring/summer chinook salmon was historically used for migration, spawning or rearing. These areas are currently designated as critical habitat for chinook salmon (Federal Register, Dec. 28, 1993).

The IDFG conducts aerial redd surveys for chinook salmon that include the 12 mile reach of the river. (See **Plate 40 & 41)**

Historically, approximately 50 streams in the Challis RA, including Round Valley, were accessible and probably used to some extent at some time of the year for either migration, spawning or rearing. Within the Challis Resource Area of the BLM, only 12 of the historically occupied streams currently contain chinook salmon. Of these, only Herd Creek, a tributary of the East Fork Salmon River, contains a spawning population on public lands. All others are now used for rearing or migration. There are little data on numbers present in any of these streams, but it is known that as recently as the 1960's, Herd Creek had several hundred redds and the East Fork Salmon River had even more (BLM, 1998).

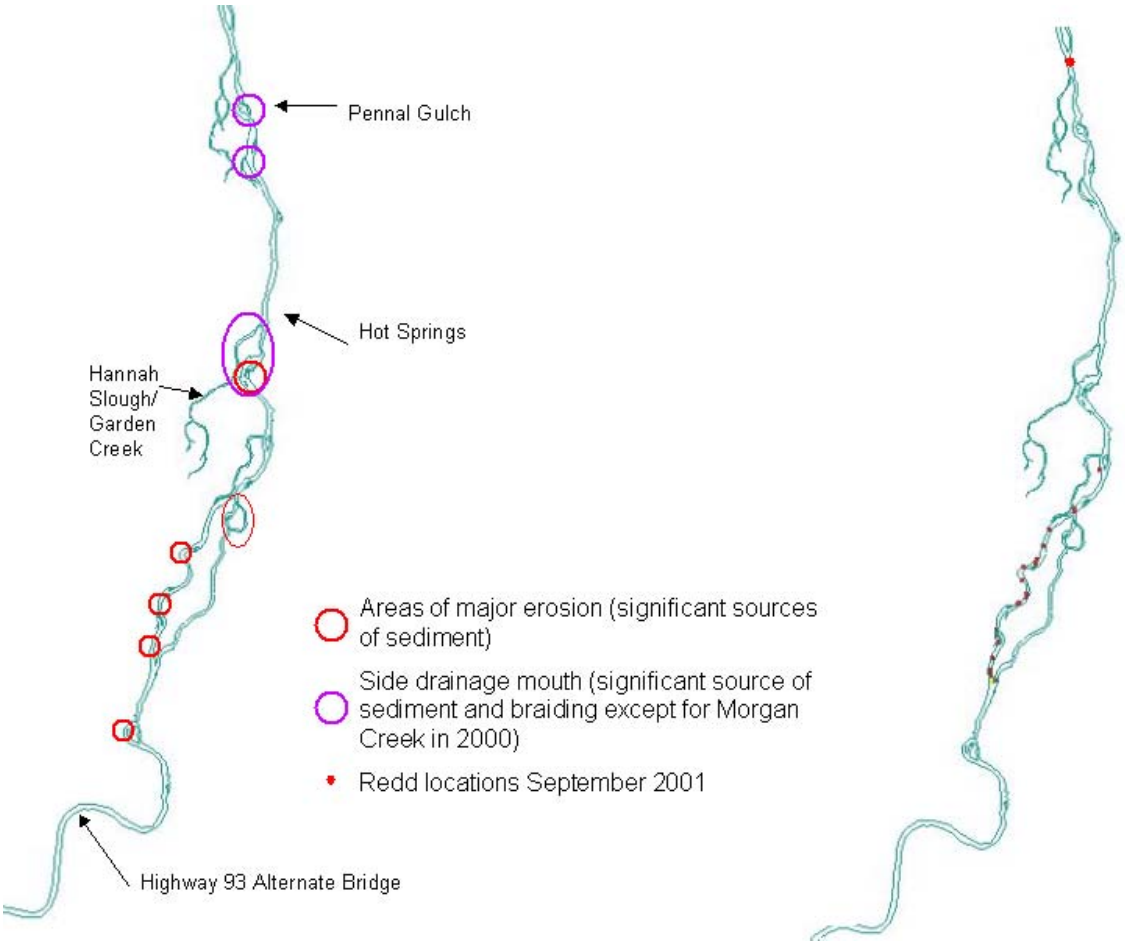


Plate 40. Redd locations and areas of sediment deposition in the southern half of the 12 Mile Project reach from the Highway 93 Bridge site north to Pennal Gulch.

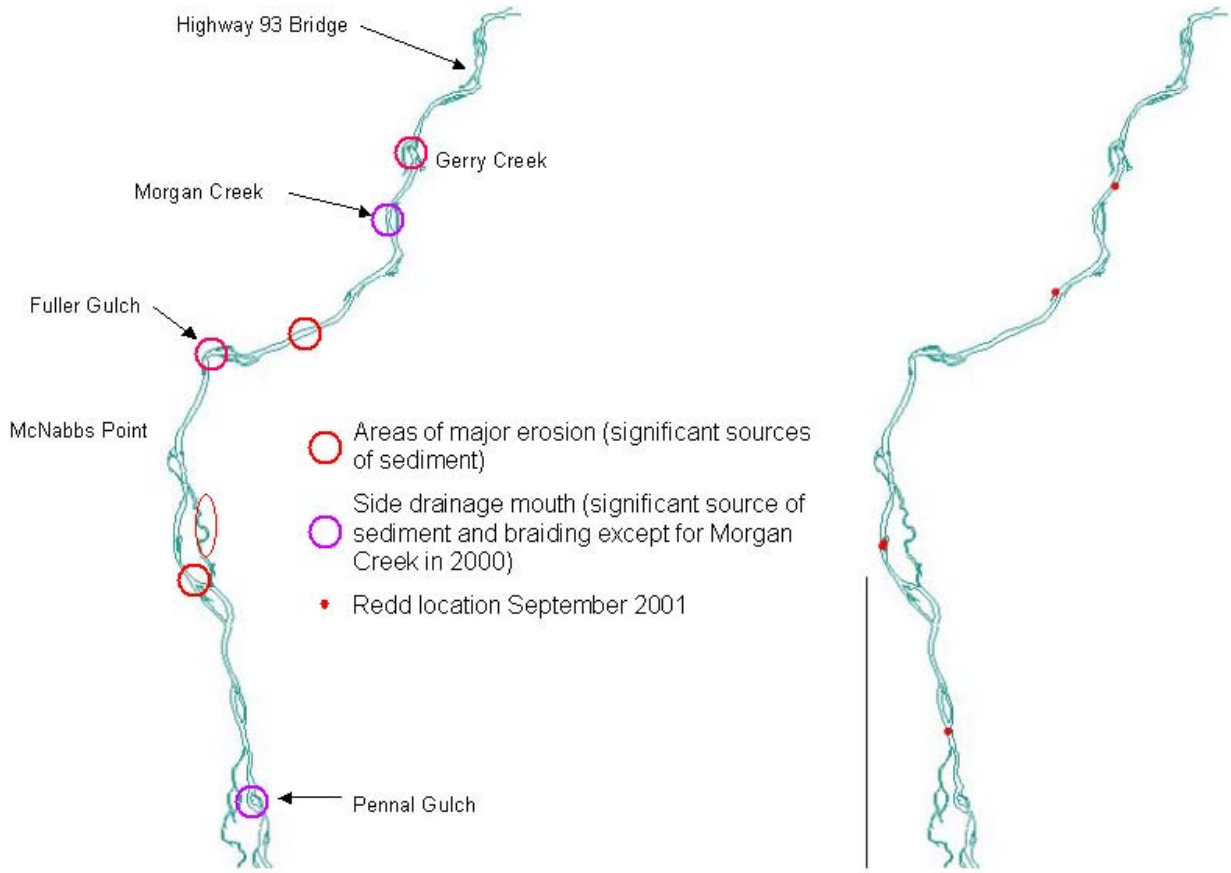


Plate 41. Redd locations and areas of sediment deposition in the north half of the 12 Mile Project reach from Pennal Gulch to the Highway 93 bridge downstream from Morgan Creek.

8. **Snake River Steelhead**

Snake River steelhead (*Oncorhynchus mykiss)* were listed by the National Marine Fisheries Service as a threatened species in September 1997. Both A and B run steelhead are present in the Salmon River. Spawning by wild A-run fish occurs mostly in Salmon River tributaries below the North Fork Salmon River with the exception of the Middle and South Forks of the Salmon River, which support spawning by wild B-run fish. The USRC area is upstream of the South, Middle and North Forks of the Salmon River. Areas of the sub-basin upstream of the Middle Fork have been stocked with hatchery steelhead, and the IDFG has classified these runs of steelhead as natural. Naturally produced steelhead upstream of the Middle Fork (including the 12 Mile reach) are classified as A-run fish, based on characteristics of size, ocean age, and timing of migration. (DEQ, 2001).

Recent and historical data on the spawning populations of steelhead in specific streams within the Salmon sub-basin, including the USRC, are very limited. Steelhead use the USRC area for adult holding and as a rearing area for juveniles. Professional judgment and observations by local biologists indicate that some spawning occurs in the 12 Mile reach, all by hatchery steelhead. (Personal communication, Tom Curet, IDFG, Nov. 2002). Historically, an estimated 55% of all Columbia River steelhead originated from the Snake River basin, which includes the Salmon River basin.

Monitoring data from sub-basins within the Mountain Snake Province (of which the Salmon sub-basin is a primary component) shows a general decline in parr densities for steelhead. The Salmon River Sub-basin Summary team estimated the parr carrying capacity of the upper Salmon River basin to be approximately 1.2 million steelhead. This summary identified 117 miles of suitable spawning and rearing habitat in excellent condition within the upper Salmon River hydrologic unit (which includes the USRC); 253 miles in good condition, 175 miles in fair condition, and 38 miles in poor condition (DEQ, 2001).

<u>Steelhead Life Cycle in the Upper Salmon River</u>

Adult migration requirements are generally similar to those described for spring/summer chinook salmon. However, adult holding takes place over a much longer period (from fall arrival in the Snake River drainage until spring spawning). Holding generally takes place in streams greater than 100 feet wide, and in channels with gradients less than 1.5 percent. Pools greater than five feet deep are significant features associated with suitable holding habitat.

Steelhead spawn in the Upper Salmon River from April through June. Cool, clean water is required across all ecologic strata for successful spawning and incubation. Steelhead frequently spawn in pool tail-outs, similar to spring/summer chinook. However, steelhead do not spawn much in the main channel. They make more use of smaller spawning areas, generally using small tributaries and side channels. They also use long runs and areas of spring upwelling. The substrate size is 1 to 3 inches in diameter and it must be stable to avoid shifting and damaging the eggs. Water depth is usually between 1 and 2 feet. The optimum range for water temperature is

between 50 and 60 degrees F.

Rare examples of steelhead spawning habitat in the USRC area are the graded sediment bars that form behind some of the barbs, and the graded sediment at the downstream end of large bars and islands. (**Refer to Plate 39)** The typical conditions in the 12 Mile reach where limited steelhead spawning has occurred are in very gradual tail-out pools with oversized cobbles that are choked with sediment.

Steelhead fry emerge from the gravel in June and July, depending on water temperatures. They rear in natal streams, in the main channel of the Salmon River where slower water velocities occur, and in side channels during their first summer. Optimum water temperatures are between 53 and 60 degrees F, with an upper limit of about 77 degrees for a short period. (**Refer to Plate 36)** for average daily water temperatures in the 12 Mile reach). In the tributaries, otters, herons, and kingfishers are the primary terrestrial predators. Large fish such as northern pike minnow and larger rainbow trout are probably the primary fish predators on fry and parr. Complex habitat such as debris piles and bank overhangs are important shelters from the terrestrial predators. During the 1 to 3 years of juvenile freshwater residence, the fry/parr seek cover in pocket water off the swift stream flow of the tributaries.

While the fry/parr are in the main channel of the Salmon River they seek shelter near the edge of the river. During the winter, the fry/parr shelter in the interstitial spaces in the substrate of the channel bed (consequently, sediment free substrate is important).

Good examples of side channel habitat in the USRC are the Hannah Sloughs and the slough near the Sportsman's Access on Pennal Gulch property. More common rearing habitat within the USRC is shallow pools around two feet deep with low water velocities.

Steelhead generally require two to three years of summer rearing periods before out-migration. During the fall of their second or third year, they begin migrating to the lower reaches of the Salmon River for over-wintering. Seaward migration for steelhead begins in late spring generally coinciding with runoff. Optimum water temperatures are the same as for fry/parr. They travel at night mainly, probably to avoid predators. Water depths vary and a channel free of obstructions is the main feature necessary for migration.

Adult steelhead migrate back into the Salmon River basin arriving in January and February after 2 to 3 years in the ocean. Optimum water temperatures are the same as for fry/parr. Complex habitat features such as deep pools and fallen trees provide protection from predators. Steelhead hold in pool-like runs that are usually less than 4 feet deep but more than 2 feet deep, with uniform flows across the channel. A common example of this type of habitat in the USRC area is the run areas between Fuller Gulch and Gerry Creek, and near the Hannah Slough Two project reach.

<u>Snake River Steelhead Inventories and Surveys</u>

Extensive inventories and surveys of steelhead have been conducted by various State and Federal agencies. Although the emphasis of most of the inventories was primarily to identify the distribution of chinook salmon habitat, the information gathered was also pertinent to management of steelhead, because they use virtually the same spawning and rearing habitats as chinook. Nearly every stream accessible to steelhead in the Challis RA was used for migration, spawning or rearing. These historic use areas have not been formally designated as critical habitat, but if they are, critical habitat areas are expected to coincide with designated chinook salmon habitat. Historically, approximately 50 streams in the Challis RA were accessible and probably used to some extent at some time of the year for steelhead migration, spawning or rearing. Within the Challis RA, at least 16 of the historically occupied streams currently contain steelhead. Of these, three are tributaries within the 12 Mile reach; Morgan Creek, Challis Creek, and Garden Creek. These streams, as well as the main stem of the upper Salmon River, contain populations of spawning steelhead. The remaining streams are used for rearing. Only minimal data are available on the steelhead numbers present in any of these streams (BLM, 1998).

V. DIRECT, INDIRECT & CUMULATIVE EFFECTS OF THE PROPOSED PROJECT

In order to facilitate the review of this BA the effects will be described separately, by species, for each project area (e.g. Bald eagle for Dunfee Slough, One Mile Island, Hot Springs, etc.). In order to reduce repetition, the cumulative effect narrative for all five property sites will be presented at the end of each species section.

A. Bald Eagle

Up to 30 bald eagles may occupy the 12-mile reach of the Salmon River near Challis during the winter. They roost in the cottonwoods near the river along the entire USRC. They probably feed mainly on road-killed deer and other animals. The birds are frequently seen in and around a road-killed animal dump site used by the county roads department. During the spring and summer, an individual bald eagle may occasionally travel through the 12-mile reach. There are no current or historic nesting sites in the 12-mile reach.

The construction and other activities associated on the five proposed project sites would not occur on all of the project sites simultaneously. Therefore, if a bald eagle was present on one property they would probably not be confronted by repeated encounters with people and machinery on all of the other four project sites.

A.1. HIGHWAY 93 BRIDGE

Direct Effects:

Most of the construction and other activities associated with this project (e.g. reconnecting the existing side channel, installing the French drain , building the jack fence, installing a rock sill at the upstream end of the new side channel, etc.) would take place during the winter when eagles are known to inhabit the area. Planting trees and installing the sill on the fill slope of Highway 93 are the two exceptions that may be done in the spring or fall. The machines and human activities may displace some eagles from roost sites. The construction would not affect their foraging or food supply since their primary winter food source in Round Valley is carrion, not fish.

The physical presence of all of the new structures (i.e. culverts, fence, and the new channels) would have very little or no effect on foraging or roosting bald eagles.

Planting the willows and trees along the existing channel may displace eagles from roost trees for short periods, perhaps one to two days. The loss of 10 to 30 mature trees during construction activities would reduce the number of roosting sites available for bald eagles. None of these trees would be cut along the main channel of the Salmon River.

Equipment and material storage areas would be located within disturbed areas created by prior vehicle use and gravel removal, 500 to 1000 feet from the side channel and the river. There would probably not be any direct effects on bald eagles from the storage and parking areas. Hauling rock, weir material, and fencing would take 110 to 215 truckloads. This activity could disturb or displace bald eagles if they were perching or roosting in this area.

Indirect Effects:

The new trees that are planted may provide additional roosting or nesting opportunities in about 20 years. The new channels, boulders, culvert, chain fence and other improvements and changes would not produce any indirect effects on bald eagles.

The human activities in the parking and material storage areas could disturb eagles if they were near these sites. The eagles may leave perch trees around this site until the project is completed, which could be weeks. They may get used to the activities and use the trees for perching during the day if work is being done at one end of the site and they use trees at the other end (about 1500 to 2000 feet apart).

The construction of a side channel would provide additional rearing habitat for chinook salmon and steelhead, which, in turn, could lead to a higher number of returning adults that could be available to eagles as a food source if they use this reach during the summer and fall runs.

The human activities associated with the vehicle parking and material storage area could disturb eagles if they were in the vicinity. This disturbance would last for several weeks, until the project was completed. A fluid spill, such as antifreeze, from a truck or machine would probably not present a hazard because a bird, such as a bald eagle, would probably not be attracted to the spill site. Spill kits that would be kept on-site would help prevent any animal from being poisoned by a toxic spill.

Continuing Construction and Maintenance:

The parts of this project that could require additional work in order to make them perform as they were intended include the rock sill, the side channel itself, the French drain and refuge pool, the barbs in the side channel, the hardened road section, the levee, the high flow channel and culvert. If work is required on any of these improvements, the direct and indirect effects on bald eagles would be the same as those described for the initial construction.

The improvements that may need occasional maintenance include planting additional trees to replace ones that die, repairing the jack fence or boulder fence, dredging the side channel, refuge pool or the entrance to the side channel near the rock sill. These activities, if they are needed, would create nearly the same direct and indirect effects as described for the initial construction except the duration of the disturbance to bald eagles would tend to be shorter.

The impacts of continuing construction assume that the work is done during the same work window of September 1 through March 1. Maintenance could proceed at other times of the year depending on the need , such as immediate repairs to jack fence or replanting trees in the spring or fall.

A.2. DUNFEE SLOUGH

Direct Effects:

The activities that are most likely to displace or disturb eagles from roost trees if they were nearby include constructing 250 feet of new channel, installing a 48 inch culvert at the entrance of the new channel, installing a rock sill in the Salmon River, deepening and defining the channel between some ponds, and building the wire fence. Planting trees along the side channel, and installing fish barriers on another slough/pond/side channel would not be very disruptive to the birds if they were present. The degree of disturbance from the construction activities would depend largely on the duration, but they may leave the area for several weeks.

The activities around the ponds and channels on the Dunfee Slough property could keep eagles from foraging in there. However, the present winter condition of the ponds and channels is dry or almost dry. Therefore, there is no foraging opportunity for eagles. **(Refer to Plate 11**) If the ponds keep water in them, they often freeze in the winter (according to the landowner) and would not provide much forage fish for eagles. The construction would probably not affect their food supply since their primary winter food source in Round Valley is carrion, not fish.

If eagles were present, the activity of hauling 1500 to 2500 cubic yards of material from the ponds and the new side channel could disturb the birds and make them leave the area temporarily. Another factor that reduces the possibility of disturbing eagles during construction is that there are only a few trees that eagles could perch in within 200 to 400 feet of the proposed work sites.

The physical presence of the new structures (i.e. culverts and the new channels, etc.) would have very little or no effect on foraging or roosting bald eagles. It has been estimated that the construction work in the ponds and side channel may produce 1500 to 2500 cubic yards of material. The machines and people needed to accomplish this work could disturb bald eagles if they were present. The disposal of this material outside the 100 year flood plain would probably not disturb any eagles because there are hardly any suitable perch or roost trees in the valley that are outside the 100 year flood plain.

Equipment parking and material storage areas would be on disturbed areas that are currently used by the landowner for similar purposes. These areas are about 400 to 800 feet from the river and side channel. The storage and parking areas would not present any direct effects on bald eagles. Hauling plants, rock and fence materials would require 15 to 30 truckloads. These actions could disturb eagles if they were in the area, but this hauling should be completed in one to three days. This would reduce the disturbance to the birds somewhat.

Irrigation inflows into the existing side channel would be diverted, managed, or pumped into the river or other channels in order to reduce the flow into the construction areas. These activities would not have any direct effects on bald eagles.

Indirect Effects:

The new trees that would be planted may provide additional roosting or nesting opportunities in 20 years. The culvert, side channel, the jack fence, fish barriers, and the rock sill would probably not produce any indirect effects on bald eagles.

The wire fence could present a hazard to winter-weakened deer in the area. If they became entangled, they could die, presenting an additional forage opportunity for bald eagles.

The loss of 4 to 10 mature trees during construction activities would reduce the number of roosting sites available for bald eagles. None of these trees would be cut along the main channel of the Salmon River.

The human activities associated with the vehicle parking and material storage area could disturb eagles if they were in the vicinity. This disturbance would last for several weeks, until the project was completed. A fluid spill, such as antifreeze, from a truck or machine would probably not present a hazard because a bird, such as a bald eagle, would probably not be attracted to the spill site. Spill kits that would be kept on-site would help prevent any animal from being poisoned by a toxic spill.

Continuing Construction and Maintenance:

The parts of this project that could require additional work in order to make them perform as they were intended include the rock sill, the side channel itself, the culvert from the river to the side channel, and rearranging the spillway rock at the end of the ponds. If work is required on any of these improvements, the direct and indirect effects on bald eagles would be the same as those described for the initial construction.

The improvements that may need occasional maintenance include planting additional trees to replace ones that die and the wire fence . These activities, if they are needed, would create nearly the same direct and indirect effects as described for the initial construction except the duration of the disturbance to bald eagles would tend to be shorter.

The impacts of continuing construction assume that the work is done during the same work window of September 1 through March 1. Maintenance could proceed at other times of the year depending on the need , such as immediate repairs to fences, fish barriers, or replanting trees in the spring or fall.

A.3. ONE MILE ISLAND

Direct Effects:

The human activities and machinery used for grading the banks of the main Salmon River, building a barbed wire fence on One Mile Island and the east side of the river, and planting willows may cause some bald eagles to leave perch trees on the island or the bank of the river temporarily. The construction would not affect their food supply since their primary winter food source in Round Valley is carrion, not fish. The physical presence of the new structures (i.e. the bank logs and the fence) would have very little or no effect on foraging or roosting bald eagles.

Equipment parking, the construction office, and material storage areas would be on disturbed areas that have been created by the landowner before this project. These areas would be about 400 to 500 feet from the side channel and river. The presence of these areas would not have any direct effect on bald eagles. Hauling plants, rock and fence materials would require 25 to 85 truckloads. The trucks could disturb eagles if they were in the area. Hauling in the materials should take less than five days.

The bank grading is not expected to produce any excess material that would have to be hauled off. The soil and rock that is taken off the riverbank would be distributed on the upland adjacent to the project site. The machinery may disturb eagles if they are present but the graded bank would not affect them.

Indirect:

The new trees that are planted may provide additional roosting or nesting opportunities in about 20 years. These trees may also help stabilize the bank and improve habitat for steelhead, salmon and other native fishes, which, in turn, would increase the prey base for bald eagles.

The fence on the west side of the river may be a hazard to winter-weakened deer that try to jump it. These animals may occasionally become tangled in the wire and die, providing additional forage for wintering eagles.

The loss of two to five mature trees during construction activities would reduce the number of roosting sites available for bald eagles. None of these trees would be cut along the main channel of the Salmon River.

The human activities associated with the vehicle parking and material storage area could disturb eagles if they were in the vicinity. This disturbance would last for several weeks, until the project was completed. A fluid spill, such as antifreeze, from a truck or machine would probably not present a hazard because a bird, such as a bald eagle, would probably not be attracted to the spill site. Spill kits that would be kept on-site would help prevent any animal from being poisoned by a toxic spill.

Continuing Construction and Maintenance:

The parts of this project that could require additional work in order to make them perform as they were intended include the logs that would be installed at the foot of the river bank. If work is required on the logs, the direct and indirect effects on bald eagles would be the same as those described for the initial construction.

The improvements that may need occasional maintenance include planting additional trees to replace ones that die and the wire fence. These activities, if they are needed, would create nearly the same direct and indirect effects as described for the initial construction except the duration of the disturbance to bald eagles would tend to be shorter.

The impacts of continuing construction assume that the work is done during the same work window of September 1 through March 1. Maintenance could proceed at other times of the year depending on the need , such as immediate repairs to fences or planting replacement trees in the spring or fall.

A.4. HOT SPRINGS SITE

Direct:

There is more machine work and human activity proposed on the two properties of the Hot Springs site than any other site in the USRC area. In Challis Hot Springs Creek, the proposal includes creating pools for fish habitat, installing larger culverts, excavating 300 feet of vertical channel bank, placing cobble for refuge from predators, and deepening the thalweg. Approximately 15,000 to 17,000 feet of fence is proposed along with building four water gaps for livestock watering. The proposal also includes construction of a new wetland, building two channels from the wetland, draining an existing pond and excavating a new channel through it, building a flume and culvert for irrigation water diversion, constructing a new channel from the hot springs to the Salmon River, and riparian plantings. The distance from most of the work sites (i.e. 100 to 200 yards) to the nearest trees may provide sufficient buffer to minimize the disturbance to the eagles. The human activities and machinery associated with these projects may displace bald eagles from perch trees for a few days to several weeks, depending largely on the duration of the project and the distance from the perch trees.

The machine work that would occur next to the river to reopen an old side channel would be much closer to trees that are suitable for eagle perches. This work has a high probability of disturbing eagles if they are present.

The construction would not affect their food supply since their primary winter food source in Round Valley is carrion, not fish. The physical presence of the new structures (i.e. culverts, new channels, the wetland, and the flume, etc.) would have very little or no direct effect on foraging or roosting bald eagles.

Machines would use existing paths and roads on the property-owners land (i.e. Stark on the south half and Hammond on the north half). The construction office and material storage area would be on existing areas used by the property owners for similar purposes. Material that is removed from along, or in, Challis Hot Springs Creek, such as from deepening the thalweg, grading the flood-prone banks, excavating channels or the wetland, or building the channel through the existing pond would be redistributed on the owner's property. This machine work could disturb or displace bald eagles if they were present.

Hauling fence material, rock, and plants would take 80 to 160 truckloads for the entire project (both property owners). This activity is not likely to cause adverse effects on bald eagles because the hauling and storage would take place 500 to 1000 feet or more from the trees along the river where the birds would be perched or roosting. However, if the birds are present in the trees near the river, the noise and activity associated with all the trucks may cause the birds to leave the area, at least temporarily. The trees near the Stark and Hammond homes may be large enough for eagles to use them, but the continual activity in these places by the homeowners deters eagles from perching there. The equipment parking and material storage areas would be located about 500 to 1000 feet from Challis Hot Spring Creek and the river. The presence of these areas would not have any direct effect on bald eagles.

The proposed fish screens on the irrigation water intake (main channel), at the irrigation ditch inflow into Challis Hot Springs Creek (east channel), and at the outflow weirs from the wetland to the river would not affect bald eagles.

Indirect Effects:

The new trees that are planted may provide additional roosting or nesting opportunities in about 20 years. The habitat improvements in Challis Hot Springs Creek, the pond and the wetland may also improve habitat for steelhead, salmon and other native fishes, which, in turn, would increase the prey base for bald eagles. Since the new wetland would be filled with irrigation runoff, it is anticipated that the wetland would be dry, or nearly so in the winter. If this were the case, it would not provide foraging habitat for bald eagles. Even if it holds water in the winter, the fish screens should prevent fish from entering the wetland, so there would not be any foraging opportunity for eagles.

The fence along both channels of Challis Hot Springs Creek may be a hazard to winter-weakened deer that try to jump it. These animals may occasionally become tangled in the wire and die, providing additional forage for wintering eagles.

The loss of 7 to 10 mature trees during construction activities would reduce the number of roosting sites available for bald eagles. None of these trees would be cut along the main channel of the Salmon River.

The primary attraction of the Challis Hot Spring Campground is the hot spring pools. It is not likely that the proposed improvements to the creek would attract more recreational use (i.e. fishing or wildlife watching) to the campground. Therefore, it is not likely that there would be any adverse impact from recreation use associated with the project.

The human activities associated with the vehicle parking and material storage area could disturb eagles if they were in the vicinity. A fluid spill, such as antifreeze, from a truck or machine would probably not present a hazard because a bird, such as a bald eagle, would probably not be attracted to the spill site. Spill kits that would be kept on-site would help prevent any animal from being poisoned by a toxic spill.

The number of projects on the Hot Springs properties increases the probability of longer duration disturbances to eagles.

Continuing Construction and Maintenance:

The parts of this project that could require additional work in order to make them perform as they were intended include the cross section or depth of the new channels, the culverts, the wetland, the pools that are created, deepening the thalweg, and the irrigation diversion structures. If work is required on any of these improvements, the direct and indirect effects on bald eagles would be the same as those described for the initial construction. The duration of the disturbance could be shorter if adjustments rather than reconstruction are needed.

The improvements that may need occasional maintenance include planting additional trees to replace ones that die, the wire fence, dredging the wetland, cleaning the cobble beds, and repairs to the irrigation diversion structures. These activities, if they are needed, would create nearly the same direct and indirect effects as described for the initial construction except the duration of the disturbance to bald eagles would tend to be shorter for maintenance needs.

The impacts of continuing construction assume that the work is done during the same work window of September 1 through March 1. Maintenance could proceed at other times of the year depending on the need, such as immediate repairs to fences, the irrigation diversion structures, or the fish screens, or replanting trees in the spring or fall.

A.5. PENNAL GULCH

Direct Effects:

Much of the work proposed for the Pennal Gulch land is 50 to 300 feet from mature cottonwoods that may be used as perches by bald eagles. The machines and people involved in breeching and lowering the levees at the Sportsman's Access could displace bald eagles if they were perching in the cottonwoods near the river. Other activities that could potentially disturb bald eagles would be constructing the new side channel, installing the rock sill at the side channel entrance from the river, installing barbs and sills in the new side channel, installing the culverts and water gaps, anchoring the logs in the bank, planting willows, and

building about 7000 feet of wire fence. Additional work that could cause eagles to leave the area include building a levee between the new channel and the wetland, excavating down the existing side channel/slough from the confluence with the new channel around the wetland, constructing a high flow channel across the Sportsman's Access road, and constructing temporary roads.

The construction probably would not affect their food supply since their primary winter food source in Round Valley is carrion, not fish. The physical presence of the new structures (i.e. culverts, the anchored logs, the lowered levee, and the new channels) would have very little or no effect on foraging or roosting bald eagles.

Temporary roads up to 3000 feet long may be constructed within the site to connect various construction points. This activity could disturb bald eagles if they were in the area. Vehicle parking and material storage would be in wide areas along the road, so there should be little effects on eagles from this. These areas are 500 to 1500 feet from the side channel and river. The presence of these areas would not have any direct effect on bald eagles.

Excavation of material to connect the main river channel and build a side channel around the wetland would take 250 to 800 truckloads. Excess material would be used to fill borrow pits on the property approximately 1000 feet from the river. It would take 25 to 45 truckloads to bring in the rock, culverts, fence material and plants for this project. If bald eagles were present, this much truck activity would probably disturb them, causing them to leave the area for a few days to several weeks when the construction activity was completed.

Indirect Effects:
The loss of 5 to 10 mature trees during construction activities would reduce the number of perch sites available for bald eagles. However, the new trees that are planted should make up for this loss by providing additional perch or nesting opportunities in 15 to 20 years. None of these trees would be cut along the main channel of the Salmon River.

The side channel, bank logs and willow/tree plantings may improve habitat for steelhead, salmon and other native fishes, which, in turn, would increase the prey base for bald eagles. The addition of 1 1/3 miles of wire fence along the side channel may present a hazard to winter-weakened deer that try to jump it. These animals may occasionally become tangled in the wire and die, providing additional forage for wintering eagles.

The human activities associated with the vehicle parking and material storage area could disturb eagles if they were in the vicinity. The eagles may leave the area for a few days to a month or more, when the construction work was completed.

The rock sill at the upstream end of the side channel, as well as the water gaps would not create any indirect effects on bald eagles.

Continuing Construction and Maintenance:
The parts of this project that could require additional work in order to make them perform as they were intended include the cross section or depth of the new channel, the culverts, the

rock sill in the river, the levee between the new channel and the wetland, the breeched or lowered levee, the high flow section over the road, or
re-anchoring the logs at the foot of the bank. If work is required on any of these improvements, the direct and indirect effects on bald eagles would be the same as those described for the initial construction. The duration of the disturbance could be shorter if adjustments rather than reconstruction were needed.

The improvements that may need occasional maintenance include planting additional trees to replace ones that die, the wire fence, or dredging the new channel. These activities, if they are needed, would create nearly the same direct and indirect effects as described for the initial construction except the duration of the disturbance to bald eagles would tend to be shorter for maintenance needs.

The impacts of continuing construction assume that the work is done during the same work window of September 1 through March 1. Maintenance could proceed at other times of the year depending on the need, such as immediate repairs to fences, the Sportsman's Access road, or replanting trees in the spring or fall.

A.6. BALD EAGLE CUMULATIVE EFFECTS FOR ALL SITES (Spatial & Temporal)

The proposed projects for all five sites are not expected to increase recreational use (e.g. rafting, fishing, hunting, etc.) of the Salmon River. There would not be an increase in consumptive uses such as livestock grazing, agriculture or mining attributed to the proposed projects.

There are no expected adverse cumulative effects from these or other consumptive uses on bald eagles for the projects proposed on the Highway 93 Bridge, Dunfee Slough, One Mile Island, the Hot Springs, or Pennal Gulch properties. These projects, and subsequent Corps projects on other private property in the river corridor, should improve the riparian corridor by establishing more trees for cover, perches, and nesting. The projects should also increase the number of salmonid smolts that survive to migrate to the ocean, which, in turn, should increase the number of returning adults as a potential food source for eagles.

Building and agricultural use are not likely to occur on the parts of the USRC that are on land administered by the BLM.

Home or business construction is not expected to increase in the river corridor because of the proposed project. Building and sub-dividing will probably continue in the river corridor for a number of years, regardless of the proposed USRC. Building/subdividing would not continue on the private lands where the Corps of Engineers' acquires an ecosystem restoration easement. These easements reserve the owners' rights but prohibit destroying, modifying or disturbing the habitat improvements that are completed with the USRC. The easement also precludes the construction or maintenance of any structure on the property. However, it is reasonable to expect some cumulative effects from land development and building on private property that is not under a Corps of Engineers ecosystem restoration easement. These effects could include loss of riparian woodlands, human activity around homes, livestock grazing, or conflicts with power-lines.

B. Bull Trout

Please note for all project sites, recent sampling (1999) associated with Idaho DEQ's large river Beneficial Use Reconnaissance Project (BURP) collected fish in the main stem Salmon River near the town of Clayton (about 25 miles upstream from Round Valley), and at the mouth of the Pahsimeroi River near Challis (about 9 miles downstream from the project are.). They found rainbow trout and chinook salmon, but no bull trout (DEQ, 2001). Other fish surveys have revealed numerous chinook and steelhead, but very few bull trout within the Upper Salmon River (DEQ, 2001). The Idaho Dept. of Fish and Game conducted snorkel surveys of Challis Hot Springs Creek (Stark & Hammond property) in July 2002. They did not find any bull trout (personal communication, Tom Curet, IDFG, 2002).

B.1. HIGHWAY 93 BRIDGE

Direct Effects:

Construction activities on the Highway 93 Bridge property that would take place in the water (e.g. reconnecting the existing side channel, and placing boulders for the rock sill) would take place during the winter, possibly the most likely time of year that bull trout would be present in the main Salmon River. The work in the main channel of the river would be at the upstream and downstream ends of the channel. If a bull trout was near the machine when it started working in the water, it could easily avoid the area until the work was completed. However, it is not likely that bull trout would be holding in the area near the ends of the side channel to be opened because this is not the type of habitat they prefer (i.e. there are no logs, overhanging banks or large in-water structures in this vicinity).

The physical presence of the new structures (i.e. culverts and the new channels) would have little effect on bull trout if they were in the main Salmon River during the winter. The side channel that would be reopened may have a beneficial effect by creating foraging and holding habitat for sub-adult or adult bull trout.

Planting the willows and trees along the existing channel would not affect bull trout because this work would be done on dry land.

The storage of rock and other materials would not cause any direct, or indirect, effects on bull trout because they would be located 500 to 1000 feet from the river in disturbed areas created by prior vehicle use and gravel removal. Hauling rock, weir material, and fencing would take 110 to 215 truckloads. This activity would not have any direct effects on bull trout.

The loss of 4 to 10 mature trees during construction activities would have no direct effect on bull trout. None of these trees would be cut along the main channel of the Salmon River.

Indirect Effects:

The trees and shrubs would probably not provide much shade or forage for bull trout since these fish are not likely to be in the main stem during the summer because of high water temperatures.

The initial flush of sediment created by opening the side channel may have minor adverse effects on bull trout if they were immediately downstream of these sites when the sediment was released into the river. Adult or sub-adult bull trout may not be present at the ends of the new side channel if the water velocity is too high for them to seek refuge here during spring peak flows. The four-hour per day work window used when constructing the entrance would help reduce the amount of sediment that would be produced in any 24- hour period. The flush of sediment should not create any migration barriers or interruptions for bull trout because it should be dissipated well before they would be migrating back up the tributaries some time in May or June.

There could be adverse indirect effects on bull trout if there was a toxic fluid leak, such as diesel fuel, from the storage and parking areas, or during hauling materials. The probability that a leak would reach the river is quite low because of the distance between the river and the storage areas. A spill is possible from a truck delivering rock or by the machinery used in the construction of the rock sill. Spill kits on the site would be able to contain a spill before it could create adverse impacts on fish.

The rock sill at the upstream entrance of the new side channel should not create a barrier to fish passage because the main stem would remain open. Fish should be able to move over or around the sill during all flow stages in the river.

The proposed projects on the Highway 93 Bridge site would not create any suitable spawning habitat for bull trout.

None of the other project activities proposed for the Highway 93 Bridge property would cause any indirect effects on bull trout.

Continuing Construction and Maintenance:

The rock sill, the side channel itself, the French drain and refuge pool, the barbs in the side channel, the hardened road section, the levee, the high flow channel and culvert may require additional work in order to make them perform as they were intended. The improvements that may need occasional maintenance include planting replacement trees, repairing the jack fence or boulder fence, dredging the side channel, refuge pool or the entrance to the side channel near the rock sill. These activities, if they are needed, would create nearly the same direct and indirect effects as described for the initial construction except the duration of the disturbance to bull trout would tend to be shorter.

The impacts of continuing construction assume that the work is done during the same work window described in Section III.d.1. Maintenance such as immediate repairs to the fence or

replanting trees, that did not involve working in the wetted channel, could proceed at other times of the year depending on the need.

B.2. DUNFEE SLOUGH

Direct Effects:

The activities associated with building the jack fence, rearranging the boulders in the spillways of the ponds, installing the culverts, and other work in the side channel would probably not effect bull trout. They are not likely to be in the side channel during the work window because it dries up in the winter after the irrigation water is turned off. Any water that is still in the channel/ponds often freezes. In addition to this, it is not likely that bull trout would be holding in the side channel/slough on this project site because this is not the type of habitat they prefer (i.e. there are no logs, overhanging banks or large in-water structures in this channel). If bull trout are present in the main Salmon River during the winter, the work on the rock sill and opening the entrance of the short channel to reconnect the existing side channel could affect fish in the immediate vicinity. However, the effects would be minor because they could easily avoid the area. It is not likely that bull trout would be holding in the main stem of the river near this project site because the habitat components they prefer are not present (e.g. logs, overhanging banks or large in-water structures). The physical presence of the new structures (i.e. culverts and the new channels) would have no effect on bull trout or their spawning, rearing or holding habitat. Installing fish barriers would not have direct effects on bull trout.

Hauling rock and materials into the site would take 15 to 30 truckloads. There would be no direct effects from this activity on bull trout.

The storage of rock and other materials would not cause any direct effects on bull trout because they would be located 400 to 800 feet from the river in disturbed areas created by prior vehicle use and gravel removal.

Indirect Effects:

Planting the willows and trees along the side channel and ponds may improve the over-wintering habitat for bull trout if they enter the main Salmon River from tributaries. Rearranging the spillway rock in the ponds and installing culverts would provide access to the side channel and ponds for wintering bull trout.

Excavating 250 feet of old channel and installing a culvert to connect an existing side channel to the main river should open up about 2500 feet of over-wintering habitat for bull trout. The sediment that is produced when the side channel is connected to the river, when the culvert is installed, and when the sill is being constructed should be dissipated long before bull trout would be migrating up the tributaries in May or June. This sediment should not effect their migration. Sediment eroded from patches of bare soil where trees were planted may enter the river during the first high spring flow. Protective erosion material and planting native sedges and grasses would be used on patches of bare soil to avoid adverse impacts to bull trout and other fish. Turbidity curtains would be placed downstream of the

work sites in the side channel/slough to reduce the amount of sediment released. Another management practice to reduce sediment effects at in-water work sites would be to pump flows around them and back into the side channel below the work site.

Even though the side channel/slough and ponds would be designed to have water all year, it is not likely that bull trout would select the ponds or side channel because there is very little large wood and overhanging bank habitat present. The jack fence would probably not produce any indirect effects on bull trout. The loss of 4 to 10 mature trees during construction activities would not affect bull trout habitat. None of these trees would be cut along the main channel of the Salmon River.

The rock sill at the upstream entrance of the new side channel should not create a barrier to fish passage. Fish should be able to move over or around the sill during all flow stages in the river.

The fish barriers would keep bull trout from becoming stranded in irrigation ditches.

There could be adverse indirect effects on bull trout if there was a toxic fluid leak, such as diesel fuel, from the storage and parking areas, or from hauling materials. The probability that a leak would reach the river is quite low because of the distance between the river and the storage areas. A spill is possible from a truck during rock delivery or by the machinery used in the construction of the rock sill. Spill kits on the site would be able to contain a spill before it could create adverse impacts on fish.

The proposed projects on the Dunfee Slough site would not create any suitable spawning habitat for bull trout.

Continuing Construction and Maintenance:

The rock sill, the side channel itself, the culvert from the river to the side channel, and rearranging the spillway rock at the end of the ponds could require additional work in order to make them perform as they were intended. If work is required on any of these improvements, the direct and indirect effects on bull trout would be the same as those described for the initial construction.

Planting replacement trees and repairing the fence are improvements that may need occasional maintenance. These activities, if they are needed, would not have any direct and indirect effects on bull trout.

The impacts of continuing construction assume that the work is done during the same work window described in Section III.d.1. Maintenance such as immediate repairs to fences, fish barriers, or replanting trees could proceed at other times of the year depending on the need.

B.3. ONE MILE ISLAND

Direct Effects:

If bull trout are present, they should be able to avoid the area when machines are working on grading the banks along the river and One Mile Island. The effects of the machine work should be minor to non-existent.

The human activities and machinery used for building a barbed wire fence and planting willows would not cause any direct effects on bull trout.

The construction office, material and vehicle storage areas would be 400 to 500 feet from the river on areas used by the landowner for similar purposes. These areas would not have any direct effects on bull trout.

Hauling rock and materials into the site would take 25 to 85 truckloads. There would be no direct effects from this activity on bull trout.

Indirect Effects:

The physical presence of the logs in the bank may improve the winter holding or foraging habitat for bull trout.

The sediment produced by grading the banks of the main Salmon River could create stress or cause bull trout to leave the area if they were downstream from the work site. This scenario is not likely because the river habitat below this site does not have the components that bull trout prefer (i.e. overhanging banks, large wood, and large structures in the river). Sediment may enter the river during the first high spring flow from patches of bare soil where the willows and trees were planted or where the bank logs have been placed. In order to reduce the impact from sediment on bull trout, bare soil would be covered with protective erosion material and planted with native grasses and sedges. The initial flush of sediment should not create any migration barriers or interruptions for bull trout because it should be dissipated before they would migrate up the tributaries in May or June. Sediment that is deposited in a few backwaters of the river and small channels during the first high flows past this project site would probably have no effect on juvenile bull trout because this habitat is not suitable for them.

The fence would not have any indirect effect on bull trout. However, the proposal to remove livestock or intensively manage their use of this area eventually may allow riparian vegetation to reestablish on the river bank and provide some large wood habitat for wintering bull trout.

The loss of up to seven mature trees during construction activities is not likely to effect bull trout or their habitat. None of these trees would be cut along the main channel of the Salmon River.

There could be adverse indirect effects on bull trout if there was a toxic fluid leak, such as diesel fuel, from the storage and parking areas, or from hauling materials. The probability that a leak would reach the river is quite low because of the distance between the river and the storage areas. A spill is possible from the machinery used to grade the riverbank. On-site spill kits would be able to contain a spill before it could create adverse impacts on fish.

The proposed projects on the One Mile Island site would not create any suitable spawning habitat for bull trout.

Continuing Construction and Maintenance:

The logs that would be installed at the foot of the river bank could require additional work in order to make them perform as they were intended. If work is required on the logs, the direct and indirect effects on bull trout would be the same as those described for the initial construction.

Planting replacement trees and repairing the fence are improvements that may need occasional maintenance. These activities would not create any direct and indirect effects on bull trout.

The impacts of continuing construction assume that the work is done during the same work window described in Section III.d.1. Immediate repairs to fences or planting replacement trees could proceed at other times of the year depending on the need.

B.4. HOT SPRINGS SITE

Direct Effects:

In Challis Hot Springs Creek, the proposal includes a variety of in-water work , including creating pools, placing cobble, deepening the thalweg , and installing culverts. The human activities and machinery associated with these projects are not likely to effect bull trout because they probably do not use this tributary due to the warm water temperatures from the mouth of the creek upstream to where the hot springs flows into the creek. The work on the old side channel along the river would also not be likely to create any adverse effects on bull trout because this is not the type of habitat they prefer (i.e. there are no logs, overhanging banks or large in-water structures in this vicinity).

The construction office, as well as storage areas for materials and equipment would not have any direct effects on bull trout. These areas would be 500 to 1000 feet from the creek and river. Hauling the materials and rock in for this project would take 80 to 160 truckloads. This would not have any direct effect on bull trout.

Indirect Effects:

The proposed fish screens on the water pump intake, the weirs on the channel from the wetland to the river, and on the irrigation ditch inflow would prevent bull trout from being impinged or stranded. Bull trout could be stranded in the channel from the wetland to the river below the weir barriers when irrigation outflow was turned off. However, it is unlikely that bull trout would be present in this channel in the summer because water temperatures would be above those that bull trout prefer. If bull trout enter this stream, it would probably occur after this project is completed and the water from the hot spring is diverted into a new channel that will take the hot water directly to the Salmon River. The water in Challis Hot

Springs Creek would then remain cooler all the way from its source to where it flows into the Salmon River.

Most of the sediment produced by installing the culverts and flume, creating pools, deepening the thalweg, excavating 300 feet of stream bank, and placing cobble beds in the stream should have little or no effect on bull trout because the sediment should be trapped by turbidity curtains. Sediment may also be controlled by pumping water around the work site. The sediment generated by opening the old side channel along the river could create stress or cause bull trout to leave the area if they were downstream from the work site. This scenario is not likely because the river habitat below the Hot Springs site does not have the components that bull trout prefer (i.e. overhanging banks, large wood, and large structures). The first flush of sediment should not create any migration barriers or interruptions for bull trout because it should be dissipated before they would start migrating up the tributaries in May or June. Sediment that is deposited in a few backwater channels during the first high flows past this project site would have no effect on juvenile bull trout because this habitat is not suitable for them.

The new trees that are planted along the river may provide winter holding habitat for bull trout in the future. The habitat improvements in the creek (e.g. culverts, deepening the thalweg, cobble beds, etc.), could improve winter habitat for bull trout.

The fence along Challis Hot Springs Creek may improve winter habitat for bull trout, if they come up the creek, by protecting the banks and the trees that are planted along it.

The loss of 7 to 10 mature trees during construction activities would not affect bull trout or their habitat. None of these trees would be cut within two tree lengths of the main channel of the Salmon River.

There could be adverse indirect effects on bull trout if there was a toxic fluid leak, such as diesel fuel, from the storage and parking areas, or during hauling materials. The probability that a leak would reach the creek or river is quite low because of the distance between the creek and river, and the storage areas. A spill is possible from a truck delivering rock or by the machinery used for the in-water work such as the cobble beds, gravel dams or deepening the thalweg. On-site spill kits would be able to contain a spill before it could create adverse impacts on fish.

The proposed projects on the Hot Springs site would not create any suitable spawning habitat for bull trout.

Continuing Construction and Maintenance:

The new channels, the culverts, the wetland, the pools that are created, deepening the thalweg, and the irrigation diversion structures could require additional work in order to make them perform as they were intended. The direct and indirect effects for these adjustments would be the same as those described for the initial construction. Planting replacement trees, the fence, dredging the wetland, cleaning the cobble beds, and repairs to

the irrigation diversion structures may need occasional maintenance. These activities are not likely to create any direct or indirect effects on bull trout.

The impacts of continuing construction assume that the work is done during the work window described in Section III.d.1. Maintenance to fences, the irrigation diversion structures, or the fish screens, or replanting trees could proceed at other times of the year depending on the need.

B.5. PENNAL GULCH

Direct Effects:

If bull trout were present in the main Salmon River, it would most likely be during the winter because water temperatures during the summer are warmer than bull trout generally prefer.

The work in the river would begin by September 1 and end no later than January 15 because of the steelhead migration. If bull trout enter the Salmon River from the tributaries in the 12 Mile reach, they would probably come into the river in November or December after spawning. The work in the river could stress or disturb them if they are present.

The physical disturbance of the riverbank when the levees were lowered or breeched could displace bull trout if they were near the activity. The probability of bull trout being present is low because the habitat components that bull trout prefer (i.e. large wood and overhanging banks) are not present in this vicinity in the main Salmon River.

The in-water construction (e.g. the rock sill in the river, breeching the levee, building the new side channel, or installing the culverts in the levee) may cause stress or make bull trout leave the vicinity if they were present. The 4-hourper day work schedule would help reduce the disturbance. Bull trout are not likely to be present because the river habitat above and below the Pennal Gulch site does not have the components that bull trout prefer (i.e. overhanging banks, large wood, and large structures in the river).

Building the water gaps in the fence would probably not have any direct effects on bull trout because they are not likely to be in this side channel when the work is being done. They would not be affected by any other part of the 3400 feet of wire fence or the willow planting.

The temporary roads, along with the material storage areas and equipment parking would not have any direct effects on bull trout. Bringing the fence materials, rock, culverts, etc. into the work site would take 45 to 85 truckloads. This would not have any direct effects on bull trout.

The physical presence of the structures and improvements (e.g. the rock sill, the new side channel, etc.) would not have any direct effects on bull trout. The structures would be designed to allow fish passage year-round.

Indirect Effects:

The beaver dams that may present a passage barrier, ice and lower water levels are conditions that reduce the probability of bull trout presence, and subsequent indirect effects, during the work that is proposed in the side channel.

The sediment produced by breeching and lowering the levees at the Sportsman's Access could stress or displace bull trout if they were immediately downstream of the work site.

The sediment created by the initial spring flush through the new channel around the wetland and the short channel connecting the old side channel to the river should be dissipated before bull trout would be migrating up the tributaries in May or June. The sediment would have no effect on bull trout spawning or bull trout fry because all spawning is done in the upper reaches of tributary streams.

Over-winter habitat for bull trout in the side channel/slough could be improved by planting the willows and trees, and by installing the bank logs.

The addition of 1 1/3 miles of wire fence along the side channel would probably not produce any indirect effects on bull trout. The fence would protect the new trees that would help in reestablishing riparian vegetation for cover.

The loss of 5 to 10 mature trees during construction activities would not affect bull trout habitat. None of these trees would be cut within two tree lengths of the main channel of the Salmon River.

The physical presence of the channel/slough improvements (i.e. culverts, new channels, barbs, deepening the thalweg, etc.) could have beneficial, indirect effects on bull trout if they use this area. The improvements would not create suitable spawning or rearing habitat. However, they may improve foraging habitat for bull trout during the winter when water temperatures are more suitable.

Continuing Construction and Maintenance:

The new channel, the culverts, the rock sill in the river, the levee between the new channel and the wetland, the breeched or lowered levee, the high flow section over the road, or re-anchoring the logs at the foot of the bank could require additional work in order to make them perform as they were intended. If work is required on any of these improvements, the direct and indirect effects on bull trout would be the same as those described for the initial construction. The duration of the disturbance could be shorter if adjustments rather than reconstruction were needed.

Planting replacement trees, the fence, or dredging the new channel are the improvements that may need occasional maintenance. These activities, if they are needed, would create nearly the same direct and indirect effects as described for the initial construction except the duration of the disturbance to bull trout would tend to be shorter.

The impacts of continuing construction assume that the work is done during the work window described in Section III.d.1. Maintenance could proceed at other times of the year depending on the need.

B.6. BULL TROUT CUMULATIVE EFFECTS FOR ALL SITES (Spatial & Temporal):

The proposed projects on all five sites are not expected to increase recreational use (e.g. rafting, fishing, hunting, etc.) of the Salmon River. There would not be an increase in consumptive uses such as livestock grazing, agriculture or mining attributed to the proposed project. There are no expected adverse cumulative effects from these or other consumptive uses on bull trout from the projects proposed on the Highway 93 Bridge, Dunfee Slough, One Mile Island, the Hot Springs Site or Pennal Gulch properties.

These projects, and subsequent Corps projects on other private property in the river corridor, should improve the riparian corridor by establishing more trees for shade and contributing large wood cover in the river. This would improve the winter habitat for bull trout if they use the river. The projects should also increase the number of salmonid smolts that survive to migrate to the ocean, which, in turn, could increase the forage supply for adult bull trout. The habitat in the side channels should be improved for bull trout by increasing the amount of large woody debris and overhanging banks for cover.

Home or business construction is not expected to increase in the river corridor because of the proposed project. Building and sub-dividing will probably continue in the river corridor for a number of years, regardless of the proposed USRC. Building/subdividing would not continue on the private lands where the Corps of Engineers' acquires an ecosystem restoration easement. These easements reserve the owners' rights but prohibit destroying, modifying or disturbing the habitat improvements that are completed with the USRC. The easement also precludes the construction or maintenance of any structure on the property.
Building and agricultural use are not likely to occur on the parts of the USRC that are on land administered by the BLM.

The probability of cumulative effects on bull trout from activities outside the USRC (e.g. land development, building, or recreational fishing) are quite low because of the very low numbers of bull trout that may be in the river. If future surveys show that more bull trout use the main stem of the Salmon River than is presently documented, the probability for cumulative effects would increase.

C. Canada Lynx

Canada lynx have not been documented in the area of the proposed USRC to date, or on adjacent Federal, State, or private land. The riparian habitat along the 12 Mile reach and Round Valley is not suitable habitat for denning. It may be suitable for travel and foraging. It is possible (but not likely) that a lynx may move through the USRC Area on its way to more suitable habitat. Although cover is important to lynx when searching for food, lynx often hunt along edges. However, lynx have been

observed (via snow tracking) to avoid large openings, either natural or created, during daily movements within their home range (Ruediger et al., 2000).

The boundary of the River of No Return Wilderness (i.e. boreal forest habitat) is about 15 miles west of the project area. About 8 to 9 miles of this distance is open sage/grass habitat except for a few narrow riparian zones. Adverse impacts from the USRC project are unlikely because a lynx would have to cross a large distance of open habitat and avoid the high concentration of human activity in the valley before they arrived in any of the project sites.

The construction and other activities associated with the project sites would not occur on all of the five sites simultaneously. Therefore, if a lynx was present on one property they would not be confronted by repeated encounters with people and machinery on any of the other four project sites. If a lynx were in the Round Valley, it would probably not stay long because of the lack of cover and the high density of people.

C.1. HIGHWAY 93 BRIDGE

Direct:

If a lynx was in the river corridor, the construction activities could affect their ability to forage and move through the area. All construction activities associated with this site (e.g. reconnecting the existing side channel, constructing the second high flow channel, post and chain fence, placing boulders, barbs along Highway 93, etc.) would take place during the fall or winter. These activities could all have adverse impacts on lynx if they were traveling in this area.

The probability of lynx crossing the project area or the valley in the winter is low because there is sparse vegetative cover and less prey. The physical presence of the new structures (i.e. culverts and the new channels) would have very little or no effect on foraging or movements of lynx.

The loss of 4 to 10 mature trees during construction activities would have little or no effect on lynx traveling through the river corridor.

Storing equipment and materials near this project site would not create additional effects on lynx movements or foraging. An estimated 110 to 215 truckloads of materials and rock would be hauled into this project site. The truck traffic would probably cause a minor increase in stress if the animal moved through this part of the Round Valley.

Indirect:

New tree planting may provide additional cover and foraging habitat for lynx if they traveled through the area. None of the other projects on the Highway 93 Bridge site (i.e. the new channels, boulders, culvert, chain fence, the French drain, etc.) would create any indirect effects on Canada lynx.

The human activities associated with the vehicle parking and material storage area could disturb lynx if they were in the vicinity. A fluid spill, such as antifreeze, from a truck or

machine could present a hazard to a lynx if it found the spill site. Considering the human activity around the storage and parking areas, it is unlikely that a lynx would venture into a spill site. On-site spill kits would speed cleanup and help prevent any animal from being poisoned by a toxic spill.

Continuing Construction and Maintenance:

The rock sill at the upstream end of the side channel, the side channel itself, the French drain and refuge pool, the barbs in the side channel, the hardened road section, the levee, the high flow channel and culvert could require additional work in order to make them perform as they were intended. If work is required on any of these improvements, the direct and indirect effects on Canada lynx would be the same as those described for the initial construction.

Planting replacement trees, repairing the jack fence or boulder fence, dredging the side channel, refuge pool or the entrance to the side channel near the rock sill may need occasional maintenance. These activities, if they are needed, would create nearly the same direct and indirect effects as described for the initial construction except the duration of the disturbance to Canada lynx would tend to be shorter.

The impacts of continuing construction assume that the work is done during the same work window described in Section III.d.1. Immediate repairs to the jack fence or replanting trees could proceed at other times of the year depending on the need.

C.2. DUNFEE SLOUGH

Direct Effects:

If there were a lynx traveling through the river corridor, the construction activities associated with all the proposed projects on this site (e.g. building the jack fence, constructing a channel to connect to the river, rearranging the boulders in the pond spillways, installing the culverts, installing the fish barriers, etc.) could affect their ability to forage and move through the area.

The physical presence of the new structures would have very little or no effect on foraging or movements of lynx.

Equipment parking and material storage areas would be located on disturbed areas that are currently used by the landowner for similar purposes so there would not be any vegetative cover removed. The machine work and human activity involved with disposing of 1500 to 2500 cubic yards of material from the ponds and side channel might reduce the number of routes that lynx could travel and forage on if they moved through the river corridor. Hauling rock and materials into the Dunfee Slough site would take about 15 to 30 truckloads. If a lynx was present, this activity would disrupt their movements. However, a lynx would probably not stay long because of the lack of cover and the high density of people. The truck traffic would probably cause a minor increase in stress as the animal moved through the valley.

Indirect Effects:

The new trees that are planted may provide additional cover and foraging habitat for lynx if they traveled through the area. The culverts, new channel, rock sill and spillway work would not produce any indirect effects on lynx. If a deer became accidentally entangled in the wire fence and died, it could provide an additional source of food for a lynx. The loss of 4 to 10 mature trees during construction activities would not have any indirect effects on lynx if they moved through the area.

The human activities associated with the vehicle parking and material storage area could disturb lynx if they were in the vicinity. A fluid spill, such as antifreeze, from a truck or machine could present a hazard to a lynx if it found the spill site. Considering the human activity around the storage and parking areas, it is unlikely that a lynx would venture into one of these areas. Spill kits would be kept on-site to help speed cleanup and prevent any animal from being poisoned by a toxic spill.

Continuing Construction and Maintenance:

The rock sill, the side channel itself, the culvert from the river to the side channel, and rearranging the spillway rock at the end of the ponds are projects that could require additional work in order to make them perform as they were intended. If work is required on any of these improvements, the direct and indirect effects on Canada lynx would be the same as those described for the initial construction.

Planting replacement trees and the wire fence are improvements that may need occasional maintenance. These activities, if they are needed, would create nearly the same direct and indirect effects as described for the initial construction except the duration of the disturbance to Canada lynx would tend to be shorter.

The impacts of continuing construction assume that the work is done during the same work window described in Section III.d.1. Immediate repairs to fences, fish barriers, or replanting trees could proceed at other times of the year depending on the need.

C.3. ONE MILE ISLAND

Direct Effects:

The human activities and machinery used for grading the banks of the main Salmon River, building a barbed wire fence, and planting willows could affect the ability of lynx to forage and move through the area.

The physical presence of the new structures (i.e. the fence and the bank logs) would have very little or no direct effect on foraging or movements of lynx.

The construction office, vehicle parking and material storage would be on areas previously used by the landowner for vehicle staging and equipment parking. These activities would not have any direct effects on lynx if one were moving through the area. Hauling plants, rock and fence material would take about 25 to 85 truckloads. This activity would disturb the movements of a lynx temporarily. If a lynx were in the Round Valley, it would probably not stay long because of the lack of cover and the high density of people. The truck traffic would probably cause a minor increase in stress as the animal moved quickly through the valley.

Indirect Effects:

Planting trees may provide additional cover and foraging habitat for lynx if they traveled through the area.

The fence on the west side of the river may be a hazard to deer that try to jump it. These animals may occasionally become tangled in the wire and die, providing additional forage for lynx if they were moving through the area.

The loss of up to seven mature trees during construction activities would not have any indirect effects on lynx if they moved through the area.

The human activities associated with the vehicle parking and material storage area could disturb lynx if they were in the vicinity. A fluid spill, such as antifreeze, from a truck or machine could present a hazard to a lynx if it found the spill site. Considering the human activity around the storage and parking areas, it is unlikely that a lynx would venture into one of these areas. Spill kits would be kept on-site to help speed cleanup and prevent any animal from being poisoned by a toxic spill.

Continuing Construction and Maintenance:

The logs that would be installed at the foot of the river bank are projects that could require additional work in order to make them perform as they were intended. If work is required on the logs, the direct and indirect effects on Canada lynx would be the same as those described for the initial construction.

Planting replacement trees and the wire fence are improvements that may need occasional maintenance. These activities, if they are needed, would create the same direct and indirect effects as described for the initial construction except the duration of the disturbance to a lynx would tend to be shorter.

The impacts of continuing construction assume that the work is done during the same work window described in Section III.d.1. Immediate repairs to fences or planting replacement trees could proceed at other times of the year depending on the need.

C.4. HOT SPRINGS SITE

Direct Effects:

If a lynx was in this area during the construction period the human activities and machinery associated with any of these projects may affect its' ability to forage and move through the area. The probability of a lynx moving along Challis Hot Springs Creek on either Stark or Hammond's property is very low because nearly all of this land is open meadow or pasture. There are no shrubs, trees or other cover along Challis Hot Springs Creek on Starks' land, and none on Hammonds' until you reach the channel coming out of the existing pond, about 1000 feet from the Hammond's home.

The physical presence of the new structures (i.e. the fence, in-stream work, wetland, etc.) would have very little or no effect on foraging or movements of lynx.

The proposed installation of fish screens on the irrigation water intake would not affect lynx.

The equipment parking, construction office, and material storage areas would have few, if any, impacts to lynx traveling through this property because they would probably stay close to the wooded river corridor. These projects would require 80 to 160 truckloads to bring in all of the rock, equipment and other materials. This activity could temporarily disturb, divert or prevent a lynx from moving through the open sagebrush or pastureland inside the project area. The effects of the trucks would be much less if a lynx was moving through the wooded river corridor. The truck traffic would probably cause a minor increase in stress as the animal moved through the valley. If a lynx were in the Round Valley, it would probably not stay long because of the lack of cover and the high density of people.

Indirect Effects:

Planting trees may provide additional cover and foraging habitat for lynx if they traveled through the area. The habitat improvements in Challis Hot Springs Creek, the pond and the wetland may also improve habitat for species such as cottontail rabbits, waterfowl and rodents that, in turn, could increase the prey base for lynx. The fence along both channels of Challis Hot Springs Creek may be a hazard to deer that try to jump it. These animals may occasionally become tangled in the wire and die, providing additional forage for lynx that may move through the river corridor.

The loss of 7 to 10 mature trees during construction activities would not have any indirect effects on lynx if they moved through the area.

The human activities associated with the vehicle parking and material storage area could disturb lynx if they were in the vicinity. A fluid spill, such as antifreeze, from a truck or machine could present a hazard to a lynx if it found the spill site. Considering the human activity around the storage and parking areas, it is unlikely that a lynx would venture into one of these area. Spill kits would be kept on-site to speed cleanup and help prevent any animal from being poisoned by a toxic spill.

Continuing Construction and Maintenance:

The new channels, the culverts, the wetland, the pools that are created, deepening the thalweg, and the irrigation diversion structures are parts of this project that could require additional work in order to make them perform as they were intended. If work is required on any of these improvements, the direct and indirect effects Canada lynx would be the same as those described for the initial construction. The duration of the disturbance could be shorter if adjustments rather than reconstruction are needed.

Planting replacement trees, the wire fence, dredging the wetland, cleaning the cobble beds, and repairs to the irrigation diversion structures are improvements that may need occasional maintenance. These activities, if they are needed, would create the same direct and indirect effects as described for the initial construction except the duration of the disturbance to a lynx would tend to be shorter for maintenance needs.

The impacts of continuing construction assume that the work is done during the same work window described in Section III.d.1. Immediate repairs to fences, the irrigation diversion structures, or the fish screens, or replanting trees could proceed at other times of the year depending on the need.

C.5. PENNAL GULCH

Direct Effects:

If a lynx was in the area during the fall/winter construction period, the machines and people involved in breeching and lowering the levees at the Sportsman's Access, as well as all other projects on this property, could affect the ability of lynx to forage and move through the area.

The physical presence of the new structures (i.e. the fence, culverts, barbs, new channel around the wetland, etc.) would have very little or no effect on foraging or movements of lynx.

Other activities that could adversely affect lynx movements in this area would be the construction of temporary roads, and the 45 to 85 truck trips that would be needed to bring in the rock, fence material and plants for the project. These activities would disturb the movements of a lynx temporarily. The truck traffic would probably cause a minor increase in stress as the animal moved quickly through the valley. If a lynx were in the Round Valley, it would probably not stay long because of the lack of cover and the high density of people.

Equipment parking and material storage would have little or no direct effect on a lynx that wanted to move through the river corridor in this area.

Indirect Effects:

Planting trees may provide additional cover and foraging habitat for lynx if they traveled through the area. The side channel and tree plantings may also improve habitat for species such as cottontail rabbits, waterfowl and rodents that, in turn, would increase the prey base for lynx. The addition of 3400 feet of wire fence along the side channel may present a

hazard to deer that try to jump it. These animals may occasionally become tangled in the wire and die, providing additional forage for lynx if they were traveling through the area.

The other habitat improvements and structures (e.g. side channel, culverts, rock sill, etc.) would not have any indirect effects on lynx.

The water gaps would not create any indirect effects on lynx.

The loss of 5 to 10 mature trees during construction activities would not have any indirect effects on lynx if they moved through the area.

The human activities associated with the vehicle parking and material storage area could disturb lynx if they were in the vicinity. A fluid spill, such as antifreeze, from a truck or machine could present a hazard to a lynx if it found the spill site. Considering the human activity around the storage and parking areas, it is unlikely that a lynx would venture into one of these areas to get at an antifreeze spill. Spill kits would be kept on-site to help speed cleanup and prevent any animal from being poisoned by a toxic spill.

Continuing Construction and Maintenance:

The new channel, the culverts, the rock sill, the levee between the new channel and the wetland, the breeched or lowered levee, the hardened road section, or re-anchoring the logs at the foot of the bank are parts of this project that could require additional work in order to make them perform as they were intended. If work is required on any of these improvements, the direct and indirect effects on Canada lynx would be the same as those described for the initial construction. The duration of the disturbance could be shorter if adjustments rather than reconstruction were needed.

Planting additional trees to replace ones that die, the wire fence, or dredging the new channel are improvements that may need occasional maintenance. These activities, if they are needed, would create the same direct and indirect effects as described for the initial construction except the duration of the disturbance to a lynx would tend to be shorter for maintenance needs.

The impacts of continuing construction assume that the work is done during the same work window described in Section III.d.1. Immediate repairs to fences, the Sportsman's Access road, or replanting trees could proceed at other times of the year depending on the need.

C.6. LYNX CUMULATIVE EFFECTS FOR ALL SITES (Spatial and Temporal)

The recreational use at the Challis Hot Springs Campground may affect lynx if they traveled through the area. If a lynx wanted to travel through the river corridor near the Hot Springs Campground, the habitat on the other side of the river is suitable for travel and there is less chance of encountering a human.

The proposed projects are not expected to increase recreational use (e.g. rafting, fishing, hunting, etc.) of the Salmon River. There would not be an increase in livestock use, agriculture or mining attributed to the proposed project.

There are no expected adverse cumulative effects from these or other consumptive uses on lynx from the projects proposed on the Highway 93 Bridge, Dunfee Slough, One Mile Island, the Hot Springs Site, or Pennal Gulch properties. These projects, and subsequent Corps projects on other private property in the river corridor, should improve the riparian corridor by establishing more vegetation for cover and habitat for prey species such as deer, rabbits and other small mammals. This would improve the habitat for lynx if they moved through this area.

Home or business construction is not expected to increase in the river corridor because of the proposed project. Building and sub-dividing will probably continue in the river corridor for a number of years, regardless of the USRC. Building/subdividing would not continue on the private lands where the Corps of Engineers' acquires an ecosystem restoration easement. These easements reserve the owners' rights but prohibit destroying, modifying or disturbing the habitat improvements that are implemented with the USRC. The easement also precludes the construction or maintenance of any structure on the property.

There may be cumulative effects (e.g. loss of cover) caused by home construction or other similar development on private property in the river corridor that is not under a Corps ecosystem restoration easement. However, the probability of adverse effects is very low because the habitat in the entire Round Valley area is not suitable for lynx for anything but travel between widely separated, suitable habitat blocks to the west and north. There are far better travel routes available for lynx than the river corridor, agricultural land and open sagebrush of Round Valley.

D. Gray Wolf

Gray wolves have not been documented in the proposed USRC area to date, or on adjacent Federal, State, or private land. The riparian habitat along the 12 Mile reach and Round Valley are not suitable habitat for denning. It may be suitable for travel and foraging. There are no documented wolf packs that include the Round Valley in their home range. There are documented packs 20 to 60 miles west and southwest of Challis. These include Jureano Mountain, Moyer Basin, Twin Peaks and Whitehawk Mountain. There have been several lone wolves moving through the Challis area in the recent past. During winter, there have been wolves moving through the foothills along the western breaks of the Salmon River from the town of Challis, south to the town of Stanley. Most of the pack and lone wolf activity is concentrated in the forested public lands to the north, west, and south of Challis. (Personal communication, Curt Mack, 2002.)

Most construction activities would take place during the fall or winter. The probability of a wolf or pack of wolves crossing the project area or the valley is low because of the possibility of human contact and lack of cover. Their presence in the valley could depend on whether the pack size was increasing, the dispersal of lone wolves, or the lack of available prey in their established home range. It is possible that

a pack or lone wolf may move through the USRC Area while hunting or moving to other suitable habitat to the west of Round Valley. The boundary of the River of No Return Wilderness (i.e. boreal forest habitat) is about 15 miles west of the project area. About 8 to 9 miles of this distance is open sage/grass habitat except for a few narrow riparian zones. The effects of this project on gray wolves is expected to be minimal due to the large distance of open habitat between suitable coniferous forest habitat and the Round Valley, and the high concentration of human activity in the valley.

The construction and other activities associated with these projects would not all take place simultaneously. Therefore, if a wolf pack or lone wolf were trying to move through the valley, they would probably not be confronted by repeated encounters with people and machinery.

D.1. HIGHWAY 93 BRIDGE

Direct Effects:

All of the construction activities associated with this project site (e.g. reconnecting an existing side channel, the levee along this channel, the French drain, planting trees, and the rock sill in the river, etc.) could adversely effect a wolf pack or lone wolf if they wanted to travel through this work site.

The physical presence of the new structures (i.e. culverts, the new channels, etc.) would have very little or no direct effect on foraging or movements of wolves.

Other activities that could also adversely affect the ability of a wolf pack or lone wolf to move through this area include the hauling of 110 to 215 truckloads of plants, rock, and other materials needed for this job. The truck traffic would probably cause a minor, temporary increase in stress as the animals moved through the valley. The vehicle parking area and the materials storage area would not create any direct adverse effects on wolves that wanted to travel through this area. If wolves were in the Round Valley, they would probably not stay long because of the lack of cover and the high density of people.

Planting the willows and trees along the existing channel may cause wolves to avoid this area temporarily. The loss of 4 to 10 mature trees during construction activities would have little or no direct effect on lone wolves or packs traveling through the river corridor.

Indirect Effects:

Planting trees may provide additional cover for wolves if they traveled through this project area. The new channels, boulders, culvert, chain fence and barbs in highway 93 would not produce any indirect effects on gray wolves.

The human activities associated with the vehicle parking and material storage area could disturb wolves if they were moving through the area. A fluid spill, such as antifreeze, from a truck or machine could present a hazard to a wolf if it found the spill site. Considering the human activity around the storage and parking areas, it is unlikely that a wolf would venture into one of these area. Spill kits would be kept on-site to help speed cleanup and prevent any animal from being poisoned by a toxic spill.

Continuing Construction and Maintenance:

The rock sill at the upstream end of the side channel, the side channel itself, the French drain and refuge pool, the barbs in the side channel, the hardened road section, the levee, the high flow channel and culvert are parts of this project that could require additional work in order to make them perform as they were intended. If work is required on any of these improvements, the direct and indirect effects on gray wolves would be the same as those described for the initial construction.

Planting replacement trees, repairing the jack fence or boulder fence, dredging the side channel, refuge pool or the entrance to the side channel near the rock sill are improvements that may need occasional maintenance. These activities, if they are needed, would create the same direct and indirect effects as described for the initial construction except the duration of the disturbance to wolves would tend to be shorter.

The impacts of continuing construction assume that the work is done during the same work window described in Section III.d.1. Immediate repairs to jack fence or replanting trees could proceed at other times of the year depending on the need.

D.2. DUNFEE SLOUGH

Direct Effects:

If there were a lone wolf or pack traveling through the river corridor, all of the activities associated with this project (e.g. the jack fence, planting trees, the culverts, constructing the rock sill, fish barriers, etc.) could affect their ability to forage and move through this project site.

The physical presence of the new structures would have very little or no direct effect on wolves that were foraging or moving through the Round Valley.

Equipment parking and material storage areas would be on disturbed areas that are currently used by the landowner, for similar purposes so these activities would not create any direct effects by removing cover. Hauling 15 to 30 truckloads of plants, rock and fence material into this site could adversely affect the ability of a wolf to travel through the Dunfee Slough property. The truck traffic would probably cause a minor temporary increase in stress as the animals moved through the valley.

If wolves were in the Round Valley, they would probably not stay long because of the lack of cover and the high density of people.

Indirect Effects:

Planting trees may provide additional cover for wolves if they traveled through the area. Rearranging the rock in the pond spillways, the fish screens, installing culverts and the jack fence would not produce any indirect effects on wolves. The loss of 4 to 10 mature trees during construction activities would not have any indirect effects on wolves if they moved through the area.

The wire fence could be a hazard to deer that try to jump it. They may occasionally be entangled in the wire and die, providing an additional forage opportunity for wolves that may move through the Dunfee Slough property.

The human activities associated with the vehicle parking and material storage area could disturb wolves if they were in the vicinity. A fluid spill, such as antifreeze, from a truck or machine could present a hazard to a wolf if it found the spill site. Considering the human activity around the storage and parking areas, it is unlikely that a wolf would venture into one of these areas. Spill kits would be kept on-site to help speed cleanup and prevent any animal from being poisoned by a toxic spill.

Continuing Construction and Maintenance:

The rock sill at the upstream end of the new side channel, the side channel itself, the culvert from the river to the side channel, and rearranging the spillway rock at the end of the ponds are parts of this project that could require additional work in order to make them perform as they were intended. If work is required on any of these improvements, the direct and indirect effects on gray wolves would be the same as those described for the initial construction.

Planting replacement trees and the wire fence are improvements that may need occasional maintenance. These activities, if they are needed, would create the same direct and indirect effects as described for the initial construction except the duration of the disturbance to wolves would tend to be shorter.

The impacts of continuing construction assume that the work is done during the same work window as described in Section III.d.1. Immediate repairs to fences, fish barriers, or replanting trees could proceed at other times of the year depending on the need.

D.3. ONE MILE ISLAND

Direct Effects:

The human activities and machinery used for grading the banks of the main Salmon River, building a barbed wire fence, and planting willows could affect the ability of lone wolves or packs to forage and move through the area. However, most of the work is planned for an island so the effects would be slight.

The 25 to 85 truckloads of rock, fence materials and plants that would have to be hauled to this site could disturb the movements of wolves if they were in the area. The truck traffic would probably cause a minor temporary increase in stress as the animals moved through

the valley. If wolves were in the Round Valley, they would probably not stay long because of the lack of cover and the high density of people.

The physical presence of the new structures (i.e. the fence, the bank logs, construction office, material storage, etc.) would have no direct effect on wolves.

Indirect Effects:

Planting trees may provide additional cover for wolves if they traveled through the area.

The fence on the west side of the river may be a hazard to deer that try to jump it. These animals may occasionally become tangled in the wire and die, providing additional forage opportunities for wolves if they were moving through the area.

The loss of up to seven mature trees during construction activities would not have any indirect effects on wolves if they moved through the area.

The human activities associated with the vehicle parking and material storage area could disturb wolves if they were in the vicinity. A fluid spill, such as antifreeze, from a truck or machine could present a hazard to a wolf if it found the spill site. Considering the human activity around the storage and parking areas, it is unlikely that a wolf would venture into one of these areas to get at an antifreeze spill. Spill kits would be kept on-site to help speed cleanup and prevent any animal from being poisoned by a toxic spill.

Continuing Construction and Maintenance:

The logs that would be installed at the foot of the river bank could require additional work in order to make them perform as they were intended. If work is required on the logs, the direct and indirect effects on gray wolves would be the same as those described for the initial construction.

Planting replacement trees and the wire fence are improvements that may need occasional maintenance include. These activities, if they are needed, would create nearly the same direct and indirect effects as described for the initial construction except the duration of the disturbance to wolves would tend to be shorter.

The impacts of continuing construction assume that the work is done during the same work window as described in Section III.d.1. Immediate repairs to fences or planting replacement trees could proceed at other times of the year depending on the need.

D.4. HOT SPRINGS SITE

Direct Effects:

All of the human activity and machinery associated with the projects on this site (e.g. placing cobble, creating pools, excavating 300 feet of vertical stream bank, installing culverts, the fence, planting trees, etc.) could adversely effect a pack of wolves or a lone wolf it they wanted to travel through the Hot Springs property.

The physical presence of these structures (e.g. the fence, culverts, wetland, new channel, etc.), along with the construction office and machinery/material storage area would not create any direct impacts on wolves that were moving through the area.

It would take 80 to 160 truckloads to haul in all of the materials and rock for these projects. This activity could disturb, divert or prevent a pack or lone wolf from moving through the open sagebrush or pasture inside the project area. The effects of the trucks would be much less on wolves moving through this work site because of the 200 to 300 yard distance from the creek to the wooded corridor. If wolves were moving through this area, they would probably select the riparian woodland instead of the open pasture where most of the work is planned. The truck traffic would probably cause a minor temporary increase in stress as the animals moved through the valley. If wolves were in the Round Valley, they would probably not stay long because of the lack of cover and the high density of people.

The proposed installation of fish screens would not affect wolves.

Indirect Effects:

Planting trees may provide additional cover for wolves if they traveled through the area. The habitat improvements in Challis Hot Springs Creek, the pond and the wetland may also improve habitat for species such as cottontail rabbits, waterfowl and rodents. This would have only minor foraging benefit for wolves. The fence along both channels of Challis Hot Springs Creek may be a hazard to deer that try to jump it. These animals may occasionally become tangled in the wire and die, providing additional forage for wolves that may move through the river corridor.

The loss of 7 to 10 mature trees during construction activities would not have any indirect effects on wolves if they moved through the area.

The human activities associated with the vehicle parking and material storage area could disturb wolves if they were in the vicinity. A fluid spill, such as antifreeze, from a truck or machine could present a hazard to a wolf if it found the spill site. Considering the human activity around the storage and parking areas, it is unlikely that a wolf would venture into one of these areas to get at an antifreeze spill. Spill kits would be kept on-site to help speed cleanup and prevent any animal from being poisoned by a toxic spill.

Continuing Construction and Maintenance:

The new channels, the culverts, the wetland, the pools that are created, deepening the thalweg, and the irrigation diversion structures are parts of this project that could require additional work in order to make them perform as they were intended. If work is required on any of these improvements, the direct and indirect effects on wolves would be the same as those described for the initial construction. The duration of the disturbance could be shorter if adjustments rather than reconstruction are needed.

Planting replacement trees, the wire fence, dredging the wetland or new channels, cleaning the cobble beds, and repairs to the irrigation diversion structures are improvements that may need occasional maintenance. These activities, if they are needed, would create the same

direct and indirect effects as described for the initial construction except the duration of the disturbance to wolves would tend to be shorter for maintenance needs.

The impacts of continuing construction assume that the work is done during the same work window described in Section III.d.1. Immediate repairs to fences, the irrigation diversion structures, or the fish screens, or replanting trees could proceed at other times of the year depending on the need.

D.5. PENNAL GULCH

Direct Effects:

All of the human activity and machinery associated with the projects on the Pennal Gulch land could adversely effect a pack of wolves or a lone wolf it they wanted to travel through this project site. This includes breeching and lowering levees, constructing the new side channel, installing barbs and sills, the culverts and water gaps, planting willows, and the fence.

Other activities that could adversely affect wolf movements in this area would be the construction of temporary roads, hauling 250 to 800 truckloads of material excavated from the new side channel and the 45 to 85 truck trips that would be needed to bring in the rock, fence material and plants for the project. The truck traffic would probably cause a minor temporary increase in stress as the animals moved through the valley. If wolves were in the Round Valley, they would probably not stay long because of the lack of cover and the high density of people.

The physical presence of these structures (e.g. the fence, water gaps, culverts, new channel, the barbs, etc.), along with the construction office and machinery/material storage area would not create any direct impacts on wolves that were moving through the area.

Equipment parking and material storage would have little or no direct effect on wolves that wanted to move through the river corridor in this area.

Indirect Effects:

Planting trees may provide additional cover for wolves if they traveled through the area. The side channel and willow/tree plantings may also improve habitat for species such as cottontail rabbits, waterfowl and rodents, which would have little benefit for wolves. The addition of 1 1/3 miles of wire fence along the side channel may present a hazard to deer that try to jump it. These animals may occasionally become tangled in the wire and die, providing additional forage for wolves if they were traveling through the area.

The water gaps would not create any indirect effects on wolves.

The loss of 5 to 10 mature trees during construction activities would not have any indirect effects on lone wolves or packs if they moved through the area.

The human activities associated with the vehicle parking and material storage area could disturb wolves if they were in the vicinity. A fluid spill, such as antifreeze, from a truck or machine could present a hazard to a wolf if it found the spill site.
Considering the human activity around the storage and parking areas, it is unlikely that a wolf would venture into one of these areas to get at an antifreeze spill. Spill kits would be kept on-site to help speed cleanup and prevent any animal from being poisoned by a toxic spill.

Continuing Construction and Maintenance:

The new channel, the culverts, the rock sill, the levee between the new channel and the wetland, the breeched or lowered levee, the hardened road section, or re-anchoring the logs at the foot of the bank are parts of this project that could require additional work in order to make them perform as they were intended. If work is required on any of these improvements, the direct and indirect effects on gray wolves would be the same as those described for the initial construction. The duration of the disturbance could be shorter if adjustments rather than reconstruction were needed.

Planting replacement trees, the wire fence, or dredging the new channel are improvements that may need occasional maintenance. These activities, if they are needed, would create nearly the same direct and indirect effects as described for the initial construction except the duration of the disturbance to wolves would tend to be shorter for maintenance needs.

The impacts of continuing construction assume that the work is done during the same work window described in Section III.d.1. Immediate repairs to fences, the Sportsman's Access road, or replanting trees could proceed at other times of the year depending on the need.

D.6. GRAY WOLF CUMULATIVE EFFECTS FOR ALL SITES (Spatial and Temporal)

The proposed projects are not expected to increase recreational use (e.g. rafting, fishing, hunting, etc.) of the Salmon River. The projects would not create opportunities for wolves to enter the valley to prey on livestock (and result in a human conflict). There would not be an increase in livestock use, agriculture or mining attributed to the proposed project.

There are no expected adverse cumulative effects from these or other consumptive uses on gray wolves from the projects proposed on the Highway 93 Bridge, Dunfee Slough, One Mile Island, Hot Springs site, or Pennal Gulch properties. These projects, and subsequent Corps projects on other private property in the river corridor, should improve the riparian corridor by establishing more vegetation for cover and habitat for prey species such as deer, rabbits and other small mammals. This would improve the habitat for wolves if they moved through this area.

Home or business construction is not expected to increase in the river corridor because of the proposed project. Building and sub-dividing will probably continue in the river corridor for a number of years, regardless of the USRC. Building and subdividing would not continue on the private lands where the Corps of Engineers' acquires an ecosystem

restoration easement. These easements reserve the owners' rights but prohibit destroying, modifying or disturbing the habitat improvements that are implemented with the USRC. The easement also precludes the construction or maintenance of any structure on the property.

There may be cumulative effects (i.e. loss of cover) caused by home construction or other similar development on private property in the river corridor that is not under a Corps ecosystem restoration easement. However, the probability of adverse effects is very low because the habitat in the Round Valley area is only marginally suitable for travel between widely separated, suitable habitat blocks to the west and north. There are far better travel routes available for wolves than the river corridor, agricultural land and open sagebrush of Round Valley.

E. Yellow-billed Cuckoo

There has been one confirmed sighting of a yellow-billed cuckoo in the proposed USRC during the breeding season near Pennal Gulch. (Personal comm., Jerry Gregson, March 10, 2003). In northern and central Idaho, there have only been four records of yellow-billed cuckoo over the last century. Less than 15 sightings have been recorded in this area during the past 25 years. In southwestern Idaho, the yellow-billed cuckoo has been considered a rare, sometimes erratic, visitor and breeder in the Snake River valley (FWS website, 2001).

Most construction activities would take place from the end of August through March 1. The probability of a yellow-billed cuckoo still residing in the Round Valley this late in the year is low because they would probably have migrated south by late August or early September (ODFW Endangered Species Fact Sheet, 2002).

Studies conducted in California found that areas with tree canopy cover less than 40 percent were unsuitable for yellow-billed cuckoo. Riparian habitats that were smaller than 38 acres and less than 325 feet in width were also considered unsuitable habitat. (The Nature Conservancy, 1999). Based on this criteria, some of the riparian habitat along the USRC project and Round Valley is suitable habitat for nesting, foraging, and rearing young. A yellow-billed cuckoo may use the riparian corridor along the river to move to other suitable habitat upstream or downstream of the USRC area.

The construction and other activities associated on the five proposed project sites would not occur on all of the project sites simultaneously. Therefore, if a yellow-billed cuckoo was present on one property they would probably not be confronted by repeated encounters with people and machinery on any of the other four project sites.

E.1. <u>HIGHWAY 93 BRIDGE</u>

<u>Direct Effects</u>:

The probability that the construction activities associated with all of the projects on this site (e.g. reconnecting the existing side channel, the fences, placing boulders, the French drain, installing barbs and sills, etc.) would effect yellow-billed cuckoos is very low because the

work would take place during the fall and winter, after the birds migrate south. There a low probability of any adverse effects occurring here because the habitat is unsuitable for yellow-billed cuckoos. The canopy cover is only about 25 to 30 percent (based on site visits by a Corps biologist and air photo interpretation [May 2000 flight]), and the land area covers only about 12 acres, and is about 250 feet across. If a yellow-billed cuckoo were present, impacts could be avoided by postponing these activities until after the bird migrated out, probably some time in late August or early September.

Planting the willows and trees along the existing channel could take place in the spring or fall when yellow-billed cuckoos could be present. This activity could disturb cuckoos if they were present. The loss of 4 to 10 mature trees during construction activities would have little or no direct effect on yellow-billed cuckoos because the trees would be cut during the winter when the birds would not be present.

The equipment and materials storage area would be 500 to 1000 feet outside of the forested riparian area around this project site. There would not be any direct effects from parking vehicles or storing materials due to the time of year that these areas would have activity in them (i.e. fall and winter). Hauling rock, weir material, etc. would take 110 to 215 truckloads. This is not likely to disturb or displace yellow-billed cuckoos for the same reasons mentioned above.

Indirect Effects:

The canopy closure in this area is currently too low to be suitable nesting habitat for yellow-billed cuckoos. If 4 to 10 more mature trees were cut, this would reduce the canopy closure slightly. This would also reduce the number of potential nest and foraging sites. The new trees that are planted would more than make up for the loss of 4 to 10 trees, creating better habitat in about 15 or 20 years. The long-term benefits should outweigh the short-term losses. Whether the trees are cut or additional new trees are planted, the area would probably still be too small and disconnected from more continuous habitat to support a nesting pair.

The boulders, culvert, chain fence and barbs in highway 93 would not produce any indirect effects on yellow-billed cuckoos. The new channel may help make the habitat a little more suitable by aiding the reestablishment and growth of a healthy riparian woodland.

If yellow-billed cuckoos returned to Round Valley before the March 1 project work window closing date, the activity around the material storage and parking area would probably not effect them very much because of the distance of these areas (i.e. 500 to 1000 feet) to the riparian woodland next to the river.

Continuing Construction and Maintenance:

The rock sill at the upstream end of the side channel, the side channel itself, the French drain and refuge pool, the barbs in the side channel, the hardened road section, the levee, the high flow channel and culvert are parts of this project that could require additional work in order to make them perform as they were intended. If work is required on any of these

improvements, the direct and indirect effects on yellow-billed cuckoos would be the same as those described for the initial construction.

Planting replacement trees, repairing the jack fence or boulder fence, dredging the side channel, refuge pool or the entrance to the side channel near the rock sill are improvements that may need occasional maintenance. These activities, if they are needed, would create the same direct and indirect effects as described for the initial construction except the duration of the disturbance to yellow-billed cuckoos would tend to be shorter.

The impacts of continuing construction assume that the work is done during the same work window described in Section III.d.1. Immediate repairs to jack fence or replanting trees could proceed at other times of the year depending on the need.

E.2. DUNFEE SLOUGH

Direct Effects:

The probability that the construction activities associated with all of the projects on this site (e.g. the fences, planting trees, constructing the new channel, the rock sill in the river, etc.) would effect yellow-billed cuckoos is very low because the work would take place during the fall and winter, after the birds migrate south. If the work was to take place earlier in the summer the probability of impacting these birds is still low because approximately half of the Dunfee Slough property is unsuitable, open habitat with very low or no tree canopy, such as the side channel that would have the jack fence along it. The rest of the site is unsuitable broken, clumps (2 or 3 acres), of trees that have canopy covers over 40 to 50 percent.

The installation of the fish barriers would not have any direct effects on yellow-billed cuckoo.

The physical presence of the new structures would have no direct effect on yellow-billed cuckoos if they were present in this area.

The equipment and materials storage area would be outside of the forested riparian area around this project site, about 400 to 800 feet away. There would not be any direct effects from parking vehicles or storing materials due to the time of year that these areas would have activity in them (i.e. fall and winter). Hauling rock, weir material, etc. would take 15 to 30 truckloads. This is not likely to disturb or displace yellow-billed cuckoos for the same reasons mentioned above.

Planting the willows and trees along the existing side channel/slough could take place in the spring or fall when yellow-billed cuckoos could be present. This activity could disturb cuckoos if they were present. The loss of 4 to 10 mature trees during construction activities would have little or no effect on yellow-billed cuckoos because the trees would be cut during the winter when the birds would not be present.

Indirect Effects:

The canopy closure in about half of this area is currently too low to be suitable for yellow-billed cuckoos to nest in. If 4 to 10 mature trees were cut, this would reduce the canopy closure slightly, reducing the suitability of the habitat for nesting. However, the long-term benefits should outweigh the short-term losses. The new trees that are planted would make up for the loss of 4 to 10 trees, creating better nesting habitat over a larger percentage of the Dunfee Slough properties in about15 to 20 years.

The culverts and the jack and wire fences would not cause any indirect effects on yellow-billed cuckoos. The managed grazing area would aid the reestablishment and growth of a healthy riparian woodland and increase the suitable habitat for yellow-billed cuckoos.

If yellow-billed cuckoos returned to Round Valley before the March 1 project work window closing date, the activity around the material storage and parking area would probably not effect them very much because of the distance of these areas (i.e. 400 to 800 feet) to the riparian woodland next to the river.

Continuing Construction and Maintenance:

The rock sill, the side channel itself, the culvert from the river to the side channel, and rearranging the spillway rock at the end of the ponds are parts of this project that could require additional work in order to make them perform as they were intended. If work is required on any of these improvements, the direct and indirect effects on yellow-billed cuckoos would be the same as those described for the initial construction.

Planting replacement trees and the wire fence are improvements that may need occasional maintenance. These activities, if they are needed, would create nearly the same direct and indirect effects as described for the initial construction except the duration of the disturbance to yellow-billed cuckoos would tend to be shorter.

The impacts of continuing construction assume that the work is done during the same work window described in Section III.d.1. Immediate repairs to fences, fish barriers, or replanting trees could proceed at other times of the year depending on the need.

E.3. ONE MILE ISLAND

Direct Effects:

The probability that the construction activities associated with all of the projects on this site (e.g. grading the banks, putting logs in to stabilize the banks, the fence, and planting willows**.)** would effect yellow-billed cuckoos is very low because the work would take place during the fall and winter, after the birds migrate south. The habitat is also very low quality. About ½ to ¾ of One Mile Island has a tree canopy of 0 to 5 percent. Where riparian woodland exists, the canopy closure is only about 30 to 40 percent. The wooded areas are between 300 and 450 feet across but only about 2 to 5 acres in size. Therefore, the probability of adverse impacts is very low because the birds would probably not use this island for nesting, and perhaps not even foraging.

If the work was to take place earlier in the summer the probability of affecting these birds is still low because all but about 300 feet of the bank grading and willow planting would be open habitat with no tree canopy. Such as the side channel (i.e. Hannah Slough) that would have trees and shrubs planted along it, and the fence on One Mile Island's property boundary on the west side of the river. The wooded areas on this project site are narrow and scattered (i.e. less than 400 feet across and less than five acres in size).

Up to seven mature trees may be cut during project activities. This would lower the canopy closure slightly, reducing the suitability of the habitat for nesting.

The fence would be built through open areas and narrow bands of cottonwoods where the canopy varies from 20 to 40 percent.

Therefore, it is not likely that the activities associated with the previously mentioned projects would affect yellow-billed cuckoos, regardless of whether the work was done in August or December.

The physical presence of the new structures (i.e. the fence and the bank logs) would have no direct effect on the birds.

The material storage area, the parking area for the equipment, and the construction office would all be on disturbed areas that have been created by the landowner before this project. These areas would be on treeless sites about 400 to 500 feet from the river. They may be within a few hundred feet of clumps of trees that are marginally suitable for nesting or foraging. However, it is not likely that these activities and structures would have any direct effect on yellow-billed cuckoos. Hauling in the materials, rock, etc. for this project (25 to 85 truckloads) would not disturb the birds because they are not likely to be present during the work window from September 1 through March 1.

Indirect Effects:

Approximately ½ to ¾ of the affected One Mile Island property has a tree canopy of 0 to 5%, too low to be suitable for yellow-billed cuckoo nesting habitat. The habitat is either sparsely vegetated gravel bars or grasses and sedges. The forested riparian area canopy is about 30 to 40%, barely suitable for nesting habitat. If up to seven mature trees are cut, this would reduce the canopy closure slightly. However, the long-term benefits should outweigh the short-term losses. The new trees that would be planted would more than make up for the loss of seven trees, creating contiguous, higher quality forage and nesting habitat in about 15 to 20 years.

The fence would not have any indirect effects on yellow-billed cuckoos.

The bank logs may stabilize the bank and make it possible for trees and shrubs to become established. This could provide foraging or nesting habitat for the birds in 15 or 20 years.

If yellow-billed cuckoos returned to Round Valley before the March 1 project work window closing date, the activity around the material storage and parking area would probably not

effect them very much because of the distance of these areas (i.e. 400 to 500 feet) to the riparian woodland next to the river.

Continuing Construction and Maintenance:

The logs that would be installed at the foot of the river bank could require additional work in order to make them perform as they were intended. If work is required on the logs the direct and indirect effects on yellow-billed cuckoos would be the same as those described for the initial construction.

Planting replacement trees and the wire fence are improvements that may need occasional maintenance. These activities, if they are needed, would create nearly the same direct and indirect effects as described for the initial construction except the duration of the disturbance to yellow-billed cuckoos would tend to be shorter.

The impacts of continuing construction assume that the work is done during the same work window described in Section III.d.1. Immediate repairs to fences or planting replacement trees could proceed at other times of the year depending on the need.

E.4. HOT SPRINGS SITE

Direct Effects:

The tree/shrub canopy closure is zero percent on over 95% of the project sites on the Hot Springs properties. There is a narrow band of willows and trees that are less than 20 feet tall along a slough for approximately 1500 feet on the north landowner's property, and another narrow band of willows along the main channel of Challis Hot Springs Creek downstream from the existing pond. The nearest suitable habitat of continuous riparian tree/shrub cover on the Hot Springs properties is 500 to 900 feet west of the project sites, along the Salmon River. (Please refer to Plates 24 and 27). The activities in and along Challis Hot Springs Creek on both properties, (placing cobble, creating pools, planting shrubs and trees, building a wetland, constructing a fence, etc.) would probably not effect yellow-billed cuckoos because all of this work would be done in unsuitable habitat consisting of grasses, forbs, sedges and scattered low shrubs. One other reason that the project activities are not likely to effect yellow-billed cuckoos is because the birds would probably migrate south soon after the planned project start date on September 1.

If yellow-billed cuckoos nested in the wooded area along the river, they could use the project sites along Challis Hot Springs Creek as foraging habitat. However, the possibility of disturbing these birds is quite low because they would probably migrate before or soon after the project start date on September 1. If the birds were present, adverse impacts could be avoided by postponing the start date until the birds migrated, probably some time in early September.

The loss of 7 to 10 mature trees during project activities would lower the canopy closure slightly, reducing the suitability of the habitat for nesting and foraging.

The proposed installation of fish screens on the irrigation water intake, on the weirs in the channel from the wetland to the river and the irrigation inflow into the wetland would not affect yellow-billed cuckoos.

The physical presence of the project structures (e.g. the fence, wetland, culverts, etc.) would not have any direct effects on these birds.

The construction office, equipment parking area and material storage area will probably not have any direct effects on yellow-billed cuckoos because these areas would be 500 to 1000 feet from the nearest suitable habitat next to the Salmon River. The 80 to 160 truckloads needed to haul in the materials, plants, and rock for this project would probably have little or no effect on cuckoos if they were in the area.

Indirect Effects:

If 7 to 10 mature trees were cut, this would reduce the canopy closure slightly. However, the long-term benefits should outweigh the short-term losses in habitat that is currently unsuitable. The new trees that would be planted should more than make up for the loss of 10 trees, creating additional nesting habitat in about 20 years, and foraging habitat in only about 10 years.

The fence could have beneficial effects for the trees and shrubs that are planted by protecting them from livestock. Thus, the planted zone along the creek may become suitable for foraging sooner than if the fence was not built. The riparian zone inside this fence would probably be too narrow to be suitable for nesting.

The new wetland, the channel from the new wetland to the river, the channel around the existing pond, and the channel to reroute the hot springs directly into the Salmon River could enhance the habitat for yellow-billed cuckoos by creating better soil moisture conditions for establishing trees and shrubs along these riparian zones. This habitat would be a narrow band of riparian vegetation that would probably be suitable for foraging but not nesting.

If yellow-billed cuckoos returned to Round Valley before the March 1 project work window closing date, the activity around the material storage and parking area would probably not effect them very much because of the distance of these areas (i.e. 500 to 1000 feet) to the riparian woodland next to the river.

The other projects (i.e. the flume, culverts, water gaps, cobble beds, deepening the thalweg and the fish screens) would not have any indirect effects on yellow-billed cuckoos.

Continuing Construction and Maintenance:

The new channels, the culverts, the wetland, the pools that are created, deepening the thalweg, and the irrigation diversion structures are parts of this project that could require

additional work in order to make them perform as they were intended. If work is required on any of these improvements, the direct and indirect effects on yellow-billed cuckoos would be the same as those described for the initial construction. The duration of the disturbance could be shorter if adjustments rather than reconstruction are needed.

Planting replacement trees, the wire fence, dredging the wetland or the new channels, cleaning the cobble beds, and repairs to the irrigation diversion structures are improvements that may need occasional maintenance. These activities, if they are needed, would create nearly the same direct and indirect effects as described for the initial construction except the duration of the disturbance to yellow-billed cuckoos would tend to be shorter for maintenance needs.

The impacts of continuing construction assume that the work is done during the same work window described in Section III.d.1. Immediate repairs to fences, the irrigation diversion structures, or the fish screens, or replanting trees could proceed at other times of the year depending on the need.

E.5. PENNAL GULCH

Direct Effects:

The probability of any direct impacts from this project are very low because they would all be carried out between September 1 and March 1, after the birds had migrated south and probably before they came back in the spring. Another condition that greatly reduces the probability of any impacts to yellow-billed cuckoos is the habitat quality. The tree/shrub canopy closure varies from zero to about 25 percent on approximately 60 percent of the side channels on the Pennal Gulch land north and west of the Sportsman's Access. There are small, 2 to 3-acre clumps of riparian woodland that have a canopy closure of 50 to 60 percent. The wooded habitat on the west side of the main Salmon River, is only suitable as foraging habitat because it is broken up into three to four-acre clumps. The habitat on the east side of the river is also only suitable for foraging. It is characterized by a very narrow band of trees and shrubs along the river and an abrupt transition to sagebrush and grass up the steep slopes of the breaks of the river. In short, the habitat on both sides of the river at the Pennal Gulch project site falls short of the minimum 38 acres and width of 325 feet described by Laymon and Halterman (1989) [in The Nature Conservancy, 1999] for suitable nesting habitat. There is no work proposed on the east side of the river. **(Refer to Plates 28 – 33**)

If the birds were present, the machines and people involved in breeching and lowering the levees at the Sportsman's Access could disturb them. The other activities that could potentially disturb these birds, if they were present, would be constructing the new side channel, installing the culverts and water gaps, anchoring the logs in the bank, and planting willows. The fence construction would disturb the birds if they were present. Constructing the sill in the river may also disturb the birds if they were present.

If 5 to 10 mature trees were cut, this would reduce the canopy closure slightly. However, the long-term benefits should outweigh the short-term losses in habitat that is currently unsuitable. The new trees that would be planted should more than make up for the loss of 5 or 10 trees, creating additional nesting habitat in about 20 years, and foraging habitat in only about 10 years.

The construction office, equipment parking area, and material storage site would be located about 500 to 1500 feet from the side channel and river. These areas would probably not have any direct effects on yellow-billed cuckoos. The physical presence of the improvements (e.g. culvert, side channel, fence, etc.) would not have any direct effect on these birds. However, hauling 45 to 85 truckloads of material, rock, etc. for this project could disturb the birds if they were present.

Indirect Effects:

If 5 to 10 mature trees were cut, this would reduce the canopy closure slightly. However, the long-term benefits should outweigh the short-term losses in habitat. The new trees that would be planted should more than make up for the loss of 10 trees, creating additional nesting habitat in about 20 years, and foraging habitat in about 10 years.

The fence could have beneficial effects for the trees and shrubs that are planted by protecting them from livestock. Thus, the planted zone along the creek may become suitable for foraging sooner than if the fence was not built. The riparian zone inside this fence would probably be too narrow to be suitable for nesting.

If yellow-billed cuckoos returned to Round Valley before the March 1 project work window closing date, the activity around the material storage and parking area would probably not effect them very much because of the distance of these areas (i.e. 500 to 1500 feet) to the riparian woodland next to the river.

The culverts and water gaps would not have any indirect effects on yellow-billed cuckoos.

Continuing Construction and Maintenance:

The new channel, the culverts, the rock sill, the levee between the new channel and the wetland, the breeched or lowered levee, the high flow channel, or the bank logs are parts of this project that could require additional work in order to make them perform as they were intended. If work is required on any of these improvements, the direct and indirect effects on yellow-billed cuckoos would be the same as those described for the initial construction. The duration of the disturbance could be shorter if adjustments rather than reconstruction were needed.

Planting replacement trees to replace ones that die, the wire fence, or dredging the new channel are improvements that may need occasional maintenance. These activities, if they are needed, would create nearly the same direct and indirect effects as described for the initial construction except the duration of the disturbance to yellow-billed cuckoos would tend to be shorter for maintenance needs.

The impacts of continuing construction assume that the work is done during the same work window described in Section III.d.1. Immediate repairs to fences, the Sportsman's Access road, or replanting trees could proceed at other times of the year depending on the need.

E.6. YELLOW-BILLED CUCKOO CUMULATIVE EFFECTS FOR ALL SITES (Spatial and Temporal)

The proposed projects are not expected to increase recreational use (e.g. rafting, fishing, hunting, etc.) of the Salmon River. There would not be an increase in livestock use, agriculture or mining attributed to the proposed projects. Livestock and agricultural use may fluctuate but probably not enough in the near future to make any difference in cumulative effects. Therefore, there are no expected adverse or beneficial cumulative effects from consumptive uses on yellow-billed cuckoo or their habitat.

Home or business construction is not expected to increase in the river corridor because of the proposed project. Building and sub-dividing will probably continue in the river corridor for a number of years, regardless of the USRC. However, building/subdividing would not continue on the private lands where the Corps of Engineers' acquires an ecosystem restoration easement. These easements reserve the owners' rights but prohibit destroying, modifying or disturbing the habitat improvements that are implemented with the USRC. The easement also precludes the construction or maintenance of any structure on the property. There are no expected adverse cumulative effects, on the Highway 93 Bridge, Dunfee Slough, One Mile Island, the Hot Springs site, or Pennal Gulch properties from of the proposed projects.

If yellow-billed cuckoos are using this area, or if they move into it, it is reasonable to expect some cumulative effects from land development and building on private property that is not under a Corps of Engineers ecosystem restoration easement. There may be cumulative effects caused by home construction or other similar development on private property in the river corridor. The adverse effects may include loss of riparian woodlands or actual harassment of the birds by the landowner. Beneficial effects might include better habitat condition due to protection and enhancement by the landowner, as well as removing livestock from the riparian corridor.

F. Sockeye Salmon

Sockeye salmon migrate through Round Valley from July through the first week of August. They do not spawn, hold, or rear in waters within Round Valley or the tributaries that flow into the Salmon River within the valley. Spawning and rearing occurs upriver in Redfish Lake, Alturas Lake, and other lakes, historically.

The construction and other activities associated with the five proposed project sites would not occur simultaneously. The goal for each site would be to reach near completion during one construction season. Separate sites would be constructed during separate seasons. Therefore, any impacts on sockeye salmon would be minimized to one site per year. The fish would not be confronted by repeated encounters with people and machinery on all of the project sites during one migration season.

F.1. HIGHWAY 93 BRIDGE

Direct Effects:

The only work in the main channel of the river would be the sill constructed at the upstream end of the side channel and when the upstream and downstream ends of the side channel was opened. This work would take place from September 1 through January 15, when sockeye would not be present in the Salmon River. All of the other construction activities associated with the Highway 93 Bridge projects (e.g. constructing the second high flow channel, building the jack fence, the culvert, the levee, planting trees, etc.) would take place in a dry channel.

The physical presence of the new structures (i.e. culvert, levees, the French drain, the refuge pool, and the new channel) would not have any direct effects on sockeye salmon if they migrated through the side channel, traditionally from July through early August. The probability that sockeye would migrate through this new channel is low because the flow velocities (i.e. attraction) at the entrance to the channel would be less than the flows in the main channel of the Salmon River. This condition may deter adult sockeye from entering the side channel. All of these structures would be designed and constructed to provide year-round passage for fish.

The presence of the rock sill on the upstream end of the new channel should not create a migration barrier for sockeye. The rock sill would extend into the river about 100 to 120 feet. It would be designed to provide access over and around it (Refer to Section III, 5., Description of Project Sites, page 11**,** for a full description of the rock sill). The upstream side of the sill would have a top surface elevation that is approximately 0.3 feet above the riverbed elevation. The downstream side of the sill would be flush with the shore ground line. It would be designed so that the thalweg section of the sill remains submerged year-round.

Planting the willows and trees along the existing channel would not have any direct effects on sockeye salmon migration.

The loss of 4 to 10 mature trees during construction activities would have no direct effect on sockeye migration because the project would not cut any trees along the main channel of the Salmon River.

The equipment parking area and the material storage site would be about 500 to 1000 feet from the river. These areas would not create any direct effects on sockeye salmon. Hauling in 110 or 215 truckloads of fence material, rock, and weir material would not have any direct effects on sockeye salmon.

The barbs along Highway 93, the jack fence and boulders, and the hardened road section would not have any direct or indirect effects on sockeye salmon.

Indirect Effects:

The side channel that would be reopened should provide suitable habitat for sockeye migration. When the sockeye population recovers, this channel could provide holding habitat for them.

The trees planted along the river or side channel would probably not have a measurable effect on water temperature. However, if the tree planting is successful on all of the projects, the combined effect may be enough to slightly lower water temperatures in the main channel, thus improving migration habitat for sockeye.

The sediment produced when the new side channel is opened, and by the construction of the sill in the main channel, should be dissipated long before the sockeye arrive in Round Valley and should not effect their migration. Protective erosion material may be used on patches of bare soil to avoid adverse impacts to sockeye and other fish. The sediment would not have any effect on juvenile sockeye because they rear in a hatchery or Redfish Lake.

The elevation of the side channel and the culvert would be designed to accommodate low flows, based on historic flow records for the river. Sockeye salmon may be stranded in a drought year. In a drought year, low water would also be a problem in other natural side channels in the 12 Mile reach. However, in droughts years, the flows in July and August (i.e. during their migration) would probably not be sufficient for sockeye to enter the side channel by the time they arrived in Round Valley. Another consideration is the channel length. This channel is only 1800 feet long and it would only take sockeye about 45 minutes to pass back to the main river channel if they migrated through the new side channel. If there was sufficient water to enter the downstream end of the channel, it is very unlikely that the river level would drop enough in 45 minutes to strand these fish.

The high flow channel and the hardened road section would be designed only to carry water when the culvert in the main side channel could not accommodate high water events that usually occur in the spring before migrating sockeye arrive in Round Valley. The culvert is designed to be overtopped by high water events on a 1½ to 3-year cycle. If there was a thunderstorm in July or August when the adults were migrating, there might be enough water to cause the high flow channel to temporarily fill with water. Adult sockeye could go into this high flow channel after thunderstorms. This channel would only be 500 feet long, short enough for a salmon to get out one end or the other before receding water flows could leave it stranded. In order to prevent fish from being stranded, the high flow channel would be designed without pools or backwaters.

The French drain and refuge pool, and the barbs and sills for scour pools in the side channel would provide resting/holding habitat for sockeye if they migrated through this channel.

The jack fence, the levee and the barbs along Highway 93 would not have any indirect effects on sockeye salmon.

The vehicle parking and material storage areas would be 500 to 1000 feet from the river. This should prevent a contaminant from reaching the river or side channel before it could be contained and picked up. When the trucks drop rock near the sill location, and while the

machine was working in the river, there is a possibility of an oil, antifreeze or other type of fluid spill. All project vehicles and offices would have spill kits in order to contain and pick up any contaminant that might be spilled in or near the river. Any spill that might occur should be cleaned up well before sockeye migrate through Round Valley.

The proposed projects on the Highway 93 Bridge site would not create any suitable spawning habitat for sockeye salmon.

Continuing Construction and Maintenance:

The parts of this project that could require additional work in order to make them perform as they were intended include the rock sill at the upstream end of the side channel, the side channel itself, the French drain and refuge pool, the barbs in the side channel, the hardened road section, the levee, the high flow channel and culvert. If work is required on any of these improvements, the direct and indirect effects on sockeye salmon would be the same as those described for the initial construction.

The improvements that may need occasional maintenance include planting additional trees to replace ones that die, repairing the jack fence or boulder fence, dredging the side channel, refuge pool or the entrance to the side channel near the rock sill. These activities, if they are needed, would create the same direct and indirect effects as described for the initial construction except the duration of the possible disturbance to sockeye salmon would tend to be shorter.

The impacts of continuing construction assume that the work is done during the same work window of September 1 through January 15. Maintenance could proceed at other times of the year depending on the need, such as immediate repairs to jack fence or replanting trees in the spring or fall.

F.2. DUNFEE SLOUGH

Direct Effects:

None of the activities associated with this project (e.g. the fences, rearranging the rock in pond spillways, excavation of 250 feet of new channel, the culverts, the rock sill in the river, etc.) would affect sockeye salmon because this work would be done in dry channels, in the fall and winter, when the sockeye are not migrating.

The only work that would be in the river is the rock sill and opening the end of the new side channel to connect the river with the existing slough/side channel.

The physical presence of the new structures (i.e. culverts, water gaps, and the new channels) would not likely effect migrating sockeye salmon. Sockeye would probably not enter this channel because the flow velocities (i.e. attraction) at the downstream entrance to the channel would be less than the flows in the main channel of the Salmon River. Sockeye are not likely to be attracted to the lower velocities in the side channel.

The presence of the rock sill on the upstream end of the new channel should not create a migration barrier for sockeye. The rock sill would extend into the river about 50 to 80 feet. It would be designed to provide access over and around it year-round (Refer to Section III, 5., Description of Project Sites, Highway 93 Bridge site, page 11, for a full description of the rock sill). The upstream side of the sill would have a top surface elevation that is approximately 0.3 feet above the riverbed elevation. The downstream side of the sill would be flush with the bank ground line. It would be designed so that it remained submerged year-round and should not present a migration barrier to sockeye salmon.

The material storage site and the equipment parking area would not have any direct effects on sockeye because these areas would be 400 to 800 feet from the side channel and river. There would not be any direct effects from the 15 to 30 truckloads required to haul in the rock, plants, and fencing material.

Indirect Effects:

Planting the willows and trees along the side channel and ponds will not improve the rearing or holding habitat for sockeye salmon because they only migrate through this area. The trees planted along the river or side channel would probably not have a measurable effect on water temperature in the main channel. However, if all projects complete the tree-planting phase, the combined effect may be enough to slightly lower water temperatures in the main channel, thus improving migration habitat for sockeye. The most likely habitat improvement would be holding areas created by large wood recruitment into the river.

The sediment produced when the side channel is connected to the river at the ends, and by the construction of the sill in the main channel should be dissipated long before the sockeye arrive in Round Valley and should not effect their migration. Excavation occurring on the river bank near the levees would have a bench at the toe of the slope to plant trees and willows on. If necessary, a protective erosion material may be used to help protect the bank until the vegetation is established which should help avoid adverse impacts to sockeye and other fish.

The flow velocities (i.e. attraction) at the downstream entrance to the side channel would be less than the flows in the main channel of the Salmon River. The flows from the side channel would probably not be sufficient to attract migrating sockeye. If sockeye salmon were attracted into the side channel during migration, the pond spillways and culverts would be designed to provide access back to the main channel of the river.

The fish screens/barriers would not create any indirect effects on sockeye salmon because they probably will not use the new side channel. If they did enter the side channel, the screens/barriers would prevent them from becoming stranded in an irrigation ditch.

The wire fences would not produce any indirect effects on sockeye salmon. The loss of 4 to 10 mature trees that may be cut during construction activities would not affect migration because none of the trees along the main channel of the Salmon River would be cut.

The material storage site and the equipment parking area should not have any indirect effects on sockeye because these areas would be 400 to 800 feet from the side channel and river. This should prevent a contaminant from reaching the river or side channel before it could be contained and picked up. When the trucks drop rock near the sill location, and while the machine was working in the river, there is a possibility of an oil, antifreeze or other type of fluid spill. All project vehicles and offices would have spill kits in order to contain and pick up any contaminant that might be spilled in or near the river. Any spill that might occur should be cleaned up well before sockeye migrate through Round Valley.

The proposed projects on the Dunfee Slough site would not create any suitable spawning habitat for sockeye salmon.

Continuing Construction and Maintenance:

The rock sill, the side channel itself, the culvert from the river to the side channel, and rearranging the spillway rock at the end of the ponds are parts of this project that could require additional work in order to make them perform as they were intended. If work is required on any of these improvements, the direct and indirect effects on sockeye salmon would be the same as those described for the initial construction.

Planting replacement trees and the wire fence are improvements that may need occasional maintenance. These activities, if they are needed, would create the same direct and indirect effects as described for the initial construction except the duration of the possible disturbance to sockeye salmon would tend to be shorter.

The impacts of continuing construction assume that the work is done during the same work window of September 1 through January 15. Immediate repairs to fences, fish barriers, or replanting trees could proceed at other times of the year depending on the need.

F.3. ONE MILE ISLAND

Direct Effects:

None of the activities associated with this project (e.g. grading the river banks, the fence, and planting trees and willows) would affect sockeye salmon because this work would be done in the fall and winter, when the sockeye are not migrating.

The construction office, the material storage site and the equipment parking area would have no direct effects on sockeye because these areas would be 400 to 500 feet from the river. There would not be any direct effects from the 25 to 85 truckloads required to haul in the rock, plants, and fencing material.

The physical presence of the logs in the bank may improve the migration (i.e. holding) habitat for sockeye.

The fence would have no effect on sockeye.

Indirect Effects:

The sediment produced by grading the banks of the main Salmon River should be dissipated long before the sockeye arrive in Round Valley and should not effect their migration. Excavation occurring on the riverbank would have a bench near the toe of the slope to plant trees and willows on. If necessary, a protective erosion material could be used to help protect the bank until the vegetation is established. This should help avoid adverse impacts to sockeye and other fish.

Planting the willows and trees along the graded riverbank may provide a small amount of cover for migrating sockeye salmon. The trees planted along the river would probably not have a measurable effect on water temperature in the main river channel. However, if all projects complete the tree planting, the combined effect may be enough to slightly lower water temperatures in the main channel, thus improving migration habitat for sockeye. The most likely habitat improvement would be holding areas created by large wood recruitment into the river.

The fence may indirectly improve the river habitat for sockeye by removing livestock or intensively manage their use. This should provide more bank stability, which would tend to create better in-river habitat for sockeye salmon as they migrated through this area. Moving the fence material and willows across the river to the island is not likely to have any indirect effects on sockeye because they would not be present.

The loss of up to seven mature trees that may be cut during construction activities would not affect migration because none of the trees would be cut along the main channel of the Salmon River.

The proposed projects on the One Mile Island site would not create any suitable spawning habitat for sockeye salmon.

The construction office, the material storage site and the equipment parking area would not have any indirect effects on sockeye because these areas would be 400 to 500 feet from the river. This should prevent a contaminant from reaching the river before it could be contained and picked up. When the machine was working on the riverbank, or when it crosses the river, there is a possibility of an oil, antifreeze or other type of fluid spill. All project vehicles and offices would have spill kits in order to contain and pick up any contaminant that might be spilled in or near the river. Any spill that might occur should be cleaned up well before sockeye migrate through Round Valley.

Continuing Construction and Maintenance:

The logs that would be installed at the foot of the riverbank could require additional work in order to make them perform as they were intended. If work is required on the logs, the direct and indirect effects on sockeye salmon would be the same as those described for the initial construction.

Planting replacement trees and the wire fence are improvements that may need occasional maintenance. These activities, if they are needed, would create nearly the same direct and

indirect effects as described for the initial construction except the duration of the possible disturbance to sockeye would tend to be shorter.

The impacts of continuing construction assume that the work is done during the same work window of September 1through January 15. Immediate repairs to fences or planting replacement trees could proceed at other times of the year depending on the need.

F.4. HOT SPRINGS SITE

Direct Effects:

The Idaho Dept. of Fish and Game conducted snorkel surveys of Challis Hot Springs Creek in July 2002. They did not find any adult or juvenile sockeye salmon.

None of the proposed activities along or in Challis Hot Springs Creek (placing cobble, creating pools, installing larger culverts, deepening the thalweg, the fence, the new wetland, the fish screens, etc.) would have any direct effect on sockeye because they would not be in this channel in the fall or winter, when the work would be done. The main reason that sockeye salmon have not historically used this creek is probably the high water temperature caused by the inflow of the hot spring water near the mouth of Challis Hot Springs Creek and the lack of suitable spawning habitat. Also, the flow (velocity and volume) of the water entering the Salmon River are much less than in the main river and are probably not sufficient to cause sockeye to stray from the main channel during migration.

The construction office, the material storage site and the equipment parking area would have no direct effects on sockeye because these areas would be 500 to 1000 feet from the creek and river. There would not be any direct effects from the 80 to 160 truckloads required to haul in the rock, plants, weirs, culverts, and fencing material.

Indirect Effects:

It is not likely that sockeye would stray into this stream after the projects on the Hot Springs properties are completed. Even though water temperature in Challis Hot Springs Creek would probably no longer be a barrier to sockeye migrating up this tributary, the lower flow velocities from the creek would still probably not be enough to attract sockeye into this stream from the main river. Therefore, the projects in or along Challis Hot Springs Creek would probably not have any indirect effects on sockeye salmon.

Diverting the hot spring water directly into the Salmon River would probably not change the river habitat very much because it would only change the location that the hot water came into the river. It would not make any difference in the overall temperature of the river water. Sockeye migrate past several other hot springs that flow directly into the Salmon River between Challis and Stanley so changing the location of where Challis Hot Spring flows into the river is not expected to present a migration barrier to sockeye salmon.

The proposed fish screens would prevent sockeye from entering the irrigation ditches, the new wetland, or the residential intake if they did enter Challis Hot Springs Creek. Sockeye

may stray up the channel from the wetland to the river, but it is unlikely that they would be attracted by the lower water velocity and higher water temperatures that would be coming out of this channel.

The habitat improvements in Challis Hot Springs Creek, the pond, planting trees, constructing the wetland, and the fence along both channels of Challis Hot Springs Creek would probably not have any beneficial or adverse effects on migrating sockeye because it is highly unlikely that sockeye salmon would stray into this tributary.

The trees that would be planted along 4000 feet of riverbank may have a minor effect on water temperature. Measurable effects in water temperature would come from the combined affects of all the trees planted on all five properties in the USRC.

The material storage site and the equipment parking area would not have any indirect effects on sockeye because these areas would be 500 to 1000 feet from the side channel and river. This should prevent a contaminant from reaching the river before it could be contained and picked up. While the machine is working on the old side channel, there is a possibility of an oil, antifreeze or other type of fluid spill. All project vehicles and offices would have spill kits in order to contain and pick up any contaminant that might be spilled in or near the river. Any spill that might occur should be cleaned up well before sockeye migrate through Round Valley.

The loss of 7 to 10 mature trees that may be cut during construction activities would not affect migration because none of the trees would be cut that provide shade along the main channel of the Salmon River.

The proposed projects on the Hot Springs site would not create any suitable spawning habitat for sockeye salmon.

Continuing Construction and Maintenance:

The new channels, the culverts, the wetland, the pools that are created, deepening the thalweg, and the irrigation diversion structures are parts of this project that could require additional work in order to make them perform as they were intended. If work is required on any of these improvements, the direct and indirect effects on sockeye salmon would be the same as those described for the initial construction. The duration of the possible disturbance could be shorter if adjustments rather than reconstruction are needed.

Planting replacement trees, the wire fence, dredging the wetland, cleaning the cobble beds, and repairs to the irrigation diversion structures are improvements that may need occasional maintenance. These activities, if they are needed, would create nearly the same direct and indirect effects as described for the initial construction except the duration of the disturbance to sockeye would tend to be shorter for maintenance needs.

The impacts of continuing construction assume that the work is done during the same work window of September 1 through March 1. Immediate repairs to fences, the irrigation

diversion structures, or the fish screens, or replanting trees could proceed at other times of the year depending on the need.

F.5. PENNAL GULCH

Direct Effects:

The human activities, machinery, and in-water work associated with the projects at the Pennal Gulch area are not likely to affect sockeye salmon because they would not be present in the fall and winter, when this work would be done. The work proposed in the main river channel includes constructing a rock sill and opening the upstream end of the new side channel, bank logs, lowering a levee and removing a levee. The proposed projects for side channel work are building a fence with water gaps, planting trees, excavating a new channel from the breeched levee around a wetland, and installing, barbs, sills and a culvert in the new channel.

The material storage site and the equipment parking area would have no direct effects on sockeye because these areas would be 500 to 1500 feet from the side channel and river. There would not be any direct effects from the 45 to 85 truckloads required to haul in the rock, plants, and fencing material. The 3000 feet of temporary roads that may be needed to move material and equipment between sites would not create any direct effects on sockeye.

Excavation of material to connect the main river channel to the side channel, and building a side channel around the wetland would take 250 to 800 truckloads. Excess material from this excavation would be used to fill borrow pits on the property approximately 1000 feet from the Salmon River. This work would not have any direct effect on sockeye because it would be done when these fish are not present in the river, and all of the work would be on dry land except for opening the end of the new channel.

The physical presence of the new structures (i.e. culverts, new channels, fences, etc.) would not create migration barriers for sockeye salmon. All of the improvements would be designed to allow fish passage year-round.

The lack of fish screens on the irrigation water in-flow would probably not create a direct affect on sockeye because the fish are not likely to use this side channel.

Indirect Effects:

Straying into the side channel after the project is completed is not likely because the velocity of the flows (attraction) at the downstream end of the channel probably will not be sufficient to attract sockeye into the channel. If any sockeye strayed into the side channels on Pennal Gulch lands they would be able to follow the channel out to the main river because the culverts would be installed so as to provide year-round passage for fish.

If any sockeye did enter the side channel, the lack of fish screens on the irrigation outflows could allow them to stray into the irrigation ditches and becoming stranded.

The sediment produced by breeching one levee and lowering another, construction of the new side channel, installing the culverts, building water gaps in the fence, and/or anchoring the logs in the bank should not affect sockeye because it should be dissipated by the time sockeye arrive in Round Valley. The initial flush of sediment from the side channel would occur before July, when the sockeye salmon arrive in this reach of the Salmon River. The flush of sediment should not create any migration barriers or interruptions for sockeye because it should be dissipated well before the salmon arrive in Round Valley.

Excavation occurring on the riverbank would have a bench near the toe of the slope to plant trees and willows on. If necessary, a protective erosion material could be used to help protect the bank until the vegetation is established. This should help avoid adverse impacts to sockeye and other fish.

The trees that would be planted along the side channel may have a minor effect on water temperature. Measurable effects in lowering the water temperature would come from the combined affects of all the trees planted on all five properties in the USRC. Planting the willows and trees along the side channel/slough will not improve the rearing or holding habitat for sockeye salmon because they only migrate through this area. The most likely habitat improvement would be holding areas created by large wood recruitment into the river.

The addition of 1 1/3 miles of wire fence along the side channel would not produce any indirect effects on sockeye because they would probably not be in this side channel.

The material storage site and the equipment parking area would not have any indirect effects on sockeye because these areas would be 500 to 1500 feet from the side channel and river. This should prevent a contaminant from reaching the river before it could be contained and picked up. While the machine is working on the new side channel or the levees, there is a possibility of an oil, antifreeze or other type of fluid spill. All project vehicles and offices would have spill kits in order to contain and pick up any contaminant that might be spilled in or near the river. Any spill that might occur should be cleaned up well before sockeye migrate through Round Valley.

The lack of fish screen on the irrigation water in-flow would probably not create any indirect affects on sockeye. The lower flows at the downstream end of the side channel would probably not be sufficient to attract them into this side channel during migration.

The loss of 5 to 10 mature trees during construction activities would not affect migration because none of the trees would be cut along the main channel of the Salmon River.

The proposed projects on the Pennal Gulch site would not create any suitable spawning habitat for sockeye salmon.

Continuing Construction and Maintenance:

The new channel, the culverts, the rock sill in the river, the levee between the new channel and the wetland, the breeched or lowered levee, the high flow section over the road, or re-

anchoring the logs at the foot of the bank are parts of this project that could require additional work in order to make them perform as they were intended. If work is required on any of these improvements, the direct and indirect effects on sockeye salmon would be the same as those described for the initial construction. The duration of the disturbance could be shorter if adjustments rather than reconstruction were needed.

Planting replacement trees, the wire fence, or dredging the new channel are improvements that may need occasional maintenance. These activities, if they are needed, would create nearly the same direct and indirect effects as described for the initial construction except the duration of the possible disturbance to sockeye would tend to be shorter for maintenance needs.

The impacts of continuing construction assume that the work is done during the same work window of September 1 through March 1. Immediate repairs to fences, the Sportsman's Access road, or replanting trees could proceed at other times of the year depending on the need.

F.6. SOCKEYE SALMON CUMULATIVE EFFECTS FOR ALL PROJECT SITES (Spatial and Temporal):

The proposed projects for all five sites are not expected to increase recreational use (e.g. rafting, fishing, hunting, etc.) of the Salmon River. There would not be an increase in consumptive uses such as livestock grazing, agriculture or mining attributed to the proposed project. Sockeye salmon spawn and rear in Redfish Lake, over 50 miles upstream from the USRC area. There are no expected adverse cumulative effects from these or other consumptive uses on sockeye salmon from the projects proposed on the Highway 93 Bridge, Dunfee Slough, One Mile Island, Hot Springs site, or Pennal Gulch properties.

All of the USRC projects, and subsequent environmental restoration projects on other private property in the river corridor, should improve the riparian corridor by establishing more trees for shade and contributing large wood cover in the river. This may improve the migration habitat for sockeye.

Home or business construction is not expected to increase in the river corridor because of the proposed project. Building and sub-dividing will probably continue in the river corridor for a number of years, regardless of the proposed USRC. Building/subdividing would not continue on the private lands where the Corps of Engineers' acquires an ecosystem restoration easement. These easements reserve the owners' rights but prohibit destroying, modifying or disturbing the habitat improvements that are completed with the USRC. The easement also precludes the construction or maintenance of any structure on the property.

Building and agricultural use are not likely to occur on the parts of the USRC that are on land administered by the BLM.

There may be cumulative effects caused by home construction or other similar development on private property in the river corridor that could affect the suitability of the habitat for migrating sockeye. These effects may include higher sediment loads from private roads that deliver soil into the river, chemicals that leach into the river from yards or livestock pastures, or unmanaged livestock grazing that damages the riverbank or removes riparian vegetation. In a possible worse case scenario, chemicals leaching into the river from private property could create a water quality barrier to sockeye. At the other end of the impact scale, livestock may damage or kill a few low bushes in the riparian corridor 150 feet from the river, which would have little or no effect on migration of sockeye.

G. Snake River Spring/Summer Chinook Salmon and Steelhead

Spawning habitat for chinook salmon in the 12 Mile reach is very limited and of marginal quality. Most of the Chinook spawning in the 12 Mile reach during 2002 occurred in pool tail-outs near One Mile Island (Refer to Plates 40 and 41). There are a few rearing areas in the 12 Mile reach. Primary habitat for rearing for chinook salmon in the 12 Mile reach is in the perennial side channels that offer refuge from high flows and predators, and a few of the barbs and other similar structures in the main channel of the river. Most adult chinook salmon begin to arrive in the Upper Salmon River in late July and August. They spawn in late August through September in the main stem. The fry emerge from the gravel in late February through March.

Steelhead spawn in the 12 Mile reach, but are believed to be all hatchery fish (personal comm. Tom Curet, IDFG, 2002). Most of the steelhead spawning occurs in a few pool tail-outs and in some of the tributaries, such as Morgan Creek (Personal comm. Thornock and Hughes, Aug, 2002). The limiting habitat components for steelhead are substrate that is too large for spawning, and sediment. There are a few rearing areas in the 12 Mile reach. Primary habitat for steelhead is virtually the same areas as described for chinook, i.e. the perennial side channels that offer refuge from high flows and predators, and a few of the barbs and other similar structures in the main channel of the river. Most adult steelhead arrive in January and February. They spawn from April through June. The fry emerge from the gravel in June and July, depending on water temperature.

The construction and other activities associated on the five proposed project sites would not occur on all of the project sites simultaneously. The goal for each site would be to reach near completion during one construction season. Separate sites would be constructed during separate seasons. Therefore, any impacts on chinook salmon or steelhead would be minimized to one site per year. Repeated effects would not confront the fish on all of the project sites during one migration or rearing season.

G.1. HIGHWAY 93 BRIDGE

Direct Effects:

Most of the construction activities associated with the Highway 93 Bridge projects would take place from September 1 through January 15, in a dry channel (e.g. constructing the second high flow channel, the levee, the culvert, the French drain and refuge pool, the barbs in the side channel, and the hardened road section, etc.). The only work that would be done in the water would be constructing the sill at the upstream end of the new channel, and opening both ends of the new channel when it was completed. Adult chinook and steelhead would not be affected by any of this work because they would not be present. However, juvenile chinook and steelhead could be along the edge of the river where the current is slower. Although juveniles could be present, the probability is low because ice builds up in the slower current in numerous sections of the USRC. During a field trip to another landowners' property located on the north bank of the river, across from the Highway 93 Bridge project site, the landowner mentioned that the river often ices-up from the Highway 93 bridge downstream several hundred feet. If juveniles were near the machine when it started working in the water, they could avoid the area until the work was completed. Machines would work slowly, allowing any juveniles that may be in the area to move out before any material was taken from the channel and deposited in trucks or on the ground.

The rock sill would extend into the river about 100 to 120 feet. It would be designed to provide year-round access over and around it (Refer to section III, 5. Description of Project Sites, Highway 93 Bridge, on page 11, for a full description of the rock sill). The upstream side of the sill would have a top surface elevation that is approximately 0.3 feet above the riverbed elevation. The downstream side of the sill would be flush with the riverbank ground line. This design should not present a migration barrier to adult or juvenile salmonids.

The work window for the other projects proposed at the Highway 93 Bridge site (i.e. the boulders, the jack fence, the barbs along the highway, and the riparian planting could take place at any time of year. These activities would not have any direct effects on adult or juvenile salmonids.

The physical presence of the new structures (i.e. culvert, levees, the French drain, the refuge pool, the new channel, etc.) would not have any direct effects on adults if they migrated through the side channel (late July through September for chinook and January through March for steelhead). All of these structures would be designed and constructed to provide year-round passage for fish. The flow velocities (i.e. attraction) at the downstream entrance to the side channel would be less than the flows in the main channel of the Salmon River. This condition may deter adults from entering the side channel.

The loss of 4 to 10 mature trees during construction activities would not have any direct effects on chinook salmon or steelhead because the fish would not be present. None of the trees would be cut within two tree lengths of the main river channel.

The equipment parking area and the material storage site would not cause any direct, effects on adult or juvenile chinook salmon or steelhead because they would be located 500 to 1000 feet from the river. Hauling in 110 or 215 truckloads of fence material, rock, and weir material would not have any direct effects on adults.

Indirect Effects:

The side channel that would be reopened should provide foraging and holding habitat for juvenile salmonids. The trees and shrubs that would be planted along the new side channel would provide additional benefits for juveniles by increasing woody debris. As the trees grow, they will help cool the water and add biomass to the side channel, increasing the amount of in-water cover and aquatic invertebrate prey for the juveniles. The loss of 4 to 10 mature trees during construction activities would not have any indirect effects on adults or juveniles because no trees would be cut within two tree lengths of the main channel of the Salmon River.

The first flush of sediment created by opening the side channel may have minor adverse effects on juvenile chinook or steelhead if they were immediately downstream of these sites. However, juveniles may not be present below the Highway 93 Bridge site because the water velocity may be too high for them to use the rivers' edge for rearing.

Sediment that is produced from the in-water work and opening the side channel on the Highway 93 Bridge site should be dissipated before the adults arrive in Round Valley. This sediment should not affect Chinook or steelhead migration because they would not be present during the work window of September 1 through January 15.

Sediment that is released from any of the projects on this site could have and adverse impact on chinook fry or eggs if chinook spawned downstream from this site during the previous season. Chinook fry emerge from the gravel in late February or March following spawning in August through September the previous year. Sediment from this project could enter the river from September 1 through January 15, depending on which work window is applied. The river could be monitored for chinook spawning near this property in the season before the work is scheduled. This could help verify the absence or presence of redds in order to avoid adverse sediment impacts.

The sediment generated from the in-river work and the new side channel has a low probability of effecting chinook eggs or fry because chinook use very little of the 12 Mile reach for spawning. Aerial spawning surveys were conducted by IDFG on the upper Salmon River in 1999 through 2002. **(See Plate 40 & 41)** Chinook salmon spawning redds from this survey averaged only 0.67 per year from 1999 to 2002 in approximately 19 miles of the Salmon River between the Highway 93 bridge south of Challis and the mouth of the Pahsimeroi River. Approximately 18 redds were observed during a Corps float trip after the aerial survey in September 2001. Almost all of these redds were found along One Mile Island. The IDFG 2002 aerial survey was conducted in late September to coincide with the Corps float trip in 2001 and did not observe any redds in the 19-mile reach described above. The IDFG believe that the 2001 observations were unique and probably related to the large number of adult chinook that returned in 2001. That year they saw fish in locations and at times that were quite unexpected. (Personal comm., Tom Curet, IDFG 2002). Based on these figures and IDFG comments, it is not likely that the sediment produced from the work on the Highway 93 Bridge property would have an adverse effect on chinook redds.

The IDFG does not conduct redd counts for steelhead in the USRC area. There is some steelhead spawning in the 12 Mile reach, but the IDFG estimates that it is all by hatchery fish. Adult steelhead could be adversely affected by the flush of sediment if they arrived in the valley before the close of the work window on January 15. Steelhead fry emerge from June through July, so they should not be affected by sediment that is deposited during this project from September 1 through January 15. The river could also be monitored for returning steelhead downstream of this property starting on January 1. If steelhead arrive in the Round Valley earlier than January 15, the work could be halted or postponed. This would help avoid adverse impacts from sediment produced by the project.

Steelhead are spawning in April through June, about the same time that annual high flows occur. The initial flush through the new side channel and the in-river work could affect steelhead redds downstream.

A variety of best management practices would be used to greatly reduce the possibility of adverse effects from sediment. Turbidity curtains may be used in the side channel when it is initially opened if the current is not too swift. Patches of bare soil could be covered with protective erosion material and/or planted with native grasses and sedges in order to avoid adverse impacts. The four-hour per day work window would help reduce the amount of sediment that would be produced in any 24- hour period. Another consideration is that the USRC projects would not all be carried out simultaneously. Therefore, sediment concentrations and turbidity, and the subsequent effects on fish should be less than if all of the in-water work were done in the same season.

The elevation of the reopened side channel and the culvert would be designed to have water in it during low flows, based on historic flow records in the main Salmon River. Adult chinook and steelhead should be able to move through the side channel during all flow levels without any possibility of being stranded. In a drought year, the flows from the side channel may not be sufficient to attract adults out of the main river. One point to keep in mind is that this channel is only 1800 feet long. If adults entered the side channel under drought conditions, it would take only about 30 or 40 minutes to pass back to the main river channel. If there was sufficient water to enter the downstream end of the channel, it is very unlikely that the river level would drop enough in 2 or 3 hours to strand these migrating fish.

The new side channel is being constructed in order to provide additional rearing habitat for juvenile salmonids. Therefore, it is conceivable that juveniles may be present in the side channel during a drought year. The design elevation of this side channel should be sufficient to maintain juveniles during low-flow years. However, a drought is an event that cannot be predicted nor prevented, and the fate of juvenile salmonids in this side channel would probably be the same as those that are in the naturally occurring side channels along the 12 Mile reach.

Avian or mammal predators pose a possible adverse impact to juveniles in the side channel rearing habitat. However, the increase in high quality rearing habitat from the Highway 93 Bridge property, as well as the other sites in the USRC, should help increase the number of juveniles that reach smolt age and migrate downstream.

The high flow channel and the hardened road section would be designed only to carry water when the culvert in the main side channel could not accommodate high water events that usually occur from March through June before adult chinook migrate, but after steelhead arrive in Round Valley. The culvert would be designed so that it would be overtopped during high water events of 1 ½ to 3-year cycles. If there was a thunderstorm in late July or August when adult chinook were migrating, there might be enough water to cause the high flow channel to temporarily fill with water. During the 1 ½ to 3-year peak flow cycle when river levels would be slightly higher than normal, there would be enough water to cause the high flow channel to temporarily fill with water. Adult steelhead could go into this high flow channel during these flow peaks. This channel would only be about 500 feet long so adult chinook or steelhead should be able to get out one end or the other before receding water flows could leave them stranded. The possibility for being stranded is higher for juveniles if they are carried into the high flow channel, but the risk is no different than for other natural high-flow channels along the river. In order to prevent fish from being stranded, the high flow channel would be designed without pools or backwaters.

The rock sill in the main channel of the river would be designed to have water flowing over, around and through it. It should not create any indirect effects on adult or juvenile chinook salmon or steelhead, other than its' influence on diverting part of the river flows into the side channel.

The French drain and the refuge pool and, the barbs and sills to create scour pools in the side channel would be designed to create rearing habitat for juvenile salmonids. The indirect benefits for juveniles from these structures should be favorable flow velocities and refuge from predators. If adults migrated up the side channel, the French drain and other structures mentioned above would have beneficial indirect impacts on them. These structures should provide better conditions for migration (i.e. cool water and cover).

Planting trees and shrubs along the side channel would improve the rearing habitat for juveniles by cooling the water and contributing woody cover. The litter from the trees and shrubs would also help increase aquatic insects as a food source for juveniles. The trees should help cool the water for adults and provide woody cover in the future for holding/resting habitat.

The levee along the side channel and the barbs along Highway 93 would not have any indirect effects on adults or juveniles. The jack fence would not have the indirect effect of protecting fish habitat by controlling grazing because there is not any livestock use on this site. The jack fence and boulders along the road may help preserve the side channel habitat by preventing people from driving pickups and ATV's in the area inside the fence.

The construction office, parking area, and the material storage site and the equipment parking area would not have any indirect effects on adults or juveniles because these areas would be 400 to 500 feet from the river. This should prevent a contaminant from reaching the river before it could be contained and picked up. When the machine was working on the rock sill or opening the ends of the side channel, there is a possibility of an oil, antifreeze or

other type of fluid spill. All project vehicles and offices would have spill kits in order to contain and pick up any contaminant that might be spilled in or near the river. Any spill that might occur should be cleaned up well before chinook or steelhead migrate through Round Valley.

The proposed projects on the Highway 93 Bridge site are not expected to create any suitable spawning habitat for chinook salmon or steelhead.

Continuing Construction and Maintenance:

The rock sill, the side channel itself, the French drain and refuge pool, the barbs in the side channel, the hardened road section, the levee, the high flow channel and the culvert are parts of this project that could require additional work in order to make them perform as they were intended. If work were required on any of these improvements, the direct and indirect effects on chinook or steelhead would be the same as those described for the initial construction.

Planting replacement trees, repairing the jack fence or boulder fence, dredging the side channel, refuge pool or the entrance to the side channel near the rock sill are improvements that may need occasional maintenance. These activities, if they were needed, would create the same direct and indirect effects as described for the initial construction except the duration of the possible disturbance to chinook or steelhead would tend to be shorter.

The impacts of continuing construction assume that the work is done during the same work window of late September 1 through January 15. Immediate repairs to jack fence or replanting trees could proceed at other times of the year depending on the need.

G.2. DUNFEE SLOUGH

Direct Effects:

The activities associated with building the wire fences, rearranging the rock in the pond spillways, planting trees, and installing fish barriers would not directly effect adult or juvenile chinook or steelhead because they cannot get into this side channel due to physical barriers (i.e. the rock dams and spillways in the ponds). Installing the culverts, building the rock sill in the river, and excavating 250 feet of old channel would not have any direct effect on adults because all of this work would be done between September 1 and January 15, when they are not present.

If juveniles are present along the riverbank, they could be adversely affected when the rock sill was constructed, as well as when the culvert was installed or when the side channel connection to the river was excavated. There is a low probability that juveniles would be present around this work site because the riverbank is steep and the water velocity is probably too swift for juveniles to hold here. If juveniles were present, the machine would work slowly in order to allow them to leave the area and relocate to other suitable habitat.

The physical presence of the new structures (i.e. culverts, the new channels, etc.) would not likely effect migrating chinook salmon or steelhead. Adults would probably not enter this

channel because the flow velocities at the entrance to the channel may not be high enough to attract them away from the main channel of the Salmon River. The presence of the rock sill on the upstream end of the new channel should not create a migration barrier for chinook or steelhead.

The rock sill would extend into the river about 50 to 80 feet. It would be designed to provide access over and around it (Refer to page 11, for a full description of the rock sill). The upstream side of the sill would have a top surface elevation that is approximately 0.3 feet above the riverbed elevation. The downstream side of the sill would be flush with the riverbank ground line. It would be designed so that it remained submerged and should not present a migration barrier to chinook or steelhead.

The presence of the fence, the fish screens, and the new trees would not have any direct effect on juveniles or adults.

The material storage site and the equipment parking area would not have any direct effects on adult or juvenile chinook salmon. These sites would be 400 to 800 feet or farther from the river and side channel. The 15 to 30 truckloads required to haul in the rock, plants, and fencing material would not have any direct effect on adults or juveniles.

Indirect Effects:

Excavating 250 feet of old channel and installing a culvert to connect an existing side channel to the main river should open up about 2500 feet of rearing habitat for juvenile chinook or steelhead. The new channel would provide access for adults and juveniles.

The sediment that is produced when the side channel is connected to the river, when the culvert is installed, and when the sill is being constructed should be dissipated before the adults arrive in Round Valley. This sediment should not affect adult chinook or steelhead migration because they would not be present during the work window of September 1 through January 15.

The initial flush from the side channel/slough complex would probably occur during annual high flows from March through June, before adult Chinook arrive (in July) and after steelhead arrive (in January). The flush of sediment should not create any migration barriers for Chinook or steelhead because it should be dissipated/mitigated before the adults arrive in Round Valley.

It is not likely that the sediment produced from the work on the Dunfee Slough property would have any effect on chinook redds because most of the sediment would be trapped by best management practices (e.g. turbidity curtains). Chinook fry emerge from the gravel in late February or March of the year following spawning. If chinook spawned downstream from this site during the previous season, the eggs or fry could be adversely affected by sediment from this project. The river could be monitored for chinook spawning near this property in the season before the work is scheduled. This could help verify the absence or presence of redds in order to avoid adverse sediment impacts.

Sediment that is released from any of the projects on this site could have an adverse impact on chinook fry or eggs if chinook spawned downstream from this site during the previous season. Chinook fry do not emerge from the gravel until late February or March following spawning. Sediment from this project could enter the river from September 1 through January 15, depending on which work window is applied. The river could be monitored for chinook spawning near this property in the season before the work is scheduled. This could help verify the absence or presence of redds in order to avoid adverse sediment impacts.

The probability that sediment from the rock sill, culvert and side channel/slough work on the Dunfee Slough would affect chinook eggs or fry is small because Chinook use very little of the 12 Mile reach for spawning. (Refer to the IDFG explanation for Chinook spawning in the 12 Mile reach in 2001 in the "Indirect Effects" for the Highway 93 Bridge site, Pers. Comm. With Tom Curet, on **page 132**)

The river could also be monitored for returning steelhead downstream of this property starting on January 1. If steelhead arrive in the Round Valley earlier than January 15, the work could be halted or postponed. This would help avoid adverse impacts from sediment produced by the project.

Steelhead are spawning in April through June, about the same time that annual high flows occur. The initial flush through the side channel/slough complex and the in-river work could affect steelhead redds downstream.

A variety of best management practices would be used in order to greatly reduce the possibility of adverse effects from sediment. Turbidity curtains would be placed downstream of the work sites in the side channel/slough to catch the majority of the sediment. Another precaution to reduce sediment effects on juveniles would be to pump flows from around the work site and back into the side channel below the work. Patches of bare soil could be covered with protective erosion material and/or planted with native grasses and sedges in order to avoid adverse impacts to chinook and/or steelhead. The 4-hour per day work limit would also help reduce the amount of sediment that entered the river during any 24 your period. Another point to consider about the effects of sediment is that the USRC projects would not all be carried out in the same season. Therefore, sediment concentrations and turbidity should be less than if all of the in-water work were done in the same year. **(Refer to Plates 40 and 41)**

Planting the willows and trees along the side channel and ponds should improve the rearing or holding habitat for juveniles. The trees would provide shade to cool the water and add biomass to the system, which should increase invertebrate prey. The trees planted along the river or side channel would probably not have a measurable effect on water temperature in the main channel. However, if all projects complete the tree-planting phase, the combined effect may be enough to slightly lower water temperatures in the main channel, thus improving migration habitat for chinook and steelhead.

The loss of 4 to 10 mature trees during construction activities would not affect adult migration because none of the trees that are cut would be within two tree lengths of the main channel of the Salmon River.

The flow velocities (i.e. attraction) at the downstream entrance to the reopened side channel would be less than the flows in the main channel of the Salmon River. Therefore, these flows may not be sufficient to attract migrating chinook or steelhead into the side channel. If adults were attracted into the side channel during migration, the pond spillways, the new channel and culvert would be designed to provide access back to the main channel of the river. The side channel would provide lower water velocities and may allow adults to hold and rest for short periods during their upstream migration. It is possible that juvenile chinook or steelhead could enter the side channel during downstream migration. The side channel would provide foraging habitat and access back to the main channel of the river without barriers.

The side channel/slough complex is being opened in order to provide additional rearing habitat for juvenile salmonids. Therefore, it is conceivable that juveniles may be present in the side channel/slough during a drought year. The design elevation of this side channel should be sufficient to maintain juveniles during low-flow years. Irrigation water inflow and flow from springs would help keep the side channel/slough complex from drying up in drought years. However, a drought is an event that cannot be predicted nor prevented, and the fate of juvenile salmonids in this side channel would probably be the same as those that are in the naturally occurring side channels along the 12 Mile reach.

The wire fence would provide a managed grazing area of 70 to 100 acres. The management would control the timing and duration of grazing in order to allow riparian vegetation recovery. This would help improve the function of the riparian zone along the side channel and the quality of rearing habitat for juveniles by providing shade, insect forage and cover from predators. The fences would not produce any indirect effects on adults unless they migrated in the side channel. The improved riparian vegetation could help keep water temperatures at suitable levels in the main stem for adult migration.

Rearranging the rock that is in the spillways of the ponds would remove any fish passage barriers for adults and juveniles. The rocks could provide beneficial effects of rearing habitat and refuge for juveniles.

The fish screens would prevent juveniles and adults from straying up irrigation ditches and becoming stranded.

The material storage site and the equipment parking area would probably not have any indirect effects on adults or juveniles. These sites would be 400 to 800 feet or farther from the river and side channel, which should prevent a contaminant from reaching the river or side channel before it could be contained and picked up. When the machine was working on the rock sill or when trucks dump rock near the river for the sill, there is a possibility of an oil, antifreeze or other type of fluid spill. All project vehicles and offices would have spill kits in order to contain and pick up any contaminant that might be spilled in or near the

river. Any spill that might occur should be cleaned up well before Chinook or steelhead migrate through Round Valley. Juveniles could also be adversely affected if the trucks dumped the rock into the river on top of them. This impact could be avoided by specifying that rock be deposited on dry land.

One possible adverse impact of the side channel rearing habitat may be avian or mammal predators. However, the increase in high quality rearing habitat from the Dunfee Slough property, as well as the other sites in the USRC, should help increase the number of juveniles that migrate downstream.

The proposed projects on the Dunfee Slough site would not create any suitable spawning habitat for chinook salmon or steelhead.

Continuing Construction and Maintenance:

The rock sill, the side channel itself, the culvert from the river to the side channel, and rearranging the spillway rock at the end of the ponds are parts of this project that could require additional work in order to make them perform as they were intended. If work were required on any of these improvements, the direct and indirect effects on chinook salmon or steelhead would be the same as those described for the initial construction.

Planting replacement trees and the wire fence are improvements that may need occasional maintenance. These activities, if they are needed, would create nearly the same direct and indirect effects as described for the initial construction except the duration of the disturbance to chinook salmon would tend to be shorter.

The impacts of continuing construction assume that the work is done during the same work window of September 1 through January 15. Immediate repairs to fences, fish barriers, or replanting trees could proceed at other times of the year depending on the need.

G.3. ONE MILE ISLAND

Direct Effects:

The human activities and machinery used for grading the river bank, building a barbed wire fence, placing bank logs, and planting willows would not have any direct effects on adult chinook salmon or steelhead because this work would take place from September 1 to January 15 when adults are not present. Building the fence and planting the willows would not have any direct effect on juvenile chinook or steelhead.

If juveniles were present along the riverbank when the machine was grading the slope of the bank, they could be adversely affected if the machine dropped rock or soil into the river. They may also be adversely affected if the bank logs are rolled into the water. There is a low probability that juveniles would be present around this work site because the riverbank

is steep and the water velocity is probably too swift for juveniles to hold here. If juveniles are present, the machine would work slowly in order to allow them to leave the area and find suitable habitat elsewhere. Other in-water work, such as anchoring the bank logs, would also proceed slowly in order to allow juveniles to leave the vicinity.

The construction office, the material storage site and the equipment parking area would not have any direct effect on juveniles or adults because these areas would be 400 to 500 feet from the river. Hauling in the rock, plants, and fencing material would take 25 to 85 truckloads. This would not cause any direct effects on juveniles or adults.

Indirect Effects:

The sediment produced by grading the banks of the main Salmon River should not affect adult chinook and steelhead migration because they would not be present during the work window of September 1 through January 15.

Sediment may enter the river during the first high spring flow from patches of bare soil where the willows and trees were planted or where the bank logs have been placed. Sediment from this project could adversely affect chinook eggs or fry because the fry do not emerge from the gravel until late February or March of the year following spawning in August and September. If Chinook spawned downstream from this site during the previous season, the eggs or fry could be adversely affected by sediment from this project. It is not likely that the sediment produced from the work on the One Mile Island property would have any effect on chinook redds or fry because much of the sediment would be controlled by best management practices (e.g. turbidity curtains). The river could be monitored for chinook spawning downstream from this property in the season before the work is scheduled. This could help verify the absence or presence of redds in order to avoid adverse sediment impacts.

Another reason that there is a low probability that sediment from grading the banks along the One Mile Island site would affect chinook eggs or fry is because chinook use very little of the 12 Mile reach for spawning. (Refer to the IDFG explanation for chinook spawning in the 12 Mile reach in 2001 in the "Indirect Effects" for the Highway 93 Bridge site, Pers. Comm. With Tom Curet, on **page 132**)

There is some steelhead spawning in the 12 Mile reach. The river could also be monitored for returning steelhead downstream of this property starting on January 1. If steelhead arrive in the Round Valley earlier than January 15, the work could be halted or postponed. This would help avoid adverse impacts from sediment produced by the project.

Steelhead are spawning in April through June, about the same time that annual high flows occur. The initial flush of sediment from the bank grading could affect steelhead redds downstream.

The sediment produced from working on the bank at One Mile Island would probably not affect adult steelhead migration because it would occur before they arrive in Round Valley

later in January and February. The annual spring flows should dissipate the sediment before the steelhead spawn from April through early June.

A variety of best management practices would be used in order to reduce the possibility of adverse effects from sediment. Patches of bare soil could be covered with protective erosion material and/or planted with native grasses and sedges in order to avoid adverse impacts to chinook and/or steelhead. The 4-hour per day work limit would also help reduce the amount of sediment that entered the river during any 24 your period. Another point to consider about the effects of sediment is that the USRC projects would not all be carried out in the same season. Therefore, sediment concentrations and turbidity should be less than if all of the in-water work were done in the same year. **(Refer to Plates 40 and 41)**

The physical presence of the logs in the bank may improve the migration habitat for adult chinook and steelhead by providing a holding area. The logs and willows planted here may also provide a small amount of rearing habitat for juveniles if the water velocities are suitable. The trees planted along the river would probably not have a measurable effect on water temperature in the main river channel. However, if all projects complete the tree planting, the combined effect may be enough to slightly lower water temperatures in the main channel, thus improving migration habitat for chinook and steelhead.

The loss of up to seven mature trees during construction activities would not affect adult salmonid migration because none of the trees would be cut within two tree lengths of the main channel of the Salmon River. There would not be any indirect effects on juveniles from the loss of these trees.

The fence may have a slight positive effect on adults. The fence would remove livestock or intensively manage their use of this area, providing more bank stability, which would tend to create better in-river habitat for adults as they migrated through this area. The fence would help protect riparian vegetation and improve rearing habitat for juveniles by increasing shade, providing cover from predators, and insect forage.

Trucks or machines could cause injury or mortality to juveniles if they are along the riverbank when they ford the river to deliver materials to the island or work on the riverbank. These vehicles and machines would move slowly into the water in order to avoid adverse impacts to the fish. When the machine was working on the riverbank, there is a possibility of an oil, antifreeze or other type of fluid spill. All project vehicles and offices would have spill kits in order to contain and pick up any contaminant that might be spilled in or near the river. Any spill that might occur should be cleaned up well before Chinook and steelhead migrate through Round Valley.

The construction office, the material storage site and the equipment parking area would not have any indirect effects on chinook or steelhead because these areas would be 400 to 500 feet from the river. The distance from the river and spill kits should prevent a contaminant from reaching the river before it could be contained and picked up.

The proposed projects on the One Mile Island site would not create any suitable spawning habitat for chinook salmon or steelhead.

Continuing Construction and Maintenance:

The logs that would be installed at the foot of the river bank is the part of this project that could require additional work in order to make them perform as it was intended. If work were required on the logs, the direct and indirect effects on chinook salmon and steelhead would be the same as those described for the initial construction.

Planting additional trees to replace ones that die and the wire fence are improvements that may need occasional maintenance. These activities, if they were needed, would create nearly the same direct and indirect effects as described for the initial construction except the duration of the disturbance to chinook and steelhead would tend to be shorter.

The impacts of continuing construction assume that the work is done during the same work window of September 1 through January 15. Immediate repairs to fences or planting replacement trees could proceed at other times of the year depending on the need.

G.4. HOT SPRINGS SITE

The Idaho Dept. of Fish and Game conducted snorkel surveys of Challis Hot Springs Creek in July 2002. They surveyed about 192 meters of stream starting about 500 feet downstream of the confluence of the main branch of the creek and the channel from the hot spring pool, up the main channel of the creek to the north/south property. They counted 41 age 0 chinook juveniles and 2 juvenile steelhead/rainbow trout in the first section of the creek between the mouth of the hot springs channel and the footbridge next to the northern landowners' house. They counted 13 juvenile steelhead and 254 juvenile Chinook in the second section between the footbridge and the culvert under the Challis Hot Springs road. In the third section between the upstream end of the pond to the fence boundary between the north and south properties, they counted 230 steelhead and 233 juvenile chinook. They did not find any adult chinook or steelhead. (IDFG 2002). Although the IDFG snorkel survey did not go up the east or west branches of Challis Hot Springs Creek, the southern landowner has observed numerous juvenile steelhead/rainbow trout in these channels. (Personal comm. landowner, March 2003) Although their presence seems unlikely because of the concrete structure on the pond downstream from these two channels, "dozens" of juvenile steelhead/rainbow trout, as well as "18 or 20-inch adult fish", have been seen in the creek by the landowner. There have been no recorded observations of spawning steelhead or chinook in this creek. A few spots in the creek above and below the pond have suitable steelhead spawning substrate. If steelhead do spawn in Challis Hot Springs Creek that would explain the source of the juveniles that are seen every year by the landowners. Juvenile steelhead and Chinook may also get into the creek by coming up the creek from the river or, they may come through or around irrigation intake screens upriver and enter the

creek through the irrigation ditch inflow near the boundary between the south and north landowner.

Direct Effects:

None of the proposed activities along or in Challis Hot Springs Creek (placing cobble, creating pools, the culverts, deepening the thalweg, riparian plantings, constructing a new channel through the existing pond, etc.) would have any direct effect on adult Chinook or steelhead. They would not be present in the fall or winter, when the work would be done. Chinook may not use this tributary for spawning due to the warm water temperatures at the mouth of the creek. In addition, the flow (velocity and volume) of the water entering the Salmon River from the creek may not be sufficient to attract chinook from the main channel during migration. As was mentioned above, there is suitable spawning substrate for steelhead but spawning has not been recorded in this creek.

The in-water work proposed for the east, west or main branches of the creek could have adverse impacts on juvenile chinook or steelhead if they are near the work. The work most likely to cause adverse impacts includes placing cobble, creating pools, the culvert work, constructing water gaps, deepening the thalweg, building a flume and culvert for irrigation water diversion, and excavating 300 feet of vertical bank. The cobble material placed in the creek could be dropped on juvenile fish if they were present. The other projects require machinery to work in or near the channel, increasing the possibility of injuring or killing juvenile salmonids. The machines would work slowly, allowing any juveniles that may be in the area to move out before any material was taken from the channel and deposited in trucks or on the ground. Project personnel or other people designated by NOAA and/or IDFG would be trained in the proper techniques of salvaging fish from an operation.

Draining the existing pond and constructing a new channel through the site would not create any direct impacts to adults because this work would be done in the fall and winter when Chinook and steelhead are not present. Juvenile fish salvage efforts would be conducted for any fish stranded in the pond, in preparation for constructing the new channel.

Installing fish screens at the residential irrigation inlet, on the weirs in the channel to the river from the new wetland, and at the mouth of the irrigation ditch would not have any direct effect on juvenile or adult chinook or steelhead.

Approximately 15,000 to 17,000 feet of fence is proposed. Building the fence would have no direct effects on adult or juvenile chinook or steelhead. Constructing the four water gaps could affect juveniles if they were present when the machine was working in the channel. Working slowly and allowing juveniles to leave the vicinity until the gap was completed could avoid adverse impacts. Trained personnel would salvage fish if necessary.

This proposal also includes construction of a new wetland, excavating a new channel from the wetland to the river, and another channel from the wetland to an irrigation ditch on the northern landowners' property. Most of the wetland would be built on dry land on the southern landowner's property near the north/south property boundary. The wetland would encompass about 200 to 400 feet of the western spring channel. The source or water for this

channel during the winter is two small springs located about 150 to 200 feet south of the boundary fence on the south landowners property. During the summer and fall, the spring water is augmented by subsurface irrigation flows. The south landowner remarked that he has never seen fish in the western spring channel, probably because it does not have enough water in if for most of the year. (NOTE: The flows coming out of the western spring channel in Plate 20 are substantially augmented by subsurface irrigation flows when the photo was taken in August 2002.) It is possible that juvenile Chinook or steelhead could be in this channel when the wetland was built, but it is very unlikely. As a precaution, the machine would work slowly in order to allow fish to move to other suitable habitat. Trained personnel would salvage fish if necessary and release them downstream from the work site. The channels out of the wetland would be constructed on dry land. There would not be any direct effect on adult or juvenile chinook or steelhead from the channel work.

A new channel is also proposed from the hot springs outlet directly to the Salmon River. This channel would be built on dry land and would have no effect on adult or juvenile chinook or steelhead.

Planting trees and shrubs along the east and west channels of creek, as well as 4000 feet of river bank on the southern property would not have any direct effect on chinook salmon or steelhead.

The construction office, the material storage site and the equipment parking area would be 500 to 1000 feet or farther from the creek or river. These areas would not have any direct effects on adult or juvenile chinook or steelhead. There would not be any direct effects on adults or juveniles from hauling 80 to 160 truckloads of rock, plants, weirs, culverts, and fencing material to the storage areas or work sites.

Indirect Effects:

The old side channel along the main stem of the river would be opened to provide additional rearing habitat for juvenile steelhead and chinook. Therefore, it is conceivable that juveniles may be present in the side channel during a drought year. The design elevation of this side channel should be sufficient to maintain juveniles during low-flow years. However, a drought is an event that cannot be predicted nor prevented, and the fate of juvenile salmonids in this side channel would probably be the same as those that are in the naturally occurring side channels along the 12 Mile reach. The channel would be designed to carry perennial flows, based on historical flow records. Adult chinook and steelhead could migrate through without encountering passage barriers.

It would more likely for adult chinook or steelhead to enter Challis Hot Springs Creek after this project is completed and the water from the hot spring is diverted directly to the Salmon River. If this project were completed, the water in the creek would remain cool from its source to the confluence with the Salmon River. Even though water temperature would probably no longer be a barrier to chinook migrating up this tributary, the small size of the stream may present a physical deterrent to chinook spawning.

Diverting the hot spring water directly into the Salmon River would probably not change the river habitat because it would only change the location that the hot water came into the river. It would not make any difference in the overall temperature of the main stem. Chinook and steelhead migrate past several other hot springs that flow directly into the Salmon River between Challis and Stanley. Therefore, changing the location of where Challis Hot Spring flows into the river is not expected to present a migration barrier to chinook or steelhead. Diverting the hot spring water out of the creek may reduce or remove any thermal barrier that might have existed for juveniles that attempted to enter the creek for refuge or rearing.

The new trees that would be planted along the creek are not likely to provide any benefits to adult chinook or steelhead migration habitat in the main stem. The trees that would be planted along 4000 feet of the main river channel would probably not have a measurable water temperature benefit for migrating adults because the channel here is oriented north and south. After the trees have grown for 15 or 20 years, they may develop a canopy large enough to provide some shading to cool the river water. They should also help stabilize the riverbanks, which would have a beneficial effect by reducing the amount of sediment that entered the river. Measurable effects in water temperature would come from the combined affects of all the trees planted on all five properties in the USRC area, especially along the side channels. The trees and shrubs that would be planted along the new channel through the existing pond and along the creek on the southern landowners' property would improve the rearing habitat for juvenile chinook or steelhead. The trees would provide shade for water temperature regulation, insects for forage, and large wood for in-stream cover.

The downstream end of the pond presently has a three-foot drop to the creek that presents a barrier to upstream fish passage. When the concrete structure is removed, the new channel through the existing pond would provide better access to the creek above the pond for juvenile chinook and steelhead, and possibly adults. The new channel would provide about 1500 feet of additional habitat while providing better access to approximately 4500 to 5000 feet of improved habitat in the east and west branches of the creek.

The flume and culvert that would reroute the incoming irrigation water out of the creek and into the new wetland would help reduce sediment in the creek and help maintain cooler water temperatures.

The larger culverts that are proposed would provide better fish passage for juveniles and adults.

The gravel dams and riffles that would be placed in the creek channels to create pools would provide improved rearing habitat for juvenile Chinook and steelhead. The cobble beds could also provide refuge and reduce avian predation on juveniles. According to observations by the landowners and IDFG biologists, great blue herons spend weeks along the creek taking hundreds of juvenile salmonids. The cobble and gravel material placed would have less than 10% passing the 200-sieve to minimize the turbidity generated during placement.

Installing the culverts and flume, creating pools, deepening the thalweg, excavating 300 feet of stream bank, and placing cobble beds would be planned so that it would be expeditious and associated turbidity would be of short duration.

Under Environmental Protection Agency guidelines, the wetland would be designed to hold average flows from the irrigation system for at least 5 days. This would allow much of the sediment to settle out in the wetland before the water was released back into the return channel to the creek or directly back to the river, depending on water quality and flow needs in the creek.

The sediment that is produced when the old side channel is connected to the river and opened should be dissipated before the adults arrive in Round Valley. This sediment should not effect adult chinook or steelhead migration because they would not be present during the work window of September 1 through January 15.

It is not likely that the sediment produced from opening the old side channel on the Hot Springs property would have any affect on chinook redds because most of the sediment would be trapped by best management practices (e.g. 4-hour work days). Chinook fry emerge from the gravel in late February or March of the year following spawning. If Chinook spawned downstream from this site during the previous season, the eggs or fry could be adversely affected by sediment from this project. The river could be monitored for chinook spawning near this property in the season before the work is scheduled. This could help verify the absence or presence of redds in order to avoid adverse sediment impacts. The sediment from opening the old side channel would probably not affect chinook eggs or fry because chinook use very little of the 12 Mile reach for spawning. Spawning habitat in the 12 Mile reach below the Hot Springs site is mostly unsuitable because of large substrate and a straight channel with swifter water and few pool tail-outs or other suitable habitat. [Note: the Hot Springs site is downstream from the One Mile Island site.] (Refer to the IDFG explanation for Chinook spawning in the 12 Mile reach in 2001 in the "Indirect Effects" for the Highway 93 Bridge site, Pers. Comm. With Tom Curet, on **page 132**)

The river could also be monitored for returning steelhead downstream of this property starting on January 1. If steelhead arrive in the Round Valley earlier than January 15, the work could be halted or postponed. This would help avoid adverse impacts on adults from sediment produced by opening the old side channel.

Steelhead are spawning in April through June, about the same time that annual high flows occur. The initial flush through the old side channel could affect steelhead redds downstream.

A variety of best management practices would be used in order to greatly reduce the possibility of adverse effects on chinook and steelhead eggs and fry from opening the old side channel. Patches of bare soil could be covered with protective erosion material and/or planted with native grasses and sedges in order to avoid adverse impacts. The 4-hour per day work limit would also help reduce the amount of sediment that entered the river during any 24 your period. Another point to consider about the effects of sediment is that the USRC

projects would not all be carried out in the same season. Therefore, sediment concentrations and turbidity should be less than if all of the in-water work were done in the same year. **(Refer to Plates 40 and 41)**

A flush of sediment would be generated from the proposed in-water work such as grading banks, deepening the thalweg, the new channel from the hot spring to the river, the new channel through the pond site, and the channel from the wetland to the river. This is not expected to present a threat to juvenile or adult chinook or steelhead because turbidity curtains would be placed downstream of the work sites in the creek, the new channels, and the wetland to capture a majority of the sediment. Another precaution that would reduce sediment effects on juveniles and adults would be to pump flows around the in-water work sites and back into the creek below the work or into the new wetland. Project personnel or other people designated by NOAA and/or IDFG would be trained in the proper techniques of salvaging fish if it should become necessary. Any sediment released by the turbidity curtains would probably be a minor amount and should not create any migration barriers adults or adverse impacts to juveniles or eggs. As riparian and aquatic vegetation develop in subsequent years, the sediment generated from these channels should not be any more than what the creek produced before the project.

Deepening the thalweg and installing larger culverts would improve fish passage. Deepening the thalweg would also improve rearing habitat for juvenile Chinook or steelhead, as well as provide refuge from predators.

Grading the vertical banks would help in establishing riparian vegetation that will help cool the water and provide cover and insects as forage for juveniles. Grading the banks would also improve floodplain connection.

The fence along all three branches of the creek would provide a grazing exclusion area of 25 to 40 acres. This would protect trees and shrubs, which would improve the function of the riparian zone and the quality of rearing habitat for juvenile chinook and steelhead. The fences would not produce any beneficial indirect effects on adult chinook or steelhead unless they begin using the creek to spawn.

The hardened water gaps would be constructed in a manner to minimize the amount of sediment released. The rock material used would have less than 10% passing the 200-sieve to minimize the turbidity generated during placement. This should help reduce potential indirect impacts on juvenile chinook or steelhead. Water quality downstream of the water gap may have higher coliform levels because of the livestock fecal material entering the creek. However, the fecal contaminant levels could be lower than the current levels in the creek because the landowner’s cattle and horses presently have access to the entire length of both creek channels. Fecal contaminants have not been identified as having an adverse effect on water quality or juvenile salmonids in the Round Valley.

The proposed fish screens would prevent adult steelhead and chinook from entering the irrigation ditch and becoming stranded. The screen on the residential irrigation intake would prevent juveniles from becoming impinged on the intake pipe. The five screen on the weirs

in the channel from the wetland to the river would prevent juveniles and adults from getting into the wetland and becoming stranded. However, fish would have access to 500 – 600 feet of channel between the river and the wetland. When the irrigation water is turned off to the wetland, any fish that may be in this channel could be stranded. The channel would be sloped from the wetland to the river in order to reduce the risk of fish becoming stranded.

The old side channel is being reopened in order to provide additional rearing habitat for juvenile salmonids. Therefore, it is conceivable that juveniles may be present in the side channel during a drought year. The design elevation of this old side channel should be sufficient to maintain juveniles during low-flow years. However, a drought is an event that cannot be predicted nor prevented, and the fate of juvenile salmonids in this side channel would probably be the same as those that are in the naturally occurring side channels along the 12 Mile reach.

The loss of 7 to 10 mature trees that may be cut during construction activities would not affect adult migration or juveniles because no trees would be cut within two tree lengths of the main channel of the Salmon River. (There are no trees along the creek.)

None of the projects proposed for the Hot Springs properties are expected to provide spawning habitat for chinook salmon or steelhead.

Continuing Construction and Maintenance:

The new channels, the culverts, the wetland, the pools that are created, deepening the thalweg, and the irrigation diversion structures are parts of this project that could require additional work in order to make them perform as they were intended. If work is required on any of these improvements, the direct and indirect effects on chinook salmon would be the same as those described for the initial construction. The duration of the disturbance could be shorter if adjustments rather than reconstruction are needed.

Planting replacement trees, the wire fence, dredging the wetland, cleaning the cobble beds, and repairs to the irrigation diversion structures are improvements that may need occasional maintenance include. These activities, if they are needed, would create nearly the same direct and indirect effects as described for the initial construction except the duration of the disturbance to Chinook or steelhead would tend to be shorter for maintenance needs.

The impacts of continuing construction assume that the work is done during the same work window of September 1 through January 15. Immediate repairs to fences, the irrigation diversion structures, or the fish screens, or replanting trees could proceed at other times of the year depending on the need.

G.5. PENNAL GULCH

Direct Effects:

The work in the main channel of the river that is associated with the projects at the Pennal Gulch site (i.e. lowering a levee and removing a levee, installing the culverts in the levees,

and constructing a rock sill) are not likely to effect adult chinook or steelhead. Adverse effects are unlikely because adults would not be present when this work would be done, from September 1 through January 15.

If juvenile chinook or steelhead are present along the riverbank they could be adversely affected when the rock sill was constructed, when the culvert was installed, when the levees are breeched or lowered, or when the side channel connection to the river was excavated. There is a low probability that juveniles would be present around this work site because the riverbank is steep and the water velocity is probably too swift for juveniles to hold here. If juveniles were present, the machine would work slowly in order to allow them to leave the area to find suitable habitat elsewhere. Trained personnel would salvage fish if necessary.

The proposed work that is not in the main river includes a fence and water gaps, planting trees, excavating a new channel from the breeched levee around a wetland, installing barbs in this new channel, and constructing a levee between the new side channel and the wetland. This work would not have any direct effects on adult or juvenile chinook because it would be done on dry land. The only access to the wetland from the river is a narrow, shallow channel (about 3 to 5 feet wide and less than 12 inches deep) at the downstream end of the wetland. It is very unlikely that juvenile chinook or steelhead would be in the wetland near the new channel and levee during the in-water work window because the lower river flows cause the wetland edge to become dewatered for 10 to 20 feet.

Additional excavation would be required in the existing side channel/slough to transition the thalweg of the new channel around the wetland to the thalweg of the existing side channel/slough. The proposal also includes installing a culvert to join the new channel and the existing side channel/slough, and an armored road section that would serve as a high flow bypass channel. This work could have adverse effects on juvenile chinook or steelhead if they came up the side channel/slough from the river. A series of beaver dams in this side channel/slough may hinder juveniles from reaching this work site. If juveniles were present, the machine would work slowly in order to allow them to leave the area to find suitable habitat elsewhere. Trained personnel would salvage fish if necessary.

Excavating the old side channel behind the lowered levee and placing bank logs along this channel would not have any effects on adult or juvenile chinook or steelhead because the work would be done on dry land.

The material storage site and the equipment parking area would have no direct effects on adults or juvenile chinook or steelhead because these areas would be 500 to 1500 feet from the side channel and river. There would not be any direct effects from the 45 to 85 truckloads required to haul in the rock, plants, and fencing material. The 3000 feet of temporary roads that may be needed to move material and equipment between sites would not create any direct effects on adults or juveniles.

Excavation of material to connect the main river channel to the side channel, and building a side channel around the wetland would take 250 to 800 truckloads to remove this material. Excess material from this excavation would be used to fill borrow pits on the property

approximately 1000 feet from the Salmon River. This work would not have any direct effect on adult or juvenile chinook or steelhead because these fish would not be present in the river when the work was done in the fall and winter. Another reason there would not be any direct effects on adults is because all of the excavation would be done on dry land or old, dry side channel segments except for the last few yards of levee that are removed when the new side channel is connected to the river.

The physical presence of the new structures (i.e. culverts, new channels, fences, etc.) would not have a direct effect on migration habitat conditions for adult chinook or steelhead. The flow (velocity and volume) of the water entering the Salmon River from the side channels on the Pennal Gulch land may not be sufficient to attract them away from the main channel during migration. If adults entered the side channels, they would be able to follow the channel out to the main river because the culverts and channel would be designed to provide year-round passage for fish.

Indirect Effects:

There would be sediment produced by constructing the rock sill in the river, breeching one levee and lowering another, installing three culverts, building water gaps, the high flow channel with a hardened road section, and anchoring the logs in the bank. Additional sources of sediment would come from the initial spring flush when the new channel around the wetland and the short channel from the lowered levee. Smaller amounts of sediment would come from the levee between the wetland and the new side channel, and the barbs and sills in the new side channel.

The sediment that is produced when the side channel is connected to the river, the levee work, when the culvert is installed, and when the sill is being constructed should be dissipated before the adults arrive in Round Valley. This sediment should not affect adult chinook or steelhead migration because they would not be present during the work window of September 1 through January 15. The initial flush from the side channels would probably occur during normal high flows from March through June, before adult chinook arrive in July, and after steelhead arrive in January. The flush of sediment should not create any migration barriers for chinook because it should be dissipated well before they arrive in Round Valley. Steelhead are normally migrating or holding when spring high flows, and associated sediment, occur. Best management practices (e.g. 4-hour work day for machines) should help reduce sediment and the possibility of adverse effects on adult steelhead

Sediment that is released from any of the projects on this site could have an adverse impact on chinook fry or eggs if chinook spawned downstream from this site during the previous season. Chinook fry do not emerge from the gravel until late February or March following spawning. Sediment from this project could enter the river from September 1 through January 15, depending on which work window is applied. The river could be monitored for chinook spawning near this property in the season before the work is scheduled. This could help verify the absence or presence of redds in order to avoid adverse sediment impacts.

The probability that sediment from the side channel/slough and levee work would affect chinook eggs or fry is small because Chinook use very little of the 12 Mile reach for

spawning. (Refer to the IDFG explanation for Chinook spawning in the 12 Mile reach in 2001 in the "Indirect Effects" for the Highway 93 Bridge site, Pers. Comm. With Tom Curet, on **page 132**)

The river could also be monitored for steelhead arriving downstream of this property starting on January 1. If steelhead arrive in the Round Valley earlier than January 15, the work could be halted or postponed. This would help avoid adverse impacts from sediment produced by the project. Steelhead are spawning in April through June, about the same time that high flows occur. The initial flush of sediment through the side channel/slough and the in-river work could affect steelhead redds downstream.

A variety of best management practices would be used in order to greatly reduce the possibility of adverse effects from sediment on steelhead and chinook redds. Turbidity curtains would be placed downstream of the work sites in the side channel/slough to catch the majority of the sediment. Another precaution to reduce sediment effects on eggs and juveniles would be to pump flows from around the work site and back into the side channel below the work. Patches of bare soil could be covered with protective erosion material and/or planted with native grasses and sedges in order to avoid adverse impacts to chinook and/or steelhead. The 4-hour per day work limit would also help reduce the amount of sediment that entered the river during any 24 your period. Another point to consider about the effects of sediment is that the USRC projects would not all be carried out in the same season. Therefore, sediment concentrations and turbidity should be less than if all of the in-water work were done in the same year. **(Refer to Plates 40 and 41)**

The side channel/slough complex is being constructed in order to provide additional rearing habitat for juvenile salmonids. Therefore, it is conceivable that juveniles may be present in the side channel during a drought year. The design elevation of this side channel should be sufficient to maintain juveniles during low-flow years. Irrigation water inflow and flow from springs would help keep the side channel/slough complex from drying up in drought years. However, a drought is an event that cannot be predicted or prevented, and the fate of juvenile salmonids in this side channel would probably be the same as those that are in the naturally occurring side channels along the 12 Mile reach.

The fence would provide a managed grazing area of about 81 acres. This management would subsequently improve the function of the riparian zone along the side channel and the quality of rearing habitat for juvenile chinook and steelhead. The fence would also protect the trees and shrubs that were planted along the side channels. This would also improve the rearing habitat for juveniles by cooling the water, providing insect forage, and woody debris for cover. If adults used the side channel for migration, the fence could indirectly help keep water temperatures in the channel at a suitable level by protecting the trees and shrubs along it. There is not any suitable spawning gravel in the side channel for chinook or steelhead.

Possible adverse impacts in the side channel and subsequent rearing habitat may be avian or mammal predators. This is a natural part of the ecosystem and this project is not attempting to alter predation.

The omission of fish screens to prevent fish from getting up a side channel and into irrigation ditches could present a hazard to juvenile chinook and steelhead. This channel (See Plate 28) segment has perennial flows supported by a combination of spring and/or ground water and irrigation flows. The IDFG opinion is that the habitat benefit from the additional unscreened side channel segment outweighs the risk of fish being trapped further upstream where the irrigation system feeds in

The 3000 feet of temporary roads that may be needed to move material and equipment between sites would not create any indirect effects on adult or juvenile chinook and steelhead because these trails would be water-barred and re-vegetated to prevent soil erosion.

The loss of 5 to 10 mature trees that may be cut during construction activities would not affect migration because none of the trees would within two tree lengths of the main channel of the Salmon River.

The proposed projects on the Pennal Gulch site is not expected to create any suitable spawning habitat for chinook salmon or steelhead.

Continuing Construction and Maintenance:

The new channel, the culverts, the rock sill in the river, the levee between the new channel and the wetland, the breeched or lowered levee, the high flow section over the road, or re-anchoring the logs at the foot of the bank are parts of this project that could require additional work in order to make them perform as they were intended. If work were required on any of these improvements, the direct and indirect effects on chinook salmon or steelhead would be the same as those described for the initial construction. The duration of the disturbance could be shorter if adjustments rather than reconstruction were needed.

Planting replacement trees, the wire fence, or dredging the new channel are improvements that may need occasional maintenance. These activities, if they are needed, would create nearly the same direct and indirect effects as described for the initial construction except the duration of the disturbance to chinook salmon would tend to be shorter for maintenance needs.

The impacts of continuing construction assume that the work is done during the same work window of September 1 through January 15. Immediate repairs to fences, the Sportsman's Access road, or replanting trees could proceed at other times of the year depending on the need.

G.6. SPRING/SUMMER CHINOOK SALMON and STEELHEAD CUMULATIVE EFFECTS FOR ALL PROJECT SITES (Spatial and Temporal):

The proposed projects are not expected to increase recreational use (e.g. rafting, fishing, hunting, etc.) of the Salmon River. There would not be an increase in livestock use, agriculture or mining attributed to the proposed project. There are no expected adverse

cumulative effects from these or other consumptive resource uses on the Highway 93 Bridge, Dunfee Slough, One Mile Island, Hot Springs, or Pennal Gulch properties.

All of the USRC projects, and subsequent Corps environmental restoration projects on other private property in the river corridor, should improve the fisheries habitat by establishing more trees for shade and contributing large wood cover to the river.

Home or business construction is not expected to increase in the river corridor because of the proposed project. Building and sub-dividing will probably continue in the river corridor for a number of years, regardless of the USRC. However, building and subdividing would not continue on the private lands where the Corps of Engineers' acquires an ecosystem restoration easement. These easements reserve the owners' rights but prohibit destroying, modifying or disturbing the habitat improvements that are implemented with the USRC. The easement also precludes the construction or maintenance of any structure on the property.

Building and agriculture use are not likely to occur on the parts of the USRC that are on land administered by the Bureau of Land Management.

There may be adverse cumulative effects caused by home construction or other similar development on private property in the river corridor that could affect the suitability of the habitat for chinook salmon and steelhead. These effects may include higher sediment loads from private roads that deliver soil into the river, chemicals that leach into the river from yards or livestock pastures, or unmanaged livestock grazing that damages the riverbank or removes riparian vegetation. In a possible worse case scenario, chemicals leaching into the river from private property could create a migration barrier to adult hinook or steelhead, or possibly kill some juveniles if contaminant concentrations were high enough. At the other end of the impact scale, livestock may damage or kill a few low bushes in the riparian corridor 150 feet from the river, which would have little or no effect on adult or juvenile chinook or steelhead.

VI. DETERMINATION OF EFFECTS MATRIX BY SPECIES

The first matrix is for reference only to explain the criteria used for each Indicator, and the abbreviations used in the "Status of Baseline" and "Effects of the Action" columns. **NOTE: Unless noted otherwise, all responses to 'Status of Baseline' and 'Effects of the Action' will apply to the project site and the river or side channel/slough habitat immediately upstream and downstream of the work site. Flow/Hydrology and Watershed Condition responses will apply to the Upper Salmon River basin as a whole.**

MATRIX OF PATHWAYS AND INDICATORS FOR SALMONIDS

(Adapted from "Making Endangered Species Act Determinations of Effect for Individual or Grouped Actions at the Watershed Scale", The NMFS, August 1996. **PF** Proper Functioning **FR** Functioning at Risk **NPF** Not Properly Functioning **NA** Not Applicable **R** Restores **M** Maintains **D** Degrades **PJ** Professional Judgment.

Pathway	Indicator	Status of Baseline?	Effects of the Action?	Basis for Rationale
Water Quality	Temperature Bull Trout: spawning, 44° - 47° Egg development, 39° - 43° Rearing, 44° – 47°. Above 59° limits distribution. Steelhead/Chinook: spawning & egg development, 42° – 51°, with upper limit of 60.8°. Rearing, 53° – 60°, short periods up to 77°.	PF/FR/NPF /NA	R/M/D/NA	PJ, or state data, surveys, etc.
	Sediment/Turbidity PF <20% depth fines FR 26-29% depth fines NPF >30%depth fines	PF/FR/NPF /NA	R/M/D/NA	
	Chemical Contaminants/Nutrients PF. Low levels chem. from agric, industry. no excess nutrients. no CWA 303d reaches. FR. Moderate levels chem. from agric., etc. Some excess nutrients. One CWA 303d reach. NPF. High levels chem. Excess nutrients from agriculture, industry or other source. More than two CWA 303d reaches.	PF/FR/NPF /NA	R/M/D/NA	
Habitat Access	Physical Barriers: PF Manmade barriers allow up & downstream passage @ all flows. FR - Manmade barriers do not allow up &/or downst. passage @ base flows. NPF - Manmade barriers do not allow up or downst. passage @ any flows.	PF/FR/NPF /NA	R/M/D/NA	

Pathway	Indicator	Status of Baseline?	Effects of the Action?	Basis for Rationale
Habitat Elements	Substrate: PF - Dominant subst. Is gravel or cobble, or <20%embeddedness. FR – gravel & cob. is subdominant, or 20-30% embeddness. NPF - Dominant substrate is large cobble >5 inches in diameter, and/or embeddedness > 35%.	PF/FR/NPF/NA	R/M/D/NA	
	LWD : PF > 20 pieces/mile > 24″ diameter > 35 ft. long, & adequate source of LWD recruitment. FR Meets stds for PF but lacks potential sources for LWD recruitment to maintain the standard. NPF Does not meet stds for PF & lacks potential sources for LWD recruitment.	PF/FR/NPF /NA	R/M/D/NA	
	Pool Frequency: Channel width # pools per mile 10′ 95 20′ 56 50′ 28 PF Meets pool freq. stds. (above)& LWD requirements for PF habitat. FR Meets pool freq. stds. But LWD recruitment too low to maintain pools over time. NPF Does not meet pool freq. stds., LWD recruitment almost non-existent.	PF/FR/NPF /NA	R/M/D/NA	
	Pool Quality: PF Pools >1 meter deep with good cover & cool water, minor fill of pool by fine sediment. FR Few pools > 1 meter or inadequate cover/temp., moderate fill of pool by fine sediment. NPF Many pools < 1 meter deep, pool volume greatly reduced by fine sediment..	PF/FR/NPF /NA	R/M/D/NA	
	Off-channel habitat: PF - Back waters with cover, low energy off-channel ponds, oxbows, etc. FR - Some backwaters & high energy side channels. NPF - Back waters scattered w/ intermittent veg. cover.	PF/FR/NPF /NA	R/M/D/NA	

Pathway	Indicator	Status of Baseline?	Effects of the Action?	Basis for Rationale
Habitat Elements	Refugia: PF Refugia exist & are adequately buffered by intact riparian zone; sufficient size, number & connectivity to maintain viable pops. or sub-pops. FR refugia not adequately buffered; size, number & connectivity insufficient. NPF Unaware of criteria for Not Properly Functioning system.	PF/FR/NPF /NA	R/M/D/NA	
Channel Condition and Dynamics	Width/depth ratio (We are unaware of any criteria to reference.)	PF/FR/NPF /NA	R/M/D/NA	
	Stream bank Condition: PF > 90% stable; < 10% of banks are actively eroding. FR 80 – 90% stable. NFP <75% stable banks	PF/FR/NPF /NA	R/M/D/NA	
	Floodplain Connectivity: PF Off channel areas frequently linked to main channel; over-bank flows occur & maintain wetland function, riparian vegetation & succession. FR Less linkage of wetland, floodpl. & riparian areas to main channel; over-bank flows reduced, moderate degradation of wetland function & riparian vegetation/succession. NPF Little or no link to wetl., flood plain, & riparian areas; over-bank flow occurs only in > 10 year flood events; flood pl & wetland converted to dryer habitats or agricultural use.	PF/FR/NPF /NA	R/M/D/NA	
Flow Hydrology	Increase in Drainage Networks: PF Zero or minimum increases in drainage network density due to roads. FR Moderate incr. In drainage netw. density due to roads. NPF High increases in drainage network density.	PF/FR/NPF /NA	R/M/D/NA	

Pathway	Indicator	Status of Baseline?	Effects of the Action?	Basis for Rationale
Flow Hydrology	Change in Peak/Base Flows; PF - Watershed hydrograph indicates peak & base flows & timing characteristics comparable to an undisturbed watershed of similar size, geology & geography. FR – Some evidence of altered peak or base flow &/or flow timing relative to an undisturbed watershed etc. NPF – Peak or base flows, &/or timing indicate common disturbance in the watershed.	PF/FR/NPF /NA	R/M/D/NA	
Watershed Conditions	Road Density and Location: PF < 2 miles/sq.mi.; no valley bottom roads. FR 2 – 3 miles/sq. mi.; some valley bottom roads. NPF > 3 miles/sq. mi., valley bottom roads common.	PF/FR/NPF /NA	R/M/D/NA	
	Disturbance History: PF < 15% equivalent clear-cut acres [ECA] (entire watershed) with no concentration of disturbance in unstable areas, &/or refugia, &/or riparian zone. FR < 15% ECA but disturbance concentrated in unstable areas, &/or refugia, &/or riparian zones. NPF > 30% ECA with disturbance in unstable areas, &/or refugia, &/or riparian zones.	PF/FR/NPF /NA	R/M/D/NA	

Pathway	Indicator	Status of Baseline?	Effects of the Action?	Basis for Rationale
Watershed Conditions	Riparian Reserves: PF Reserve provides adequate shade, LWD recruitment & hbt. protection & connectivity in all subwatersheds, & buffers or includes refugia for sensitive aquatic species (> 80% intact), &/or for grazing impacts; > 50% similar to potential natural riparian community. FR Mod. loss of connectivity or function (shade, LWD recruitment, etc.) of riparian reserves, or incomplete protection of hbt. & refugia for sensitive aquatic species (70 – 80% intact), &/or grazing impacts. 25 - 50% or more similar to potential natural riparian community. NPF High loss of connectivity or function of riparian reserves, or loss of protection of hbt. & refugia (< 60% intact). < 25% similar to potential natural riparian community.	PF/FR/NPF /NA	R/M/D/NA	

Determination of Affect Matrix for BULL TROUT

Authorizing Agency: U.S. Army Corps of Engineers Mgmt. Area: **Highway 93 Bridge site**
Watershed: Upper Salmon River, Round Valley Action Type: Habitat Restoration
Specific Actions : **In the main river**; construct a rock sill. **In or along the new side channel**; Open new side channel, point bars, French drain & refuge pool, barbs to create pools, levee for flood plain connection, pipe arch, high flow channel, construct a hardened road section, parking & storage area(s), planting trees, placing boulders, building a jack fence and continuing construction and maintenance.

Unless otherwise stated, assessment of the matrix indicator is based on criteria in "Making Endangered Species Act Determinations of Effect for Individual or Grouped Actions at the Watershed Scale" (National Marine Fisheries Service, 1996). The stated indicator criteria was developed by fisheries biologists on the Salmon-Challis National Forest for the area. The R4 Natural conditions "Database is based on "User's Guide to Fish Habitat: Descriptions that Represent Natural Conditions in the Salmon River Basin, Idaho (Overton et al., 1995).

Pathway	Indicator	Status of Baseline?	Effect of the Action?	Basis for Rationale
Water Quality	Temperature	NPF; This is presently a dry channel. FR – for the rock sill.	R. The new channel would be filled with water from the main river. M	PJ; Idaho DEQ listed sediment & temp as pollutants in Salmon R. – no reference to 12 Mile reach. Summer temps may not be suitable. Planting trees would incr. shade; boulders & fence would protect trees.
	Sediment/Turbidity	NA – for new channel. PF- for sill/river	M M	PJ; See Temperature
	Chemical Contaminants/Nutrients	PF – for new channel & river.	M Not expected to cause any increase in nutrients or chemicals.	PJ; Upper Salmon Subbasin Assmt. did not address chem/nut pollutants in the main river. Parking area 500 – 1000 ft from river. Spill kits should help reduce risk.
Habitat Access	Physical Barriers	NPF; dry channel PF- sill/river	R M	Side ch. will increase access to new habitat.

Pathway	Indicator	Status of Baseline?	Effect of the Action?	Basis for Rationale
Habitat Elements	Substrate	NA; Dry channel and dry land. NPF-sill/river	R; There would be shifting of fines until the channel reached a stable state in 1 or 2 years. M	PJ; site specific data available. Assume substrate would be suitable for over-wintering. Sill designed to prevent substrate deposition at entrance of new side channel.
	LWD	NA; dry channel. NPF-sill/river	R; tree planting should increase LWD over time. M	Very little LWD. Sill would have little influence on LWD.
	Pool Frequency	NA; Dry channel. (FR after new ch. is completed.) NPF-sill/river	M; after new channel is completed. R	PJ; Barbs should create pools in addition to the refuge pool, but not to PF level. Sill would have indirect influence by directing water into the side channel.
	Pool Quality	NA; dry channel (PF after new ch. is done. NPF-sill/river	R; after new channel. R	See Pool Frequency
	Off-channel habitat	NPF	R	PJ; May be some along the river after new channel is done.
	Refugia	FR	R	PJ; The refuge pool should provide over-winter habitat. Sill = indirect influence.
Channel Condition and Dynamics	Width/depth ratio	NA; dry channel PF-sill/river	R or D (?) M	PJ; Side ch. design should meet suitable W/D ratio; may decline in the main river due to water diverted into the side channel.
	Stream bank condition	NA; dry channel FR-sill/river	R M	PJ; New channel design would meet this criteria. Sill would not change bank stability.
	Flood plain connectivity	NPF	R; M for the sill.	PJ; New channel would restor some connectivity. Sill = indirect influence by directing water to new channel.

Pathway	Indicator	Status of the Baseline?	Effect of the Action?	Basis for Rationale
Flow/Hydrology	Change in peak/base flows	FR	M	Project too small to have any effect.
	Increase in drainage networks	NA	NA	Project too small to have any effect.
Watershed Conditions	Road Density and Location	PF	M	No new roads.
	Disturbance History	FR	M	See Peak/base Flows
	Riparian Reserves	FR	M	See Peak/base Flows

Dichotomous Key Determination:

1. Does the authorizing agency have discretionary authority to grant, modify, or amend provisions of the use authorization(s)? **YES/**NO/NA

If the answer is "NO", document the No Effect determination and the evaluation is completed. If "YES", move to question #2.

2. Are there naturally reproducing bull trout present at any time of the year in riverine habitat directly or indirectly affected by the actions? YES/NO/**Unkown, no survey data for main stem Salmon River.**

If "yes", continue with question #3 through #11. If "NO, document the No Effect determination and the evaluation is completed.

3. Is the action likely to change the existing input of Large Woody Debris (LWD) into occupied habitat? **YES** (the answers for 3 – 11 will all be different for each type of activity, e.g. fence, culvert, cobble bed, wetland, etc.) (**Planting trees should increase LWD over time. The sill would direct some flow from the river into the new side channel.)**

4. Is the action likely to affect stream morphology for occupied habitat? **YES/**NO/NA **(The new side channel would be designed to function as a natural part of the river. The sill would have little or no effect on LWD.)**

5. Is the action likely to affect properly functioning condition of the riparian area for occupied habitat? **YES**/NO/NA **(Side channel design should function as a natural channel & should improve flood plain connectivity. Sill would have an indirect effect.)**

6. Is the action likely to affect water quality and/or quantity in the occupied habitat? YES/**NO**/NA (**Water quality "NO", water quantity – there would be less water in the main channel for the 1800 feet distance of the side channel, until the water went back into the main river.)**

7. Is the action likely to affect the water flow regime/annual hydrography in the occupied habitat? YES/**NO/**NA.

8. Is the action likely to affect juvenile or adult behavior related to survival or reproduction? **YES**/NO/NA **(If adults enter the river in the winter, they could use the side channel. The sill would not have any effects on adults or juveniles.)**

9. Is the action likely to involve toxic and/or hazardous materials that may reach occupied habitat? **YES**/NO/NA (**Fluids from machines**.)

10. Is the action likely to affect juvenile or adult access to habitat? **YES**/NO/NA **(The side channel should provide increased access to adult over-wintering habitat. The sill would have indirect effects by directing flow into the side channel.)**

11. Is the action likely to affect substrate material? **YES/**NO/NA (**When the channel is opened, there would be shifting of material until it reached a stable state, probably during the first or second year.)**

"NO" responses to question #3 – 11 would result in a "No Affect" finding and should be documented in the action file.

A "YES", to any of the questions #3 – 11, however, requires in-depth evaluation by a professional biologist to determine if the action may affect the listed species. If the determination is made that an action "May affect" a listed species, continue with questions 12 – 15.

12. In addition the criteria listed in #3 – 11, do the actions, or the monitoring of them, likely involve any "taking", including "incidental taking" of listed or proposed species? YES/**NO**/NA **(Very low probability that bull trout are present; see "Rationale".**)
13. Are the effects described in #3-11 inconsequential/temporary in nature and not likely to degrade the habitat over time? **YES**/NO/NA **(Perhaps not "inconsequential", but the effects should be beneficial, not degrading.)**
14. Do the actions employ Best Management Practices (BMPs) designated to meet State water quality standards? **YES/**NO/NA
15. Is mitigation established that will preclude or reduce measurable effects on species and their habitat? **YES**/NO/NA

If the response to #12 above is "NO" and the response to criteria 13 – 15 are "YES", the determination of effects of this activity on listed or proposed salmonids is: The construction of the **rock sill, the new side channel, point bars, French drain & refuge pool, barbs to create pools, levee for flood plain connection, pipe arch, high flow channel, construct a hardened road section, parking & storage area(s), planting trees, placing boulders, building a jack fence and continuing construction and maintenance**.at the **Highway 93 Bridge** site "MAY EFFECT BUT IS NOT LIKELY TO ADVERSELY AFFECT" bull trout or their habitat.

Rationale: There was no recent information found that showed bull trout present in or near the 12 Mile Project reach of the Salmon River. The probability of bull trout being present at the Highway 93 Bridge site during construction of the rock sill is very low because their preferred habitat components (e.g. large structure, large wood, water temperature, and overhanging banks) are not present. The sill would have a beneficial effect by directing water into the side channel that could be used for over-wintering by adults.

All of the new channel work would be done in a dry channel. The only possible direct effect would be when the upstream and downstream ends of the channel are opened to allow flows from the river to enter. The probability of bull trout being present in the Highway 93 Bridge site during construction of the rock sill is very low because their preferred habitat components (e.g. large structure, large wood, water temperature, and overhanging banks) are not present. If bull trout were present at either end of the channel, they could easily avoid the work area in favor of other river habitat.

The machine would work slowly to allow bull trout to avoid the work area if they were present. Precautions to prevent toxic spills, such as hydraulic fluid, would be taken and spill kits would

be on hand to confine and quickly pick up a possible spill. The new side channel should provide good over-wintering habitat for adult bull trout if they use this reach of the Salmon River. Planting trees should help increase large wood in the channel. The jack fence would be 200 to 300 feet from the river and side channel. It would have no adverse (direct, indirect or cumulative) effects on bull trout. It may have slight **beneficial effects** by preventing vehicles from driving in the new side channel and riparian zone. Planting trees along the side channel (collectively for all five sites) could have a **beneficial effect** on bull trout by reducing water temperatures in the summer. The effects of continuing construction and maintenance would be similar to the effects of initial construction.

Determination of Affect Matrix for BULL TROUT

Authorizing Agency: U.S. Army Corps of Engineers Mgmt. Area: **Highway 93 Bridge site**
Watershed: Upper Salmon River, Round Valley Action Type: Habitat Restoration
Specific Actions : **Outside the river or side channel**; Cut 4 to 10 mature trees, install barbs on the Highway 93 fill slope, and place boulders.

Pathway	Indicator	Status of Baseline?	Effect of the Action?	Basis for Rationale
Water Quality	Temperature	FR	M	PJ; boulders may help protect trees that shade river.
	Sediment/Turbidity	NA	R	PJ; Boulders may help protect trees, thus stabilizing the bank.
	Chemical Contaminants/Nutrients	NA	NA	
Habitat Access	Physical Barriers	NA	NA	NO affect on access.
Habitat Elements	Substrate	NA	NA	
	LWD	NPF	M	PJ; Boulders protecting trees that would eventually add LWD. Cut trees too far from river to add LWD.
	Pool Frequency	NA	NA	
	Pool Quality	NA	NA	
	Off-channel habitat	NPF	M	PJ; Boulders would protect riparian zone.
	Refugia	NA	NA	
Channel Condition and Dynamics	Width/depth ratio	NA	NA	
	Stream bank condition	NA	NA	
	Floodplain connectivity	NA	NA	
Flow/Hydrology	Change in Peak/Base Flows	NA	NA	
	Increase in Drainage Networks	NA	NA	
Watershed Conditions	Road Density and Location	PF	M	PJ; Boulders & fence would decrease vehicle access in riparian zone.
	Disturbance History	NA	NA	
	Riparian Reserves	NA	NA	

Dichotomous Key Determination:

1. Does the authorizing agency have discretionary authority to grant, modify, or amend provisions of the use authorization(s)? **YES**

If the answer is "NO", document the No Effect determination and the evaluation is completed. If "YES", move to question #2.

2. Are there naturally reproducing bull trout present at any time of the year in riverine habitat directly or indirectly affected by the actions? YES/**NO**/Unkown If "YES", continue with question #3 through #11. If "NO":, document the No Effect determination and the evaluation is completed.

Rationale: Cutting 4 to 10 mature trees would have no effect on bull trout because none of the trees would be cut next to the river or within two tree lengths. The barbs on the Highway 93 fill slope are 500 to 1000 feet from the river and their installation would not have any direct, indirect or cumulative effects on bull trout. The boulders along the road into the public boat access are 50 to 100 feet from the side channel or river and would be for vehicle control. Spill kits on the machines and vehicles would contain and pick up any fluid spill before it could effect the water quality. If anything, the boulders may have a slight **beneficial effect** by preventing vehicles from driving in or through the new side channel. Therefore, it is our determination that **cutting 4 to 10 mature trees, placing boulders, and installing barbs on the Highway 93 fill slope** on the **Highway 93 Bridge** site will have "NO EFFECT ON BULL TROUT OR THEIR HABITAT".

Determination of Affect Matrix for BULL TROUT

Authorizing Agency: U.S. Army Corps of Engineers Mgmt. Area: **Dunfee Slough**
Watershed: Upper Salmon River, Round Valley Action Type: Habitat Restoration

Specific Actions : **In the main stem of the river**; Construct the rock sill & install a 48" culvert. **In the side channel/slough**; construct 200 to 400 feet of new channel, rearrange pond spillway rock, install fish screens, deepen ponds and channels between them, build a fence, plant trees, use parking and storage area(s), and continuing construction and maintenance.

Pathway	Indicator	Status of the Baseline?	Effects of the Action?	Basis for Rationale
Water Quality	Temperature	FR – for the river. NA – for new channel, it's dry in the fall & winter.	R	PJ; ID DEQ listed sed. & temp as pollutants in Salmon R. – however, no reference to 12 Mile reach. Summer temps may be unsuitable. Fence protects trees & trees shade water & reduce temperature.
	Sediment/Turbidity	FR – in river & side channel/slough	M – sill & culvert. Side channel should stabilize in 1 or 2 years.	PJ; Design of new side channel/slough should meet sediment objectives.
	Chemical Contaminants/Nutrients	PF	M	PJ; Upper Salmon Subbasin Assmt. Did not address chem/nut pollutants in the main river. Spill kits should reduce risk.
Habitat Access	Physical Barriers	NPF – side channel/slough & river.	R	PJ; Sill - no affect on access. Culvert, side ch. & pond spillway work will increase access to habitat.
Habitat Elements	Substrate	NPF – river and side channel/slough	R; Sill would be designed to prevent substrate deposition at entrance of the new side ch./slough.	PJ; site specific data available. Assume habitat suitable for over-wintering. Flow through side ch/sl should clean substrate.

Pathway	Indicator	Status of the Baseline?	Effects of the Action?	Basis for Rationale
Habitat Elements	LWD	FR – side channel/sl NPF - river	R – side ch M – river	PJ; trees/fence/culvert should help increase LWD in the side channel over time.
	Pool Frequency	FR – side ch/sl NPF - river	R	PJ; Ponds may serve as pool habitat. Sill – indirect effect by directing water into new channel/slough.
	Pool Quality	FR – side ch/sl NPF - river	R	See Pool Frequency.
	Off-channel habitat	FR- side ch/sl NPF - river	R	PJ; Planting trees & creating perennial flow will help.
	Refugia	FR	R	See Off channel Hbt.
Channel Condition and Dynamics	Width/depth ratio.	PF - both	R or D	PJ; W/d would improve in the side channel, may decline in the main river due to water diverted into the side chan/slough.
	Stream bank condition	PF – new channel FR - river	R; both channel and river.	Banks steep & unstable above & below this site. New ch. design should meet objectives.
	Floodplain connectivity	FR – side channel; only extreme events allow connection NPF - river	R	PJ; New side channel/sl should function naturally, provide better floodpl. connect.
Flow/Hydrology	Change in Peak/Base Flows	FR	M	No change expected.
	Increase in Drainage Networks	NA	NA	Project too small to have any effect.
Watershed Conditions	Road Density and Location	PF	M	No new roads.
	Disturbance History	FR	M	See Inc. in Drainage Network.
	Riparian Reserves	FR	M	See Inc. in Drainage Network.

Dichotomous Key Determination:

1. Does the authorizing agency have discretionary authority to grant, modify, or amend provisions of the use authorization(s)? **YES**/NO/NA

If the answer is "NO", document the No Effect determination and the evaluation is completed. If "YES", move to question #2.

2. Are there naturally reproducing bull trout present at any time of the year in riverine habitat directly or indirectly affected by the actions? YES/NO**/Unknown, no survey data for main stem Salmon River.**

If "YES", continue with question #3 through #11. If "NO, document the No Effect determination and the evaluation is completed.

3. Is the action likely to change the existing input of Large Woody Debris (LWD) into occupied habitat? **YES** (the answers for 3 – 11 will all be different for each type of activity, e.g. fence, culvert, cobble bed, wetland, etc.) **(Planting trees along the side channel, fencing to protect the trees from livestock damage, and creating perennial flow in the side channel/slough/pond complex would help add LWD to the system.) NO – (for the sill and culvert.)**

4. Is the action likely to affect stream morphology for occupied habitat? **YES/**NO/NA (**The channel/slough would be designed to function as a natural part of the river system. The sill would direct some flow from the river to the side channel/slough complex.)**

5. Is the action likely to affect properly functioning condition of the riparian area for occupied habitat? **YES**/NO/NA. (**Side channel/slough design should function as a natural channel & should improve flood plain connectivity.)**

6. Is the action likely to affect water quality and/or quantity in the occupied habitat? YES/**NO**/NA (**Water quality "NO", water quantity – there would be less water in the main channel for the distance of the side channel, until the water went back into the main river. New trees should shade the channel/slough and cool the water.)**

7. Is the action likely to affect the water flow regime/annual hydrography in the occupied habitat? YES/**NO**/NA.

8. Is the action likely to affect juvenile or adult behavior related to survival or reproduction? **YES**/NO/NA (**If adults enter the river in the winter, they could use this channel. The culvert would provide access to the channel/slough. NO – for the sill.)**

9. Is the action likely to involve toxic and/or hazardous materials that may reach occupied habitat? **YES**/NONA (**Fluids from machines**.)

10. Is the action likely to affect juvenile or adult access to habitat? **YES**/NO/**NA (The side channel could provide increased access to adults for over-wintering habitat. Sill could contribute indirectly to increased access to over-wintering habitat.)**

11. Is the action likely to affect substrate material? **YES/**NO/NA **(When the channel is opened, there would be shifting of material until it reached a stable state, probably during the first or second year.)**

> "NO" responses to question #3 – 11 would result in a "No Affect" finding and should be documented in the action file.
>
> A "YES", to any of the questions #3 – 11, however, requires in-depth evaluation by a professional biologist to determine if the action may affect the listed species. If the determination is made that an action "May affect" a listed species, continue with questions 12 – 15.

12. In addition the criteria listed in #3 – 11, do the actions, or the monitoring of them, likely involve any "taking", including "incidental taking" of listed or proposed species? YES/**NO**/NA (**very low probability that bull trout are present because there is NO water in the**

pond/slough network during the winter. There is NO preferred habitat for bull trout near the sill [e.g. overhanging banks, large structure, etc.], so their presence is unlikely.)
13. Are the effects described in #3-11 inconsequential/temporary in nature and Not likely to degrade the habitat over time? **YES/**NO/NA **(Perhaps Not "inconsequential", but the effects should be beneficial, Not degrading.)**
14. Do the actions employ Best Management Practices (BMPs) designated to meet State water quality standards? **YES**/NO/NA
15. Is mitigation established that will preclude or reduce measurable effects on species and their habitat? **YES/**NO/NA

If the response to #12 above is "NO" and the response to criteria 13 – 15 are "YES", the determination of effects of this activity on listed or proposed salmonids is: **Constructing the rock sill & install a 48" culvert, construct 200 to 400 feet of new channel, rearrange pond spillway rock, install fish screens, deepen ponds and channels between them, build a fence, plant trees, use parking and storage area(s), and continuing construction and maintenance** on the **Dunfee Slough** site "MAY EFFECT BUT IS NOT LIKELY TO ADVERSELY AFFECT" bull trout or their habitat.

Rationale: There was no recent information found that showed bull trout present in or near the 12 Mile Project reach of the Salmon River. All of the side channel/slough work would be done in a dry channel from October (or late August) through March 1. (Please refer to Plate 11) Precautions to prevent toxic spills, such as hydraulic fluid, would be taken and spill kits would be on hand to confine and quickly pick up a possible spill. The new side channel should provide good over-wintering habitat for bull trout if they use this reach of the Salmon River. Planting trees should be a **beneficial effect**, they would help increase large wood in the channel. The effects of continuing construction and maintenance would be similar to the effects of initial construction.

The probability of bull trout being present in the Dunfee Slough site during construction of the rock sill and installing the culvert is very low because their preferred habitat components (e.g. large structure, large wood, water temperature, and overhanging banks) are not present. The machine would work slowly to allow bull trout to avoid the work area in the unlikely event that they were present.

Determination of Affect Matrix for BULL TROUT

Authorizing Agency: U.S. Army Corps of Engineers Mgmt. Area: **Dunfee Slough**
Watershed: Upper Salmon River, Round Valley Action Type: Habitat Restoration

Specific Actions : **Outside the river or side channel/slough**; Cutting 4 to 10 mature trees.

Pathway	Indicator	Does it meet Objectives?	Do Actions Affect Attainment of Objectives?	Basis for Rationale
Water Quality	Temperature	NA	NA	
	Sediment/Turbidity	NA	NA	
	Chemical Contaminants/Nutrients	NA	NA	
Habitat Access	Physical Barriers	NA	NA	
Habitat Elements	Substrate	NA	NA	
	LWD	FR	M	PJ; Short term loss of 4 – 10 trees would be offset by planting trees on 40 – 60 acres. Cut trees would be two tree lengths fro river.
	Pool Frequency	NA	NA	NA
	Pool Quality	NA	NA	NA
	Off-channel habitat	NA	NA	PJ; Short term loss of 4 – 10 trees would be offset by planting trees on 40 – 60 acres.
	Refugia	NA	NA	
Channel Condition and Dynamics	Width/depth ratio	NA	NA	
	Stream bank condition	NA	NA	
	Floodplain connectivity	NA	NA	
Flow/Hydrology	Change in Peak/Base Flows	NA	NA	Project too small to have any effect
	Increase in Drainage Networks	NA	NA	See Change in Peak/base Flows
Watershed Conditions	Road Density and Location	PF	M	See Change in Peak/base Flows
	Disturbance History	NA	NA	See Change in Peak/base Flows
	Riparian Reserves	NA	NA	See Change in Peak/base Flows

Dichotomous Key Determination:

1. Does the authorizing agency have discretionary authority to grant, modify, or amend provisions of the use authorization(s)? **YES**/NO/NA

If the answer is "NO", document the No Effect determination and the evaluation is completed. If "YES", move to question #2.

2. Are there naturally reproducing bull trout present at any time of the year in riverine habitat directly or indirectly affected by the actions? If "YES", continue with question #3 through #11. If "NO", document the No Effect determination and the evaluation is completed.

Rationale: Cutting 4 to 10 mature trees would have no effect on bull trout because none of the trees would be cut next to the river or within two tree lengths. Planting trees on 40 to 60 acres should offset the short term loss of 4 to 10 trees. Therefore, it is our determination that **cutting 4 to 10 mature trees** on the **Dunfee Slough** site will have "NO EFFECT ON BULL TROUT OR THEIR HABITAT".

Determination of Affect Matrix for BULL TROUT

Authorizing Agency: U.S. Army Corps of Engineers Mgmt. Area: **One Mile Island**
Watershed: Upper Salmon River, Round Valley Action Type: Habitat Restoration

Specific Actions : **In or along the main stem of the river**; grade river bank, install bank logs, building a fence, planting trees, parking & storage area(s), and continuing construction and maintenance.

Pathway	Indicator	Status of the Baseline?	Effects of the Action?	Basis for Rationale
Water Quality	Temperature	FR	M	PJ; Idaho DEQ listed sediment as a pollutant in Salmon R. – however, no reference to 12 Mile reach; summer temps possibly not suitable. Fence would protect trees.
	Sediment/Turbidity	FR	M	PJ; All actions should help stabilize bank & reduce sediment.
	Chemical Contaminants/Nutrients	PF	M	Upper Salmon Subbasin Assmt. (11/15/2000) addressed sediment & temps. in the main river. Spill kits should reduce risk. Park area 400 – 500 ft. from river.
Habitat Access	Physical Barriers	PF	M	PJ; No affect on access
Habitat Elements	Substrate	NPF	M	PJ site-specific data available. Assume habitat suitable for over-wintering.
	LWD	NPF	R	PJ; Planting trees may increase LWD along the river. Fence would protect trees.
	Pool Frequency	NPF	M	PJ; Grading the banks, etc. would not create pool habitat.
	Pool Quality	NPF	M	See Pool Frequency
	Off-channel habitat	NPF	M	PJ; no improvement expected.
	Refugia	FR	M	No effect on refugia.
Channel Condition and Dynamics	Width/depth ratio	PF	M	PJ; no effect on w/d.

Pathway	Indicator	Status of the Baseline?	Effects of the Action?	Basis for Rationale
Habitat Elements	Stream bank condition	NPF	R	PJ; Graded banks should be more stable
	Floodplain connectivity	NPF	R	Grading may provide some floodpl conn. connection
Flow/Hydrology	Change in Peak/Base Flows	FR	M	Project too small to have any effect.
	Increase in Drainage Networks	NA	NA	See Change in Peak/base Flows
Watershed Conditions	Road Density and Location	PF	M	No new roads.
	Disturbance History	FR	M	See Change in Peak/base Flows
	Riparian Reserves	FR	M	See Change in Peak/base Flows

Dichotomous Key Determination:

1. Does the authorizing agency have discretionary authority to grant, modify, or amend provisions of the use authorization(s)? **YES**/NO/NA

If the answer is "NO", document the No Effect determination and the evaluation is completed. If "YES", move to question #2.

2. Are there naturally reproducing bull trout present at any time of the year in riverine habitat directly or indirectly affected by the actions? YES/NO//**Unknown, no survey data for main stem Salmon River.**

If "YES", continue with question #3 through #11. If "NO, document the No Effect determination and the evaluation is completed.

3. Is the action likely to change the existing input of Large Woody Debris (LWD) into occupied habitat? **YES** (the answers for 3 -11 will all be different for each type of activity, e.g. fence, culvert, wetland, etc.) (**The trees planted should eventually add LWD to the river**. **The fence would protect the trees from livestock, allowing them to mature.)**

4. Is the action likely to affect stream morphology for occupied habitat? **YES/**NO/NA **(May allow flood plain connectivity at this point during a 20-plus year high flow event.)**

5. Is the action likely to affect properly functioning condition of the riparian area for occupied habitat? **YES/**NO/NA **(Grading the bank, placing logs, and planting trees should have a beneficial effect on proper functioning & may improve flood plain connectivity**.)

6. Is the action likely to affect water quality and/or quantity in the occupied habitat? **YES**/NO/NA (**Grading the bank, placing logs, and planting trees should have a beneficial effect on reducing sediment that is generated from this bank. It would Not affect quantity.)**

7. Is the action likely to affect the water flow regime/annual hydrography in the occupied habitat? YES/**NO**/NA

8. Is the action likely to affect juvenile or adult behavior related to survival or reproduction? YES/**NO/**NA

9. Is the action likely to involve toxic and/or hazardous materials that may reach occupied habitat? **YES/**NO/NA (**Fluids from machines**.)

10. Is the action likely to affect juvenile or adult access to habitat? **YES**/NO/NA **(May be a minor increase in over-winter habitat for adults from bank logs.)**
11. Is the action likely to affect substrate material? **YES/**NO/NA (**Maybe a little next to the bank when the machine grades the bank.)**

"NO" responses to question #3 – 11 would result in a "No Affect" finding and should be documented in the action file.

A "YES", to any of the questions #3 – 11, however, requires in-depth evaluation by a professional biologist to determine if the action may affect the listed species. If the determination is made that an action "May affect" a listed species, continue with questions 12 – 15.

12. In addition the criteria listed in #3 – 11, do the actions, or the monitoring of them, likely involve any "taking", including "incidental taking" of listed or proposed species? YES/**NO**/NA **(Very low probability that bull trout are present in the main river at this project site because preferred habitat components are Not present (e.g. large wood**).
13. Are the effects described in #3-11 inconsequential/temporary in nature and Not likely to degrade the habitat over time? **YES/**NO/NA (**Perhaps Not "inconsequential" but the effects should be beneficial, Not degrading.)**
14. Do the actions employ Best Management Practices (BMPs) designated to meet State water quality standards? **YES**/NO/NA
15. Is mitigation established that will preclude or reduce measurable effects on species and their habitat? **YES**/NO/NA

If the response to #12 above is "NO" and the response to criteria 13 – 15 are "YES", the determination of effects of this activity on listed or proposed salmonids is: **Grading the river bank, installing bank logs, building a fence, planting trees, parking & storage area(s**), and **continuing construction and maintenance** on the **One Mile Island** site "MAY EFFECT BUT IS NOT LIKELY TO ADVERSELY AFFECT" bull trout or their habitat.

Rationale: The probability of bull trout being present along either of the river channels around One Mile Island during the machine work to grade the banks or lay bank logs is very low because their preferred habitat components (e.g. large structure, large wood, water temperature, and overhanging banks) are not present. If bull trout were present, they could easily avoid the work area in favor of other river habitat. The machine would work slowly to allow bull trout to avoid the work area if they were present. Precautions to prevent toxic spills, such as hydraulic fluid, would be taken and spill kits would be on hand to confine and quickly pick up a possible spill. The effects of continuing construction and maintenance would be similar to the effects of initial construction.

The wire fence would be about 40 to 600 feet from the river. Planting trees or willows would occur from 10 to 200 feet from the river, and adjacent to an existing slough. These actions would have no direct, indirect or cumulative effects on bull trout. The fence should have beneficial effects by preventing livestock from damaging the riparian zone along the river. Planting trees along the side channel could have a **beneficial effect** on bull trout habitat by cooling the water in the main river.

Determination of Affect Matrix for BULL TROUT

Authorizing Agency: U.S. Army Corps of Engineers Mgmt. Area: **One Mile Island**
Watershed: Upper Salmon River, Round Valley Action Type: Habitat Restoration

Specific Actions : **Outside the main stem of the river**; Cutting up to 7 mature trees.

Pathway	Indicator	Does it meet Objectives?	Do Actions Affect Attainment of Objectives?	Basis for Rationale
Water Quality	Temperature	NA	NA	
	Sediment/Turbidity	NA	NA	
	Chemical Contaminants/Nutrients	NA	NA	
Habitat Access	Physical Barriers	NA	NA	
Habitat Elements	Substrate	NA	NA	
	LWD	FR	M	PJ; Short term loss of 7 trees would be offset by planting trees along 1900 ft. of channel.
	Pool Frequency	NA	NA	
	Pool Quality	NA	NA	
	Off-channel habitat	FR	NR	PJ; See LWD above.
	Refugia	NA	NA	No effect.
Channel Condition and Dynamics	Width/depth ratio	NA	NA	
	Stream bank condition	NA	NA	
	Floodplain connectivity	NA	NA	
Flow/Hydrology	Change in Peak/Base Flows	NA	NA	
	Increase in Drainage Networks	NA	NA	
Watershed Conditions	Road Density and Location	PF	M	No nes roads, no change.
	Disturbance History	NA	NA	
	Riparian Reserves	NA	NA	

Dichotomous Key Determination:

1. Does the authorizing agency have discretionary authority to grant, modify, or amend provisions of the use authorization(s)? **YES**/NO/NA

If the answer is "NO", document the NO Effect determination and the evaluation is completed. If "YES", move to question #2.

2. Are there naturally reproducing bull trout present at any time of the year in riverine habitat directly or indirectly affected by the actions? YES/NO//Unknown If "YES", continue with question #3 through #11. If "NO", document the No Effect determination and the evaluation is completed.

Rationale: Cutting up to 7 mature trees would have no effect on bull trout because none of the trees would be cut within two tree lengths of the river. Therefore, it is our determination that **cutting up to 7 mature trees** on the **One Mile Island** site will have "NO EFFECT ON BULL TROUT OF THEIR HABITAT".

Determination of Affect Matrix for BULL TROUT

Authorizing Agency: U.S. Army Corps of Engineers Mgmt. Area: **Hot Springs Site**
Watershed: Upper Salmon River, Round Valley Action Type: Habitat Restoration

Specific Actions : **In the river**; opening 700 to 800 feet of an old side channel. **Outside the main stem, in Challis Hot Springs Creek**; Build gravel dams to form pools, the cobble beds, replacing culverts, excavating banks, draining a pond, excavating a new channel through a pond, installing a flume and diversion for irrigation water, installing fish screens, building a wetland and channels to take water out of it, water gaps, deepening the thalweg, building a fence, planting trees, parking & storage area(s) and continuing construction and maintenance.

Pathway	Indicator	Status of the Baseline?	Effects of the Action?	Basis for Rationale
Water Quality	Temperature 58° in creek above pond, in August. (Above 59° limits distribution.)	FR in creek and river.	R; Idaho DEQ listed temperature & sediment as a pollutants in Salmon R. – however, no reference to 12 Mile reach	PJ; Rerouting the hot spring out of the creek may create suitable water temps. in the creek. Trees would keep water temps. down.. River temps. may not be suitable in summer.
	Sediment/Turbidity	FR in creek and river.	R; M for opening old side channel.	PJ; Routing irrigation water out of creek could reduce sediment. Opening old side ch. (o.s.c.) would probably not improve sediment conditions in the river.
	Chemical Contaminants/Nutrients	PF for creek and old side channel after it is opened.	M; No site specific data. Fertilizer & fecal are main sources of nutrient or chem. pollutant.	Upper Salmon Subbasin Assmt. (11/15/2000) did not address chem/nut as pollutants in the main river. Spill kits should reduce risk. Park area 500 – 1000 fr. from river.
Habitat Access	Physical Barriers	PF – in the river NPF – in the dry side channel or the creek.	R	PJ; Concrete at end of the pond would be removed & larger culverts installed. Opening o.c.h. would increase available hbt.

Pathway	Indicator	Status of the Baseline?	Effects of the Action?	Basis for Rationale
Habitat Elements	Substrate	FR in creek N/A in old channel; FR after old channel is opened.	R	PJ; Design of structures should not effect the condition of substrate in the creek. The actions will introduce addl. gravel/cobbles to the system. Assume substrate would be suitable for over wintering in o.s.c.
	LWD	NPF in creek. N/A in old side channel. (FR after channel is opened.)	R	PJ; Planting trees along the creek and river would add LWD to both systems. Fence would protect trees. Trees along o.s.c. would add LWD.
	Pool Frequency	FR in creek. N/A in dry side channel; (FR after it's opened).	R in creek. M in side channel after it is opened.	PJ; Gravel dams, pools, deepening thalweg, should increase pool habitat. Pool hbt. not expected in o.s.c.
	Pool Quality	FR in creek. N/A in dry side channel; (FR after it's opened).	R in creek. M in side channel after it is opened.	See Pool Frequency
	Off-channel habitat	FR in creek. NPF in old side channel.	R for both.	PJ; Planting trees, the wetland, and the fence should improve. Opening the old side channel should help increase water table & improve off-ch. hbt.
	Refugia	FR for both	R in creek. M for old side channel.	PJ; Riparian zone should increase in size & condition. No effect from old side channel
Channel Condition and Dynamics	Width/depth ratio	PF in creek. N/A in o.s.c. (dry)	M in creek. R in o.s.c.	PJ; Deepening thalweg would improve w/d ratio in one reach. W/d ratio would improve in the o.s.c. after it's opened.

Pathway	Indicator	Status of the Baseline?	Effects of the Action?	Basis for Rationale
Channel Condition and Dynamics	Stream bank condition	PF in creek. NPF in o.s.c.	R uin creek. M in o.s.c.	PJ; tree planting & fence would improve condition in creek. No change from o.s.c.
	Floodplain connectivity	FR in creek. NPF in o.s.c.	R in creek. M in o.s.c.	PJ; Bank work in creek should improve flood plain connection. O.s.c. not intended to improve floodplain connect.
Flow/Hydrology	Change in Peak/Base Flows	PF in creek. FR in river.	M for both.	The water source for this creek is a spring that fluctuates little throughout the year. Project too small to cause change in watershed.
	Increase in Drainage Networks	NA	NA	See "Change in Peak/base Flows"
Watershed Conditions	Road Density and Location	PF	M	PJ; no new roads.
	Disturbance History	FR	M	See "Change in Peak/base Flows"
	Riparian Reserves	FR	M	See "Change in Peak/base Flows"

Dichotomous Key Determination:

1. Does the authorizing agency have discretionary authority to grant, modify, or amend provisions of the use authorization(s)? **YES/**NO/NA

If the answer is "NO", document the No Effect determination and the evaluation is completed. If "YES", move to question #2.

2. Are there naturally reproducing bull trout present at any time of the year in riverine habitat **directly** (no) or **indirectly** (yes) affected by the actions? YES/NO/**Unknown, probably Not. Water at mouth of creek is too warm. Snorkel survey in 2002 did Not find any bull trout in the creek.** If "YES", continue with question #3 through #11. If "NO", document the No Effect determination and the evaluation is completed.

3. Is the action likely to change the existing input of Large Woody Debris (LWD) into occupied habitat? **YES** (the answers for 3 – 11 will all be different for each type of activity, e.g. fence, culvert, cobble bed, wetland, etc.) (**Planting trees along the creek and river would add LWD, there is presently none. Old side channel should add some LWD.)**

4. Is the action likely to affect stream morphology for occupied habitat? **YES**/NO/NA (**The new channel through the pond, deepening the thalweg, & bank excavation would affect morphology; but habitat is probably NOT occupied by bull trout. Opening the old side channel would increase over-wintering habitat for adult bull trout.)**

5. Is the action likely to affect properly functioning condition of the riparian area for occupied habitat? **YES/**NO/NA. (**Excavating the banks, deepening the thalweg, and installing larger**

culverts should improve the function of this creek riparian zone. Side channel should function as a natural channel and could improve flood plain connectivity.)
6. Is the action likely to affect water quality and/or quantity in the occupied habitat?
YES/NO/NA **Water quality "yes", water quantity "no". Rerouting the hot spring would help reduce water temperatures at the mouth of the creek, possibly making it suitable for bull trout. Water quantity would not change because the spring that feeds the creek does not fluctuate much throughout the year. Water quantity in main riverwould be less when the side channel is opened.)**
7. Is the action likely to affect the water flow regime/annual hydrography in the occupied habitat? YES/**NO**/NA
8. Is the action likely to affect juvenile or adult behavior related to survival or reproduction?
YES/NO/NA **(If adults enter the river in the winter, they could use this creek if water temperatures were suitable. Adults could use the side channel in the winter.)**
9. Is the action likely to involve toxic and/or hazardous materials that may reach occupied habitat? **YES/**NO/NA (**Fluids from machines**.)
10. Is the action likely to affect juvenile or adult access to habitat? **YES**/NO/NA (**The rerouting of the hot springs, larger culverts, and the removal of the concrete structure at the pond would provide increased access to adults for over-wintering habitat. The side channel should provide increased access to over-wintering habitat for adults.)**
11. Is the action likely to affect substrate material? **YES**/NO/NA **(There could be minor shifting of material (gravel dams) until it reached a stable state, probably during the first or second year. The flows of the creek are not high enough to move material larger than sand, so there should be very little movement of materials placed in the creek by this project. There would be shifting of material in the side channel until it reach a stable state in one or two years.)**

> "NO" responses to question #3 – 11 would result in a "No Affect" finding and should be documented in the action file.
>
> A "YES", to any of the questions #3 – 11, however, requires in-depth evaluation by a professional biologist to determine if the action may affect the listed species. If the determination is made that an action "May affect" a listed species, continue with questions 12 – 15.

12. In addition the criteria listed in #3 – 11, do the actions, or the monitoring of them, likely involve any "taking", including "incidental taking" of listed or proposed species? YES/**NO**/NA **(Very low probability that bull trout are present because of warmer water temperatures at the mouth of the creek. Very low probability that bull trout are present in the river because there is no preferred habitat (e.g. large structure) in the river or old side channel.)**
13. Are the effects described in #3-11 inconsequential/temporary in nature and Not likely to degrade the habitat over time? **YES**/NO/NA **(Perhaps Not "inconsequential", but the effects should be beneficial, Not degrading.)**
14. Do the actions employ Best Management Practices (BMPs) designated to meet State water quality standards? **YES**/NO/NA
15. Is mitigation established that will preclude or reduce measurable effects on species and their habitat? **YES/**NO/NA

If the response to #12 above is "NO" and the response to criteria 13 – 15 are "YES", the determination of effects of this activity on listed or proposed salmonids is: **Opening the old side channel, building the gravel dams to form pools, the cobble beds, replacing culverts, excavating banks, draining a pond, excavating a new channel through a pond, installing a flume and diversion for irrigation water, installing fish screens, building a wetland and channels to take water out of it, water gaps, planting trees along the creek and the river, building a fence, deepening the thalweg, parking & storage area(s) and continuing construction and maintenance** on the **Hot Springs** site "MAY EFFECT BUT IS NOT LIKELY TO ADVERSELY AFFECT" bull trout or their habitat.

Rationale: The IDFG conducted snorkel surveys of Challis Hot Springs Creek in July 2002 and found no bull trout. Although this survey was not conducted at a time of year that is the most likely for bull trout to be present in the river or this stream (i.e. winter), we believe that the higher water temperatures at the mouth of Challis Hot Springs Creek would create a barrier to bull trout. As mentioned in the "Direct, Indirect and Cumulative Effects of the Proposed Projects" section in the narrative of this BA, Challis Hot springs, a natural geothermal spring, flows into the creek about 900 to 1000 feet from the confluence of the creek and the Salmon River. The unsuitable water temperatures at the mouth of the creek (63 to 66 according to Scott Kings' data, Plate 39) make it unlikely that bull trout would enter this stream. Therefore, we believe that all effects from the proposed projects would be indirect. If water temperatures were suitable for bull trout after the projects were completed, bull trout could use Challis Hot Springs Creek. If they did, we believe that all of the indirect effects associated with the projects would be beneficial. Access would be improved (culverts, channel through existing pond, removing concrete structure at end of pond, etc.), LWD would be added to the stream (planting trees & building the fence), and in-stream habitat would be improved (cobble beds, pools, etc.). The effects of continuing construction and maintenance would be similar to the effects of initial construction.

Installing the fish screens on the outlet of the channel from the new wetland to the river could have an indirect beneficial effect on adult bull trout by preventing them from entering this channel and being stranded in the wetland.

There was no recent information found that showed bull trout present in or near the 12 Mile Project reach of the Salmon River. The work on the old side channel would be done in a dry channel from October (or late August) to January 15. The only possible direct effect would be when the ends of the new channel are opened to allow flows from the river to enter the side channel. Bull trout are not likely to be present in the vicinity of the old channel because of poor habitat but if they were present at either end of the channel, they could easily avoid the work area in favor of better river habitat. The machine would work slowly to allow fish to escape if they were present. Precautions to prevent toxic spills, such as hydraulic fluid, would be taken and spill kits would be on hand to confine and quickly pick up a possible spill. The new side channel should provide good over-wintering habitat for bull trout if they use this reach of the Salmon River. Planting trees should help increase large wood in the channel. The effects of continuing construction would be similar to the effects of initial construction.

Determination of Affect Matrix for BULL TROUT

Authorizing Agency: U.S. Army Corps of Engineers Mgmt. Area: **Hot Springs Site**
Watershed: Upper Salmon River, Round Valley Action Type: Habitat Restoration
Specific Actions : **Outside the main stem of the river;** Cutting 7 to 10 mature trees.

Pathway	Indicator	Status of the Baseline?	Effects of the Action?	Basis for Rationale
Water Quality	Temperature	NA	NA	PJ; Trees cut would be two tree lengths from river.
	Sediment/Turbidity	NA	NA	
	Chemical Contaminants/Nutrients	NA	NA	
Habitat Access	Physical Barriers	NA	NA	
Habitat Elements	Substrate	NA	NA	
	LWD	FR	M	PJ; Short term loss of 7 – 10 trees would be offset by planting trees along 14,000 – 18,000 ft. of channel.
	Pool Frequency	NA	NA	
	Pool Quality	NA	NA	
	Off-channel habitat	NA	NA	PJ; See LWD
	Refugia	NA	NA	PJ; See LWD
Channel Condition and Dynamics	Width/depth ratio	NA	NA	
	Stream bank condition	NA	NA	
	Floodplain connectivity	NA	NA	
Flow/Hydrology	Change in Peak/Base Flows	NA	NA	
	Increase in Drainage Networks	NA	NA	
Watershed Conditions	Road Density and Location	PF	M	No new roads.
	Disturbance History	NA	NA	
	Riparian Reserves	NA	NA	

Dichotomous Key Determination:

1. Does the authorizing agency have discretionary authority to grant, modify, or amend provisions of the use authorization(s)? **YES**/NO/NA

If the answer is "NO", document the No Effect determination and the evaluation is completed. If "YES", move to question #2.

2. Are there naturally reproducing bull trout present at any time of the year in riverine habitat directly or indirectly affected by the actions? YES/**NO**/NA/ If "YES", continue with question

#3 through #11. If “NO”:, document the No Effect determination and the evaluation is completed.

Rationale: Cutting up to 7 mature trees would have no effect on bull trout because none of the trees would be cut within two tree lengths of the river. This action would have no direct, indirect or cumulative effects on bull trout. Therefore, it is our determination that **cutting 7 to 10 mature trees** on the **Hot Springs site** will have “NO EFFECT ON BULL TROUT OR THEIR HABITAT”.

Determination of Affect Matrix for BULL TROUT

Authorizing Agency: U.S. Army Corps of Engineers Mgmt. Area: **Pennal Gulch**
Watershed: Upper Salmon River, Round Valley Action Type: Habitat Restoration
Specific Actions : **In or along the side channel/slough;** Building water gaps, constructing a new channel around a wetland, building a levee between the new channel and the wetland, barbs in the new channel, a culvert, excavating down an existing side channel, bank logs on side channel, high flow channel across road, reopening an old side channel for intermittent flows, build a fence, plant trees, temporary roads, parking & storage area(s), and continuing construction and maintenance.

Pathway	Indicator	Status of the Baseline?	Effects of the Actions?	Basis for Rationale
Water Quality	Temperature	FR	R	PJ; Side channel temps may be suitable, would be joined by spring water from an existing side ch. May help reduce temps in river.
	Sediment/Turbidity	PF, in the existing side channel/slough. NA in the new channel, it's dry.	M	PJ; Opening new side ch. would generate sediment. Should stabilize in 1 or 2 years.
	Chemical Contaminants/Nutrients	PF	M	Upper Salmon Subbasin Assmt. (11/15/2000) did not address chem/nut as pollutants in the main river. Spill kits should reduce risk. Park area is 500 – 1500 ft. from the river.
Habitat Access	Physical Barriers	FR	R	PJ; Beaver dams in existing channel may be barriers. New channel/slough & culvert would be designed for fish passage.
Habitat Elements	Substrate	FR	R	PJ No site specific data. Perennial flow in new hannel/slough could clean the substrate.

Pathway	Indicator	Status of the Baseline?	Effects of the Actions?	Basis for Rationale
Habitat Elements	LWD	FR	R	PJ; Planting trees along the side channel/slough would add LWD to the system.
	Pool Frequency	FR	R	PJ; Barbs & channel work should increase pool habitat. No site-specific data.
	Pool Quality	PF	M or R	See Pool Frequency
	Off-channel habitat	FR	R	PJ; Planting trees and the fence should improve this. Much of the hbt. is in good or better condition.
	Refugia	FR	R	PJ; New side channel/slough should increase over-winter habitat.
Channel Condition and Dynamics	Width/depth ratio	PF	R or D	PJ; W/d would improve in the side channel, may decline in the main river due to water diverted into the side chan/slough.
	Stream bank condition	PF	M	PJ; Bank logs, trees & barbs would help improve stability.
	Floodplain connectivity	FR	R	PJ; New sice ch./slough, culvert, lowering levee, would all help reconnect flood plain.
Flow/Hydrology	Change in Peak/Base Flows	FR	M	PJ; Project too small to effect watershed.
	Increase in Drainage Networks	NA	NA	
Watershed Conditions	Road Density and Location	PF	M	No new roads.
	Disturbance History	FR	M	See Change in Peak/base Flows
	Riparian Reserves	FR	M	See Change in Peak/base Flows

Dichotomous Key Determination:

1. Does the authorizing agency have discretionary authority to grant, modify, or amend provisions of the use authorization(s)? **YES**/NO/NA

If the answer is "NO", document the No Effect determination and the evaluation is completed. If "YES", move to question #2.

2. Are there naturally reproducing bull trout present at any time of the year in riverine habitat **directly** (no) or **indirectly** (yes) affected by the actions? YES/NO/ **Unknown, No survey data for main stem of the Salmon River.** If "YES", continue with question #3 through #11. If "NO": document the No Effect determination and the evaluation is completed.
3. Is the action likely to change the existing input of Large Woody Debris (LWD) into occupied habitat? **YES** (the answers for 3 – 11 will all be different for each type of activity, e.g. fence, culvert, cobble bed, wetland, etc.) **The habitat is probably Not occupied by bull trout. But if they use the side channel/slough system, there would be more LWD available because the trees that are planted would add LWD; Not much LWD presently.)**
4. Is the action likely to affect stream morphology for occupied habitat? **YES**/NO/NA **(The new channel, existing side channel/slough system, and the old channel that is reopened would be designed to function as a natural system.)**
5. Is the action likely to affect properly functioning condition of the riparian area for occupied habitat? **YES**/NO/NA. (**Excavating the existing side channel, opening a new side channel, the levee along the new channel, the barbs, anchor logs, and installing larger culverts should improve the function of this side channel/slough system by tying it to the main stem of the river at both ends).**
6.Is the action likely to affect water quality and/or quantity in the occupied habitat? **YES/**NO/NA (**Water quality may be improved because water entering the side channel/slough system , as well as the old side channel that is reopened, would drop some of the sediment in the river water. Water quantity would be less in the main stem of the river when some of the flow is diverted into the side channel/slough system. This water would reenter the main river about 4300 to 4500 feet downstream from the upstream end of the side channel/slough. The riparian vegetation shading the side channel would help cool the water before it went back into the river.)**
7. Is the action likely to affect the water flow regime/annual hydrography in the occupied habitat? YES/NO/NA
8. Is the action likely to affect juvenile or adult behavior related to survival or reproduction? **YES**/NO/NA **(If adults enter the river in the winter, they could use this side channel/slough system for over-wintering.)**
9. Is the action likely to involve toxic and/or hazardous materials that may reach occupied habitat? **YES/**NO/NA (**Fluids from machines**.)
10. Is the action likely to affect juvenile or adult access to habitat? **YES/**NO/NA (**The new channel/slough would make additional over-wintering habitat available if bull trout were present)**
11. Is the action likely to affect substrate material? **YES**/NO/NA **(There could be minor shifting of material when the new side channel/slough system is opened, and when the old channel is reopened. This should stabilize itself in the first year or two.)**

"NO" responses to question #3 – 11 would result in a "No Affect" finding and should be documented in the action file.

A "YES", to any of the questions #3 – 11, however, requires in-depth evaluation by a professional biologist to determine if the action may affect the listed species. If the determination is made that an action "May affect" a listed species, continue with questions 12 – 15.

12. In addition the criteria listed in #3 – 11, do the actions, or the monitoring of them, likely involve any "taking", including "incidental taking" of listed or proposed species? **YES/**NO/NA **(Very low probability that bull trout are present. Beaver dams & braided channels may present barriers to adults. Low probability of juveniles being present.)**
13. Are the effects described in #3-11 inconsequential/temporary in nature and Not likely to degrade the habitat over time? **YES/**NO/NA **(Perhaps Not "inconsequential", but the effects should be beneficial, Not degrading.)**
14. Do the actions employ Best Management Practices (BMPs) designated to meet State water quality standards? **YES**/NO/NA
15. Is mitigation established that will preclude or reduce measurable effects on species and their habitat? **YES/**NO/NA

If the response to #12 above is "NO" and the response to criteria 13 – 15 are "YES", the determination of effects of this activity on listed or proposed salmonids is: The **water gaps, the fence**, **constructing a new channel around a wetland, between the new channel and the wetland, barbs in the new channel, a culvert in the new channel, excavating down an existing side channel, logs on a side channel bank, high flow channel across a road, reopening an old side channel for intermittent flows, planting trees, constructing temporary roads, and continuing construction and maintenance** on the Pennel Gulch site "MAY EFFECT BUT IS NOT LIKELY TO ADVERSELY AFFECT" BULL TROUT OR THEIR HABITAT.

Rationale: The work on the new side channel, the levee between the wetland and the new side channel, the barbs in the side channel, the bank logs, the high flow channel across the road, the old channel that would be reopened, and the temporary roads would all be done on dry land. An adult bull trout could get into the wetland from the downstream exit of the wetland. It is highly unlikely that a bull trout would go into a wetland with such unsuitable habitat (i.e. about 80 percent of the wetland is occupied by cattail). It is very unlikely that bull trout would be in the wetland near the new channel and levee during the in-water work window because the lower river flows cause the wetland edge to become dewatered for 10 to 20 feet.

Adult access up the existing side channel/slough may be impeded or excluded by a series of beaver dams and braided channels adjacent to the dams. Juveniles would not be present because summer temperatures are Not suitable for rearing.

The in-water work for the culvert, excavating the existing side channel/slough, and the water gaps in the fence would proceed slowly in order to allow fish to escape if they were present. The crew would also be trained to salvage any fish if necessary and put them back in the system upstream from the work site. All vehicles and machines would be equipped with spill kits to contain and pick up any toxic fluid that may be spilled. Another precaution would be the use of turbidity curtains and/or pumps to reduce sediment and possible impacts to fish.

The effects of continuing construction and maintenance would be similar to the effects of initial construction.

Determination of Affect Matrix for BULL TROUT

Authorizing Agency: U.S. Army Corps of Engineers Mgmt. Area: **Pennal Gulch**
Watershed: Upper Salmon River, Round Valley Action Type: Habitat Restoration
Specific Actions : **In the main stem of the river;** Lowering the levee at the Sportsman's Access, breeching a levee upstream from the Sportsman's Access, building a rock sill in the river near the breeched levee, installing 48-inch culverts at both levee sites and continuing construction and maintenance.

Pathway	Indicator	Status of the Baseline?	Effects of the Action?	Basis for Rationale
Water Quality	Temperature	FR	R Upper Salmon Subbasin Assmt. (11/15/2000) addressed sediment & temps. in the main river.	PJ; Sill and levee work should help improve temps by increasing the size of the riparian woodland.
	Sediment/Turbidity	FR	R	PJ. Some sediment in the river should be deposited in the old side ch. & side ch./slough.
	Chemical Contaminants/Nutrients	PF	M Upper Salmon Subbasin Assmt. did not address chem/nut as pollutants in the main river.	PJ; Spill kits should reduce risks.
Habitat Access	Physical Barriers	PF	R	PJ; The culverts would be designed to allow fish passage to the side chan/slough.
Habitat Elements	Substrate	NPF	M.	PJ; site specific data. Sill designed to prevent deposition of substrate at entrance of new side channel.
	LWD	NPF	R	PJ;The levee & culvert may imcrease the flood plain which would influence establishment of riparian veg. & LWD.
	Pool Frequency	NPF	R	PJ; no site-specific data for present condition. Indirect influence - culvert will allow flows to scour pools in the new side ch.

Pathway	Indicator	Status of the Baseline?	Effects of the Action?	Basis for Rationale
Habitat Elements	Pool Quality	NPF	R	See Pool Frequency.
	Off-channel habitat	NPF	M	PJ; Indirect influence; culvert & levee work would reestablish some floodplain connection.
	Refugia	FR	M	See Off-channel habitat.
Channel Condition and Dynamics	Width/depth ratio	PF	R or D Indirect effects.	PJ; W/d would improve in the side channel; may decline in the main river due to water diverted into the side channel.
	Stream bank condition	NPF Banks steep & armored along this site	R	PJ; ; levee work & culvert indirectly improve bank cond.
	Floodplain connectivity	NPF	R	PJ; Levee work & culverts would restore some floodplain connection.
Flow/Hydrology	Change in Peak/Base Flows	FR	M	PJ; Levee & culverts would not effect peak/base flows.
	Increase in Drainage Networks	NA	NA	Project too small to have any effect on the watershed.
Watershed Conditions	Road Density and Location	PF	M	No new roads.
	Disturbance History	FR	M	See Inc. in Drainage Networks
	Riparian Reserves	FR	M	See Inc. in Drainage Networks

Dichotomous Key Determination:

1. Does the authorizing agency have discretionary authority to grant, modify, or amend provisions of the use authorization(s)? **YES**/NO/NA

If the answer is "NO", document the No Effect determination and the evaluation is completed. If "YES", move to question #2.

2. Are there naturally reproducing bull trout present at any time of the year in riverine habitat **directly** (no) or **indirectly** (yes) affected by the actions? YES/NO /**Unknown, no survey data for main stem Salmon River.**

If "YES", continue with question #3 through #11. If "NO" document the No Effect determination and the evaluation is completed.

3. Is the action likely to change the existing input of Large Woody Debris (LWD) into occupied habitat? YES/**NO**/NA (the answers for 3 – 11 will all be different for each type of activity, e.g.

fence, culvert, cobble bed, wetland, etc.) (**The levee work and culverts may indirectly increase the flood plain which would influence establishment of riparian vegetation and LWD.)**

4. Is the action likely to affect stream morphology for occupied habitat? **YES/**NO/NA **(The levee work and culverts would divert part of the main stem flows for about 4300 to 4500 feet.)**

5. Is the action likely to affect properly functioning condition of the riparian area for occupied habitat? **YES/**NO/NA. **(Breeching and lowering the levees would allow opening the old side channel and the new side channel/slough, which should improve riparian function.)**

6.Is the action likely to affect water quality and/or quantity in the occupied habitat? **YES/**NO/NA (**Water quality may be improved because water entering the side channel/slough system , as well as the old side channel that is reopened, would trap some of the sediment in the river water. Water quantity would be less in the main stem of the river when some of the flow is diverted into the side channel/slough system. This water would reenter the main river about 4300 to 4500 feet downstream from the upstream end of the side channel/slough. The riparian vegetation shading the side channel would help cool the water before it went back into the river.)**

7. Is the action likely to affect the water flow regime/annual hydrography in the occupied habitat? YES/**NO**/NA.

8. Is the action likely to affect juvenile or adult behavior related to survival or reproduction? YES/**NO/**NA **(Juvenile bull trout may not present in the Salmon River because water temperatures are too warm. If adult bull trout were in the river, their behavior should not be changed by the sill or levee work.)**

9. Is the action likely to involve toxic and/or hazardous materials that may reach occupied habitat? **YES**/NO/NA (**Fluids from machines**.)

10. Is the action likely to affect juvenile or adult access to habitat? **YES**/NO/NA (**Adult bull trout would have access to the new side channel/slough as over-wintering habitat. Juveniles probably would Not be present to use the side channel/slough.)**

11. Is the action likely to affect substrate material? YES/**NO**/NA **(The sill would be designed to prevent deposition of substrate at the entrance of the new side channel. Some substrate may go through the culvert at the lowered levee and into the old side channel. This should stabilize itself in the first year or two.)**

> "NO" responses to question #3 – 11 would result in a "No Affect" finding and should be documented in the action file.
>
> A "YES", to any of the questions #3 – 11, however, requires in-depth evaluation by a professional biologist to determine if the action may affect the listed species. If the determination is made that an action "May affect" a listed species, continue with questions 12 – 15.

12. In addition the criteria listed in #3 – 11, do the actions, or the monitoring of them, likely involve any "taking", including "incidental taking" of listed or proposed species? YES/**NO**/NA **(Habitat components that bull trout prefer, such as large wood and structures, or overhanging banks, are Not present along the river bank at either of the levee work sites.**

It is unlikely that bull trout would be present at these sites because of the poor quality habitat.)

13. Are the effects described in #3-11 inconsequential/temporary in nature and Not likely to degrade the habitat over time? **YES**/NO/NA **(Perhaps Not "inconsequential", but the effects should be beneficial, Not degrading.)**

14. Do the actions employ Best Management Practices (BMPs) designated to meet State water quality standards? **YES/**NO/NA

15. Is mitigation established that will preclude or reduce measurable effects on species and their habitat? **YES/**NO/NA

If the response to #12 above is "NO" and/or the response to criteria 13 – 15 are "YES", the determination of effects of this activity on listed or proposed salmonids is: The **breeching of one levee and lowering the levee at the Sportsman's Access, building a rock sill in the river, installing culverts, and continuing construction and maintenance** on the Pennal Gulch site "MAY EFFECT BUT IS NOT LIKELY TO ADVERSELY AFFECT" BULL TROUT OR THEIR HABITAT.

Rationale: There was no recent information found that showed bull trout present in or near the 12 Mile Project reach of the Salmon River. The probability of bull trout being present in the Pennal Gulch site during construction of the rock sill, lowering and breeching levees, and installing the culverts is very low because the site has none of the components that bull trout prefer (i.e. large structure, large wood, water temperature, and overhanging banks). If bull trout were present, they could easily avoid the work area in favor of other river habitat. The machine would work slowly in order to allow fish to escape from the area if they were present. Standard precautions to prevent toxic spills, such as hydraulic fluid, would be taken and spill kits would be on hand to confine and quickly pick up a possible spill. The effects of continuing construction and maintenance would be similar to the effects of initial construction.

Determination of Affect Matrix for BULL TROUT

Authorizing Agency: U.S. Army Corps of Engineers Mgmt. Area: **Pennal Gulch**
Watershed: Upper Salmon River, Round Valley Action Type: Habitat Restoration
Specific Actions : **Outside the main stem or side channel/slough**; Cutting up 5 to 10 mature trees.

Pathway	Indicator	Status of the Baseline?	Effects of the Action?	Basis for Rationale
Water Quality	Temperature	NA	NA	PJ; Trees would be two tree lengths from the river.
	Sediment/Turbidity	NA	NA	
	Chemical Contaminants/Nutrients	NA	NA	
Habitat Access	Physical Barriers	NA	NA	No affect on access.
Habitat Elements	Substrate	NA	NA	
	LWD	FR	R	PJ; Short term loss of 5 – 10 trees would be offset by planting trees along 300 - 400 ft. of channel.
	Pool Frequency	NA	NA	
	Pool Quality	NA	NA	
	Off-channel habitat	NA	NA	PJ; See LWD
	Refugia	NA	NA	PJ; See LWD
Channel Condition and Dynamics	Width/depth ratio	NA	NA	
	Stream bank condition	NA	NA	
	Floodplain connectivity	NA	NA	
Flow/Hydrology				
	Change in Peak/Base Flows	NA	NA	Project too small to have any effect on the watershed.
	Increase in Drainage Networks	NA	NA	See Change in Peak/base Flows
Watershed Conditions	Road Density and Location	PF	M	No new roads.
	Disturbance History	NA	NA	See Change in Peak/base Flows
	Riparian Reserves	NA	NA	See Change in Peak/base Flows

Dichotomous Key Determination:

1. Does the authorizing agency have discretionary authority to grant, modify, or amend provisions of the use authorization(s)? **YES**/NO/NA

If the answer is "NO", document the No Effect determination and the evaluation is completed. If "YES", move to question #2.

2. Are there naturally reproducing bull trout present at any time of the year in riverine habitat directly or indirectly affected by the actions? YES/NO/Unknown If "TES", continue with question #3 through #11. If "NO", document the No Effect determination and the evaluation is completed.

Rationale: Cutting 5 to 10 mature trees would have no effect on bull trout because none of the trees would be cut next to the river or within two tree lengths. These actions would have no direct, indirect or cumulative effects on bull trout. Therefore, it is our determination that **cutting 5 to 10 mature trees** on the Pennal Gulch site will have "NO EFFECT ON BULL TROUT OR THEIR HABITAT".

Summary of ESA terrestrial species and determination of effects from proposed actions on the 12 Mile Project near Challis, Idaho.

Species	**ESA Status**	**Occurrence in the 12 Mile Project area.**	**Determination of Project Effects**	**Criteria used for Determination**
Bald Eagle (*Haliaeetus leucocephalus)*	Threatened	Present. Up to 30 in winter. No known nests.	May affect, Not likely to adversely effect.	No work scheduled for spring/summer. If birds nested on any of the five project sites there would be No impacts. Human & machinery disturbance during the winter would be limited to one project site per winter. The activities could disturb eagles and cause them to leave the project site for a few days or until the project was completed. Continuing construction & maintenance) would have the same effects on eagles. If the birds were disturbed from a site, there are plentiful perch and hunting stands of hardwoods along the rest of the 12 Mile reach. Their main food source in winter is carrion so construction should have little or no effect on food for eagles.
Canada Lynx (*Lynx canadensis)*	Threatened	Presence unlikely. No known sightings.	NO EFFECT.	The habitat is only suitable for travel. Lynx would have to cross 10 to 12 miles of open, unsuitable habitat from the west to reach this area. They could follow the Salmon River from the mountains to the south of Challis (roughly 35 miles) or drop into the Salmon River from the mountains to the north (about 15 or 20 miles from Challis). Highly unlikely they would travel that far from suitable habitat to travel or take up residence in the river corridor. Human activity/density in the Round Valley would also deter them from this area.
Gray Wolf (*Canus lupus)*	Experimental, non-essential population	Presence unlikely. No known sightings in Round Valley.	May affect Not likely to adversely effect.	Some probable sightings on adjacent National Forest land. The habitat in the 12 Mile Project area is only suitable for travel. Same reasoning as for lynx. Greater possibility of wolves coming into Round Valley because open, non-forested habitat is Not as much of a barrier for them as for lynx. Although there is a higher possibility of a wolf coming into this area, it is very unlikely because of high human activity and density. The effects of continuing construction and maintenance would be similar to the effects of initial construction.
Yellow-billed cuckoo (*Coccyzus americanus)*	Candidate species	One confirmed sighting during breeding season near Pennal Gulch.	May affect not likely to adversely effect. (likely beneficial effects)	All work would be done between late August (or Oct.) and March 1. The probability that a yellow-billed cuckoo would be present during this work window is low because they probably migrate some time from late August to early September, and do not return until April or later. About 20 to 50 mature trees may be cut for the whole project over 5 to 7 years. This would reduce habitat, but 60 to 100 acres would be planted with tree. The long-term benefits would outweigh the loss of 20 to 50 trees. There are only a few suitable habitat patches in the 12 Mile reach (i.e. >38 acres, >325 feet across, with tree canopy closures > 40 %; [The Nature Conservancy, 1999]).

Determination of Affect Matrix for SOCKEYE SALMON

Authorizing Agency: U.S. Army Corps of Engineers Mgmt. Area: **Highway 93 Bridge site**
Watershed: Upper Salmon River, Round Valley Action Type: Habitat Restoration
Specific Actions : **In the main stem of the river and in and along the new side channel**; Construct a rock sill in the river, construct a new side channel & excavate ends to connect to the river, point bars, French drain & refuge pool, barbs to create pools, levee for flood plain connection, pipe arch, high flow channel, construct a hardened road section, build a jack fence, plant trees, parking & storage area(s), and continuing construction and maintenance.

Pathway	Indicator	Status of the Baseline?	Effects of the Action?	Basis for Rationale
Water Quality	Temperature	FR, this is presently a dry channel .	R M – for the sill	PJ; Trees would shade the channel, fence would protect trees. Sill has no influence.
	Sediment/Turbidity	NA, dry channel FR for sill/river	M	PJ; Mobilized sediment should stabilize after the initial watering-up of the new channel.
	Chemical Contaminants/Nutrients	PF	M; not expected to cause any increase.	Upper Salmon Subbasin Assmt. (11/15/2000) addressed sediment & temps. in the main river. Spill kits should reduce risks. Park area is 500 – 1000 ft. from the river.
Habitat Access	Physical Barriers	PF	R M - for the sill	PJ; side channel would increase access.
Habitat Elements	Substrate	NA; projects are in a dry channel & on dry land. NPF – for the sill.	R. (See Sediment/Turbidity above.) M – Sill; designed to prevent substrate deposition at entrance of new side channel.	No site-specific data available. Substrate size should be suitable for migration. No spawning potential.
	LWD	NA; new channel & related projects are on dry land. FR – for the sill	R M – for the sill.	PJ; Trees should enter the side channel & create LWD

Pathway	Indicator	Status of the Baseline?	Effects of the Action?	Basis for Rationale
	Pool Frequency	(FR after channel is opened. FR – for the sill	R (after channel is opened) M – for the sill	PJ: Barbs should create pools in addition to the refuge pool. Sill would indirectly help create pool hbt. in side ch. by directing flows into the side channel.
Habitat Elements	Pool Quality	(PF after channel is opened) FR – for the sill	R	See Pool Frequency
	Off-channel habitat	FR	R	PJ; Should be some habitat after channel is opened.
	Refugia	FR	M	PJ: No change in refugia.
Channel Condition and Dynamics	Width/depth ratio	NA; dry channel PF – for the sill	R or D Indirect effects from sill diverting water from the main river.	PJ; W/d would improve in the side channel, may decline in the main river due to water diverted into the side channel.
	Stream bank condition	NA; dry channel FR – for the sill	R	PJ; Banks along new channel would meet objectives.
	Floodplain connectivity	FR	R.	PJ; Floodplain connection should be better after project. Sill would indirectly effect flood plain connection by directing flow into the new side channel
Flow/Hydrology	Change in Peak/Base Flows	FR	M	PJ: The side channel would not affect peak/base flows.
	Increase in Drainage Networks	NA	NA	Project too small to have any effect on the watershed.
Watershed Conditions	Road Density and Location	PF	M	No new roads.
	Disturbance History	FR	M	See Increase Drainage Networks
	Riparian Reserves	FR	NA	See Increase Drainage Networks

Dichotomous Key Determination:

1. Does the authorizing agency have discretionary authority to grant, modify, or amend provisions of the use authorization(s)? **YES**

If the answer is "NO", document the No Effect determination and the evaluation is completed. If "YES", move to question #2.

2. Are there naturally reproducing Sockeye Salmon present at any time of the year in riverine habitat directly or indirectly affected by the actions? **YES/**NO/NA

If "YES", continue with question #3 through #11. If "NO, document the No Effect determination and the evaluation is completed.

3. Is the action likely to change the existing input of Large Woody Debris (LWD) into occupied habitat? **YES** (the answers for 3 – 11 will all be different for each type of activity, e.g. fence, culvert, cobble bed, wetland, etc.) (**It would increase the LWD**.)

4. Is the action likely to affect stream morphology for occupied habitat? **YES/**NO/NA **(The new side channel would be designed to function as a natural part of the river. The sill would direct flows to the new side channel.)**

5. Is the action likely to affect properly functioning condition of the riparian area for occupied habitat? **YES/**NO/NA **(Side channel design should function as a natural channel & should improve flood plain connectivity. The sill would not affect proper function.)**

6. Is the action likely to affect water quality and/or quantity in the occupied habitat? YES/**NO**/NA (**Water quality "NO", water quantity – the side channel would temporarily divert part of the flows from the river.)**

7. Is the action likely to affect the water flow regime/annual hydrography in the occupied habitat? YES/**NO/**NA.

8. Is the action likely to affect juvenile or adult behavior related to survival or reproduction? **YES/**NO/NA **(Adults could use the side channel during migration.)**

9. Is the action likely to involve toxic and/or hazardous materials that may reach occupied habitat? **YES/**NO/NA (**Fluids from machines**.)

10. Is the action likely to affect juvenile or adult access to habitat? **YES**/NO/NA **(The side channel would be available for adult migration.)**

11. Is the action likely to affect substrate material? **YES/**NO/NA (**When the channel is opened, there would be shifting of material until it reached a stable state, probably during the first or second year. The sill would move around the substrate in the river.)**

"NO" responses to question #3 – 11 would result in a "No Affect" finding and should be documented in the action file.

A "YES", to any of the questions #3 – 11, however, requires in-depth evaluation by a professional biologist to determine if the action may affect the listed species. If the determination is made that an action "May affect" a listed species, continue with questions 12 – 15.

12. In addition the criteria listed in #3 – 11, do the actions, or the monitoring of them, likely involve any "taking", including "incidental taking" of listed or proposed species? YES/**NO**/NA (**There is no possibility of a "take" for any of the side channel work or the sill because this work would be done when sockeye are not present. The only work that would be done in the water is construction of the sill and opening the ends of the new side channel.**)

13. Are the effects described in #3-11 inconsequential/temporary in nature and Not likely to degrade the habitat over time? **YES/**NO/NA **(Perhaps not "inconsequential", but the effects should be beneficial, Not degrading.)**
14. Do the actions employ Best Management Practices (BMPs) designated to meet State water quality standards? **YES**/NO/NA
15. Is mitigation established that will preclude or reduce measurable effects on species and their habitat? **YES/**NO/NA

If the response to #12 above is "NO" and/or the response to criteria 13 – 15 are "YES", the determination of effects of this activity on listed or proposed anadromous salmonids is: The construction of a **rock sill, construct a new side channel & excavate ends to connect to the river, point bars, French drain & refuge pool, barbs to create pools, levee for flood plain connection, pipe arch, high flow channel, construct a hardened road section in the overflow channel, build a jack fence, plant trees, parking & storage area(s), and continuing construction and maintenance** at the **Highway 93 Bridge** site will have "MAY EFFECT AND IS NOT LIKELY TO ADVERSELY AFFECT" SOCKEYE SALMON, or their habitat.

Rationale: Adult sockeye would not be migrating when the work is done from October (or late August, depending on which work window is used) to January 15. Sockeye do not spawn in the 12 Mile reach of the Salmon River. Juvenile sockeye do not rear in the Salmon River. Precautions to prevent toxic spills, such as hydraulic fluid, would be taken and spill kits would be on hand to confine and quickly pick up a possible spill. The effects of continuing construction and maintenance would be similar to the effects of initial construction.

Determination of Affect Matrix for SOCKEYE SALMON

Authorizing Agency: U.S. Army Corps of Engineers Mgmt. Area: **Highway 93 Bridge site**
Watershed: Upper Salmon River, Round Valley Action Type: Habitat Restoration
Specific Actions : **Away from the river**; Cut 4 to 10 mature trees, install barbs on the Highway 93 fill slope, place boulders.

Pathway	Indicator	Status of the Baseline?	Effects of the Action?	Basis for Rationale
Water Quality .	Temperature	FR	R	PJ; Boulders may help protect trees, that would shade the banks.
	Sediment/Turbidity	NA	NA	
	Chemical Contaminants/Nutrients	NA	NA	
Habitat Access	Physical Barriers	NA	NA	No affect on access.
Habitat Elements	Substrate	NA	NA	
	LWD	FR	R; Loss of 4 – 10 trees would be offset by planting trees along 600 feet of channel.	PJ; Boulders protecting trees that would eventually add LWD.
	Pool Frequency	NA	NA	
	Pool Quality	NA	NA	
	Off-channel habitat	FR	R;See LWD	PJ; Boulders would protect riparian zone.
	Refugia	NA	NA	
Channel Condition and Dynamics	Width/depth ratio	NA	NA	
	Stream bank condition	NA	NA	
	Floodplain connectivity	NA	NA	
Flow/Hydrology	Change in Peak/Base Flows	NA	NA	
	Increase in Drainage Networks	NA	NA	
Watershed Conditions	Road Density and Location	PF	M	PJ; Boulders & fence would decrease vehicle access in riparian zone.
	Disturbance History	NA	NA	
	Riparian Reserves	NA	NA	

Dichotomous Key Determination:

1. Does the authorizing agency have discretionary authority to grant, modify, or amend provisions of the use authorization(s)? **YES/**NO/NA

If the answer is "NO", document the No Effect determination and the evaluation is completed. If "YES", move to question #2.

2. Are there naturally reproducing Snake River sockeye salmon present at any time of the year in riverine habitat directly or indirectly affected by the actions? YES/**NO**/NA. If "YES", continue with question #3 through #11. If "NO", document the No Effect determination and the evaluation is completed. **Cutting 4 to 10 trees, placing boulders and installing barbs along Highway 93** at the Highway 93 Bridge site will have NO EFFECT ON SOCKEYE SALMON OR THEIR HABITAT.

Rationale: All of this work would be done on dry land from 20 to 1000 feet from the river. Adult sockeye would not be migrating when the work is done from October (or late August, depending on which work window is used) to January 15. Sockeye do not spawn in the 12 Mile reach of the Salmon River. Juvenile sockeye do not rear in the Salmon River. Precautions to prevent toxic spills, such as hydraulic fluid, would be taken and spill kits would be on hand to confine and quickly pick up a possible spill. The effects of continuing construction and maintenance would be similar to the effects of initial construction.

Determination of Affect Matrix for SOCKEYE SALMON

Authorizing Agency: U.S. Army Corps of Engineers Mgmt. Area: **Dunfee Slough**
Watershed: Upper Salmon River, Round Valley Action Type: Habitat Restoration
Specific Actions : **In the main stem of the river and in or along the side channel/slough;** Construct a rock sill & install a 48" culvert, construct 200 to 400 feet of new channel, rearrange pond spillway rock, install fish screens, planting trees, building a fence, deepen ponds and the channels between them, parking and storage area(s) and continuing construction and maintenance.

Pathway	Indicator	Status of the Baseline?	Effects of the Action?	Basis for Rationale
Water Quality	Temperature	FR, this is a dry channel in the winter.	R M – for the sill & culvert	PJ; Planting trees will help reduce water temps., fence would protect the trees.
	Sediment/Turbidity	FR – for the side channel/slough and the main river	M Idaho DEQ listed sediment as a pollutant in Salmon R. – however, No reference to 12 Mile reach.	PJ; Design of new side channel/slough may decrease sediment in side ch/slough. No site specific date.
	Chemical Contaminants/Nutrients	PF	M	PJ; Upper Salmon Subbasin Assmt. (11/15/2000) addressed sediment & temps. in the main river. Spill kits should reduce risks. Park area is400- 800 ft. from the river.
Habitat Access	Physical Barriers	NPF – for the side channel PF – for the river & sill	R – for the side ch M – for the sill/river	PJ; No affect on access. Side ch. will increase migration habitat. The culvert would allow access to the side ch/slough.
Habitat Elements	Substrate	NPF	R – for side ch/slough M – sill designed to prevent substrate deposition at entrance of new side channel.	PJ; No site-specific data available. Assume habitat suitable for rearing, migration, &over-wintering.

Pathway	Indicator	Status of the Baseline?	Effects of the Action?	Basis for Rationale
Habitat Elements	LWD	FR	R	PJ; LWD should increase in side channel/slough. Sill would have little influence.
	Pool Frequency	FR; existing side ch/slough dries up in winter. FR-river also.	R	PJ; Ponds may serve as pool habitat. Sill would indirectly help create pool hbt. in side ch/slough.
	Pool Quality	FR	R	See Pool Frequency
	Off-channel habitat	FR – side channel & river	R	PJ; New side channel/slough, trees, fence etc. would improve hbt.
	Refugia	FR – side channel and river	R	See Off-channel Habitat.
Channel Condition and Dynamics	Width/depth ratio	PF – for the new channel, (maybe not for the existing side channel-slouogh.)	R or D (?)	PJ; W/d would improve in the side channel, may decline in the main river due to water diverted into the side channel/slough.
	Stream bank condition	PF – side channel FR – river	M	PJ; side ch/slough banks would remain stable & should function naturally.
	Floodplain connectivity	FR	R	PJ; side channel/slough connection to river should improve floodpl. connectivity. Sill would indirectly improve flood pl. connect by directing water into side ch/sl.
Flow/Hydrology	Change in Peak/Base Flows	FR	M	PJ; The side channel/slough would Not affect peak/base flows.
	Increase in Drainage Networks	NA	NA	PJ; Project too small to have any effect on watershed.
Watershed Conditions	Road Density and Location	PF	M	No new roads.
	Disturbance History	FR	M	See Incr. In Drainage Networks
	Riparian Reserves	FR	M	See Incr. In Drainage Networks

Dichotomous Key Determination:

1. Does the authorizing agency have discretionary authority to grant, modify, or amend provisions of the use authorization(s)? **YES**

If the answer is "NO", document the No Effect determination and the evaluation is completed. If "YES", move to question #2.

2. Are there naturally reproducing Sockeye Salmon present at any time of the year in riverine habitat directly or indirectly affected by the actions? **YES** If "YES", continue with question #3 through #11. If "NO, document the No Effect determination and the evaluation is completed.

3. Is the action likely to change the existing input of Large Woody Debris (LWD) into occupied habitat? **YES** (the answers for 3 – 11 will all be different for each type of activity, e.g. fence, culvert, cobble bed, wetland, etc.) **(Creating perennial flow in the side channel/slough complex would help establish trees and add LWD to the system. Planting trees would also add LWD.)**

4. Is the action likely to affect stream morphology for occupied habitat? **YES/**NO/NA (**The channel/slough would be designed to function as a natural part of the river system. The sill would direct flows into the side channel/slough.)**

5. Is the action likely to affect properly functioning condition of the riparian area for occupied habitat? **YES/**NO/NA. (**Side channel/slough design should function as a natural, perennial channel & should improve flood plain connectivity. The sill should not effect proper function.)**

6. Is the action likely to affect water quality and/or quantity in the occupied habitat? YES/**NO/**NA (**Water quality "NO", water quantity – there would be less water in the main channel for the distance of the side channel, until the water went back into the main river.)**

7. Is the action likely to affect the water flow regime/annual hydrography in the occupied habitat? YES/**NO/**NA.

8. Is the action likely to affect juvenile or adult behavior related to survival or reproduction? **YES/**NO/NA (**Adults could use this channel/slough for migration.)**

9. Is the action likely to involve toxic and/or hazardous materials that may reach occupied habitat? **YES/**NO/NA (**Fluids from machines**.)

10. Is the action likely to affect juvenile or adult access to habitat? **YES/**NO/NA **(The side channel should provide increased access to adults for migration.)**

11. Is the action likely to affect substrate material? **YES/**NO/NA **(When the channel is opened, there would be shifting of material until it reached a stable state, probably during the first or second year. The sill would move around substrate but should have little effect on proper function.)**

"NO" responses to question #3 – 11 would result in a "No Affect" finding and should be documented in the action file.

A "YES", to any of the questions #3 – 11, however, requires in-depth evaluation by a professional biologist to determine if the action may affect the listed species. If the determination is made that an action "May affect" a listed species, continue with questions 12 – 15.

12. In addition the criteria listed in #3 – 11, do the actions, or the monitoring of them, likely involve any "taking", including "incidental taking" of listed or proposed species? YES/**NO/**NA (**There is no possibility of a "take" for any of the side channel work or the sill because this work would be done when sockeye are not present. The only work that would be done in the water is construction of the sill and opening the ends of the new side channel.)**

13. Are the effects described in #3-11 inconsequential/temporary in nature and Not likely to degrade the habitat over time? **YES/**NO/NA **(Perhaps not "inconsequential", but the effects should be beneficial, not degrading.)**

14. Do the actions employ **Best Management Practices (BMPs) designated to meet State water quality standards? YES/**NO/NA

15. Is mitigation established that will preclude or reduce measurable effects on species and their habitat? **YES/**NO/NA

> If the response to #12 above is "NO" and/or the response to criteria 13 – 15 are "YES", the determination of effects of this activity on listed or proposed anadromous salmonids is: The construction of **a rock sill & install a 48" culvert, construct 200 to 400 feet of new channel, rearrange pond spillway rock, install fish screens, planting trees, building a fence, deepen ponds and the channels between them, parking and storage area(s) and continuing construction and maintenance** at the **Dunfee Slough** site "MAY EFFECT AND IS NOT LIKELY TO ADVERSELY AFFECT" SOCKEYE SALMON, or their habitat.

Rationale: Adult sockeye would not be migrating when the work is done from October (or late August, depending on which work window is used) to January 15. Sockeye do not spawn in the 12 Mile reach of the Salmon River. Juvenile sockeye do not rear in the Salmon River. Precautions to prevent toxic spills, such as hydraulic fluid, would be taken and spill kits would be on hand to confine and quickly pick up a possible spill. The effects of continuing construction and maintenance would be similar to the effects of initial construction

Determination of Affect Matrix for SOCKEYE SALMON

Authorizing Agency: U.S. Army Corps of Engineers Mgmt. Area: **Dunfee Slough**
Watershed: Upper Salmon River, Round Valley Action Type: Habitat Restoration
Specific Actions : **Outside the main stem of the river and the side channel/slough**; Cutting 4 to 10 mature trees**.**

Pathway	Indicator	Status of the Baseline?	Effects of the Action?	Basis for Rationale
Water Quality	Temperature	NA	NA	
	Sediment/Turbidity	NA	NA	
	Chemical Contaminants/Nutrients	NA	NA	
Habitat Access	Physical Barriers	NA	NA	
Habitat Elements	Substrate	NA	NA	
	LWD	FR	M; Trees would be two tree lengths from river. They would Not add to LWD.	PJ; Short term loss of 4 – 10 trees would be offset by planting trees on 40 – 60 acres.
	Pool Frequency	NA	NA	
	Pool Quality	NA	NA	
	Off-channel habitat	NA	NA	PJ; See LWD
	Refugia	NA	NA	
Channel Condition and Dynamics	Width/depth ratio	NA	NA	Loss of 4 to 10 trees would not effect w/d ratio, bank condition or flood plain connectivity.
	Stream bank condition	NA	NA	
	Floodplain connectivity	NA	NA	
Flow/Hydrology	Change in Peak/Base Flows	NA	NA	
	Increase in Drainage Networks	NA	NA	
Watershed Conditions	Road Density and Location	PF	M	No new roads.
	Disturbance History	NA	NA	
	Riparian Reserves	NA	NA	

Dichotomous Key Determination:

1. Does the authorizing agency have discretionary authority to grant, modify, or amend provisions of the use authorization(s)? **YES**

If the answer is "NO", document the No Effect determination and the evaluation is completed. If "YES", move to question #2.

2. Are there naturally reproducing Sockeye Salmon present at any time of the year in riverine habitat directly or indirectly affected by the actions? YES/**NO**/NA. If "YES", continue with question #3 through #11. If "NO, document the No Effect determination and the evaluation is completed.

Rationale: Cutting 4 to 10 mature trees would have no effect on sockeye salmon because none of the trees would be cut within two tree lengths of the river. Planting trees on 40 to 60 acres should offset the short term loss of 4 to 10 trees. Therefore, it is our determination that **cutting 4 to 10 mature trees** on the **Dunfee Slough** site will have "NO EFFECT ON SOCKEYE SALMON OR THEIR HABITAT.

Determination of Affect Matrix for SOCKEYE SALMON

Authorizing Agency: U.S. Army Corps of Engineers Mgmt. Area: **One Mile Island**
Watershed: Upper Salmon River, Round Valley Action Type: Habitat Restoration
Specific Actions : **Along the main stem of the river and a slough**; Grade river bank and install bank logs, build a wire fence, plant trees, and continuing construction & maintenance; **Four hundred to five hundred feet from the river**; parking & material storage area(s).

Pathway	Indicator	Status of the Baseline?	Effects of the Action?	Basis for Rationale
Water Quality	Temperature	FR	R	PJ; Planting trees will increase shade. Fence will protect trees.
	Sediment/Turbidity	FR	R	PJ; New trees & bank grading will help stabilize banks, improve riparian zone, & reduce erosion.
	Chemical Contaminants/Nutrients	PF	M	PJ; Upper Salmon River Subbasin Assessment identified sediment & temp. in main river as pollutants. Spill kits help reduce risk.
Habitat Access	Physical Barriers	PF	M	No affect on access.
Habitat Elements	Substrate	NPF	M	PJ; no site specific data. Assume substrate suitable for migration.
	LWD	FR	R	PJ; Trees would eventually add LWD. Bank logs would help establish riparian veg.
	Pool Frequency	FR	M	PJ; Actions would not increase pool freq.
	Pool Quality	FR	M	See Pool Frequency.
	Off-channel habitat	FR	R	PJ; Logs, fence & trees would protect riparian zone.
	Refugia	FR	M	PJ; No effect on refugia.
Channel Condition and Dynamics	Width/depth ratio	PF	M	PJ; Grading and trees would help maintain present w/d ratio.
	Stream bank condition	FR	R	PJ; Grading, new trees & bank logs would help improve bank condition.
	Floodplain connectivity	NPF	M	PJ; actions would have no effect.

Pathway	Indicator	Status of the Baseline?	Effects of the Action?	Basis for Rationale
Flow/Hydrology	Change in Peak/Base Flows	FR	M	PJ; No effect on peak or base flows in watershed.
	Increase in Drainage Networks	NA	NA	PJ; Project too small to have any effect.
Watershed Conditions	Road Density and Location	PF	M	PJ; No new roads.
	Disturbance History	FR	M	See Incr. In Drainage Networks.
	Riparian Reserves	FR	M	See Incr. In Drainage Networks.

Dichotomous Key Determination:

1. Does the authorizing agency have discretionary authority to grant, modify, or amend provisions of the use authorization(s)? **YES**

If the answer is "NO", document the No Effect determination and the evaluation is completed. If "YES", move to question #2.

2. Are there naturally reproducing Sockeye Salmon present at any time of the year in riverine habitat directly or indirectly affected by the actions? **YES**/NO/NA If "YES", continue with question #3 through #11. If "NO", document the NO Effect determination and the evaluation is completed.

3. Is the action likely to change the existing input of Large Woody Debris (LWD) into occupied habitat? **YES** (the answers for 3 -11 will all be different for each type of activity, e.g. fence, culvert, wetland, etc.) (**The new trees should eventually add LWD to the river**.)

4. Is the action likely to affect stream morphology for occupied habitat? YES/**NO**/NA **(None of the projects would affect morphology.)**

5. Is the action likely to affect properly functioning condition of the riparian area for occupied habitat? **YES/**NO/NA **(The bank grading and logs may have a beneficial effect on off channel habitat and/or refugia**.)

6. Is the action likely to affect water quality and/or quantity in the occupied habitat? **YES/**NO/NA **(The trees could have a beneficial effect on reducing sediment by stabilizing the banks. It would not affect quantity.)**

7. Is the action likely to affect the water flow regime/annual hydrography in the occupied habitat? YES/**NO**/NA

8. Is the action likely to affect juvenile or adult behavior related to survival or reproduction? **YES**/NO/NA (**Adult migration would not be changed. The trees would help reduce water temperature.)**

9. Is the action likely to involve toxic and/or hazardous materials that may reach occupied habitat? **YES/**NO/NA (**Fluids from machines**.)

10. Is the action likely to affect juvenile or adult access to habitat? **YES/**NO/NA (**There may be a slight improvement in migration habitat.)**

11. Is the action likely to affect substrate material? YES/**NO**/NA

"NO" responses to question #3 – 11 would result in a "No Affect" finding and should be documented in the action file.

A "YES", to any of the questions #3 – 11, however, requires in-depth evaluation by a professional biologist to determine if the action may affect the listed species. If the determination is made that an action "May affect" a listed species, continue with questions 12 – 15.

12. In addition the criteria listed in #3 – 11, do the actions, or the monitoring of them, likely involve any "taking", including "incidental taking" of listed or proposed species? YES/**NO**/NA **(The fence and planting trees would all be on dry land. The parking/storage area would be 400 to 500 feet from the river. Adults would not be present during the project**. **Juvenile sockeye do not rear in the 12 Mile reach of the river.)**

13. Are the effects described in #3-11 inconsequential/temporary in nature and Not likely to degrade the habitat over time? **YES/**NO/NA (**Perhaps not "inconsequential" but the effects should be beneficial, not degrading.)**

14. Do the actions employ Best Management Practices (BMPs) designated to meet State water quality standards? **YES/**NO/NA

15. Is mitigation established that will preclude or reduce measurable effects on species and their habitat? **YES**/NO/NA

If the response to #12 above is "NO" and/or the response to criteria 13 – 15 are "YES", the determination of effects of this activity on listed or proposed anadromous salmonids is: **Grading the river bank, installing bank logs, building a wire fence, planting trees, and continuing construction & maintenance, and parking & material storage area(s)** on the **One Mile Island** site "MAY EFFECT BUT IS NOT LIKELY TO ADVERSELY AFFECT" Sockeye Salmon or their habitat.

Rationale: Adult sockeye would not be migrating when the work is done from October (or late August, depending on which work window is used) to January 15. Sockeye do not spawn in the 12 Mile reach of the Salmon River. Juvenile sockeye do not rear in the Salmon River. Grading the banks, planting trees and the bank logs should help improve the habitat for migrating sockeye. Precautions to prevent toxic spills, such as hydraulic fluid, would be taken and spill kits would be on hand to confine and quickly pick up a possible spill. The effects of continuing construction and maintenance would be similar to the effects of initial construction.

Determination of Affect Matrix for SOCKEYE SALMON

Authorizing Agency: U.S. Army Corps of Engineers Mgmt. Area: **One Mile Island**
Watershed: Upper Salmon River, Round Valley Action Type: Habitat Restoration
Specific Actions : **Along the main stem of the river and a slough**; cutting up to 7 mature trees.

Pathway	Indicator	Status of the Baseline?	Effects of the Action?	Basis for Rationale
Water Quality	Temperature	NA	NA	
	Sediment/Turbidity	NA	NA	
	Chemical Contaminants/Nutrients	NA	NA	
Habitat Access	Physical Barriers	NA	NA	
Habitat Elements	Substrate	NA	NA	
	LWD	FR	R	PJ; Trees would eventually add LWD.
	Pool Frequency	NA	NA	
	Pool Quality	NA	NA	
	Off-channel habitat	FR	R	PJ; Trees would help improve off channel hbt.
	Refugia	NA	NA	
Channel Condition and Dynamics	Width/depth ratio	NA	NA	
	Stream bank condition	FR	R	PJ; Planting trees would help improve bank condition.
	Floodplain connectivity	NA	NA	
Flow/Hydrology	Change in Peak/Base Flows	FR	M	PJ; No effect on peak or base flows.
	Increase in Drainage Networks	NA	NA	
Watershed Conditions	Road Density and Location	PF	M	PJ; No new roads.
	Disturbance History	NA	NA	
	Riparian Reserves	NA	NA	

Dichotomous Key Determination:

1. Does the authorizing agency have discretionary authority to grant, modify, or amend provisions of the use authorization(s)? **YES**

If the answer is "NO", document the No Effect determination and the evaluation is completed. If "YES", move to question #2.

2. Are there naturally reproducing Sockeye Salmon present at any time of the year in riverine habitat directly or indirectly affected by the actions? YES/**NO**/NA If "YES", continue with question #3 through #11. If "NO", document the No Effect determination and the evaluation is completed.

Rationale: Cutting up to 7 mature trees would have no effect on adult or juvenile sockeye salmon because none of the trees would be cut within two tree lengths of the river. Planting trees along 1900 feet of river channel should offset the short-term loss of 7 trees. Therefore, it is our determination that **cutting up to 7 mature trees** on the **One Mile Island** site will have "NO EFFECT ON SOCKEYE SALMON OR THEIR HABITAT".

Determination of Affect Matrix for SOCKEYE SALMON

Authorizing Agency: U.S. Army Corps of Engineers Mgmt. Area: **Hot Springs Site**
Watershed: Upper Salmon River, Round Valley Action Type: Habitat Restoration
Specific Actions : **In the main channel of the river**; reopen about 700 to 800 feet of an old side channel and continuing construction and maintenance.

Pathway	Indicator	Status of the Baseline?	Effects of the Action?	Basis for Rationale
Water Quality	Temperature	FR	R	PJ; could help reduce water temp. because this channel has mature trees on both sides.
	Sediment/Turbidity	FR	R. Idaho DEQ listed sediment as a pollutant in Salmon R. – however, no reference to 12 Mile reach.	PJ; Mobilized sediment should stabilize after the initial watering-up of the new channel.
	Chemical Contaminants/Nutrients	PF	M	PJ; Upper Salmon Subbasin Assmt. (11/15/2000) addressed sediment & temps. in the main river. Spill kits should reduce risk.
Habitat Access	Physical Barriers	PF	R	PJ; Reopening the side channel would increase migration or holding habitat.
Habitat Elements	Substrate	FR	R	PJ; No site-specific data available. Substrate size should be suitable for migration.
	LWD	NPF	R	PJ; existing and new trees along the side channel should increase LWD over time.
	Pool Frequency	FR – for the river	M	PJ; Pool habitat not expected but possible.
	Pool Quality	FR	M	See Pool Frequency
	Off-channel habitat	NPF	M	PJ; New channel not likely to improve.
	Refugia	FR	M	PJ; See Off channel Habitat

Pathway	Indicator	Status of the Baseline?	Effects of the Action?	Basis for Rationale
Channel Condition and Dynamics	Stream bank condition	FR	M	PJ; Channel would maintain or improve bank condition.
	Floodplain connectivity	NPF	M	PJ; Not intended to provide floodplain connection
Flow/Hydrology	Change in Peak/Base Flows	FR	M	The side channel would not affect peak/base flows.
	Increase in Drainage Networks	NA	NA	PJ; Project too small to have any effect.
Watershed Conditions	Road Density and Location	PF	M	No new roads
	Disturbance History	FR	M	See Incr in Drainage Networks.
	Riparian Reserves	FR	M	See Incr in Drainage Networks.

Dichotomous Key Determination:

1. Does the authorizing agency have discretionary authority to grant, modify, or amend provisions of the use authorization(s)? **YES**

If the answer is "NO", document the No Effect determination and the evaluation is completed. If "YES", move to question #2.

2. Are there naturally reproducing Sockeye Salmon present at any time of the year in riverine habitat directly or indirectly affected by the actions? **YES**/NO/NA

If "YES", continue with question #3 through #11. If "NO: document the No Effect determination and the evaluation is completed.

3. Is the action likely to change the existing input of Large Woody Debris (LWD) into occupied habitat? **YES** (the answers for 3 – 11 will all be different for each type of activity, e.g. fence, culvert, cobble bed, wetland, etc.) (**There should be more LWD in the riverine habitat after the side channel is opened – there is very little LWD in the river presently.)**
4. Is the action likely to affect stream morphology for occupied habitat? **YES**/NO/NA **(The new channel would change morphology.)**
5. Is the action likely to affect properly functioning condition of the riparian area for occupied habitat? **YES**/NO/NA. **(Side channel design should function as a natural channel**.)
6. Is the action likely to affect water quality and/or quantity in the occupied habitat? YES/**NO**/NA **(Water quality "NO", water quantity – there would be less water in the main channel for the distance of the side channel, until the water went back into the main river.)**
7. Is the action likely to affect the water flow regime/annual hydrography in the occupied habitat? YES/**NO**/NA
8. Is the action likely to affect juvenile or adult behavior related to survival or reproduction? **YES**/NO/NA **(Adult and juvenile sockeye could use the side channel for migration.)**
9. Is the action likely to involve toxic and/or hazardous materials that may reach occupied habitat? **YES**/NO/NA (**Fluids from machines**.)

10. Is the action likely to affect juvenile or adult access to habitat? **YES**/NO/NA **(The side channel should provide access to adults and juveniles for migration only.)**
11. Is the action likely to affect substrate material? **YES/**NO/NA **(When the channel is opened, there would be shifting of material until it reached a stable state, probably during the first or second year.**

"NO" responses to question #3 – 11 would result in a "No Affect" finding and should be documented in the action file.

A "YES", to any of the questions #3 – 11, however, requires in-depth evaluation by a professional biologist to determine if the action may affect the listed species. If the determination is made that an action "May affect" a listed species, continue with questions 12 – 15.

12. In addition the criteria listed in #3 – 11, do the actions, or the monitoring of them, likely involve any "taking", including "incidental taking" of listed or proposed species? YES/NO/NA **(Adults would not be effected because they would not be present. Spawning and rearing do not occur in the 12 Mile reach of the river so juveniles would not be affected.)**
13. Are the effects described in #3-11 inconsequential/temporary in nature and Not likely to degrade the habitat over time? **YES/**NO/NA **(Perhaps not "inconsequential", but the effects should be beneficial, not degrading.)**
14. Do the actions employ Best Management Practices (BMPs) designated to meet State water quality standards? **YES/**NO/NA
15. Is mitigation established that will preclude or reduce measurable effects on species and their habitat? **YES/**NO/NA

If the response to #12 above is "YES" and the response to criteria 13 – 15 are "YES", the determination of effects of this activity on listed or proposed anadromous salmonids is: The r**eopening of about 700 to 800 feet of an old side channel along the river and continuing construction and maintenance** on the **Hot Springs** site "MAY EFFECT AND IS NOT LIKELY TO ADVERSELY AFFECT" SOCKEYE SALMON or their habitat.

Rationale: All of this work would be done in a dry channel except when the ends are excavated to allow flows from the river to enter. Adult sockeye would not be migrating when the work is done from October (or late August, depending on which work window is used) to January 15. Sockeye do not spawn in the 12 Mile reach of the Salmon River. Juvenile sockeye do not rear in the Salmon River. Precautions to prevent toxic spills, such as hydraulic fluid, would be taken and spill kits would be on hand to confine and quickly pick up a possible spill. The effects of continuing construction and maintenance would be similar to the effects of initial construction.

Determination of Affect Matrix for SOCKEYE SALMON

Authorizing Agency: U.S. Army Corps of Engineers Mgmt. Area: **Hot Springs Site**
Watershed: Upper Salmon River, Round Valley Action Type: Habitat Restoration
Specific Actions : **In Challis Hot Springs Creek;** gravel dams to form pools, cobble beds, replacing culverts, excavating banks, draining a pond, excavating a new channel through a pond, installing a flume and diversion for irrigation water, fish screens, building a wetland & channels to take water out of it, water gaps, deepening the thalweg, building a fence, planting trees, cutting 7 to 10 trees, the parking & storage area(s) and continuing construction and maintenance**.**

Pathway	Indicator	Status of the Baseline?	Effects of the Action?	Basis for Rationale
Water Quality	Temperature	PF – in the creek	R	PJ; Rerouting the hot spring, planting trees out of the creek could help reduce water temps.
	Sediment/Turbidity	PF	M	PJ; Routing irrigation water out of creek should reduce sediment.
	Chemical Contaminants/Nutrients	PF	M-R. Upper Salmon Subbasin Assmt. (11/15/2000) addressed sediment & temps. in the main river.	PJ; Spill kit should reduce risks.
Habitat Access	Physical Barriers	NPF	R (D; for the unscreened mouth of the channel from the wetland to the river.)	PJ; Remove concrete at end of the pond & install larger culverts.
Habitat Elements	Substrate	FR	R	PJ; The actions will introduce addl. gravel/cobbles to the system.
	LWD	NPF	R	PJ; Planting new trees would add LWD to the creek.
	Pool Frequency	FR	R	Gravel dams, pools, deepening thalweg, should increase pool habitat.
	Pool Quality	FR	R	See Pool Frequency
	Off-channel habitat	NPF	R	PJ: The wetland, and the new channel thru pond should improve off ch. hbt.

Pathway	Indicator	Status of the Baseline?	Effects of the Action?	Basis for Rationale
Habitat Elements	Refugia	FR	R	PJ; more rearing habitat available. Better riparian zone due to thalwed deepening & pools.
Channel Condition and Dynamics	Width/depth ratio	PF	M-R	PJ; Deepening thalweg would improve w/d ratio in one reach.
	Stream bank condition	PF	R	PJ; The banks of the channel through the pond would be improved over the pond bank condition. New trees would help maintain condition.
	Floodplain connectivity	PF	R. Not much flood plain because this is a first order stream.	PJ; Bank work should improve flood plain connection.
Flow/Hydrology	Change in Peak/Base Flows	PF	M	PJ; The water source for this creek is a spring that fluctuates little throughout the year.
	Increase in Drainage Networks	NA	NA	PJ; Project is too small to have any effect.
Watershed Conditions	Road Density and Location	PF	M	No new roads.
	Disturbance History	FR	M	See Incr in Drainage Networks
	Riparian Reserves	FR	M	See Incr in Drainage Networks

Dichotomous Key Determination:

1. Does the authorizing agency have discretionary authority to grant, modify, or amend provisions of the use authorization(s)? **YES**

If the answer is "NO", document the No Effect determination and the evaluation is completed. If "YES", move to question #2.

2. Are there naturally reproducing Sockeye salmon present at any time of the year in riverine habitat **directly** (no) or **indirectly** (yes) affected by the actions? YES/**NO/**NA If "YES", continue with question #3 through #11. If "NO": document the No Effect determination and the evaluation is completed. It is our determination that **installing gravel dams to form pools, cobble beds, replacing culverts, excavating banks, draining a pond, excavating a new channel through a pond, installing a flume and diversion for irrigation water, fish screens, building a wetland & channels to take water out of it, water gaps, deepening the thalweg, building a fence, planting trees, cutting 7 to 10 trees, the parking & storage area(s) and continuing construction and maintenance** in Challis Hot Springs Creek will have "NO EFFECT ON SOCKEYE SALMON OR THEIR HABITAT."

Rationale: Adult sockeye would not be migrating when the work is done from October (or late August, depending on which work window is used) to January 15. There are no historic records of sockeye ever using Challis Hot Springs Creek. Sockeye do not spawn in the 12 Mile reach of the Salmon River. Juvenile sockeye do not rear in the Salmon River. Precautions to prevent toxic spills, such as hydraulic fluid, would be taken and spill kits would be on hand to confine and quickly pick up a possible spill. The effects of continuing construction and maintenance would be similar to the effects of initial construction

Determination of Affect Matrix for SOCKEYE SALMON

Authorizing Agency: U.S. Army Corps of Engineers Mgmt. Area: **Pennal Gulch**
Watershed: Upper Salmon River, Round Valley Action Type: Habitat Restoration
Specific Actions : **In or along the side channel/slough:** Build water gaps, constructing a new channel around a wetland, building a levee between the new channel and the wetland, barbs in the new channel, a culvert in the new channel, excavating down an existing side channel, logs on a side channel bank, high flow channel across a road, reopening an old side channel for intermittent flows, constructing temporary roads, building a fence, planting trees, the parking & storage area, and continuing construction and maintenance; **Along the main river**; lowering the levee at the Sportsman's Access, breeching a levee upstream from the Sportsman's Access, building a rock sill in the river, installing 48-inch culverts at both levee sites, and continuing construction & maintenance.

Pathway	Indicator	Status of the Baseline?	Effects of the Action?	Basis for Rationale
Water Quality	Temperature	FR – river and side channel	R	PJ; Side channel temps should be suitable, would be joined by spring water from an existing side ch. May help reduce temps in river.
	Sediment/Turbidity	PF – in side channel/slough FR – in the river	M-R	PJ. Sediment in the new channel & existing side channel/slough should stabilize in 1 0r 2 years. Some sed. from river may be deposited in the old sid channel. Trees should help stabilize bank and reduce sediment.
	Chemical Contaminants/Nutrients	PF	M	Upper Salmon Subbasin Assmt. (11/15/2000) addressed sediment & temps. in the main river. Spill kits should reduce risks.
Habitat Access	Physical Barriers	NPF – in side channel/slough PF – in the river	R – side ch/slough M - river	PJ; Beaver dams in existing channel are barriers to adults & maybe juveniles. New channel & culverts would be designed for fish passage.

Pathway	Indicator	Status of the Baseline?	Effects of the Action?	Basis for Rationale
Habitat Elements	Substrate	FR – in river and side channel/slough	M-R Sill would be designed to prevent substrate depositon at entrance of the new side channel.	PJ; No site specific data. Opening new side ch. would generate sediment. Should stabilize in 1 or 2 years.
	LWD	NPF – in the river FR – in side channel	R	PJ; New channel & levee work & trees should improve floodplain connect. & help add LWD to the system.
	Pool Frequency	FR. (Existing side channel is mostly pools/glides)	R	PJ; Barbs & channel work should increase pool habitat. No site-specific data for present condition.
	Pool Quality	FR	R	See Pool Frequency
	Off-channel habitat	FR	R	See LWD.
	Refugia	FR	R	PJ; New side channel/slough should increase refugia.
Channel Condition and Dynamics	Width/depth ratio	PF – in the river FR – in the side channel/slough	R	PJ; W/d would improve in the side channel, may decline in the main river due to water diverted into the side channel.
	Stream bank condition	FR – in the river PF – in the side ch/slough	M-R	PJ; Bank logs would help establish riparian veg and stabilize banks.
	Floodplain connectivity	NPF – in the river PF - in the side channel/slough	R	PJ; The new channel, levee work & culverts would improve flood plain connection.
Flow/Hydrology	Change in Peak/Base Flows	FR	M	No change in peak/base flows.
	Increase in Drainage Networks	NA	NA	PJ; Project too small to have any effect.
Watershed Conditions	Road Density and Location	PF	M	NO new roads.
	Disturbance History	FR	M	See Incr Drainage Networks.
	Riparian Reserves	FR	M	See Incr Drainage Networks.

Dichotomous Key Determination:

1. Does the authorizing agency have discretionary authority to grant, modify, or amend provisions of the use authorization(s)? **YES**

If the answer is "NO", document the No Effect determination and the evaluation is completed. If "YES", move to question #2.

2. Are there naturally reproducing Sockeke Salmon present at any time of the year in riverine habitat **directly** (NO) or **indirectly** (NO) affected by the actions? **YES**/NO/NA. If "YES", continue with question #3 through #11. If "NO": document the No Effect determination and the evaluation is completed.

3. Is the action likely to change the existing input of Large Woody Debris (LWD) into occupied habitat? **YES** (the answers for 3 – 11 will all be different for each type of activity, e.g. fence, culvert, cobble bed, wetland, etc.) (**Opening a new side channel/slough, and planting new trees would add more LWD to the system.)**

4. Is the action likely to affect stream morphology for occupied habitat? **YES/**NO/NA **(The new channel, existing side channel/slough system, and the old channel that is reopened would be designed to function as a natural system.)**

5. Is the action likely to affect properly functioning condition of the riparian area for occupied habitat? **YES**/NO/NA. **Excavating the existing side channel, opening a new side channel, the levee along the new channel, the barbs, anchor logs, and installing culverts should improve the function of this side channel/slough system.**

6.Is the action likely to affect water quality and/or quantity in the occupied habitat? **YES/**NO/NA **Water quality may be improved because water entering the side channel/slough system and the old side channel would trap some of the sediment in the river water. Water quantity would be less in the main stem of the river when some of the flow is diverted into the side channel/slough system. This water would reenter the main river about 4300 to 4500 feet downstream from the upstream end of the side channel/slough. The riparian vegetation shading the side channel would help cool the water before it went back into the river.**

7. Is the action likely to affect the water flow regime/annual hydrography in the occupied habitat? YES/**NO**/NA.

8. Is the action likely to affect juvenile or adult behavior related to survival or reproduction? **YES/**NO/NA **(Adult and juvenile sockeye could use the side channel/slough for migration.)**

9. Is the action likely to involve toxic and/or hazardous materials that may reach occupied habitat? **YES/**NO/NA **(Possible spill of toxic fluid from trucks or machine.)**

10. Is the action likely to affect juvenile or adult access to habitat? **YES/**NO/NA (**Culverts, side channel/slough, and levee work would be designed to allow passage)**

11. Is the action likely to affect substrate material? **YES**/NO/NA **(There could be minor shifting of material when the new side channel/slough system is opened, and when the old channel is reopened. This should stabilize itself in the first year or two. The sill in the river would move substrate around but should not effect migration habitat.)**

"NO" responses to question #3 – 11 would result in a "No Affect" finding and should be documented in the action file.

A "YES", to any of the questions #3 – 11, however, requires in-depth evaluation by a professional biologist to determine if the action may affect the listed species. If the determination is made that an action "May affect" a listed species, continue with questions 12 – 15.

12. In addition the criteria listed in #3 – 11, do the actions, or the monitoring of them, likely involve any "taking", including "incidental taking" of listed or proposed species? YES/**NO/**NA **(The channel around the wetland and the levee between the wetland and the channel would be built on dry land. Adult sockeye would not be present during the late August (or October, depending on work window) – January 15 work window.)**

13. Are the effects described in #3-11 inconsequential/temporary in nature and Not likely to degrade the habitat over time? **YES**/NO/NA **(Perhaps not "inconsequential", but the effects should be beneficial, not degrading.)**

14. Do the actions employ Best Management Practices (BMPs) designated to meet State water quality standards? **YES**/NO/NA

15. Is mitigation established that will preclude or reduce measurable effects on species and their habitat? **YES/**NO/NA

If the response to #12 above is "NO" and the response to criteria 13 – 15 are "YES", the determination of effects of this activity on listed or proposed salmonids is: In or along the side channel; **Building water gaps, constructing a new channel around a wetland, building a levee between the new channel and the wetland, barbs in the new channel, a culvert in the new channel, excavating down an existing side channel, logs on a side channel bank, high flow channel across a road, reopening an old side channel for intermittent flows, constructing temporary roads, building a fence, planting trees, the parking and storage area and continuing construction and maintenance**; Along the main river; **lowering the levee at the Sportsman's Access, breeching a levee upstream from the Sportsman's Access, building a rock sill in the river, installing 48-inch culverts at both levee sites, and continuing construction & maintenance** on the Pennal Gulch site "MAY EFFECT BUT IS NOT LIKELY TO ADVERSELY AFFECT" SOCKEYE SALMON OR THEIR HABITAT.

Rationale: The new side channel, the levee between the wetland and the new side channel, the barbs, the bank logs, the high flow channel across the road, the old channel that would be reopened, the fence, planting trees, and the temporary roads would all be done on dry land. The levee work, the sill and the culverts would be in or next to the river. The parking & storage area would be 500 to 1500 feet from the river. Adult sockeye would not be migrating when the work is done from October (or late August, depending on which work window is used) to January 15. Sockeye do not spawn in the 12 Mile reach of the Salmon River. Juvenile sockeye do not rear in the Salmon River. Spill kits would be on all equipment and vehicles in order to contain and pick up any toxic fluid spill before it could affect water quality or the fish. Another precaution would be the use of turbidity curtains and/or pumps to reduce sediment and possible impacts to salmonids. The effects of continuing construction and maintenance would be similar to the effects of initial construction.

Determination of Affect Matrix for SOCKEYE SALMON

Authorizing Agency: U.S. Army Corps of Engineers Mgmt. Area: **Pennal Gulch Site**
Watershed: Upper Salmon River, Round Valley Action Type: Habitat Restoration
Specific Actions : **Along the river and side channel/slough;** cutting 5 to 10 mature trees.

Pathway	Indicator	Status of the Baseline?	Effects of the Action?	Basis for Rationale
Water Quality	Temperature	FR	M	PJ; The trees would be two tree lengths or more from the river, there should be no loss of shade.
	Sediment/Turbidity	FR	M	See Temperature.
	Chemical Contaminants/Nutrients	NA	NA	
Habitat Access	Physical Barriers	NA	NA	
Habitat Elements	Substrate	NA	NA	
	LWD	FR	M	PJ; The trees would be two tree lengths or more from the river, there should be no loss of LWD.
	Pool Frequency	NA	NA	
	Pool Quality	NA	NA	
	Off-channel habitat	NA	NA	
	Refugia	NA	NA	
Channel Condition and Dynamics	Width/depth ratio	NA	NA	
	Stream bank condition	NA	NA	
	Floodplain connectivity	NA	NA	
Flow/Hydrology	Change in Peak/Base Flows	NA	NA	
	Increase in Drainage Networks	NA	NA	
Watershed Conditions	Road density and location.	NA	NA	
	Disturbance History	NA	NA	
	Riparian Reserves	NA	NA	

Dichotomous Key Determination:

1. Does the authorizing agency have discretionary authority to grant, modify, or amend provisions of the use authorization(s)? **YES**

If the answer is "NO", document the No Effect determination and the evaluation is completed. If "YES", move to question #2.

2. Are there naturally reproducing Sockeye Salmon present at any time of the year in riverine habitat directly or indirectly affected by the actions? YES/**NO**/Unknown If "YES", continue with question #3 through #11. If "NO", document the No Effect determination and the evaluation is completed.

Rationale: Cutting 5 to 10 mature trees would have no effect on adult or juvenile Chinook salmon or steelhead because none of the trees would be cut within two tree lengths of the river or side channel/slough. The short-term loss of 5 to 10 trees should be offset by planting trees along 300 to 500 feet of the side channel/slough and river. The new trees would shade the channel and also add LWD to the system. Therefore, it is our determination that **cutting 5 to 10 mature trees** on the **Pennal Gulch** site will have "NO EFFECT ON SOCKEYE SALMON OR THEIR HABITAT".

Determination of Affect Matrix for SNAKE RIVER SPRING/SUMMER CHINOOK SALMON and STEELHEAD

Authorizing Agency: U.S. Army Corps of Engineers Mgmt. Area: **Highway 93 Bridge site**
Watershed: Upper Salmon River, Round Valley Action Type: Habitat Restoration
Specific Actions : **In the main stem of the river**; Construct a rock sill, open the ends of a new side channel, and continuing construction and maintenance.

Pathway	Indicator	Status of the Baseline?	Effects of the Action?	Basis for Rationale
Water Quality	Temperature	FR	M	PJ; No influence on temperature. See Sediment/Turbidity
	Sediment/Turbidity	FR	M; The sill would have little influence on deposition of sediment.	Idaho DEQ listed sediment & temp. as pollutants in Salmon R. – however, No reference to 12 Mile reach.
	Chemical Contaminants/Nutrients	PF	M	Upper Salmon Subbasin Assmt. (11/15/2000) addressed sediment & temps. in the main river. Spill kits should reduce risks.
Habitat Access	Physical Barriers	PF	M	No affect on access
Habitat Elements	Substrate	NPF	M; Sill designed to prevent substrate deposition at entrance of the new side channel.	PJ; No site specific data available. Assume habitat suitable for migration. Substrate too large for spawning.
	LWD	NPF	M.	PJ; Sill would have little influence on establishing trees and LWD.
	Pool Frequency	NPF	R	PJ; The sill may indirectly help create pool hbt. in the side channel.
	Pool Quality	NPF	R	See Pool Frequency
	Off-channel habitat	NPF	R	Sill would indirectly affect off channel hbt. by directing water into new side channel.
	Refugia	FR	R	PJ; No influence in the river. Maybe some in the side channel.

Pathway	Indicator	Status of the Baseline?	Effects of the Action?	Basis for Rationale
Channel Condition and Dynamics	Width/depth ratio	PF	M	PJ; no effect on w/d ratio.
	Stream bank condition	FR	M	PJ; Banks steep & unstable above & below this site.
	Floodplain connectivity	FR	R	PJ; The sill would indirectly affect flood plain connectivity by directing flow into the new side channel
Flow/Hydrology	Change in Peak/Base Flows	FR	M	PJ; The sill would Not affect peak/base flows.
	Increase in Drainage Networks	NA	NA	
Watershed Conditions	Road Density and Location	PF	M	No new roads.
	Disturbance History	FR	M	
	Riparian Reserves	FR	M	

Dichotomous Key Determination:

1. Does the authorizing agency have discretionary authority to grant, modify, or amend provisions of the use authorization(s)? **YES**/NO/NA

If the answer is "NO", document the No Effect determination and the evaluation is completed. If "YES", move to question #2.

2. Are there naturally reproducing Snake River spring/summer Chinook salmon or Steelhead present at any time of the year in riverine habitat directly or indirectly affected by the actions? **YES**/NO/NA If "yes", continue with question #3 through #11. If "no, document the No Effect determination and the evaluation is completed.

3. Is the action likely to change the existing input of Large Woody Debris (LWD) into occupied habitat? **NO** (the answers for 3 – 11 will all be different for each type of activity, e.g. fence, culvert, cobble bed, wetland, etc.)

4. Is the action likely to affect stream morphology for occupied habitat? **YES**/NO/NA **(The sill would direct some of the flow from the river into the new side channel.)**

5. Is the action likely to affect properly functioning condition of the riparian area for occupied habitat? **YES**/NO/NA (**Indirectly could improve the flood plain connectivity.)**

6. Is the **action likely to affect water quality and/or quantity in the occupied habitat? YES/NO/NA (Water quality – NO. Water quantity - the sill would direct some of the volume of water from the river into the side channel. The water would reenter the main stem of the river after flowing about 1800 feet in the side channel.)**

7. Is the action likely to affect the water flow regime/annual hydrography in the occupied habitat? YES/**NO**/NA

8. Is the action likely to affect juvenile or adult behavior related to survival or reproduction? **YES/**NO/NA (**Juvenile behavior may be indirectly affected by providing flows to the new side channel that would create new rearing habitat. Adults may migrate up the new channel and back to the main stem of the river.)**

9. Is the action likely to involve toxic and/or hazardous materials that may reach occupied habitat? **YES**/NO/NA (**Fluids from machines**.)

10. Is the action likely to affect juvenile or adult access to habitat? **YES**/NO/NA **(The sill should contribute indirectly to increased access to adult migration habitat and juvenile rearing habitat.)**

11. Is the action likely to affect substrate material? **YES/**NO/NA (**Substrate Not suitable for sqawning.)**

A "NO" responses to question #3 – 11 would result in a "No Affect" finding and should be documented in the action file.

A "YES", to any of the questions #3 – 11, however, requires in-depth evaluation by a professional biologist to determine if the action may affect the listed species. If the determination is made that an action "May affect" a listed species, continue with questions 12 – 15.

12. In addition the criteria listed in #3 – 11, do the actions, or the monitoring of them, likely involve any "taking", including "incidental taking" of listed or proposed species? **YES**/NO/NA **(Incidental taking may occur on juveniles but there is low probability because of the poor quality of winter habitat along the bank of the river at this site (i.e. ice build-up.**)

13. Are the effects described in #3-11 inconsequential/temporary in nature and Not likely to degrade the habitat over time? **YES/**NO/NA **(Perhaps Not "inconsequential" but they should be beneficial, Not degrading.)**

14. Do the actions employ Best Management Practices (BMPs) designated to meet State water quality standards? **YES/**NO/NA

15. Is mitigation established that will preclude or reduce measurable effects on species and their habitat? **YES**/NO/NA

If the response to #12 above is "YES" and/or the response to criteria 13 – 15 are "NO", the determination of effects of this activity on listed or proposed anadromous salmonids is: The construction of a **rock sill, opening the ends of the new side channel, and continuing construction and maintenance** at the **Highway 93 Bridge** site "MAY EFFECT AND IS LIKELY TO ADVERSELY AFFECT" (juvenile) Snake River spring/summer Chinook salmon or steelhead, or their habitat.

Rationale: Adult Chinook and steelhead would not be present when the work is done from October (or late August, depending on which work window is used) to January 15. The river habitat at this project site for juveniles is often unsuitable during the winter because the river often ices up along this reach. Therefore, juvenile Chinook or steelhead are unlikely to use the edge of the river channel for over- wintering. Adults would not be present when the side channel was opened. Precautions to prevent toxic spills, such as hydraulic fluid, would be taken and spill kits would be on hand to confine and quickly pick up a possible spill. The machine would work slowly in order to allow fish to escape if they are present. The crew would be trained in proper fish-handling techniques if salvage were necessary. The effects of continuing construction and maintenance would be similar to the effects of initial construction.

The rock sill and opening the new side channel at the Highway 93 Bridge site would be beneficial for steelhead and Chinook in the long term. The improvements would help restore flood plain connectivity, increase LWD, reduce sediment in the river, open up over 1500 feet of additional rearing habitat, and increase the size of the riparian zone.

Determination of Affect Matrix for SNAKE RIVER SPRING/SUMMER CHINOOK SALMON and STEELHEAD

Authorizing Agency: U.S. Army Corps of Engineers Mgmt. Area: **Highway 93 Bridge site**
Watershed: Upper Salmon River, Round Valley Action Type: Habitat Restoration
Specific Actions : **In or along the new side channel**; Construct a new side channel, point bars, French drain & refuge pool, barbs to create pools, levee for flood plain connection, pipe arch, high flow channel, construct a hardened road section, build a jack fence, plant trees, parking & storage area(s), and continuing construction and maintenance.

Pathway	Indicator	Status of the Baseline?	Effects of the Action?	Basis for Rationale
Water Quality	Temperature	NPF, this is presently a dry channel .	R	PJ; Trees would shade the channel, fence would protect trees.
	Sediment/Turbidity	NA, See Temprerature	M	PJ; Mobilized sediment should stabilize after the initial watering-up of the new channel.
	Chemical Contaminants/Nutrients	PF	M; not expected to cause any increase.	Upper Salmon Subbasin Assmt. (11/15/2000) addressed sediment & temps. in the main river. Spill kits should reduce risks. Park area is 500 – 1000 ft. from the river.
Habitat Access	Physical Barriers	NPF – dry channel	R	PJ; side channel would increase access.
Habitat Elements	Substrate	NA; projects are in a dry channel & on dry land.	R. (See Sediment/Turbidity above.)	No site-specific data available. Substrate size should be suitable for rearing & migration. Spawning potential unknown.
	LWD	NA; projects are in a dry channel & on dry land.	R	PJ; Trees should enter the side channel & create LWD
	Pool Frequency	NA dry channel. (FR after channel is opened.	R (after channel is opened)	PJ: Barbs should create pools in addition to the refuge pool.

Pathway	Indicator	Status of the Baseline?	Effects of the Action?	Basis for Rationale
Habitat Elements	Pool Quality	NA (PF after channel is opened)	R	See Pool Frequency
	Off-channel habitat	NPF	R	PJ; Should be some habitat after channel is opened.
	Refugia	FR	M	PJ: No change in refugia.
Channel Condition and Dynamics	Width/depth ratio	NA; dry channel	R or D (?)	PJ; Side ch. design would meet suitable w/d ratio; may decline in the main river due to water diverted into the side channel.
	Stream bank condition	NA; dry channel	R	PJ; Banks along new channel would meet objectives.
	Floodplain connectivity	NPF	R	PJ; Floodplain connection should be better after project.
Flow/Hydrology	Change in Peak/Base Flows	FR	M	PJ: The side channel would not affect peak/base flows.
	Increase in Drainage Networks	NA	NA	Project too small to have any effect on the watershed.
Watershed Conditions	Road Density and Location	PF	M	No new roads.
	Disturbance History	FR	M	See Increase Drainage Networks
	Riparian Reserves	FR	M	See Increase Drainage Networks

Dichotomous Key Determination:

1. Does the authorizing agency have discretionary authority to grant, modify, or amend provisions of the use authorization(s)? **YES**

If the answer is "NO", document the No Effect determination and the evaluation is completed. If "YES", move to question #2.

2. Are there naturally reproducing Snake River spring/summer Chinook salmon or Steelhead present at any time of the year in riverine habitat directly or indirectly affected by the actions? **YES**/NO/NA

If "YES", continue with question #3 through #11. If "NO, document the No Effect determination and the evaluation is completed.

3. Is the action likely to change the existing input of Large Woody Debris (LWD) into occupied habitat? **YES** (the answers for 3 – 11 will all be different for each type of activity, e.g. fence, culvert, cobble bed, wetland, etc.) (**Planting trees would increase the LWD**.)

4. Is the action likely to affect stream morphology for occupied habitat? **YES/**NO/NA **(The new side channel would be designed to function as a natural part of the river.)**
5. Is the action likely to affect properly functioning condition of the riparian area for occupied habitat? **YES/**NO/NA **(Side channel design should function as a natural channel & should improve flood plain connectivity.)**
6. Is the action likely to affect water quality and/or quantity in the occupied habitat? YES/**NO**/NA (**Water quality "NO", water quantity – theside channel would temporarily divert part of the flows from the river.)**
7. Is the action likely to affect the water flow regime/annual hydrography in the occupied habitat? YES/**NO/**NA.
8. Is the action likely to affect juvenile or adult behavior related to survival or reproduction? **YES/**NO/NA **(Adults could use the side channel during migration. Juveniles could use the side channel for rearing and over-wintering habitat.)**
9. Is the action likely to involve toxic and/or hazardous materials that may reach occupied habitat? **YES/**NO/NA (**Fluids from machines**.)
10. Is the action likely to affect juvenile or adult access to habitat? **YES/NO/NA (The side channel should provide increased juvenile over-wintering & rearing habitat. The side channel would be available for adult migration.)**
11. Is the action likely to affect substrate material? **YES/NO/NA** (**When the channel is opened, there would be shifting of material until it reached a stable state, probably during the first or second year. Side channel substrate Not expected to be suitable for spawning.)**

"NO" responses to question #3 – 11 would result in a "No Affect" finding and should be documented in the action file.

A "YES", to any of the questions #3 – 11, however, requires in-depth evaluation by a professional biologist to determine if the action may affect the listed species. If the determination is made that an action "May affect" a listed species, continue with questions 12 – 15.

12. In addition the criteria listed in #3 – 11, do the actions, or the monitoring of them, likely involve any "taking", including "incidental taking" of listed or proposed species? YES/**NO**/NA (**There is <u>No possibility of a "take" for any of the side channel work</u>. When the ends of the side channel are opened [covered in the table with the rock sill], there is a very low probability that a "take" could occur if juvenile Chinook or steelhead were present.**)
13. Are the effects described in #3-11 inconsequential/temporary in nature and Not likely to degrade the habitat over time? **YES/**NO/NA **(Perhaps Not "inconsequential", but the effects should be beneficial, Not degrading.)**
14. Do the actions employ Best Management Practices (BMPs) designated to meet State water quality standards? **YES**/NO/NA
15. Is mitigation established that will preclude or reduce measurable effects on species and their habitat? **YES/**NO/NA

If the response to #12 above is “NO” and the response to criteria 13 – 15 are “YES”, the determination of effects of this activity on listed or proposed anadromous salmonids is: The construction of **new side channel, point bars, French drain & refuge pool, barbs to create pools, levee for flood plain connection, pipe arch, high flow channel, construct a hardened road section, planting trees, building a fence, the parking & storage area(s), and continuing construction and maintenance** at the **Highway 93 Bridge** site “MAY EFFECT BUT IS NOT LIKELY TO ADVERSELY AFFECT” spring/summer Chinook salmon and/or steelhead, or their habitat. Beneficial effects include better flood plain connectivity, improved riparian zone and increased rearing and over-wintering habitat for juvenile Chinook and steelhead.

Rationale: All of the channel work (i.e. excavating the channel, levee, barbs, etc.) would be done in a dry channel bed. No possibility of “take” for adult or juvenile chinook or steelhead. Precautions to prevent toxic spills, such as hydraulic fluid, would be taken and spill kits would be on hand to confine and quickly pick up a possible spill. The machine would work slowly to allow fish to escape if they were present. The effects of continuing construction and maintenance would be similar to the effects of initial construction.

All of the projects planned for the new side channel at the Highway 93 Bridge site would be beneficial for steelhead and Chinook in the long term. The improvements would help restore flood plain connectivity, increase LWD, reduce sediment in the river, open up over 1500 feet of additional rearing habitat, and protect and increase the size of the riparian zone.

Determination of Affect Matrix for SNAKE RIVER SPRING/SUMMER\ CHINOOK SALMON and STEELHEAD

Authorizing Agency: U.S. Army Corps of Engineers Mgmt. Area: **Highway 93 Bridge site**
Watershed: Upper Salmon River, Round Valley Action Type: Habitat Restoration
Specific Actions : **Away from the river**; Cut 4 to 10 mature trees, install barbs on the Highway 93 fill slope, place boulders.

Pathway	Indicator	Status of the Baseline?	Effects of the Action?	Basis for Rationale
Water Quality .	Temperature	FR	M	PJ; Boulders may help protect trees that shade the river.
	Sediment/Turbidity	NA	NA	
	Chemical Contaminants/Nutrients	NA	NA	
Habitat Access	Physical Barriers	NA	NA	No affect on access.
Habitat Elements	Substrate	NA	NA	
	LWD	NPF	M; Loss of 4 – 10 trees would be offset by planting trees along 600 feet of channel.	PJ; Boulders protecting trees that would eventually add LWD.
	Pool Frequency	NA	NA	
	Pool Quality	NA	NA	
	Off-channel habitat	FR	M;See LWD	PJ; Boulders would protect riparian zone.
	Refugia	NA	NA	
Channel Condition and Dynamics	Width/depth ratio	NA	NA	
	Stream bank condition	NA	NA	
	Floodplain connectivity	NA	NA	
Flow/Hydrology	Change in Peak/Base Flows	NA	NA	
	Increase in Drainage Networks	NA	NA	
Watershed Conditions	Road Density and Location	PF	M	PJ; Boulders & fence would decrease vehicle access in riparian zone.
	Disturbance History	NA	NA	
	Riparian Reserves	NA	NA	

Dichotomous Key Determination:

1. Does the authorizing agency have discretionary authority to grant, modify, or amend provisions of the use authorization(s)? **YES/**NO/NA

If the answer is "NO", document the No Effect determination and the evaluation is completed. If "YES", move to question #2.

2. Are there naturally reproducing Snake River spring/summer Chinook salmon or Steelhead present at any time of the year in riverine habitat directly or indirectly affected by the actions? YES/**NO**/NA. If "YES", continue with question #3 through #11. If "NO", document the No Effect determination and the evaluation is completed.

Rationale: Cutting 4 to 10 mature trees would have no effect on chinook salmon or steelhead because none of the trees would be cut within two tree lengths of the river. The barbs on the Highway 93 fill slope are 500 to 1000 feet from the river and their installation would not have any direct, indirect or cumulative effects on chinook salmon or steelhead. The boulders along the road into the public boat access are 50 to 100 feet from the side channel or river and would be for vehicle control. If anything, the boulders may have a slight beneficial effect by preventing vehicles from driving in or through the new side channel. Spill kits on the vehicles and machines would be able to contain and pick up any toxic fluid before it could affect the water quality. Therefore, it is our determination that **cutting 4 to 10 mature trees, placing boulders, and installing barbs** on the Highway 93 fill slope on the **Highway 93 Bridge** site will have "NO EFFECT ON SNAKE RIVER SPRING/SUMMER CHINOOK SALMON or STEELHEAD OR THEIR HABITAT".

Determination of Affect Matrix for SNAKE RIVER SPRING/SUMMER CHINOOK SALMON and STEELHEAD

Authorizing Agency: U.S. Army Corps of Engineers Mgmt. Area: **Dunfee Slough**
Watershed: Upper Salmon River, Round Valley Action Type: Habitat Restoration
Specific Actions : **In the main stem of the river;** Construct a rock sill & install a 48" culvert, and continuing construction and maintenance.

Pathway	Indicator	Status of the Baseline?	Effects of the Action?	Basis for Rationale
Water Quality	Temperature	FR	M	PJ; No influence on temperature.
	Sediment/Turbidity	FR	M. Idaho DEQ listed sediment as a pollutant in Salmon R. – however, no reference to 12 Mile reach.	PJ; Design of sill should not cause and increase in sediment deposition in the river or side channel.
	Chemical Contaminants/Nutrients	PF	M	PJ; Upper Salmon Subbasin Assmt. (11/15/2000) addressed sediment & temps. in the main river. Spill kits should reduce risks.
Habitat Access	Physical Barriers	PF	M	PJ; Culvert would increase access to new side channel.
Habitat Elements	Substrate	NPF	M; Sill designed to prevent substrate deposition at entrance of the new side channel.	PJ; site-specific data available. Assume habitat suitable for migration. Substrate too large for spawning. Flow thru side ch should clean some substrate.
	LWD	NPF	R	PJ; Sill would have little influence on establishing trees or LWD.
	Pool Frequency	NPF	R	PJ; The sill may indirectly help create pool hbt. in the side channel.
	Pool Quality	NPF	R	PJ; Culvert would make the new channel & ponds accessible
	Off-channel habitat	NPF	R	PJ; Perennial flow will help improve.

Pathway	Indicator	Status of the Baseline?	Effects of the Action?	Basis for Rationale
Habitat Elements	Refugia	FR	R	See Off channel Hbt.
Channel Condition and Dynamics	Width/depth ratio	PF	R or D Indirect effects from sill diverting water from main river.	PJ; W/d would improve in the side channel, may decline in the main river due to water diverted into the side chan/slough.
	Stream bank condition	FR	M	PJ; Sill & culvert would not effect bank condition.
	Floodplain connectivity	NPF	R	PJ; The sill would indirectly affect flood plain connectivity by directing flow into the new side channel
Flow/Hydrology	Change in Peak/Base Flows	FR	M	The sill would Not effect peak/base flows.
	Increase in Drainage Networks	NA	NA	PJ; project too small to have any effect.
Watershed Conditions	Road Density and Location	PF	M	No new roads.
	Disturbance History	FR	M	See Inc in Drainage Network
	Riparian Reserves	FR	M	See Inc in Drainage Network

Dichotomous Key Determination:

1. Does the authorizing agency have discretionary authority to grant, modify, or amend provisions of the use authorization(s)? **YES**/NO/NA

If the answer is "NO", document the No Effect determination and the evaluation is completed. If "YES", move to question #2.

2. Are there naturally reproducing Snake River spring/summer Chinook salmon or Steelhead present at any time of the year in riverine habitat directly or indirectly affected by the actions? **YES**/NO/NA. If "YES", continue with question #3 through #11. If "NO, document the No Effect determination and the evaluation is completed.

3. Is the action likely to change the existing input of Large Woody Debris (LWD) into occupied habitat? **NO** (the answers for 3 – 11 will all be different for each type of activity, e.g. fence, culvert, cobble bed, wetland, etc.)

4. Is the action likely to affect stream morphology for occupied habitat? **YES**/NO/NA **(The sill would direct some of the flow from the river into the side channel/slough complex.)**

5. Is the action likely to affect properly functioning condition of the riparian area for occupied habitat? **YES**/NO/NA (**Indirect improvement of flood plain connectivity.)**

6. Is the action likely to affect water quality and/or quantity in the occupied habitat? YES/**NO**/NA **(Quality "NO". Water quantity in the main channel would be less when the water went into the side channel/slough.)**
7. Is the action likely to affect the water flow regime/annual hydrography in the occupied habitat? YES/**NO/**NA
8. Is the action likely to affect juvenile or adult behavior related to survival or reproduction? **YES**/NO/NA (**Juvenile behavior may be indirectly affected by creating new rearing habitat. Adults may migrate up the new channel/slough back to the main stem of the river.)**

9. Is the action likely to involve toxic and/or hazardous materials that may reach occupied habitat? **YES/**NO/NA (**Fluids from machines**.)
10. Is the action likely to affect juvenile or adult access to habitat? **YES**/NO/NA **(The sill should contribute indirectly to increased access to adult migration habitat and juvenile rearing habitat.)**
11. Is the action likely to affect substrate material? **YES**/NO/NA

> "NO" responses to question #3 – 11 would result in a "No Affect" finding and should be documented in the action file.
>
> A "YES", to any of the questions #3 – 11, however, requires in-depth evaluation by a professional biologist to determine if the action may affect the listed species. If the determination is made that an action "May affect" a listed species, continue with questions 12 – 15.

12. In addition the criteria listed in #3 – 11, do the actions, or the monitoring of them, likely involve any "taking", including "incidental taking" of listed or proposed species? **YES/**NO/NA **(Low probability that juvenile steelhead or Chinook may be present along the bank of the river near the sill and culvert site. Swift current makes it difficult for them to hold here.)**
13. Are the effects described in #3-11 inconsequential/temporary in nature and Not likely to degrade the habitat over time? **YES/**NO/NA **(Perhaps Not "inconsequential" but they should be beneficial, Not degrading.)**
14. Do the actions employ Best Management Practices (BMPs) designated to meet State water quality standards? **YES/**NO/NA
15. Is mitigation established that will preclude or reduce measurable effects on species and their habitat? **YES**/NO/NA

If the response to #12 above is "YES" and/or the response to criteria 13 – 15 are "NO", the determination of effects of this activity on listed or proposed anadromous salmonids is: The construction of a **rock sill** and the **48-inch culvert and continuing construction and maintenance** at the **Dunfee Slough** site "MAY EFFECT AND IS LIKELY TO ADVERSELY AFFECT" (juvenile) spring/summer Chinook salmon or Steelhead, or their habitat.

Rationale: There would be no effects on adult chinook or steelhead because they would not be present from October through January 15 (depending on which work window is used). The probability of juvenile chinook or steelhead being present in the Dunfee Slough site during construction of the rock sill and installing the culvert is very low. The river flows along the bank at this project site are probably too swift for juveniles to hold here. If juvenile chinook or steelhead were present, they could be adversely affected when the machine was building the rock sill and installing the culvert. The machine would work slowly to avoid impacts to juvenile chinook or steelhead and to allow them to escape the area. Precautions to prevent toxic spills, such as hydraulic fluid, would be taken and spill kits would be on hand to confine and quickly pick up a possible spill. The crew would be trained in proper fish-handling techniques if salvage were necessary. The effects of continuing construction and maintenance would be similar to the effects of the initial construction.

The sill and culvert would be beneficial for steelhead and Chinook in the long term. The improvements would help restore flood plain connectivity, increase LWD, reduce sediment in the river, open up over 1500 feet of additional rearing habitat, and increase the size of the riparian zone.

Determination of Affect Matrix for SNAKE RIVER SPRING/SUMMER CHINOOK SALMON and STEELHEAD

Authorizing Agency: U.S. Army Corps of Engineers Mgmt. Area: **Dunfee Slough**
Watershed: Upper Salmon River, Round Valley Action Type: Habitat Restoration
Specific Actions : **In or along the side channel/slough;** Construct 200 to 400 feet of new channel, rearrange pond spillway rock, install fish screens, planting trees, building a fence, deepen ponds and the channels between them, parking and storage area(s) and continuing construction and maintenance.

Pathway	Indicator	Status of the Baseline?	Effects of the Action?	Basis for Rationale
Water Quality	Temperature	NA; this is a dry channel in the fall and winter.	R	PJ; Planting trees will help reduce water temps., fence would protect the trees.
	Sediment/Turbidity	FR	M Idaho DEQ listed sediment as a pollutant in Salmon R. – however, No reference to 12 Mile reach.	PJ; Design of new side channel/slough may decrease sediment in side ch/slough. No site specific date.
	Chemical Contaminants/Nutrients	PF	M	PJ; Upper Salmon Subbasin Assmt. (11/15/2000) addressed sediment & temps. in the main river. Spill kits should reduce risks. Park area is400- 800 ft. from the river.
Habitat Access	Physical Barriers	NPF	R	PJ; No affect on access. Side ch. work will increase suitable habitat.
Habitat Elements	Substrate	NPF	R	PJ; No site-specific data available. Assume habitat suitable for rearing, migration, &over-wintering. Perennial flow should clean some substrate.
	LWD	FR	R	PJ; Planting trees & channel work should increase LWD
	Pool Frequency	FR; existing side ch/slough dries up in winter.	R	PJ; Ponds may serve as pool habitat.

Pathway	Indicator	Status of the Baseline?	Effects of the Action?	Basis for Rationale
Habitat Elements	Pool Quality	FR	R	See Pool Frequency
	Off-channel habitat	FR	R	PJ; New side channel/slough, trees, fence etc. would improve hbt.
	Refugia	FR	R	See Off-channel Habitat.
Channel Condition and Dynamics	Width/depth ratio	PF – for the new channel, (maybe not for the existing side channel-slouogh.)	R or D	PJ; W/d would improve in the side channel, may decline in the main river due to water diverted into the side channel.
	Stream bank condition	PF	M	PJ; side ch/slough banks would remain stable & should function naturally.
	Floodplain connectivity	FR	R	PJ; The side channel/slough connection to river should improve floodpl. connectivity
Flow/Hydrology	Change in Peak/Base Flows	FR	M	PJ; The side channel/slough would Not affect peak/base flows.
	Increase in Drainage Networks	NA	NA	PJ; Project too small to have any effect on watershed.
Watershed Conditions	Road Density and Location	PF	M	No new roads.
	Disturbance History	FR	M	See Incr. In Drainage Networks
	Riparian Reserves	FR	M	See Incr. In Drainage Networks

Dichotomous Key Determination:

1. Does the authorizing agency have discretionary authority to grant, modify, or amend provisions of the use authorization(s)? **YES**

If the answer is "NO", document the No Effect determination and the evaluation is completed. If "YES", move to question #2.

2. Are there naturally reproducing Snake River spring/summer Chinook salmon or Steelhead present at any time of the year in riverine habitat directly or indirectly affected by the actions? **YES** If "YES", continue with question #3 through #11. If "NO, document the No Effect determination and the evaluation is completed.

3. Is the action likely to change the existing input of Large Woody Debris (LWD) into occupied habitat? **YES** (the answers for 3 – 11 will all be different for each type of activity, e.g. fence,

culvert, cobble bed, wetland, etc.) **(Creating perennial flow in the side channel/slough complex would help establish trees and add LWD to the system.)**
4. Is the action likely to affect stream morphology for occupied habitat? **YES/**NO/NA (**The channel/slough would be designed to function as a natural part of the river system.)**
5. Is the action likely to affect properly functioning condition of the riparian area for occupied habitat? **YES/**NO/NA. (**Side channel/slough design should function as a natural, perennial channel & should improve flood plain connectivity.)**
6. Is the action likely to affect water quality and/or quantity in the occupied habitat? YES/**NO/**NA (**Water quality "NO", water quantity – there would be less water in the main channel for the distance of the side channel, until the water went back into the main river.)**
7. Is the action likely to affect the water flow regime/annual hydrography in the occupied habitat? YES/**NO/**NA.
8. Is the action likely to affect juvenile or adult behavior related to survival or reproduction? **YES/**NO/NA (**Adults could use this channel/slough for migration. Juveniles may use it for rearing or over-wintering habitat.)**
9. Is the action likely to involve toxic and/or hazardous materials that may reach occupied habitat? **YES/**NO/NA (**Fluids from machines**.)
10. Is the action likely to affect juvenile or adult access to habitat? **YES/**NO/NA **(The side channel should provide increased access to adults for migration and more rearing habitat for juveniles.)**
11. Is the action likely to affect substrate material? **YES/**NO/NA **(When the channel is opened, there would be shifting of material until it reached a stable state, probably during the first or second year.)**

> "NO" responses to question #3 – 11 would result in a "No Affect" finding and should be documented in the action file.
>
> A "YES", to any of the questions #3 – 11, however, requires in-depth evaluation by a professional biologist to determine if the action may affect the listed species. If the determination is made that an action "May affect" a listed species, continue with questions 12 – 15.

12. In addition the criteria listed in #3 – 11, do the actions, or the monitoring of them, likely involve any "taking", including "incidental taking" of listed or proposed species? YES/**NO/**NA (**There would be no effect on adults because they would not be present. There would be no effect on juveniles because: 1) the pond spillways present barriers to their upstream movement in the existing side channel/slough/pond complex and 2) the ponds and slough would be dry from about mid-September through March 1 (assuming an October – March 1 work window.)**
13. Are the effects described in #3-11 inconsequential/temporary in nature and Not likely to degrade the habitat over time? **YES/**NO/NA **(Perhaps Not "inconsequential", but the effects should be beneficial, Not degrading.)**
14. Do the actions employ **Best Management Practices (BMPs) designated to meet State water quality standards? YES/**NO/NA
15. Is mitigation established that will preclude or reduce measurable effects on species and their habitat? **YES/**NO/NA

If the response to #12 above is “NO” and the response to criteria 13 – 15 are “YES”, the determination of effects of this activity on listed or proposed anadromous salmonids is: The **construction of 200 to 400 feet of new channel, rearranging pond spillway rock, installing fish screens, deepening ponds and the channels between them, the parking & storage area, planting trees, building a fence, and continuing construction and maintenance** on the **Dunfee Slough** site ”MAY AFFECT, BUT IS NOT LIKELY TO ADVERSELY EFFECT ” juvenile or adult spring/summer Chinook salmon or steelhead, or their habitat.

Rationale: All of the previously mentioned work would be done in a dry channel or on dry land from late August (or October) through March 1(depending on which work window is used). [Please refer to Plate 11] Upstream access to the side channel/slough/pond complex is precluded by the barriers formed by the rock spillways at the end of the ponds. In addition to the passage barriers, there is no water in the side channel/slough/pond complex during the time that work would take place). Presently, the main source of flows through the existing side channel/slough/pond complex is from irrigation inflow, with minor spring flows. Precautions to prevent toxic spills, such as hydraulic fluid, would be taken and spill kits would be on hand to confine and quickly pick up a possible spill. The effects of continuing construction and maintenance would be similar to the effects of the initial construction.

The new side channel should have a beneficial effect by providing new rearing and over-wintering habitat for juvenile chinook or steelhead. Adult chinook and steelhead could migrate through the channel/slough complex if they entered the downstream end. Planting trees along the side channel (on this site and the other four sites) could have a **beneficial effect** on steelhead and chinook by cooling the water in the main river. They would also add LWD to the system.

Determination of Affect Matrix for SNAKE RIVER SPRING/SUMMER CHINOOK SALMON and STEELHEAD

Authorizing Agency: U.S. Army Corps of Engineers Mgmt. Area: **Dunfee Slough**
Watershed: Upper Salmon River, Round Valley Action Type: Habitat Restoration
Specific Actions : **Outside the main stem of the river and the side channel/slough**; Cutting 4 to 10 mature trees**.**

Pathway	Indicator	Status of the Baseline?	Effects of the Action?	Basis for Rationale
Water Quality	Temperature	NA	NA	
	Sediment/Turbidity	NA	NA	
	Chemical Contaminants/Nutrients	NA	NA	
Habitat Access	Physical Barriers	NA	NA	
Habitat Elements	Substrate	NA	NA	
	LWD	FR	M; Trees would be two tree lengths from river. They would Not add to LWD.	PJ; Short term loss of 4 – 10 trees would be offset by planting trees on 40 – 60 acres.
	Pool Frequency	NA	NA	
	Pool Quality	NA	NA	
	Off-channel habitat	NA	NA	PJ; See LWD
	Refugia	NA	NA	
Channel Condition and Dynamics	Width/depth ratio	NA	NA	Loss of 4 to 10 trees would not effect w/d ratio, bank condition or flood plain connectivity.
	Stream bank condition	NA	NA	
	Floodplain connectivity	NA	NA	
Flow/Hydrology	Change in Peak/Base Flows	NA	NA	
	Increase in Drainage Networks	NA	NA	
Watershed Conditions	Road Density and Location	PF	M	No new roads.
	Disturbance History	NA	NA	
	Riparian Reserves	NA	NA	

Dichotomous Key Determination:

1. Does the authorizing agency have discretionary authority to grant, modify, or amend provisions of the use authorization(s)? **YES**

If the answer is "NO", document the No Effect determination and the evaluation is completed. If "YES", move to question #2.

2. Are there naturally reproducing Snake River spring/summer Chinook salmon or Steelhead present at any time of the year in riverine habitat directly or indirectly affected by the actions? **YES**/NO/NA. If "YES", continue with question #3 through #11. If "NO, document the No Effect determination and the evaluation is completed.

Rationale: Cutting 4 to 10 mature trees would have no effect on juvenile or adult steelhead or Chinook salmon because none of the trees would be cut within two tree lengths of the river. Planting trees on 40 to 60 acres should offset the short term loss of 4 to 10 trees. Therefore, it is our determination that **cutting 4 to 10 mature trees** on the **Dunfee Slough** site will have "NO EFFECT ON SNAKE RIVER SPRING/SUMMER CHINOOK SALMON or STEELHEAD OR THEIR HABITAT".

Determination of Affect Matrix for SNAKE RIVER SPRING/SUMMER CHINOOK SALMON and STEELHEAD

Authorizing Agency: U.S. Army Corps of Engineers Mgmt. Area: **One Mile Island**
Watershed: Upper Salmon River, Round Valley Action Type: Habitat Restoration
Specific Actions : **In or along the main stem of the river;** grade river bank and install bank logs, and continuing construction and maintenance.

Pathway	Indicator	Status of the Baseline?	Effects of the Action?	Basis for Rationale
Water Quality	Temperature	FR	R	PJ; Idaho DEQ listed temperature & sediment as a pollutant in Salmon R. – however, no reference to 12 Mile reach, possibly worse in summer. Fence would protect trees.
	Sediment/Turbidity	FR	M	PJ; All actions should help stabilize bank & reduce sediment. See Temperature.
	Chemical Contaminants/Nutrients	PF	M	PJ; Upper Salmon Subbasin Assmt. (11/15/2000) Sediment & temps. in the main river. Spill kits should reduce risks.
Habitat Access	Physical Barriers	PF	M	No affect on access
Habitat Elements	Substrate	NPF	M	PJ; No site-specific data available. Assume habitat suitable for migration. Substrate may be suitable for spawning.
	LWD	FR	R.	PJ; Bank logs may aid establishment of trees along the river.
	Pool Frequency	FR	M	PJ; Grading the banks, etc. would not create pool habitat.
	Pool Quality	FR	M	See Pool Frequency
	Off-channel habitat	FR	M	PJ; No effect on off channel habitat.
	Refugia	FR	M	PJ; No effect on refugia.

Pathway	Indicator	Status of the Baseline?	Effects of the Action?	Basis for Rationale
Channel Condition and Dynamics	Width/depth ratio	PF	M	PJ; Grading may help maintain present channel width by reducing erosion.
	Stream bank condition	NPF	R	PJ; Graded banks should be more stable. Bank logs may help establish willow to stabilize banks.
	Floodplain connectivity	NPF	R	PJ; Grading may provide some floodplain connection
Flow/Hydrology	Change in Peak/Base Flows	FR	M	PJ; No effect on peak or base flows.
	Increase in Drainage Networks	NA	NA	PJ; Project too small to have any effect.
Watershed Conditions	Road Density and Location	PF	M	No new roads.
	Disturbance History	FR	M	See Incr. in Drainage Network
	Riparian Reserves	FR	M	See Incr. in Drainage Network

Dichotomous Key Determination:

1. Does the authorizing agency have discretionary authority to grant, modify, or amend provisions of the use authorization(s)? **YES**

If the answer is "NO", document the No Effect determination and the evaluation is completed. If "YES", move to question #2.

2. Are there naturally reproducing Snake River spring/summer Chinook salmon or Steelhead present at any time of the year in riverine habitat directly or indirectly affected by the actions? **YES/**NO/NA If "YES", continue with question #3 through #11. If "NO, document the No Effect determination and the evaluation is completed.

3. Is the action likely to change the existing input of Large Woody Debris (LWD) into occupied habitat? **YES** (the answers for 3 -11 will all be different for each type of activity, e.g. fence, culvert, wetland, etc.) (**The bank logs should help establish trees and eventually add LWD to the river**.)

4. Is the action likely to affect stream morphology for occupied habitat? **YES**/NO/NA **(May allow flood plain connectivity at this point during a 20-plus year high flow event.)**

5. Is the action likely to affect properly functioning condition of the riparian area for occupied habitat? **YES/**NO/NA **(The action may have a beneficial effect on floodplain connectivity, but that is not the goal of this project**.)

6. Is the action likely to affect water quality and/or quantity in the occupied habitat? **YES/**NO/NA **(It should have a beneficial effect on reducing sediment that is generated from this bank. It would Not affect quantity.)**

7. Is the action likely to affect the water flow regime/annual hydrography in the occupied habitat? YES/**NO**/NA

8. Is the action likely to affect juvenile or adult behavior related to survival or reproduction? YES/**NO/**NA (**Adult migration would Not be changed. There may be an increase in suitable juvenile rearing habitat.)**

9. Is the action likely to involve toxic and/or hazardous materials that may reach occupied habitat? **YES/**NO/NA (**Fluids from machines**.)

10. Is the action likely to affect juvenile or adult access to habitat? **YES/**NO/NA (**There may be an increase in suitable juvenile rearing habitat.)**

11. Is the action likely to affect substrate material? YES/**NO**/NA

"NO" responses to question #3 – 11 would result in a "No Affect" finding and should be documented in the action file.

A "YES", to any of the questions #3 – 11, however, requires in-depth evaluation by a professional biologist to determine if the action may affect the listed species. If the determination is made that an action "May affect" a listed species, continue with questions 12 – 15.

12. In addition the criteria listed in #3 – 11, do the actions, or the monitoring of them, likely involve any "taking", including "incidental taking" of listed or proposed species? **YES/**NO/NA (**Juvenile Chinook or steelhead could be present in the backwater near the shore or behind the existing barbs in the river. They could be adversely affected by the machine as it graded the banks or laid the logs in. There is a low probability that this would occur.**)

13. Are the effects described in #3-11 inconsequential/temporary in nature and Not likely to degrade the habitat over time? **YES/**NO/NA (**Perhaps Not "inconsequential" but the effects should be beneficial, Not degrading.)**

14. Do the actions employ Best Management Practices (BMPs) designated to meet State water quality standards? **YES/**NO/NA

15. Is mitigation established that will preclude or reduce measurable effects on species and their habitat? **YES**/NO/NA

If the response to #12 above is "YES" and/or the response to criteria 13 – 15 are "No", the determination of effects of this activity on listed or proposed anadromous salmonids is: The **grading of the river bank, installing bank logs and continuing construction & maintenance** on the **One Mile Island** site "MAY EFFECT AND IS LIKELY TO ADVERSELY AFFECT" (juvenile) spring/summer Chinook salmon or steelhead, or their habitat.

Rationale: The proposed actions would not have any effects on adult Chinook or steelhead because they would not be present when the work was done. The probability of juvenile Chinook or steelhead being present along either of the river channels around One Mile Island during the machine work to grade the banks or laying bank logs is low because the habitat is only marginal for over-wintering or rearing. It is possible that juvenile Chinook or steelhead could be present near the bank when the machine was excavating and grading the bank. The machine would work slowly to allow any salmonids to escape the area. Precautions to prevent toxic spills, such as hydraulic fluid, would be taken and spill kits would be on hand to confine and quickly pick up a possible spill. The crew would be trained in proper fish-handling techniques in order to salvage fish if necessary. Continuing construction and maintenance would have the same effects on Chinook or steelhead as the initial construction. This project should improve the riparian habitat, reduce sediment, and possibly increase rearing habitat for juveniles

Determination of Affect Matrix for SNAKE RIVER SPRING/SUMMER CHINOOK SALMON and STEELHEAD

Authorizing Agency: U.S. Army Corps of Engineers Mgmt. Area: **One Mile Island**
Watershed: Upper Salmon River, Round Valley Action Type: Habitat Restoration
Specific Actions : **Along the main stem of the river and a slough**; Building a wire fence, planting trees, and fence maintenance; **Four hundred to five hundred feet from the river**; parking & material storage area(s).

Pathway	Indicator	Status of the Baseline?	Effects of the Action?	Basis for Rationale
Water Quality	Temperature	FR	R	PJ; Planting trees will increase shade. Fence will protect trees.
	Sediment/Turbidity	FR	R	PJ; Trees will help stabilize banks, improve riparian zone, & reduce erosion.
	Chemical Contaminants/Nutrients	NA	NA	
Habitat Access	Physical Barriers	PF	M	No affect on access.
Habitat Elements	Substrate	NA	NA	
	LWD	FR	R	PJ; Trees would eventually add LWD.
	Pool Frequency	FR	M	PJ; Actions would not increase pool freq.
	Pool Quality	FR	M	See Pool Frequency.
	Off-channel habitat	FR	R	PJ; Fence would protect riparian zone.
	Refugia	NA	NA	PJ; No effect on refugia.
Channel Condition and Dynamics	Width/depth ratio	NA	NA	
	Stream bank condition	FR	R	PJ; Planting trees would help improve bank condition.
	Floodplain connectivity	NA	NA	
Flow/Hydrology	Change in Peak/Base Flows	FR	M	PJ; No effect on peak or base flows.
	Increase in Drainage Networks	NA	NA	PJ; Project too small to have any effect.
Watershed Conditions	Road Density and Location	PF	M	PJ; No new roads.
	Disturbance History	FR	M	See Incr. In Drainage Networks.
	Riparian Reserves	FR	M	See Incr. In Drainage Networks.

Dichotomous Key Determination:

1. Does the authorizing agency have discretionary authority to grant, modify, or amend provisions of the use authorization(s)? **YES**

If the answer is "NO", document the No Effect determination and the evaluation is completed. If "YES", move to question #2.

2. Are there naturally reproducing spring /summer Chinook salmon or steelhead present at any time of the year in riverine habitat directly or indirectly affected by the actions? **YES**/NO/NA

If "YES", continue with question #3 through #11. If "NO", document the NO Effect determination and the evaluation is completed.

3. Is the action likely to change the existing input of Large Woody Debris (LWD) into occupied habitat? **YES** (the answers for 3 -11 will all be different for each type of activity, e.g. fence, culvert, wetland, etc.) (**The new trees should eventually add LWD to the river**.)

4. Is the action likely to affect stream morphology for occupied habitat? YES/**NO**/NA **(The fence, planting trees and the parking/storage area would not have any effect on morphology.)**

5. Is the action likely to affect properly functioning condition of the riparian area for occupied habitat? **YES/**NO/NA **(The action may have a beneficial effect on off channel habitat and/or refugia**.)

6. Is the action likely to affect water quality and/or quantity in the occupied habitat? **YES/**NO/NA **(The trees could have a beneficial effect on reducing sediment by stabilixing the banks. It would not affect quantity.)**

7. Is the action likely to affect the water flow regime/annual hydrography in the occupied habitat? YES/**NO**/NA

8. Is the action likely to affect juvenile or adult behavior related to survival or reproduction? **YES**/NO/NA (**Adult migration would not be changed. The trees would help reduce water temperature and may provide suitable juvenile rearing habitat.)**

9. Is the action likely to involve toxic and/or hazardous materials that may reach occupied habitat? **YES/**NO/NA (**Fluids from machines**.)

10. Is the action likely to affect juvenile or adult access to habitat? **YES/**NO/NA (**There may be an increase in suitable juvenile rearing habitat.)**

11. Is the action likely to affect substrate material? YES/**NO**/NA

"NO" responses to question #3 – 11 would result in a "No Affect" finding and should be documented in the action file.

A "YES", to any of the questions #3 – 11, however, requires in-depth evaluation by a professional biologist to determine if the action may affect the listed species. If the determination is made that an action "May affect" a listed species, continue with questions 12 – 15.

12. In addition the criteria listed in #3 – 11, do the actions, or the monitoring of them, likely involve any "taking", including "incidental taking" of listed or proposed species? YES/**NO**/NA **(The fence and planting trees would all be on dry land. The parking/storage area would be**

400 to 500 feet from the river. Adults would not be present during the project. **Juvenile Chinook or steelhead could be present in the backwater near the shore or behind the existing barbs in the river.**

13. Are the effects described in #3-11 inconsequential/temporary in nature and Not likely to degrade the habitat over time? **YES/**NO/NA (**Perhaps Not "inconsequential" but the effects should be beneficial, not degrading.)**

14. Do the actions employ Best Management Practices (BMPs) designated to meet State water quality standards? **YES/**NO/NA

15. Is mitigation established that will preclude or reduce measurable effects on species and their habitat? **YES**/NO/NA

If the response to #12 above is "NO" and/or the response to criteria 13 – 15 are "YES", the determination of effects of this activity on listed or proposed anadromous salmonids is: **Planting trees, building a fence and the parking/storage area** on the **One Mile Island** site "MAY EFFECT BUT IS NOT LIKELY TO ADVERSELY AFFECT" (juvenile) spring/summer Chinook salmon or steelhead, or their habitat.

Rationale: These actions would have no direct, indirect or cumulative effects on spring/summer Chinook salmon or steelhead. The fence should have **beneficial effects** by preventing livestock from damaging the riparian zone along the river. Planting trees along the river could have a **beneficial effect** on steelhead and Chinook by cooling the water in the main river. They would also add LWD to the system. The vehicle parking and material storage area(s) would be 400 to 500 feet or more from the river. The only type of chemical toxicant that would be present would be vehicle lubricants, coolants, and hydraulic fluids. Spills would be small and cleaned up before they could present a hazard to the river environment. The effects of fence maintenance would be similar to the effects of the initial construction.

Determination of Affect Matrix for SNAKE RIVER SPRING/SUMMER CHINOOK SALMON and STEELHEAD

Authorizing Agency: U.S. Army Corps of Engineers Mgmt. Area: **One Mile Island**
Watershed: Upper Salmon River, Round Valley Action Type: Habitat Restoration
Specific Actions : **Along the main stem of the river and a slough**; cutting up to 7 mature trees.

Pathway	Indicator	Status of the Baseline?	Effects of the Action?	Basis for Rationale
Water Quality	Temperature	NA	NA	
	Sediment/Turbidity	NA	NA	
	Chemical Contaminants/Nutrients	NA	NA	
Habitat Access	Physical Barriers	NA	NA	
Habitat Elements	Substrate	NA	NA	
	LWD	FR	R	PJ; Trees would eventually add LWD.
	Pool Frequency	NA	NA	
	Pool Quality	NA	NA	
	Off-channel habitat	FR	R	PJ; Trees would help improve off channel hbt.
	Refugia	NA	NA	
Channel Condition and Dynamics	Width/depth ratio	NA	NA	
	Stream bank condition	FR	R	PJ; Planting trees would help improve bank condition.
	Floodplain connectivity	NA	NA	
Flow/Hydrology	Change in Peak/Base Flows	FR	M	PJ; No effect on peak or base flows.
	Increase in Drainage Networks	NA	NA	
Watershed Conditions	Road Density and Location	PF	M	PJ; No new roads.
	Disturbance History	NA	NA	
	Riparian Reserves	NA	NA	

Dichotomous Key Determination:

1. Does the authorizing agency have discretionary authority to grant, modify, or amend provisions of the use authorization(s)? **YES**

If the answer is “NO”, document the No Effect determination and the evaluation is completed. If “YES”, move to question #2.

2. Are there naturally reproducing spring /summer Chinook salmon or steelhead present at any time of the year in riverine habitat directly or indirectly affected by the actions? YES/**NO**/NA

If “YES”, continue with question #3 through #11. If “NO”, document the No Effect determination and the evaluation is completed.

Rationale: Cutting up to 7 mature trees would have no effect on adult or juvenile Chinook salmon or steelhead because none of the trees would be cut within two tree lengths of the river. Planting trees along 1900 feet of river channel should offset the short-term loss of 7 trees. Therefore, it is our determination that **cutting up to 7 mature trees** on the **One Mile Island** site will have “NO EFFECT ON SPRING/SUMMER CHINOOK SALMON or STEELHEAD OR THEIR HABITAT”.

Determination of Affect Matrix for SNAKE RIVER SPRING/SUMMER CHINOOK SALMON

Authorizing Agency: U.S. Army Corps of Engineers Mgmt. Area: **Hot Springs Site**
Watershed: Upper Salmon River, Round Valley Action Type: Habitat Restoration
Specific Actions : **In the main channel of the river**; reopen about 700 to 800 feet of an old side channel and continuing construction and maintenance.

Pathway	Indicator	Status of the Baseline?	Effects of the Action?	Basis for Rationale
Water Quality	Temperature	FR	R	PJ; Idaho DEQ listed temperature & sediment as a pollutants in Salmon R. –, no reference to 12 Mile reach; temps. Could help reduce water temp. because this channel has mature trees on both sides.
	Sediment/Turbidity	FR	R.	PJ; Mobilized sediment should stabilize after the initial watering-up of the new channel.
	Chemical Contaminants/Nutrients	PF	M	PJ; Upper Salmon Subbasin Assmt. did not address chem/nut as pollutants in the main river. Spill kits should reduce risk.
Habitat Access	Physical Barriers	PF	R	PJ; Reopening the side channel would increase rearing habitat.
Habitat Elements	Substrate	NA; this is a dry channel.	R (after the channel is opened)	PJ; No site-specific data available. Substrate size should be suitable for rearing & migration. Spawning potential unknown.
	LWD	NA; dry channel	R (after the channel is opened)	PJ; Existing and new trees along the side channel should increase LWD over time.

Pathway	Indicator	Status of the Baseline?	Effects of the Action?	Basis for Rationale
Habitat Elements	Pool Frequency	NA; dry channel	M (after channel is opened)	PJ; Pool habitat not expected but possible.
	Pool Quality	NA; dry channel	M	See Pool Frequency
	Off-channel habitat	NPF	R	PJ; channel should increase water table & improve off ch hbt.
	Refugia	FR	M	PJ; Not expected to change.
Channel Condition and Dynamics	Width/depth ratio	NA; dry channel	R or D	PJ; W/d would improve in the side channel, may decline in the main river due to water diverted into the side channel.
	Stream bank condition	FR	M	PJ; Work not expected to improve banks. Banks armored all along this reach.
	Floodplain connectivity	NPF	M	PJ; Not intended to provide floodplain connection
Flow/Hydrology	Change in Peak/Base Flows	FR	M	The side channel would Not affect peak/base flows.
	Increase in Drainage Networks	NA	NA	PJ; Project too small to have any effect.
Watershed Conditions	Road Density and Location	PF	M	No new roads
	Disturbance History	FR	M	See Incr in Drainage Networks.
	Riparian Reserves	FR	M	See Incr in Drainage Networks.

Dichotomous Key Determination:

1. Does the authorizing agency have discretionary authority to grant, modify, or amend provisions of the use authorization(s)? **YES**

If the answer is "NO", document the No Effect determination and the evaluation is completed. If "YES", move to question #2.

2. Are there naturally reproducing Snake River spring/summer Chinook salmon or Steelhead present at any time of the year in riverine habitat directly or indirectly affected by the actions? **YES**/NO/NA

If "YES", continue with question #3 through #11. If "NO: document the No Effect determination and the evaluation is completed.

3. Is the action likely to change the existing input of Large Woody Debris (LWD) into occupied habitat? **YES** (the answers for 3 – 11 will all be different for each type of activity, e.g. fence, culvert, cobble bed, wetland, etc.) (**There should be more LWD in the riverine habitat after the side channel is opened – there is very little LWD in the river presently.)**
4. Is the action likely to affect stream morphology for occupied habitat? **YES**/NO/NA **(The action would increase rearing & over-wintering habitat for juvenile Chinook and steelhead, and migration habitat for adults.)**
5. Is the action likely to affect properly functioning condition of the riparian area for occupied habitat? **YES/**NO/NA. **(Side channel design should function as a natural channel**.)
6. Is the action likely to affect water quality and/or quantity in the occupied habitat? YES/**NO/**NA **(Water quality "NO", water quantity – there would be less water in the main channel for the distance of the side channel, until the water went back into the main river.)**
7. Is the action likely to affect the water flow regime/annual hydrography in the occupied habitat? YES/**NO/**NA
8. Is the action likely to affect juvenile or adult behavior related to survival or reproduction? **YES/**NO/NA **(Adult Chinook and steelhead could use the side channel for migration. Juveniles could use the side channel for rearing and over-wintering habitat.)**
9. Is the action likely to involve toxic and/or hazardous materials that may reach occupied habitat? **YES**/NO/NA (**Fluids from machines**.)
10. Is the action likely to affect juvenile or adult access to habitat? **YES**/NO/NA **(The side channel should provide increased access to adults and juveniles.)**
11. Is the action likely to affect substrate material? **YES/**NO/NA **(When the channel is opened, there would be shifting of material until it reached a stable state, probably during the first or second year.**

"NO" responses to question #3 – 11 would result in a "No Affect" finding and should be documented in the action file.

A "YES", to any of the questions #3 – 11, however, requires in-depth evaluation by a professional biologist to determine if the action may affect the listed species. If the determination is made that an action "May affect" a listed species, continue with questions 12 – 15.

12. In addition the criteria listed in #3 – 11, do the actions, or the monitoring of them, likely involve any "taking", including "incidental taking" of listed or proposed species? **YES**/NO/NA **(Adults would Not be effected because they would Not be present. There is a very low probability that juveniles would be present at either end of the old side channel when it is opened to allow river flows to enter it.)**
13. Are the effects described in #3-11 inconsequential/temporary in nature and Not likely to degrade the habitat over time? **YES/**NO/NA **(Perhaps Not "inconsequential", but the effects should be beneficial, Not degrading.)**
14. Do the actions employ Best Management Practices (BMPs) designated to meet State water quality standards? **YES/**NO/NA
15. Is mitigation established that will preclude or reduce measurable effects on species and their habitat? **YES/**NO/NA

If the response to #12 above is "YES" and the response to criteria 13 – 15 are "YES", the determination of effects of this activity on listed or proposed anadromous salmonids is: The r**eopening of about 700 to 800 feet of an old side channel along the river and continuing construction and maintenance** on the **Hot Springs** site "MAY EFFECT AND IS LIKELY TO ADVERSELY AFFECT" (juvenile) spring/summer Chinook salmon or their habitat.

Rationale: All of the work on the side channel along the Hot Springs site would be done in a dry channel from October to January 15 (depending on which work window is used) when adult Chinook salmon and steelhead would not be present. The only possible direct effect would be to juveniles when the ends of the new channel are opened to allow flows from the river to enter the side channel. It is not likely that juvenile Chinook or steelhead would be present at the ends of the old side channel because the current in the river is probably too swift for juveniles to hold here. If juveniles were present, they could be adversely affected by the machine work. The machine would work slowly in order to allow juveniles to escape and avoid injuring them. Precautions to prevent toxic spills, such as hydraulic fluid, would be taken and spill kits would be on hand to confine and quickly pick up a possible spill. The new side channel should provide a beneficial effect by creating new rearing and over-wintering habitat for juveniles. Adults would be able to migrate through this channel. The crew would be trained in proper fish-handling techniques in order to salvage fish if necessary. The effects of continuing construction and maintenance would be similar to the effects of the initial construction.

Opening this channel should be beneficial for juvenile rearing as well as holding habitat for migrating Chinook and steelhead.

Determination of Affect Matrix for SNAKE RIVER SPRING/SUMMER CHINOOK SALMON and STEELHEAD

Authorizing Agency: U.S. Army Corps of Engineers Mgmt. Area: **Hot Springs Site**
Watershed: Upper Salmon River, Round Valley Action Type: Habitat Restoration
Specific Actions : **In Challis Hot Springs Creek**; gravel dams to form pools, cobble beds, replacing culverts, excavating banks, draining a pond, excavating a new channel through a pond, installing a flume and diversion for irrigation water, fish screens, building a wetland & channels to take water out of it, water gaps, deepening the thalweg, and continuing construction and maintenance**.**

Pathway	Indicator	Status of the Baseline?	Effects of the Action?	Basis for Rationale
Water Quality	Temperature	PF	R	PJ; Rerouting the hot spring could help reduce water temps in the creek.
	Sediment/Turbidity	FR	M	PJ; Routing irrigation water out of creek should reduce sediment.
	Chemical Contaminants/Nutrients	PF	M-R.	PJ; Upper Salmon Subbasin Assmt. (11/15/2000) did not address chem/nut as pollutants in the main river.Spill kit should reduce risks.
Habitat Access	Physical Barriers	NPF	R	PJ; Remove concrete at end of the pond & install larger culverts.
Habitat Elements	Substrate	FR	R	PJ; The actions will introduce addl. gravel/cobbles to the system.
	LWD	NPF	R	PJ; Improving flood plain connect. would aid establishing trees & add LWD to the creek.
	Pool Frequency	FR	R	Gravel dams, pools, deepening thalweg, should increase pool habitat.
	Pool Quality	FR	R	See Pool Frequency
	Off-channel habitat	NPF	R	PJ: The wetland, and the new channel thru pond should improve off ch. hbt.

Pathway	Indicator	Status of the Baseline?	Effects of the Action?	Basis for Rationale
	Refugia	FR	R	PJ; more rearing habitat available. Better riparian zone due to thalwed deepening & pools.
Channel Condition and Dynamics	Width/depth ratio	PF	M-R	PJ; Deepening thalweg would improve w/d ratio in one reach.
	Stream bank condition	PF	R	PJ; The banks of the channel through the pond would be improved over the pond bank condition.
	Floodplain connectivity	PF	R. Not much flood plain because this is a first order stream.	PJ; Bank work should improve flood plain connection.
Flow/Hydrology	Change in Peak/Base Flows	PF	M	PJ; The water source for this creek is a spring that fluctuates little throughout the year.
	Increase in Drainage Networks	NA	NA	PJ; Project is too small to have any effect.
Watershed Conditions	Road Density and Location	PF	M	No new roads.
	Disturbance History	FR	M	See Incr in Drainage Networks
	Riparian Reserves	FR	M	See Incr in Drainage Networks

Dichotomous Key Determination:

1. Does the authorizing agency have discretionary authority to grant, modify, or amend provisions of the use authorization(s)? **YES**

If the answer is "NO", document the No Effect determination and the evaluation is completed. If "YES", move to question #2.

2. Are there naturally reproducing Snake River spring/summer Chinook Salmon or Steelhead present at any time of the year in riverine habitat **directly** (no) or **indirectly** (yes) affected by the actions? **YES**/NO/NA If "YES", continue with question #3 through #11. If "NO": document the NO Effect determination and the evaluation is completed.

3. Is the action likely to change the existing input of Large Woody Debris (LWD) into occupied habitat? YES/**NO**/NA (the answers for 3 – 11 will all be different for each type of activity, e.g. fence, culvert, cobble bed, wetland, etc.) (**There would be more LWD available; there is presently none.)**

4. Is the action likely to affect stream morphology for occupied habitat? **YES/**NO/NA (**The channel through the pond area, deepening the thalweg, excavating the banks, are examples of how the morphology would change.)**
5. Is the action likely to affect properly functioning condition of the riparian area for occupied habitat? **YES**/NO/NA. (**Excavating the banks, deepening the thalweg, and installing larger culverts should improve the function of this riparian zone.)**
6. Is the action likely to affect water quality and/or quantity in the occupied habitat? **YES**/NO/NA **Water quality "YES", water quantity "NO". Rerouting the hot spring would help reduce water temperatures at the mouth of the creek. Rerouting the irrigation water to the new wetland should help reduce sediment. Water quantity would not change because the spring that feeds the creek does Not fluctuate much throughout the year.**
7. Is the action likely to affect the water flow regime/annual hydrography in the occupied habitat? YES/**NO**/NA.
8. Is the **action likely to affect juvenile or adult behavior related to survival or reproduction? YES/**NO/NA **(Adults steelhead may use this creek for spawning; Chinook are unlikely to spawn here. Juveniles would also have better access to the entire length of the creek; access is presently hindered by the concrete structure at the end of the pond on the northern landowners property.)**
9. Is the action likely to involve toxic and/or hazardous materials that may reach occupied habitat? **YES/**NO/NA (**Fluids from machines**.)
10. Is the action likely to affect juvenile or adult access to habitat? **YES**/NO/NA (**The rerouting of the hot springs, larger culverts, and the removal of the concrete structure at the pond should provide increased access to adults for spawning. The beneficial effects for juveniles would have better access to the entire length of the creek, and they would have better habitat to avoid predation.)**
11. Is the action likely to affect substrate material? **YES/**NO/NA **(There could be minor shifting of material (gravel dams) until it reached a stable state, probably during the first or second year. The flows of the creek are not high enough to move material larger than sand, so there should be very little movement of materials placed in the creek by this project.)**

> "NO" responses to question #3 – 11 would result in a "No Affect" finding and should be documented in the action file.
>
> A "YES", to any of the questions #3 – 11, however, requires in-depth evaluation by a professional biologist to determine if the action may affect the listed species. If the determination is made that an action "May affect" a listed species, continue with questions 12 – 15.

12. In addition the criteria listed in #3 – 11, do the actions, or the monitoring of them, likely involve any "taking", including "incidental taking" of listed or proposed species? **YES/**NO/NA **(The creek presently has several hundred juvenile Chinook & steelhead/rainbow trout rearing in it. Machine work could adversely impact them. Adults would Not be present when work was done.)**

13. Are the effects described in #3-11 inconsequential/temporary in nature and Not likely to degrade the habitat over time? **YES/**NO/NA **(Perhaps Not "inconsequential", but the effects should be beneficial, Not degrading.)**
14. Do the actions employ Best Management Practices (BMPs) designated to meet State water quality standards? **YES/**NO/NA
15. Is mitigation established that will preclude or reduce measurable effects on species and their habitat? **YES/**NO/NA

If the response to #12 above is "YES" and/or the response to criteria 13 – 15 are "YES", the determination of effects of this activity on listed or proposed anadromous salmonids is: The **gravel dams to form pools, the cobble beds, replacing culverts, excavating banks, draining a pond, excavating a new channel through a pond, installing a flume and diversion for irrigation water, installing fish screens, building a wetland and channels to take water out of it, water gaps, deepening the thalweg, and continuing construction and maintenance** on the **Hot Springs** site "MAY EFFECT AND IS LIKELY TO ADVERSELY AFFECT" (juvenile) spring/summer Chinook salmon or steelhead, or their habitat.

Rationale: The IDFG conducted snorkel surveys of Challis Hot Springs Creek in July 2002 and found 528 juvenile Chinook salmon and 247 juvenile steelhead/rainbow trout. Machines would be working in and along the creek when the juveniles are present and may adversely impact them. The machines would work slowly in order to allow juveniles to escape. The crew would be trained in proper salvage techniques to remove juveniles if necessary to prevent injury. Turbidity curtains and portable pumps would also be used to avoid adverse impacts from sediment. Upon completion of this project, the habitat in Challis Hot Springs Creek should be greatly improved for rearing and possibly spawning habitat.

Building the wetland across the western spring channel is not likely to effect adults or juveniles because most of the construction would be on dry land. Although 200 to 400 feet of the western spring channel would be taken up by the wetland, there is low probability that fish would be present in the channel because of low water for most of the fall, winter and spring (less than 2 cfs). The southern landowner remarked that he has never seen fish in this channel, probably because there is not enough water in it.

All of the projects planned for the creek would be beneficial for steelhead and Chinook in the long term. The improvements would help reduce sediment in irrigation water, remove passage barriers, improve and increase the size of the riparian zone, improve rearing habitat for juveniles and provide sanctuary for juveniles from predators. The effects of continuing construction and maintenance would be similar to the effects of the initial construction.

Steelhead or Chinook could get up the channel from the wetland to the river approximately 500 feet. They would not be able to get past the five screens on the channel and into the wetland. However, they could be stranded in the channel when irrigation flows from the wetland are turned off. The channel would be sloped downhill to the river to help prevent fish from becoming stranded.

Determination of Affect Matrix for SNAKE RIVER SPRING/SUMMER CHINOOK SALMON and STEELHEAD

Authorizing Agency: U.S. Army Corps of Engineers Mgmt. Area: **Hot Springs Site**
Watershed: Upper Salmon River, Round Valley Action Type: Habitat Restoration
Specific Actions : **Along the creek**; build a wire fence, plant trees, and maintenance.

Pathway	Indicator	Status of the Baseline?	Effects of the Action?	Basis for Rationale
Water Quality	Temperature	PF	R	PJ; Upper Salmon Subbasin Assmt. (11/15/2000) addressed sed & temp. as pollutants in the main river.The trees would help cool the water in the creek & the fence would protect the trees.
	Sediment/Turbidity	PF	M-R	PJ. Riparian vegetation would trap sediment.
	Chemical Contaminants/Nutrients	PF	R	PJ; Upper Salmon Subbasin Assmt. did not address chem/nut as pollutants in the main river.Fence would help reduce fecal level in creek.
Habitat Access	Physical Barriers	NPF	M	PJ; fence and trees would not improve access.
Habitat Elements	Substrate	FR	M	PJ; Trees and fence would Not effect substrate.
	LWD	NPF	R	PJ; Fence would aid establishing trees & protect riparian. Trees would eventually add LWD.
	Pool Frequency	FR	R	PJ; Trees would produce LWD that could form pools.
	Pool Quality	FR	R	See Pool Frequency
	Off-channel habitat	NPF	R	PJ: New trees would add more riparian habitat. Fence would protect the riparian.

Pathway	Indicator	Status of the Baseline?	Effects of the Action?	Basis for Rationale
Habitat Elements	Refugia	FR	R	PJ; Riparian zone would increase in size & quality.
Channel Condition and Dynamics	Width/depth ratio	PF	R	PJ; Indirect effects from LWD added to the creek.
	Stream bank condition	PF	R	PJ; The fence would protect banks and the riparian vegetation.
	Floodplain connectivity	PF	M; Not much flood plain because this is a first order stream.	PJ; Fence and new trees would not have any effect.
Flow/Hydrology	Change in Peak/Base Flows	PF	M	PJ; Project too small to have any effect.
	Increase in Drainage Networks	NA	NA	See Change in Peak/base Flows
Watershed Conditions	Road Density and Location	PF	M	No new roads.
	Disturbance History	FR	M	See Change in Peak/base Flows
	Riparian Reserves	FR	M	See Change in Peak/base Flows

Dichotomous Key Determination:

1. Does the authorizing agency have discretionary authority to grant, modify, or amend provisions of the use authorization(s)? **YES**

If the answer is "NO", document the No Effect determination and the evaluation is completed. If "YES", move to question #2.

2. Are there naturally reproducing Snake River spring/summer Chinook Salmon or Steelhead present at any time of the year in riverine habitat **directly** (no) or **indirectly** (yes) affected by the actions? **YES**/NO/NA If "YES", continue with question #3 through #11. If "NO": document the No Effect determination and the evaluation is completed.

3. Is the action likely to change the existing input of Large Woody Debris (LWD) into occupied habitat? **YES** (the answers for 3 – 11 will all be different for each type of activity, e.g. fence, culvert, cobble bed, wetland, etc.) (**There would be more LWD available; there is presently none.)**

4. Is the action likely to affect stream morphology for occupied habitat? YES/**NO**/NA

5. Is the action likely to affect properly functioning condition of the riparian area for occupied habitat? **YES**/NO/NA. (**The new trees would expand the riparian zone.)**

6. Is the action likely to affect water quality and/or quantity in the occupied habitat? YES/**NO**/NA

7. Is the action likely to affect the water flow regime/annual hydrography in the occupied habitat? YES/**NO**/NA.

8. Is the action likely to affect juvenile or adult behavior related to survival or reproduction? **YES**/NO/NA **(The trees should help add forage in the form of insects to the creek.)**

9. Is the action likely to involve toxic and/or hazardous materials that may reach occupied habitat? YES/**NO**/NA (**Storage areas would be too far away.**)
10. Is the action likely to affect juvenile or adult access to habitat? YES/**NO**/NA
11. Is the action likely to affect substrate material**?** YES/**NO/**NA

"NO" responses to question #3 – 11 would result in a "NO Affect" finding and should be documented in the action file.

A "YES", to any of the questions #3 – 11, however, requires in-depth evaluation by a professional biologist to determine if the action may affect the listed species. If the determination is made that an action "May affect" a listed species, continue with questions 12 – 15.

12. In addition the criteria listed in #3 – 11, do the actions, or the monitoring of them, likely involve any "taking", including "incidental taking" of listed or proposed species? YES/**NO**/NA
13. Are the effects described in #3-11 inconsequential/temporary in nature and Not likely to degrade the habitat over time? **YES/**NO/NA **(Perhaps Not "inconsequential", but the effects should be beneficial, Not degrading.)**
14. Do the actions employ Best Management Practices (BMPs) designated to meet State water quality standards? **YES/**NO/NA

15. Is mitigation established that will preclude or reduce measurable effects on species and their habitat? **YES/**NO/NA

If the response to #12 above is "NO" and/or the response to criteria 13 – 15 are "YES", the determination of effects of this activity on listed or proposed anadromous salmonids is: Building a wire fence, fence maintenance, and planting trees on the **Hot Springs** site "MAY EFFECT BUT IS NOT LIKELY TO ADVERSELY AFFECT" (juvenile) spring/summer Chinook salmon or steelhead, or their habitat. (Beneficial effects are expected.)

Rationale: All of the effects on steelhead and Chinook salmon from planting trees and building a fence to protect them and the riparian zone are beneficial. The effects of fence maintenance should also be beneficial.

Determination of Affect Matrix for SNAKE RIVER SPRING/SUMMER CHINOOK SALMON and STEELHEAD

Authorizing Agency: U.S. Army Corps of Engineers Mgmt. Area: **Hot Springs Site**
Watershed: Upper Salmon River, Round Valley Action Type: Habitat Restoration
Specific Actions : **Away from the creek and river**; Parking and storage area(s) and cutting 7 to 10 mature trees.

Pathway	Indicator	Status of the Baseline?	Effects of the Action?	Basis for Rationale
Water Quality	Temperature	NA	NA	The trees would be too far from the river to shade the water.
	Sediment/Turbidity	NA	NA	
	Chemical Contaminants/Nutrients	NA	NA	
Habitat Access	Physical Barriers	NA	NA	No affect on access.
Habitat Elements	Substrate	NA	NA	
	LWD	FR	M. Indirect effect.	PJ; A potential seed source for new trees would be lost. Trees too far from river to add LWD.
	Pool Frequency	NA	NA	
	Pool Quality	NA	NA	
	Off-channel habitat	FR	M	PJ; The loss of 7 to 10 trees would be offset by planting trees along 14,000 to 18,000 ft. of channel.
	Refugia	NA	NA	
Channel Condition and Dynamics	Width/depth ratio	NA	NA	
	Stream bank condition	NA	NA	
	Floodplain connectivity	NA	NA	
Flow/Hydrology	Change in Peak/Base Flows	NA	NA	
	Increase in Drainage Networks	NA	NA	
Watershed Conditions	Road density and location.	PF	M	No new roads.
	Disturbance History	NA	NA	
	Riparian Reserves	NA	NA	

Dichotomous Key Determination:

1. Does the authorizing agency have discretionary authority to grant, modify, or amend provisions of the use authorization(s)? **YES**

If the answer is "NO", document the No Effect determination and the evaluation is completed. If "YES", move to question #2.

2. Are there naturally reproducing spring /summer Chinook salmon or steelhead present at any time of the year in riverine habitat directly or indirectly affected by the actions? YES/**NO**/NA

If "YES", continue with question #3 through #11. If "NO", document the No Effect determination and the evaluation is completed.

Rationale: Cutting 7 to 10 mature trees would have no effect on adult or juvenile Chinook salmon or steelhead because none of the trees would be cut within two tree lengths of the river or creek. The short-term loss of the trees would be offset by planting 14,000 to 18,000 feet of creek and river banks with willows and trees. The parking and storage area would be 500 to 1000 feet from the creek or river. Spill kits would be able to contain and pick up any fluid that may leak from a machine or vehicle before it could go into the soil or water. Therefore, it is our determination that **cutting 7 to 10 mature trees and using a vehicle parking and material storage area** on the **Hot Springs** site will have "NO EFFECT ON SPRING/SUMMER CHINOOK SALMON or STEELHEAD OR THEIR HABITAT".

Determination of Affect Matrix for SNAKE RIVER SPRING/SUMMER CHINOOK SALMON and STEELHEAD

Authorizing Agency: U.S. Army Corps of Engineers Mgmt. Area: **Pennal Gulch**
Watershed: Upper Salmon River, Round Valley Action Type: Habitat Restoration
Specific Actions : **In the side channel/slough:** Build water gaps, constructing a new channel around a wetland, building a levee between the new channel and the wetland, barbs in the new channel, a culvert in the new channel, excavating down an existing side channel, logs on a side channel bank, high flow channel across a road, opening an old side channel for intermittent flows, constructing temporary roads, and continuing construction and maintenance.

Pathway	Indicator	Status of the Baseline?	Effects of the Action?	Basis for Rationale
Water Quality	Temperature	FR	R Upper Salmon Subbasin Assmt. (11/15/2000) addressed temp & sediment as pollutants in the main river. No reference to 12 Mile reach.	PJ; Side channel temps should be suitable, would be joined by spring water from an existing side ch. May help reduce temps in river.
	Sediment/Turbidity	PF	M-R	PJ. Opening new side channel, opening old channel & temp. roads woul generate sediment. Sediment should stabilize in 1 0r 2 years.
	Chemical Contaminants/Nutrients	PF	M	Upper Salmon Subbasin Assmt. (11/15/2000) did not address chem/nut as pollutants in the main river. Spill kits should reduce risks.
Habitat Access	Physical Barriers	NPF	R	PJ; Beaver dams in existing channel are barriers to adults & maybe juveniles. New channel & slough would be designed for fish passage.
Habitat Elements	Substrate	FR	M-R	PJ; No site specific data.

Pathway	Indicator	Status of the Baseline?	Effects of the Action?	Basis for Rationale
Habitat Elements	LWD	FR – in existing side ch/slough. (FR when new side ch/slough is opened.)	R	PJ; New channel should improve floodplain connect. & help add LWD to the system.
	Pool Frequency	FR. (Existing channel is mostly pools/glides)	R	PJ; Barbs & channel work should increase pool habitat. No site-specific data for present condition.
	Pool Quality	FR	R	See Pool Frequency
	Off-channel habitat	FR	R	See LWD.
	Refugia	FR	R	PJ; New side channel/slough should increase rearing habitat & refugia.
Channel Condition and Dynamics	Width/depth ratio	FR	R	PJ; W/d would improve in the side channel, may decline in the main river due to water diverted into the side channel.
	Stream bank condition	PF	M-R	PJ; Bank logs would help establish riparian veg and stabilize banks.
	Floodplain connectivity	FR	R	PJ; The new channel & culvert to connect it to the existing channel/slough would improve flood plain connection.
Flow/Hydrology	Change in Peak/Base Flows	FR	M	No change in peak/base flows.
	Increase in Drainage Networks	NA	NA	PJ; Project too small to have any effect.
Watershed Conditions	Road Density and Location	PF	M	No new roads.
	Disturbance History	FR	M	See Incr Drainage Networks.
	Riparian Reserves	FR	M	See Incr Drainage Networks.

Dichotomous Key Determination:

1. Does the authorizing agency have discretionary authority to grant, modify, or amend provisions of the use authorization(s)? **YES**

If the answer is "NO", document the No Effect determination and the evaluation is completed. If "YES", move to question #2.

2. Are there naturally reproducing Snake River spring/summer Chinook salmon or Steelhead present at any time of the year in riverine habitat **directly** (NO) or **indirectly** (NO) affected by

the actions? **YES**/NO/NA. If "YES", continue with question #3 through #11. If "NO": document the No Effect determination and the evaluation is completed.

3. Is the action likely to change the existing input of Large Woody Debris (LWD) into occupied habitat? **YES** (the answers for 3 – 11 will all be different for each type of activity, e.g. fence, culvert, cobble bed, wetland, etc.) (**Opening a new side channel/slough would add more LWD to the system.)**
4. Is the action likely to affect stream morphology for occupied habitat? **YES/**NO/NA **(The new channel, existing side channel/slough system, and the old channel that is reopened would be designed to function as a natural system.)**
5. Is the action likely to affect properly functioning condition of the riparian area for occupied habitat? **YES**/NO/NA. **Excavating the existing side channel, opening a new side channel, the levee along the new channel, the barbs, anchor logs, and installing culverts should improve the function of this side channel/slough system.**
6.Is the action likely to affect water quality and/or quantity in the occupied habitat? **YES/**NO/NA **Water quality may be improved because water entering the side channel/slough system and the old side channel would trap some of the sediment in the river water. Water quantity would be less in the main stem of the river when some of the flow is diverted into the side channel/slough system. This water would reenter the main river about 4300 to 4500 feet downstream from the upstream end of the side channel/slough. The riparian vegetation shading the side channel would help cool the water before it went back into the river.**
7. Is the action likely to affect the water flow regime/annual hydrography in the occupied habitat? YES/**NO**/NA.
8. Is the action likely to affect juvenile or adult behavior related to survival or reproduction? **YES/**NO/NA **(Adult Chinook and steelhead could use the side channel/slough for migrating. Juveniles could use the side channel/slough for rearing and over-wintering. Spawning habitat is not expected with the proposed projects.)**
9. Is the action likely to involve toxic and/or hazardous materials that may reach occupied habitat? **YES/**NO/NA **(Possible spill of toxic fluid from trucks or machine.)**
10. Is the action likely to affect juvenile or adult access to habitat? **YES/**NO/NA (**Culverts, side channel/slough would be designed to allow passage)**
11. Is the action likely to affect substrate material? **YES**/NO/NA **(There could be minor shifting of material when the new side channel/slough system is opened, and when the old channel is reopened. This should stabilize itself in the first year or two.)**

> "NO" responses to question #3 – 11 would result in a "No Affect" finding and should be documented in the action file.
>
> A "YES", to any of the questions #3 – 11, however, requires in-depth evaluation by a professional biologist to determine if the action may affect the listed species. If the determination is made that an action "May affect" a listed species, continue with questions 12 – 15.

12. In addition the criteria listed in #3 – 11, do the actions, or the monitoring of them, likely involve any "taking", including "incidental taking" of listed or proposed species? **YES**/NO/NA

(The channel around the wetland and the levee between the wetland and the channel would be built on dry land. Adult Chinook & steelhead would Not be present during the late August (or October, depending on work window) – January 15 work window. It is possible that juvenile Chinook or steelhead could be in the slough when the culvert connecting the slough to the new side channel is installed, or when the thalweg of the slough is excavated. Juveniles may also be able to get into the existing wetland through the downstream outlet. Juvenile presence not likely because wetland edge dewaters 10 to 20 feet in the winter.)

13. Are the effects described in #3-11 inconsequential/temporary in nature and Not likely to degrade the habitat over time? **YES**/NO/NA **(Perhaps Not "inconsequential", but the effects should be beneficial, Not degrading.)**

14. Do the actions employ Best Management Practices (BMPs) designated to meet State water quality standards? **YES**/NO/NA

15. Is mitigation established that will preclude or reduce measurable effects on species and their habitat? **YES/**NO/NA

If the response to #12 above is "NO" and the response to criteria 13 – 15 are "YES", the determination of effects of this activity on listed or proposed salmonids is: The **Water gaps, constructing a new channel around a wetland, build a levee between the new channel and the wetland, barbs in the new channel, a culvert in the new channel, excavating down an existing side channel, logs on a side channel bank, high flow channel across a road, opening an old side channel for intermittent flows, constructing temporary roads, and continuing construction and maintenance** on the Pennal Gulch site "MAY EFFECT AND IS LIKELY TO ADVERSELY AFFECT" (juvenile) spring/summer Chinook salmon or steelhead, or their habitat.

Rationale: The work on the new side channel, the levee between the wetland and the new side channel, the barbs in the side channel, the bank logs, the high flow channel across the road, the old channel that would be reopened, and the temporary roads would all be done on dry land. The machine(s) that conducted this work would be near the side channel/slough and could impact juvenile salmonids if they were present. The fish could be directly effected by the machine when it was digging or maneuvering, or by a toxic fluid leak. Spill kits would be on all equipment and vehicles in order to contain and pick up any toxic fluid spill before it could affect water quality or the fish. The effects of continuing construction and maintenance would be similar to the effects of initial construction.

Access for adults up the existing side channel/slough may be impeded or excluded by a series of beaver dams and braided channels caused by the flooded areas adjacent to the dams. Even if adults can get up the slough, the work would be done from late August (or October depending on the work window) to January 15 when adult Chinook and steelhead are not present. However, juvenile steelhead or Chinook may be able to get up the slough to the proposed work site where the culvert would connect the existing slough with the new side channel around the wetland. Juveniles are not likely to be present in the wetland near the levee construction along the new side channel because the edge of the wetland becomes dewatered 10 or 20 feet during low flows in the winter.

The in-water work for the culvert, excavating the thalweg of the existing side channel/slough, and the water gaps in the fence would proceed slowly in order to allow any fish that are present to escape. The crew would also be trained to salvage any fish if necessary and put them back in the system upstream from the work site. Another precaution would be the use of turbidity curtains and/or pumps to reduce sediment and possible impacts to salmonids.

All of the projects planned for the side channel and slough at Pennal Gulch would be beneficial for steelhead and Chinook in the long term. The improvements would help reduce sediment in the river water, remove passage barriers, improve and increase the size of the riparian zone, improve rearing habitat for juveniles, and provide sanctuary for juveniles from predators. The effects of continuing construction and maintenance would be similar to the effects of the initial construction.

Determination of Affect Matrix for SNAKE RIVER SPRING/SUMMER CHINOOK SALMON and STEELHEAD

Authorizing Agency: U.S. Army Corps of Engineers Mgmt. Area: **Pennal Gulch**
Watershed: Upper Salmon River, Round Valley Action Type: Habitat Restoration
Specific Actions : **In or along the main stem of the river**; Lowering the levee at the Sportsman's Access, breeching a levee upstream from the Sportsman's Access, building a rock sill in the river near the breeched levee, installing 48-inch culverts at both levee sites, and continuing construction and maintenance.

Pathway	Indicator	Status of the Baseline?	Effects of the Action?	Basis for Rationale
Water Quality .	Temperature	FR Upper Salmon Subbasin Assmt. (11/15/2000) addressed sediment & temps. in the main river.	M-R	PJ; Sill and levee work should help improve temps by increasing the size of the riparian woodland.
	Sediment/Turbidity	FR	R	PJ. Some sediment in the river may be deposited in the old side ch. & side ch./slough.
	Chemical Contaminants/Nutrients	PF	M	PJ; Upper Salmon Subbasin Assmt. did not address chem/nut as a pollutant in the main river. Spill kits should help reduce risk.
Habitat Access	Physical Barriers	PF	R	PJ; The culverts would be designed to allow fish passage to the side channel/slough.
Habitat Elements	Substrate	NPF	M. Sill would be designed to prevent substrate deposition at entrance of the new side channel.	PJ; No site specific data. Sill designed to prevent deposition of substrate at entrance of new side channel.
	LWD	NPF	R	PJ; The culverts & levee may improve slood plain conection which would aid establishment trees & LWD.

Pathway	Indicator	Status of the Baseline?	Effects of the Action?	Basis for Rationale
Habitat Elements	Pool Frequency	NPF	R	PJ; Indirect influence; culvert and levee work would allo flows to side channel slough to scour pools.
	Pool Quality	NPF	R	PJ; See Pool Frequency
	Off-channel habitat	NPF	M-R	PJ; Indirect influence; culvert & levee work would reestablish some floodplain connection.
	Refugia	FR	M	See Off-channel habitat.
Channel Condition and Dynamics	Width/depth ratio	PF	M	PJ; Side channel construction would maintain satisfactory W/d ratio.
	Stream bank condition	NPF Banks steep & armored along this site.	R	PJ; Levee work & culvert indirectly improve bank condition.
	Floodplain connectivity	NPF	R	PJ; Levee work & culverts would restore some floodplain connection.
Flow/Hydrology	Change in Peak/Base Flows	FR	M	Levee & culverts would not effect peak/base flows. No site specific data for present condition.
	Increase in Drainage Networks	NA	NA	PJ; Project too small to have any effect.
Watershed Conditions	Road Density and Location	PF	M	No new roads.
	Disturbance History	FR	M	See Incr in Drainage Networks
	Riparian Reserves	FR	M	See Incr in Drainage Networks

Dichotomous Key Determination:

1. Does the authorizing agency have discretionary authority to grant, modify, or amend provisions of the use authorization(s)? **YES**

If the answer is "NO", document the No Effect determination and the evaluation is completed. If "YES", move to question #2.

2. Are there naturally reproducing Snake River spring/summer Chinook salmon or Steelhead present at any time of the year in riverine habitat **directly** (no) or **indirectly** (yes) affected by the actions? **YES**/NO/NA**.** If "YES", continue with question #3 through #11. If "NO", document the No Effect determination and the evaluation is completed.

3. Is the action likely to change the existing input of Large Woody Debris (LWD) into occupied habitat? **YES**/NO/NA (the answers for 3 – 11 will all be different for each type of activity, e.g. fence, culvert, cobble bed, wetland, etc.) (**The levee work and culverts may help increase flood plain connectivity, which would influence the establishment of riparian vegetation and trees for LWD.)**

4. Is the action likely to affect stream morphology for occupied habitat? **YES/**NO/NA **(The levee work and culverts would divert part of the main stem flows for about 4300 to 4500 feet.)**

5. Is the action likely to affect properly functioning condition of the riparian area for occupied habitat? **YES/**NO/NA. (**Opening the old side channel and the new side channel/slough should function as a natural riparian system.)**

6.Is the action likely to affect water quality and/or quantity in the occupied habitat? **YES/**NO/NA **Water quality may be improved because water entering the side channel/slough system , as well as the old side channel that is reopened, would deposit some of the sediment from the river water. Water quantity would be less in the main stem of the river when some of the flow is diverted into the side channel/slough system. This water would reenter the main river about 4300 to 4500 feet downstream from the upstream end of the side channel/slough. The riparian vegetation shading the side channel would help cool the water before it went back into the river.**

7. Is the action likely to affect the water flow regime/annual hydrography in the occupied habitat? YES/**NO**/NA.

8. Is the action likely to affect juvenile or adult behavior related to survival or reproduction? YES/**NO**/NA **(Adult & juvenile migration should Not be changed by the sill or levee work. Juvenile rearing habitat may be increased by this project. The sill, levee work and culverts would indirectly open additional migrating and rearing habitat. Spawning habitat is Not expected with the proposed projects.)**

9. Is the action likely to involve toxic and/or hazardous materials that may reach occupied habitat? **YES/**NO/NA **(Possible toxic fluid spill from a truck or machinery.)**

10. Is the action likely to affect juvenile or adult access to habitat? **YES/**NO/NA (**See response to number 8.)**

11. Is the action likely to affect substrate material? YES/**NO/**NA **(The sill would be designed to prevent deposition of substrate at the entrance of the new side channel. Some substrate may go through the culvert at the lowered levee and into the old side channel. This should stabilize itself in the first year or two.)**

> "NO" responses to question #3 – 11 would result in a "No Affect" finding and should be documented in the action file.
>
> A "YES", to any of the questions #3 – 11, however, requires in-depth evaluation by a professional biologist to determine if the action may affect the listed species. If the determination is made that an action "May affect" a listed species, continue with questions 12 – 15.

12. In addition the criteria listed in #3 – 11, do the actions, or the monitoring of them, likely involve any "taking", including "incidental taking" of listed or proposed species? **YES/**NO/NA

(Adult Chinook & steelhead would Not be present during the late August (or October depending on work windows)– January 15 work window. It is possible that juvenile Chinook or steelhead could be near the banks of the river when the levee work is done or when the culverts would be installed.)

13. Are the effects described in #3-11 inconsequential/temporary in nature and Not likely to degrade the habitat over time? **YES**/NO/NA **(Perhaps not "inconsequential", but the effects should be beneficial, not degrading.)**

14. Do the actions employ Best Management Practices (BMPs) designated to meet State water quality standards? **YES**/NO/NA

15. Is mitigation established that will preclude or reduce measurable effects on species and their habitat? **YES/**NO/NA

If the response to #12 above is "YES" and/or the response to criteria 13 – 15 are "NO", the determination of effects of this activity on listed or proposed salmonids is: The **breeching of one levee and lowering the levee at the Sportsman's Access, building a rock sill in the river, installing culverts, and continuing construction and maintenance** on the Pennal Gulch site "MAY EFFECT AND IS LIKELY TO ADVERSELY AFFECT" (juvenile) spring/summer Chinook salmon or steelhead, or their habitat.

Rationale: Adult Chinook and steelhead would not be present because the work would be done from late August (or October depending on the work window) to January 15. The sill and culverts would be designed for fish passage. Juvenile steelhead or Chinook may be present in the slower current near the bank of the river where the levee work and culverts are proposed. The machine would work slowly in order to allow fish to escape the area and prevent injury or mortality. The crew would be trained in proper handling techniques in order to salvage fish if necessary. All equipment would be supplied with spill kits to contain and pick up any fluid spill, such as hydraulic fluid, as soon as possible. The effects of continuing construction and maintenance would be similar to the effects of the initial construction.

All of the projects planned for the main stem of the river at Pennal Gulch would be beneficial for steelhead and Chinook in the long term. The improvements would help restore flood plain connectivity, increase LWD, reduce sediment in the river, open up over 4000 feet of additional rearing habitat, and increase the size of the riparian zone.

Determination of Affect Matrix for SNAKE RIVER SPRING/SUMMER CHINOOK SALMON and STEELHEAD

Authorizing Agency: U.S. Army Corps of Engineers Mgmt. Area: **Pennal Gulch Site**
Watershed: Upper Salmon River, Round Valley Action Type: Habitat Restoration
Specific Actions : **Along or near the main channel & side channel/slough**: Building a wire fence, maintenance, planting trees, and the parking & storage area.

Pathway	Indicator	Status of the Baseline?	Effects of the Action?	Basis for Rationale
Water Quality	Temperature	FR Upper Salmon Subbasin Assmt. (11/15/2000) addressed sediment & temps. in the main river. 12 Mile reach not mentioned.	R	PJ; Planting trees will increase shade. Fence will protect trees.
	Sediment/Turbidity	FR	M-R	PJ; Trees will help stabilize banks
	Chemical Contaminants/Nutrients	PF Upper Salmon Subbasin Assmt. did not address chem/nut as pollutants in the main river.	M	PJ; The fence and trees would not effect contaminants.
Habitat Access	Physical Barriers	PF	M	No affect on access.
Habitat Elements	Substrate	NPF	M	PJ; No change from fence or trees. Assume site suitable for migration & rearing. Substrate questionable for spawning.
	LWD	NPF	R	PJ; Trees would eventually add LWD.
	Pool Frequency	NPF	R	PJ; New trees should increase pool freq. & quality.
	Pool Quality	NPF	R	See Pool Frequency.
	Off-channel habitat	NPF	R	PJ; Fence would protect riparian zone.
	Refugia	FR	R	PJ; may be some improvement in the side chan/slough
Channel Condition and Dynamics	Width/depth ratio	PF	M	PJ; Trees may influence w/d ratio if LWD forms pools.

Pathway	Indicator	Status of the Baseline?	Effects of the Action?	Basis for Rationale
Habitat Elements	Stream bank condition	NPF Banks steep & armored along this site.	R	PJ; Fence & trees should help improve bank condition.
	Floodplain connectivity	NPF	M	PJ; No effect on flood plain.
Flow/Hydrology	Change in Peak/Base Flows	FR	M	PJ; Project too small to have any effect.
	Increase in Drainage Networks	NA	NA	See Change in Peak/base Flows
Watershed Conditions	Road density and location.	PF	M	No new roads
	Disturbance History	FR	M	See Change in Peak/base Flows
	Riparian Reserves	FR	M	See Change in Peak/base Flows

Dichotomous Key Determination:

1. Does the authorizing agency have discretionary authority to grant, modify, or amend provisions of the use authorization(s)? **YES**

If the answer is "NO", document the No Effect determination and the evaluation is completed. If "YES", move to question #2.

2. Are there naturally reproducing Snake River spring/summer Chinook salmon or Steelhead present at any time of the year in riverine habitat **directly** (no) or **indirectly** (yes) affected by the actions? **YES**/NO/NA**.** If "YES", continue with question #3 through #11. If "NO", document the No Effect determination and the evaluation is completed.

3. Is the action likely to change the existing input of Large Woody Debris (LWD) into occupied habitat? **YES**/NO/NA (the answers for 3 – 11 will all be different for each type of activity, e.g. fence, culvert, cobble bed, wetland, etc.) (**Planting trees would increase the potential LWD.)**

4. Is the action likely to affect stream morphology for occupied habitat? YES/**NO**/NA **(The levee work and culverts would divert part of the main stem flows for about 4300 to 4500 feet.)**

5. Is the action likely to affect properly functioning condition of the riparian area for occupied habitat? **YES/**NO/NA. (**Opening the old side channel and the new side channel/slough should function as a natural riparian system.)**

6.Is the action likely to affect water quality and/or quantity in the occupied habitat? **YES/**NO/NA **Water quality may be improved because water entering the side channel/slough system would be cooled by the trees and shrubs along the channel. Water quantity would not be changed by the fence or trees.**

7. Is the action likely to affect the water flow regime/annual hydrography in the occupied habitat? YES/**NO**/NA.

8. Is the action likely to affect juvenile or adult behavior related to survival or reproduction? YES/**NO**/NA **(Adult & juvenile migration should not be changed by the fence or planting**

trees. Juvenile rearing habitat may be improved by the trees. The fence would protect the trees and riparian zone.)
9. Is the action likely to involve toxic and/or hazardous materials that may reach occupied habitat? YES/**NO**/NA
10. Is the action likely to affect juvenile or adult access to habitat? YES/**NO**/NA (**The trees and fence would not affect access)**
11. Is the action likely to affect substrate material? YES/**NO/**NA

> "NO" responses to question #3 – 11 would result in a "No Affect" finding and should be documented in the action file.
>
> A "YES", to any of the questions #3 – 11, however, requires in-depth evaluation by a professional biologist to determine if the action may affect the listed species. If the determination is made that an action "May affect" a listed species, continue with questions 12 – 15.

12. In addition the criteria listed in #3 – 11, do the actions, or the monitoring of them, likely involve any "taking", including "incidental taking" of listed or proposed species? YES/**NO/** /NA **(Building the fence and planting trees would take place on dry land.)**
13. Are the effects described in #3-11 inconsequential/temporary in nature and Not likely to degrade the habitat over time? **YES**/NO/NA **(Perhaps not "inconsequential", but the effects should be beneficial, not degrading.)**
14. Do the actions employ Best Management Practices (BMPs) designated to meet State water quality standards? **YES**/NO/NA
15. Is mitigation established that will preclude or reduce measurable effects on species and their habitat? **YES/**NO/NA

Rationale: The wire fence would be about 25 to 75 feet from the side channel/slough. The fence construction would have no adverse direct, indirect or cumulative effects on spring/summer Chinook salmon or steelhead. The fence should have **beneficial effects** by preventing livestock from damaging the riparian zone along the side channel/slough. The effects of fence maintenance would also be beneficial. Planting trees along the side channel/slough and river could have a **beneficial effect** on steelhead and Chinook by cooling the water in the main river. They would also add LWD to the system. The parking and storage area would be500 to 1500 feet from the river and side channel/slough. Spill kits would be on hand to confine and quickly pick up a possible spill. Therefore, it is our determination that **planting trees, building a wire fence, maintenance and the parking & storage area** on the **Pennal Gulch** site "MAY EFFECT BUT IS NOT LIKELY TO ADVERSELY AFFECT SPRING/SUMMER CHINOOK SALMON or STEELHEAD OR THEIR HABITAT".

Determination of Affect Matrix for SNAKE RIVER SPRING/SUMMER CHINOOK SALMON and STEELHEAD

Authorizing Agency: U.S. Army Corps of Engineers Mgmt. Area: **Pennal Gulch Site**
Watershed: Upper Salmon River, Round Valley Action Type: Habitat Restoration
Specific Actions : **Along the river and side channel/slough;** cutting 5 to 10 mature trees.

Pathway	Indicator	Status of the Baseline?	Effects of the Action?	Basis for Rationale
Water Quality	Temperature	FR	M	PJ; The trees would be two tree lengths or more from the river, there should be no loss of shade.
	Sediment/Turbidity	FR	M	See Temperature.
	Chemical Contaminants/Nutrients	NA	NA	
Habitat Access	Physical Barriers	NA	NA	
Habitat Elements	Substrate	NA	NA	
	LWD	FR	M	PJ; The trees would be two tree lengths or more from the river, there should be no loss of LWD.
	Pool Frequency	NA	NA	
	Pool Quality	NA	NA	
	Off-channel habitat	NA	NA	
	Refugia	NA	NA	
Channel Condition and Dynamics	Width/depth ratio	NA	NA	
	Stream bank condition	NA	NA	
	Floodplain connectivity	NA	NA	
Flow/Hydrology	Change in Peak/Base Flows	NA	NA	
	Increase in Drainage Networks	NA	NA	
Watershed Conditions	Road density and location.	NA	NA	
	Disturbance History	NA	NA	
	Riparian Reserves	NA	NA	

Dichotomous Key Determination:

1. Does the authorizing agency have discretionary authority to grant, modify, or amend provisions of the use authorization(s)? **YES**

If the answer is "NO", document the No Effect determination and the evaluation is completed. If "YES", move to question #2.

2. Are there naturally reproducing spring /summer Chinook salmon or steelhead present at any time of the year in riverine habitat directly or indirectly affected by the actions?
YES/**NO**/Unknown If "YES", continue with question #3 through #11. If "NO", document the No Effect determination and the evaluation is completed.

Rationale: Cutting 5 to 10 mature trees would have no effect on adult or juvenile Chinook salmon or steelhead because none of the trees would be cut within two tree lengths of the river or side channel/slough. The short-term loss of 5 to 10 trees should be offset by planting trees along 300 to 500 feet of the side channel/slough and river. The new trees would shade the channel and also add LWD to the system. Therefore, it is our determination that **cutting 5 to 10 mature trees** on the **Pennal Gulch** site will have "NO EFFECT ON SPRING/SUMMER CHINOOK SALMON or STEELHEAD OR THEIR HABITAT".

VII. MITIGATION MEASURES AND MONITORING.

This section includes recommendations that should reduce the adverse effects associated with the proposed projects on the USRP if implemented. Implementation of all or part of these recommendations would not change the effects determination for any of the species covered by this biological assessment. These recommendations are subject to review by the Services and IDFG, and would be implemented as required by the respective agency Biological Opinion.

Bald Eagle

1. Avoid working within 1000 feet of bald eagles that are using trees along the river for perches or roosts.
2. Do not designate parking and material storage areas within 1000 feet of trees that are being used for roosts or perches, or old nest sites.
3. Actively monitor for bald eagle activity in the vicinity of each project site.
4. Perform the activities that are most disturbing to eagles (machine work, human activity, and excavation) when a bald eagle is least likely to be present (ask local biologists with the BLM, Forest Service and IDFG to notify the project coordinator when they show up in the 12 Mile reach.)

Gray Wolf and Yellow-billed Cuckoo

1. Coordinate with IDFG, BLM, and Forest Service to be informed of any sightings of wolf or cuckoos in Round Valley or the individual project sites.
2. If activities continue after March 1, such as planting trees or fence construction, monitor the area for yellow-billed cuckoos. If a cuckoo is identified, avoid the area within 1000 feet of the stand of trees that it was sighted in.

Bull Trout, Sockeye Salmon, Snake River Spring/Summer Chinook Salmon, and Snake River Steelhead

1. For all work in the main stem of the Salmon River, operate within the designated work window for each species. Adult migration for sockeye, chinook and steelhead begin at different times and overlap each other. Therefore, the proposed work window seeks to avoid the first arrival of sockeye, chinook and steelhead in the 12 Mile reach. It is assumed that bull trout are most likely to be present in the main stem of the Salmon River from late October through April or May. The following work window is subject to review and concurrence by US Fish & Wildlife Service, National Marine Fisheries Service (NOAA Fisheries), and Idaho Department of Fish and Game.

    - In the main stem of the river, operate from September 1 through January 15.
    - In side channels, sloughs and Challis Hot Springs Creek, operate from September 1 through March 1.

2. Monitor the river for steelhead that may arrive before the end of the work window on January 15. If steelhead do arrive before January 15, confer with NOAA Fisheries and/or FWS to determine whether discontinue all in-water work with machinery until the work window opens again the following October.

3. Operate all machinery slowly when working in the water in order to allow juvenile salmonids to escape the work area.

4. Where the velocity of the water allows, use turbidity curtains to trap sediment and avoid adverse impacts to substrate. Use coffer dams and pumps to move water in side channels, sloughs and Challis Hot Springs Creek around the work sites to avoid sediment problems.

5. Train the crew in proper fish handling techniques in order to salvage juveniles if necessary.

6. Monitor for chinook salmon redds in the 12 Mile reach during the spawning season before starting in-water work. This may help avoid adverse impacts on eggs and fry by disturbing the substrate and producing sediment.

7. If machine work produces unacceptable levels of sediment, based on NOAA guidelines and the Clean Water Act, limit in-water work to 4 hours per day.

8. On the Hot Springs site, slope the channel from the wetland to the river in order to reduce the risk of stranding fish in this channel when the irrigation flows out of the wetland are turned off. (This is the channel that has fish barriers on the weirs that control the flows into the channel to the river, and no fish screen on the mouth of the channel.)

General Recommendations

1. Place spill kits for hazardous chemicals on all equipment, project vehicles, and in on-site construction offices.
2. Monitor daily for fluid spills from machinery and vehicles. Contain and pick up as soon as possible.
3. Keep spill kits immediately at hand at all in-water work sites.

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