SA 8.3 North Umpqua Habitat Restoration/Creation Project

Implementation Plan

Prepared for
North Umpqua Hydroelectric Project
Resource Coordination Committee
Roseburg, Oregon

Prepared by
SA 8.3 Technical Work Group
March 19, 2004

March 29, 2004

The following parties approve the Section 8.3 Habitat Enhancement/Creation Project Implementation Plan.

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1 BACKGROUND AND PURPOSE

The *North Umpqua Hydroelectric Project Settlement Agreement*, 2001 (SA) established the goal of creating 5,000-15,000 square ft of spawning habitat for anadromous fish in the mainstem North Umpqua River, with a priority given to chinook salmon spawning habitat (Section 8.1 of the Agreement). An amendment to the SA describing changes to SA Section 8.3 was filed with the Federal Energy Regulatory Commission in November 2002, with the revised goal of maximizing and sustaining spawning habitat within funding limitations. The work required under the amended Section 8.3 would target a larger area (Soda Springs bypass reach and the mainstem North Umpqua River and its tributaries downstream of Soda Springs dam) to locate the best opportunities to restore or create salmonid spawning habitat.

The Feasibility Report (August 2003) describes the assessment of the area from Soda Springs Dam downstream to Steamboat Creek, including tributaries, which resulted in the selection of the upper Soda Springs bypass reach as the preferred site for implementing habitat modifications. The Resource Coordination Committee (RCC) charged the Technical Work Group (TWG) with locating specific sites and producing an Implementation Plan (plan) for the project. This plan, written by the TWG (Appendix 1 and 2), describes the details of how habitat modifications will be built and maintained at this site over the term of the license.

2 DESCRIPTION OF REACH

The upper portion of the Soda Springs bypass reach of the North Umpqua River extends from Soda Springs Dam downstream about 1,200 ft to the top of a steep boulder-cascade reach. The reach includes a large bedrock-lined pool at the base of the dam, a gravel/cobble tailout with three log weirs, a concrete weir structure (once used by ODFW to trap fish), a long trench pool with a basalt cliff on the south side and road bank on the north, and a gravel/cobble tailout with two log weirs. The log weirs in both tailouts were built in 1992 and 1993 and, for the most part, continue to help retain placed gravels. The upstream- and downstream-most weirs have substantial scour behind them and would benefit from additional support. Gravel has been added to these tailouts most years at an average rate of about 500 cubic yards (cy) per year.

Both tailouts were selected for habitat modification as part of this project. The tailout of the lower pool was identified during the feasibility study (Feasibility Report) as a suitable site for creating additional spawning habitat. This tailout currently provides about 1,200 to 1,500 ft^2 of spawning habitat for spring chinook and steelhead (Feasibility Report). Coho salmon and brown trout have also been observed spawning in this tailout (e.g. during a TWG site visit on December 3, 2003). The transition between the pool and tailout is the location of a recording stream gage and staff gage, and is the compliance point for minimum flows and ramp rates in the bypass reach. Habitat modifications will force a relocation of this gage to make room for a new weir structure (Appendix 3). The tailout of the upper pool was not assessed in the Feasibility Report, but was identified in January 2004, after high flows in mid-December damaged the uppermost log weir yet did not scour away the new gravel bed placed upstream from it in August 2003. This led the TWG to conclude that this pool tailout has potential for holding spawning gravel, and that the maintenance of a log weir in this location would enhance that potential. However, the stability of gravel in this location is uncertain, and may be affected by turbulent flow during large spill events. Although most gravel placed in the narrow channel under the bridge tends to scour away during most winters, the wider, deeper site further upstream in the pool shows more potential to hold gravel.

The bankfull discharge in this reach is about 3,500 cfs (Table 1). Results from a scour assessment in 2003 (Feasibility Report) indicate that spawning gravels were relatively stable at flows less than 2,300 cfs, but gravel stability during greater magnitude floods is uncertain under current conditions.

Table 1. Flood recurrence estimates related to various discharges in the Soda Springs Bypass Reach (Feasibility Report).

Return Period (year)	Discharge (cfs)
1.2	2,100
1.5	3,500
2	5,000
5	9,700
10	13,700

3 DESIGN

Stillwater Sciences, in consultation with the TWG, produced a draft conceptual design (Feasibility Report) that was the initial basis for implementation planning. To refine this concept and incorporate broader regional expertise, the TWG formed a Design Team (Appendix 1) of agency experts (including the USFS Restoration Assistance Team [RAT] and USFWS technical experts) to visit the site during November and December 2003 and develop a more detailed design concept for achieving project goals. The TWG and Design Team worked with the following design guidelines:

- The structures will be built to function best at a base flow of 275 cfs (the new minimum flow from September 1, 2005 throughout the license term).
- The modification can include boulders, logs, and gravel in various combinations.
- The use of artificial materials (e.g. chain link fence, rebar, cables) should be minimized to the extent possible, but not rejected.
- Fish passage (juveniles and adults, upstream and downstream) must not be obstructed.
- The bypass reach stream gage will be relocated as part of this project so as to create more available space for spawning habitat.
- Modifications should be designed to "…maximize and sustain spawning habitat, subject to the funding limitations…" (SA Amendment Section 8.3.2) primarily for chinook salmon, but also for coho salmon, steelhead, and other native fish.

3.1 Conceptual Designs

The TWG held a planning meeting on September 3, 2003 and Design Team site visits on November 20 and December 3, 2003. Several alternatives to the conceptual design in the Feasibility Report were discussed for treatment of the lower pool site. These included adding additional structures, adding boulders to existing structures, and modifying the source, amount, and location of gravel placement. The RAT and USFS provided a draft design to the TWG on January 5, 2004, which was discussed during a TWG meeting the same day. On January 15, 2004 the TWG convened to consider the new design relative to the initial conceptual design (Feasibility Report), potential modifications, and costs vs. benefits. Stillwater Sciences provided a critique of the new design, suggesting that it may create more spawning habitat but may also be more susceptible to scour during high flows. The RAT suggested that the Stillwater Sciences conceptual design (providing 4-5,000 square ft) did not appear to maximize the potential for holding gravel. The TWG considered the technical debate and decided to proceed with the new design to maximize the amount of spawning habitat created, accepting the risk of potentially higher scour. Several modifications to this design were also discussed to improve its stability, to bolster the existing weirs in disrepair (upper and lower pools), and to further increase the amount of spawning habitat potentially created. This process resulted in the following detailed design.

3.2 Detailed Design

Designs are presented with enough detail for construction guidance, but are intended to be flexible enough to accommodate unforeseen site-specific constraints and ensure the highest likelihood of success. All “right bank, left bank” designations are from the perspective of looking downstream.

Several treatments call for log weirs, which will be built with the longest logs possible for each site. Butt ends will be buried into pockets excavated as far as possible into the bank, and keyed in with a mass of large boulders (Figure 1). Cable and rebar will be used when necessary to key logs. Cable will be at least 5/8 inch galvanized or stainless steel wire rope, and should be “sewn” thru logs when possible, and pinned with spikes. Where fastened to boulders, cable or rebar will be epoxied (using Kelty T-100 or similar product) into clean, tight holes (e.g. ¾ inch diameter for 5/8 cable) to a depth of 1 ft. Synthetic matting will be placed on the upstream side of weirs during installation and backfilled with rock and gravel, to prevent undercutting. Apex ends of log weirs will be angle-cut for a tight fit, with a 120˚ angle along the downstream face of the weir, and pinned together at the point with 1” stainless steel all-thread rod, washers, and bolts (at least 1 rod per weir). Rebar may also be used to help pin apex ends together. Logs will be placed nearly level, to slope 0-1% down from the bank end to the apex end (Figure 2). Lengths of logs will vary according to site specific needs (Table 2).

Material excavated during the placement of logs weirs will be re-used on site to help secure the log structures and raise the streambed where necessary for placement of spawning gravel. Details are described below for the two pools.

Table 2. Estimated lengths (ft) for new crest logs (logs may need to be cut shorter to fit excavations).

Site	Apex shift from existing location	Left bank log	Right bank log
Weir 1	20 ft right	59	64
Weir 3	not applicable	54	69
Upper pool weir	10 ft right	51	72

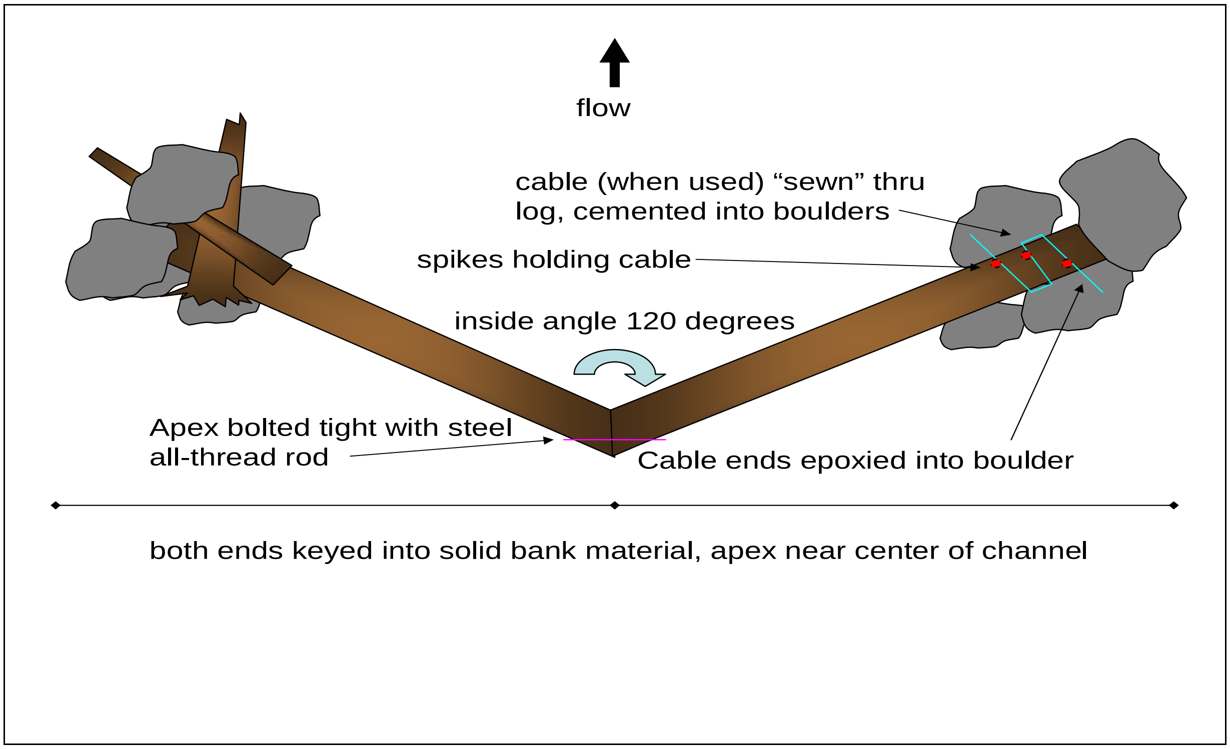

Figure 1. Plan view of typical log weir.

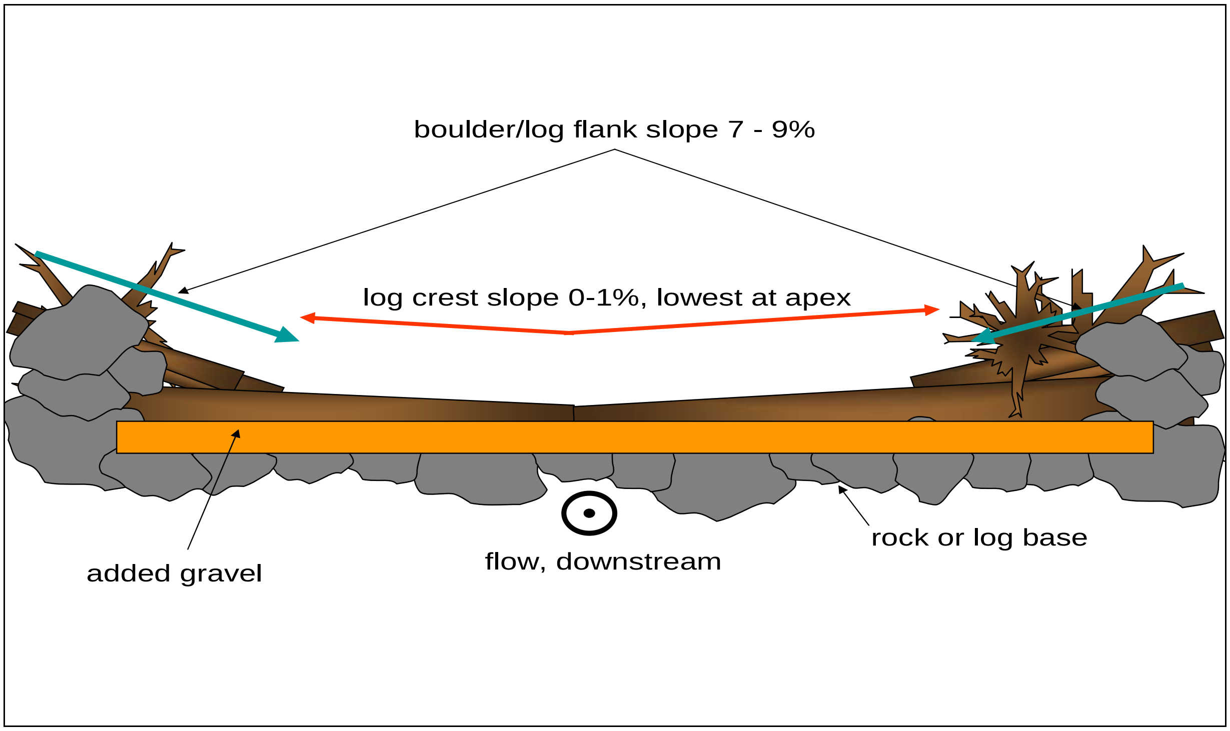

Figure 2. Downstream view of typical log weir.

Lower Pool Design

The design incorporates three weirs to maximize stable spawning substrate, reduce jump heights, reduce stream power and diversify habitat (Figures 3-6). The existing weir 2 will remain in place, and its apex will serve as an elevation control point to guide placement of the new log weirs. The goal is to create a spawning glide at a gradient of 0.4% between the three weirs (Figure 4).

From downstream up, modifications will include:

(1) Construct a “boulder garden” downstream of weir 1. Boulders (3-6 ft) and large rock will be placed to construct a boulder field to partially backwater weir 1, reduce stream energy, reduce jump height and create pocket water vortices for migrating juvenile and adult salmonids. Boulders will be spaced in a diverse, natural fashion and most will be 2-10 ft apart.

(2) Weir 1 – Replace existing weir with new, longer logs to restore structural integrity, capture additional spawning area, and to reduce the slope of the upstream water surface to 0.4%. The top of the apex elevation of weir 1 should be 0.3 feet lower than at weir 2. Logs will be level or have a slight downward slope (0-1%) from the bank to the apex. Several boulders will be placed up against the logs of weir 1 on the downstream side to reduce scour and undercutting. Boulders used to fortify weir 1 could also protrude above the logs to help backwater the upstream reach. Flank structures will be added to the ends.

(3) Excavate the area (approximately 25x75 ft, by 2 ft deep) of large cobbles along the North bank between weir 1 and 2 (Figure 3), to create more space for spawning gravels. This will also provide about 140 cy of rock for filling around weir logs and upstream of Weir 3.

(4) Gravel placement – approximately 230 cy of gravel will be spread within the reach between weirs 1 and 2 (approximately 1.5 ft deep gravel across the entire wetted channel).

(5) Weir 2 – retained in its current state, except for the addition of a flank structure on the south bank. Flanks will not be added to the North bank so that access for maintenance is not inhibited.

(6) Weir 3 – a new weir constructed of rock fill, logs, and boulders about 60 ft upstream of weir 2 (Figure 3 and 5). The apex of this weir crest should be 0.3 feet higher than the apex of weir 2, to maintain a water surface slope of 0.4% between weirs. Crest weir logs used in the construction will be at least 65-feet in length. Flanks will be abutted to the canyon wall and fortified with boulders on the left bank side. The total weir span will be approximately 85-feet with a relatively flat slope along the crest. Fish migration past the weirs should not be inhibited due to the relatively low (<0.5 ft) jump height at the weir and flow diversity near the flanks.

(7) Cobble and boulder fill may be placed upstream of weir 3 as a base for spawning gravels.

(8) Gravel placement – approximately 600 cy of gravel will be placed upstream of weir 3 (Figure 3).

(9) Flanks (general description) – Flanks will be built of small logs, rootwads, boulders, and cobbles, and are intended to inhibit lateral failure of the weirs and to diversify habitat for juvenile fish. Flanks will start about 2 ft higher than the butt end of weir logs, and slope 7-9% down to intersect the weir log about 20 ft from the bank (Figure 2). Flanks will also slope about 7-9% in the upstream and downstream directions. No cable or rebar will be used in flanks.

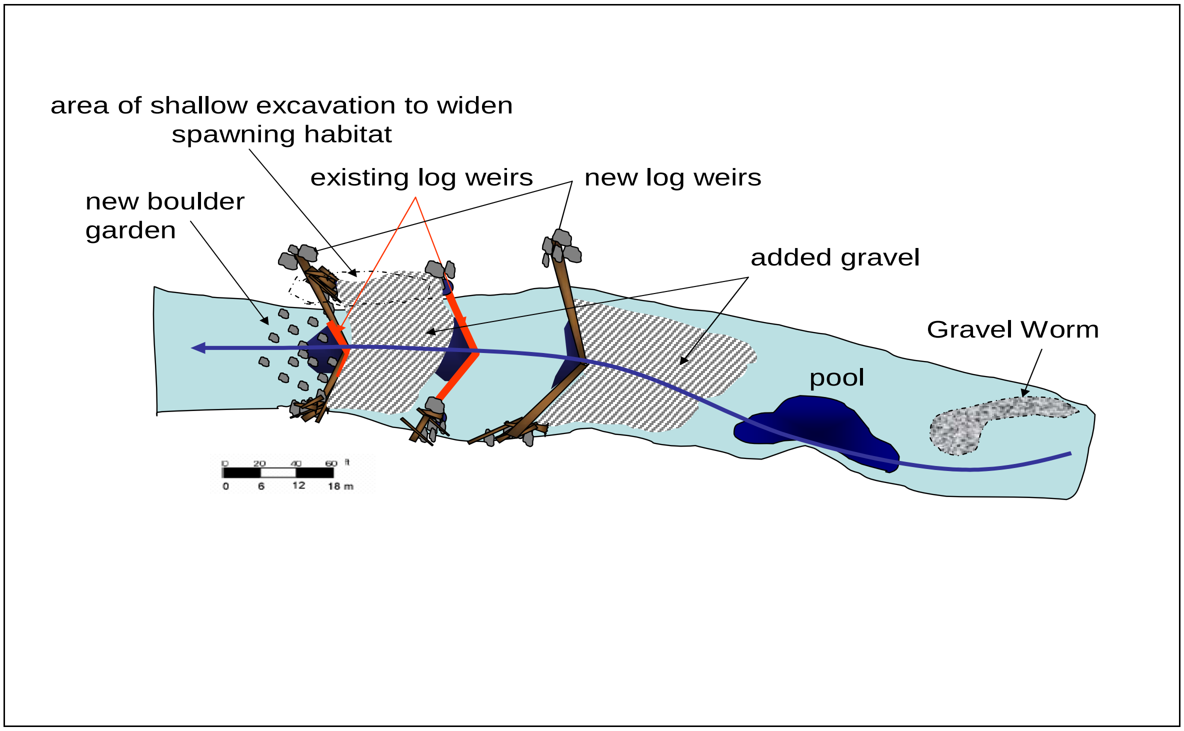

Figure 3. Plan view of proposed modifications at the lower pool.

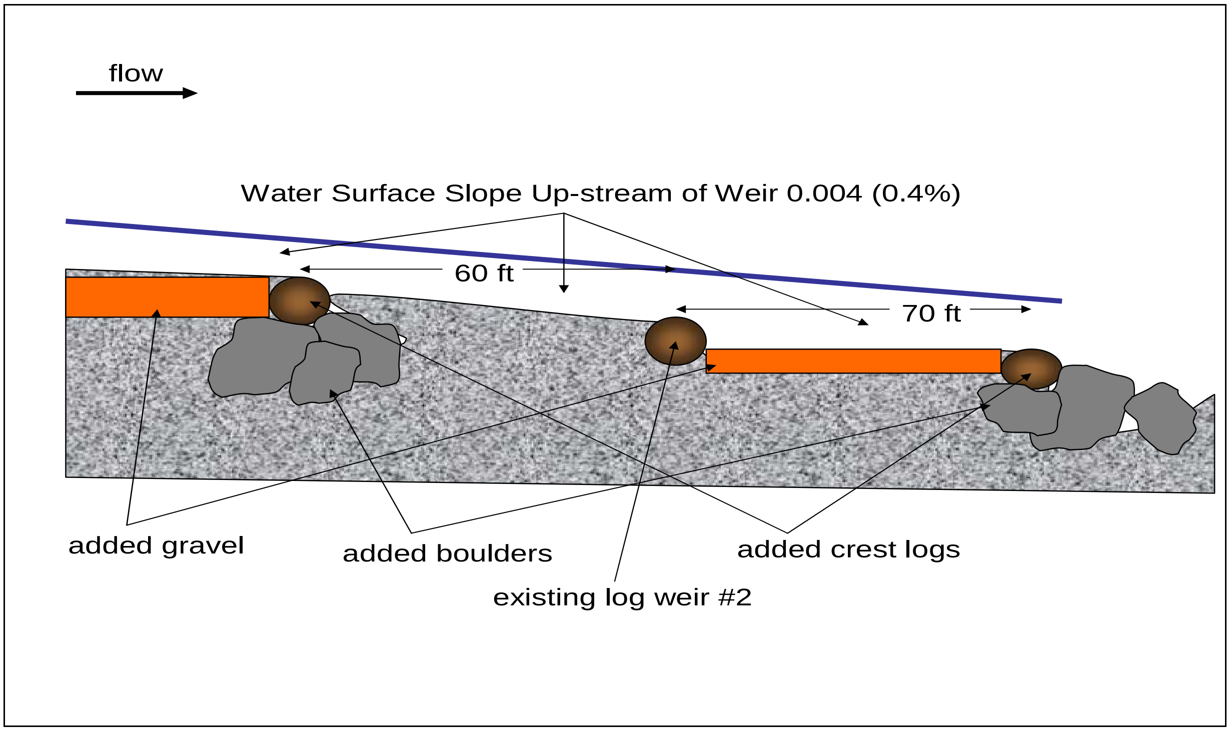

Figure 4. Section view of proposed modifications at the lower pool.

Figure 5. Lower pool tailout, showing approximate location of the new weir 3, and person standing at proposed flank structure of existing weir 2.

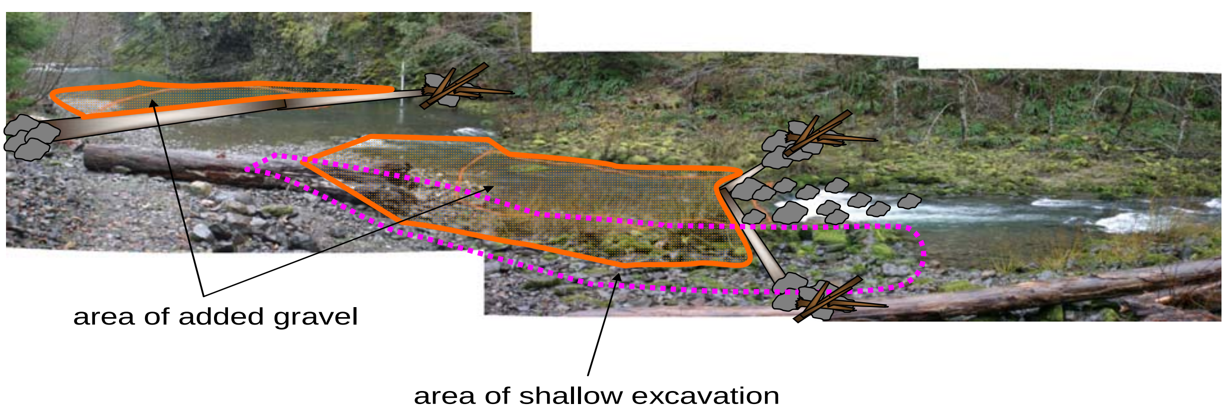

Figure 6. Lower pool showing approximate locations of proposed new weir 3, improved weir 1, boulders, excavation (pink area), and gravel placement (orange areas).

Upper Pool Design

The two existing log weirs downstream from the bridge will be left intact. The uppermost weir, damaged during December 2003 high flows, will be removed and replaced with a new log weir (Figures 7-9). The right log will be at least 65 ft long, the left log about 45 ft long. Both ends will extend to solid boulders or bedrock at the bank, and will be keyed in with large boulders. The elevation of the weir crest at the apex will be approximately 1 ft higher than the existing weir apex, to produce a water surface that is level with the pool upstream. The apex of the weir will be further toward the right bank from the location of the existing weir apex. A boulder garden will be created in the 50 ft immediately downstream from the weir, with several boulders abutting the weir behind the apex to reduce scour and improve fish passage. The tailout of the pool upstream will be filled with approximately 450 cy of gravel.

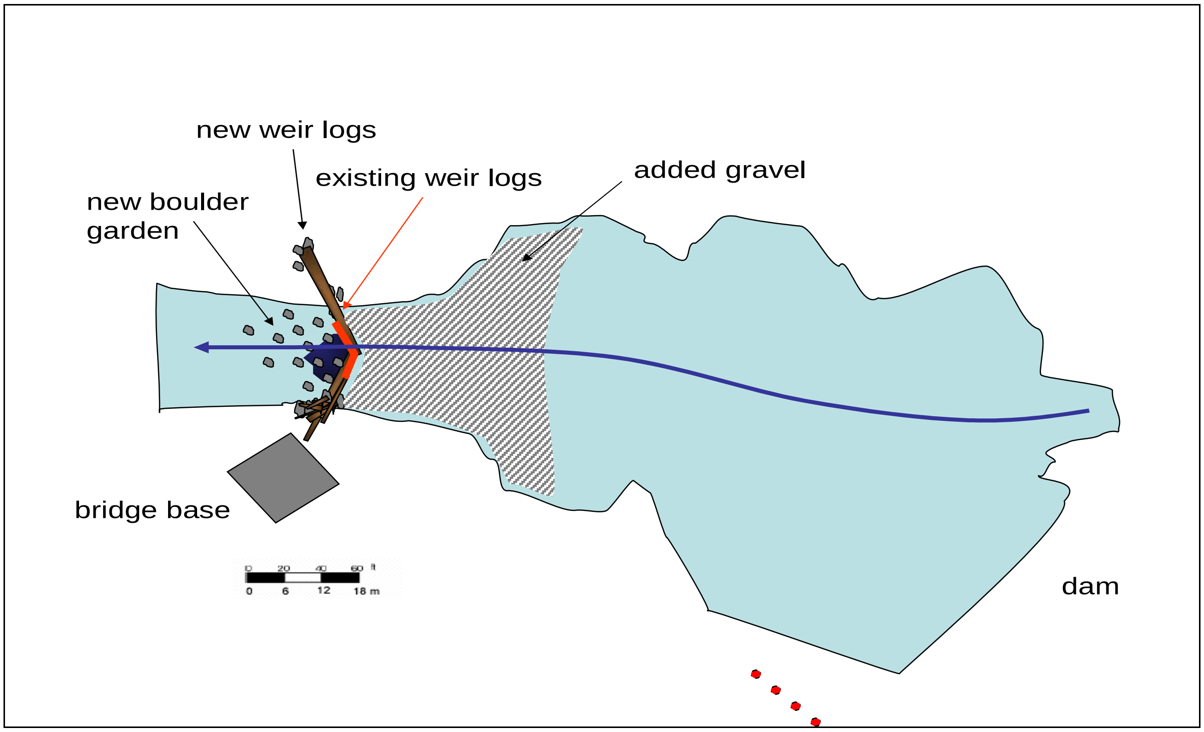

Figure 7. Plan view of proposed modifications in the upper pool.

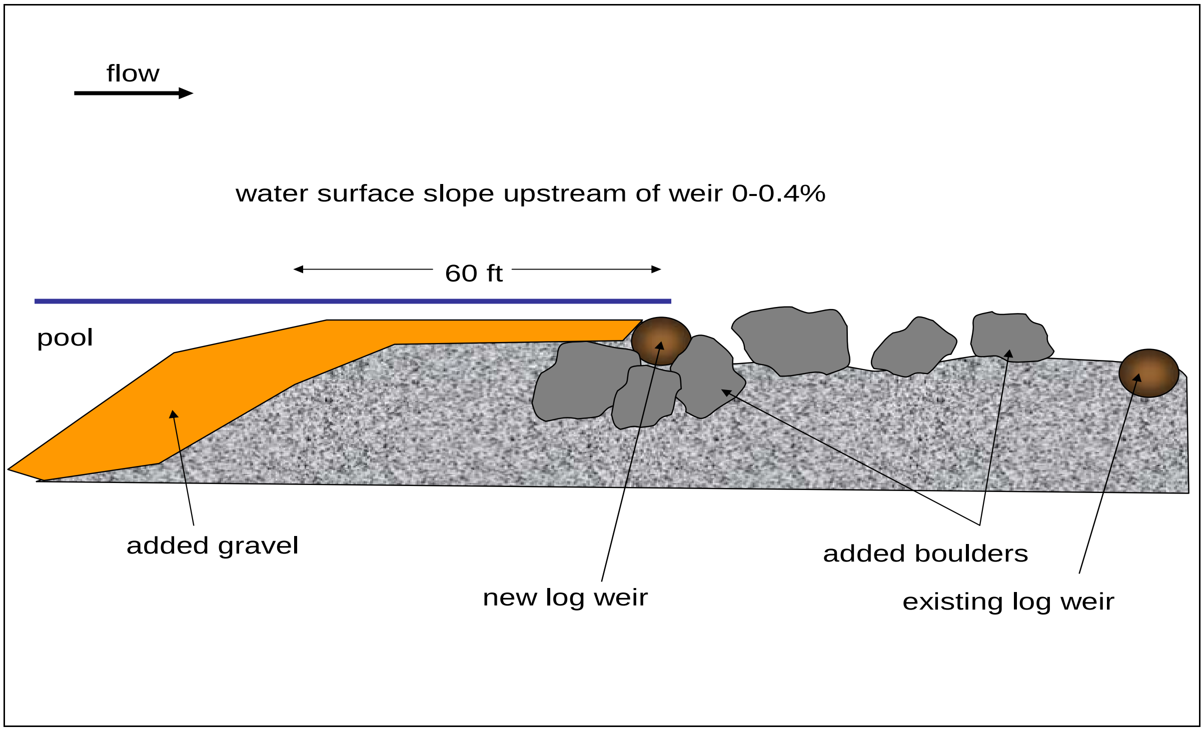

Figure 8. Section view of proposed modifications in the upper pool.

Figure 9. Upper pool tailout showing proposed new log weir, boulders, and area of gravel placement (orange area).

3.3 Design Conclusions

The above designs will maximize the potential for this reach to retain spawning gravel suitable for salmon, steelhead, and other native fish. It is expected that treatments in the lower pool may yield up to 7,000 ft^2 of spawning habitat and treatments in the upper pool may yield another 4,000 ft^2. Consequently, the total amount of spawning habitat attributed to this project, and its maintenance, could be about 11,000 ft^2. This is expected to be an increase over the amount of spawning habitat provided by the existing condition.

4 CONSTRUCTION

Construction practices and measures will be guided by the provisions of the Construction Plan (FERC Article 407) and will be consistent with the terms of the NOAA-Fisheries incidental take statement, provisions of the USDA-FS decision document, Section 404 permit issued by the ACOE, dredge/fill permit issued by the DSL, the ODFW recommended in-water work period, and associated Section 401 Water Quality provisions. Construction of this project will be coordinated with the gravel augmentation projects (SA Section 7.1 and SA Amendment Section 7.2) to maximize resource benefits and reduce impacts from all activities.

4.1 Schedule and Flow

The specified in-water work period for this project will be determined during permitting, but is expected to be August (ODFW, NOAA-Fisheries). In-water construction is planned to occur during the first 2 weeks of August. Materials will be staged earlier (mostly during July) so that in-water work is not delayed or slowed for lack of materials.

The minimum instream flow requirement for the Soda Springs bypass reach will be reduced during construction from 95 cfs to 25 cfs, as agreed by SA parties at the February 25, 2004 RCC meeting (Appendix 5). This lower flow will facilitate construction and reduce impacts to water quality. It will recreate the same flow conditions that existing during all previous habitat work in this reach (Figure 10). Flow will be ramped down immediately prior to in-water construction, and ramped back up immediately upon completion of in-water construction (not ramped up and down every day). Ramping restrictions will be followed during both flow changes. These ramps within the bypass reach will not affect flows within the Wild and Scenic river corridor.

At the beginning of in-water construction, the bulk of the gravel will be placed in each pool upstream of the weirs prior to construction, so that vehicle traffic over the new weirs will be minimized. Then work on the log weirs will be completed, then flanks and boulders added. Boulder gardens will be built when access to those areas is best and damage to weirs is least. Excavation and construction will be done “in the dry” to the extent possible, if flows can be temporarily re-directed in-channel. However, much work will need to occur in the flowing channel.

4.2 Materials

On-site materials exposed during excavation and construction will be re-used to the greatest extent possible. This will minimize the amount of fill in the channel, maximize construction efficiency, reduce costs, and result in the most natural project appearance.

Weirs crests will be constructed of sound Douglas fir, western red cedar, or other suitable species of logs which are 15 to 28 inches diameter at the small end. Logs for weir crests will range from 50 to 80 ft long (or as long as can be transported) and be cut to length to fit each site. The USDA-FS has identified and made available an inventory of suitable logs from the Medicine Creek area (Appendix 4). PacifiCorp will load and transport selected logs to the project site. Smaller logs and rootwads for flank structures will be produced when weir logs are cut to length. Small logs within the construction site may also be used for flank structures.

Figure 10. Upper pool during gravel addition in August 2003 (30 cfs) showing the uppermost weir. Note temporary road built of spawning gravel to provide equipment access.

The project will require about 1,640 cy of gravel, rock, and boulder fill (Table 3). Boulders (3-6 ft diameter) and smaller rock will come from the Lemolo Quarry, Foster Pit, or possibly along the road near the Slide Creek powerhouse. Washed and sorted gravel is anticipated to come from a commercial source and be of the same particle size composition used during 2003 in the SA Section 8.2 Slide Creek habitat modifications and the SA Section 7.1 Soda Springs bypass gravel augmentation, and in 2004 for the SA Section 7.1 and 7.2 gravel augmentation projects (Table 4).

4.3 Public Notification and Access

The public was notified in advance of construction via the USDA-FS October 2003 Schedule of Proposed Actions. During construction, the road to Soda Springs bypass reach will be signed and closed to public access.

Table 3. Estimated fill volumes to create spawning habitat (gravel), support the new weir (rock), create boulder gardens and key in weir ends (boulders). On-site material is not included in these estimates.

location	width (y)	length (y)	area (y^2)	depth of fill (y)	total fill volume (y^3)	SA 7 volume (y^3)	SA 8 volume (y^3)	material type
upstream of weir 1	20	23	460	0.5	230	0	230	spawning gravel
upstream of weir 3	20	30	600	1	600	370	230	spawning gravel
upstream of upper pool weir	30	15	450	1	450	400	50	spawning gravel
under weir 3	32	5	160	1.5	240	0	240	rock fill
downstream of weir 1					30			15+ boulders
downstream of upper pool weir					30			15+ boulders
flanks of weir 1					15			8+ boulders
flanks of weir 2					15			8+ boulders
flanks of weir 3					15			8+ boulders
flanks of upper pool weir					15			8+ boulders

Sum of total fill volume (y3) material type	Total
boulders	120
rock fill	240
spawning gravel	1280
Grand Total	1640

Table 4. Approximate size distribution of gravel used in 2003 and planned for 2004 spawning habitat modifications and augmentation, shown as grain size classes and as a cumulative particle distribution.

Grain size (inches)	Approximate percent within size category	Sieve size	Acceptable range of percent passing sieve (by mass)
0-3/8	<2	3/8	0-5
3/8–3/4	10	¾	5-15
3/4–1.5	30	1.5	25-60
1.5–4	50	4	90-100
4–5	10	5	100

5 MAINTENANCE

The spawning habitat and weirs will be monitored and maintained in a functional state throughout the term of the new license, or to the point where the specified project funds provided for in SA Amendment Section 8.3 are exhausted. A conceptual budget was drafted indicating this could be accomplished within the constraints of specified project funding (Appendix 6). If specified project funds are exhausted prior to the end of the license term, the Settlement Parties will consult regarding further maintenance.

Maintenance may be periodically needed on the structural components creating the new habitat (e.g. logs, boulders), the banks confining the channel, and the gravel forming the spawning habitat. The weirs and banks will be maintained in a condition similar to the original construction, unless modifications are approved by the RCC. Modifications requiring construction may be subject to the same provisions as the original construction. Spawning gravel similar to that used in the original construction (unless otherwise agreed by the TWG) will be periodically added to maintain the site. The frequency of maintenance and gravel augmentation will be determined by periodic monitoring of the habitat modification, in consultation with the TWG. The augmentation interval is expected to range from approximately 3-8 years (Feasibility Report).

The location of gravel placement will also be determined using insights from monitoring, in consultation with the TWG. The location may differ based on the magnitude of scour affecting the habitat in different years. Locations of gravel placement could include rebuilding spawning habitats directly or adding gravel in deeper portions of the pools upstream from spawning habitat areas (Feasibility Report). Gravel could be added during the in-water work period, or possibly during the high flow season (with agency approval). Gravel for the SA Section 7.2 augmentation program may be useful for maintaining these as well as other spawning sites.

6 RELATION TO OTHER PROJECTS

This project will be closely coordinated with SA Section 7.1 and Section 7.2 gravel augmentation work, some of which will occur in the same location and at the same time. To the extent possible, long-term gravel augmentation will be planned in a way that minimizes impacts to these structures. A scheduled maintenance shutdown of Soda Springs powerhouse is scheduled to be completed in June 2004, and should not interfere with this project. Access requirements for future projects in the vicinity, such as construction of Soda Springs fish ladder and fish screens, will be considered in the construction of this project. However, if future projects damage these structures, those future projects will be expected to bear the cost and responsibility of returning these structures to functional condition.

7 NEXT STEPS

- PacifiCorp will submit Joint Permit Applications to the ACOE and DSL (March 2004)
- The USFS will continue its environmental analysis process.
- A draft monitoring plan will be developed within 120 days of the finalization of this plan to allow estimation of the quality and quantity of new spawning habitat created (SA Amendment Section 8.3.3), and identify maintenance needs.
- A baseline habitat survey will commence within 60 days after the finalization of this plan (or as otherwise decided by the RCC) and be completed prior to the habitat modification.
- In-water construction will occur during August 1-15, with materials staged earlier.

8 REFERENCES

Feasibility Report -- North Umpqua Habitat Restoration/Creation Project: Feasibility Report. Prepared by Stillwater Sciences, modified by the TWG, approved by the RCC, final on August 28, 2003.

Appendix 1

Technical Work Group Members

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Appendix 2

Consultation Meetings and Document Dates (2003-2004)

- August 28 – Feasibility Report approved by RCC, start of implementation planning
- September 3 – TWG meeting, process planning
- November 20 – TWG site visit with design team
- December 3 – TWG site visit with RAT design team members
- December 12 – first draft implementation plan distributed to TWG
- January 5 – TWG meeting to discuss draft implementation plan, RAT design routed to TWG
- January 15 – TWG meeting to consider alternative designs and modifications with design team and Stillwater Sciences
- Several RCC meetings and conference calls to clarify design and budget issues
- March 9 – second draft implementation plan distributed to TWG
- March 12 – TWG meeting, revise implementation plan and design
- March 18 – distribution of final plan to TWG
- March 19 – distribution of final plan to RCC
- March 29 – RCC approval sought

Appendix 3

Relocation of Soda Springs Bypass Reach Gage

PacifiCorp proposes to relocate the instream flow and ramping rate compliance gage in the Soda Springs bypass reach (Figure 1). This relocation is required to vacate the current location in the pool tailout, which will be filled with log weirs, boulders, and gravel during summer 2004 to create spawning habitat per SA Section 8.3 (Figure 2). The relocation will include moving the staff gage and the bubbler, cabinet, and associated pipes, tubing, and orifice.

An interagency site visit occurred February 26, 2004. The USGS (House, Herrett) suggested, and the USFS (Sichting, Jones), OWRD (Williams), and PacifiCorp (Grost, Beyer) concurred, that the best site for relocating the bubbler and staff gage is near the mid-section of the same pool, about 150 ft upstream from the current location (Figure 1). This location was considered the least affected by near-term and future habitat work, gravel augmentation, and bedload transport. Alternative sites (nearer the dam) were judged less favorable due to turbulence at high flows.

At the proposed site, the stage-discharge rating should remain about the same as at the current site. However, they will need to be checked regularly (just as at the current site) in response to habitat, gravel augmentation, fish spawning, and flow events that may alter the tailout.

Relocation will require moving the bubbler cabinet to a different penstock support, rewiring into power and control cables, running 2” galvanized steel pipe from the cabinet under the road, then at grade along the bank to the river, then out into the river about 6 ft to a termination depth of 1.5 ft at 95 cfs (with termination suspended at least 1.5 ft above the bottom). The staff gage will be relocated to the cliff wall directly across from the bubbler (Figure 2). Relocation must be completed prior to initiation of SA Section 8.3 instream habitat work in early August 2004. With proper clearance it could occur in June or July (bypass flows will be high during April and May due to powerhouse shutdown for maintenance and automation).

Figure 1. Soda Springs bypass reach, July 2003 (about 30 cfs). Note existing staff gage on cliff to right-center of photo. Bubbler orifice is directly across stream from staff gage. Proposed new location for both is about 120 ft upstream in same pool.

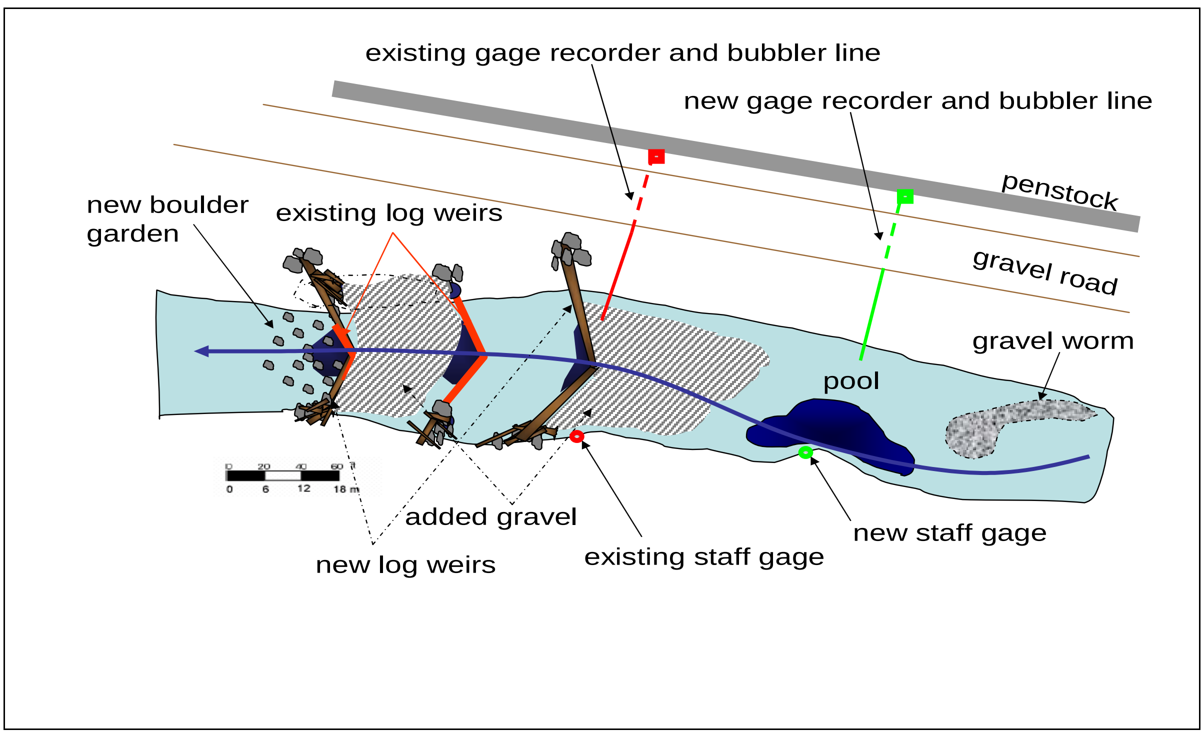

Figure 2. Plan view of the gage site in Soda Springs bypass reach, showing proposed habitat modifications, existing gage location (red), and proposed gage location (green). Bubbler line will be installed at surface grade, except where it is buried under the gravel road.

Appendix 4

SA Section 8.3 North Umpqua Spawning Restoration/Creation Log Identification Specifications USDA-FS, 1/5/04

An assortment of weir logs meeting the criteria of the SA Section 8.3 design specifications were identified by the USFS along Medicine Creek Road and below Soda Springs dam on December 19, 2003. The logs along Medicine Creek Road are marked with nailed-on 3-foot, orange-tipped survey stakes with pink flagging. Each survey stake has a number on it corresponding to the "Log #" column in the table below. Logs are located from approximately ½ mile to 5 miles up the road. The last log is located near the junction of the 4775 and 550 Roads. All are either blowdowns or were felled as part of the hazard tree reduction program. The logs below Soda Springs Dam are unmarked. Collection of logs up Medicine Creek can occur during the primary spotted owl nesting season, which runs from March 1-July 15, based on the lack of suitable owl habitat within ½ mile of the area where logs are designated. Lack of suitable habitat within ½ mile provides no potential for disturbance. The Biological Evaluation was amended on 1/5/04 to allow for this. **Log #1 may not be removed between March 1-July 15.* Loading and transporting of logs is the responsibility of PacifiCorp. Logs hauled but not used in the weir design will remain the property of the USFS.

Four logs were identified slightly downstream of the proposed 8.3 site. These particular logs would need to be yarded to the road if a decision is made by the TWG to utilize them.

8.1.1 Logs located up Medicine Creek (4775) Road					
Log #	**Length**	**Large End Dia.**	**Small End Dia.**	**Root Wad**	**Remarks**
*1	65	48	26	X	Green tree (blowdown). *Within ½ mile of suitable owl habitat.*
2	40	55	35	X	Consult with Craig Street prior to removal.
3	80	28	17		
4	70	32	20		
5	74	29	16		
6	73	37	30		
7	71	24	15		
8	69	32	24		
9	91	32	21		
10	65	20	18	X	Smaller-sized root wad
11	45	25	19	X	Smaller-sized root wad
12	45	21	16	X	Smaller-sized root wad
13	100	27	15		
14	65	23	15	X	Smaller-sized root wad
15	68	28	15		
16	45	50	38	X	Large root wad
8.1.2 Logs Located Below Soda Dam (not to be used in SA Section 8.3 project)					
Log #	**Length**	**Large End Dia.**	**Small End Dia.**	**Root Wad**	**Remarks**
1	70	40	28	X	Perched on lb; rootwad slightly functioning
2	70	34	25		Perched, mid-channel channel spanner; slightly functioning
3	75	38	29		Mid-channel, perched; functions only at very high flows
4	65	30	24	X	Mid-channel, perched, slightly functions @bf flows; partial rootwad

Appendix 5

RCC Approval of Flow Reduction during Construction (from 2-25-04 RCC minutes)

The RCC members unanimously support a flow reduction in the Soda Springs bypass reach (from the current minimum of 95 cfs to the old minimum of 25 cfs, following the SA ramp rates) during in-river construction of the SA 8.3 habitat project (estimated to take 2 weeks in early August 2004) for the following reasons:

1. All past work in this reach has been done during the old minimum flow of 25 cfs. Work during a 95 cfs flow has never been attempted and may pose worker safety, turbidity, construction efficiency and additional hurdles.
2. Solid construction of the proposed log weir designs would be very difficult during a 95 cfs flow.
3. Contractors and designers believe that the reduced flow will allow for much more efficient construction (faster, lower cost, better product).
4. Lower flow allows more construction options, such as the use of coffer dams so some work can occur "in the dry".
5. Lower flow should reduce downstream turbidity by allowing more "out-of-water" work, a shorter construction period, lower stream energy, and slower transportation of turbidity to the Wild and Scenic reach.

The approved flow reduction will not affect flows in the wild and scenic reach. In-water construction in the bypass reach will occur as rapidly as possible within the constraints of applicable permits to minimize the duration of reduced flows. Flows will be ramped down once at the beginning of in-water construction, and ramped up once at the conclusion of in-water work to minimize potential for fish stranding (i.e., flow will not be ramped up and down each day).

Appendix 6 (next page)

Conceptual Cost Estimates for SA 8.3 Spawning Habitat Creation Project

SA 8.3 Budget Tracking

Draft 2/5/04 17:00

Purpose: put construction costs in context of overall long-term project

[highlighted] = contingency items, may not be necessary

Date	Item	Estimate per event	Number of times over license term	Total estimated cost	Actual (paid)	Remaining amount	Notes
November-02	Total fund amount (2002 dollars, SA 22.4.4)					$410,000	
August-03	Feasibility Report (Stillwater)		1		$46,035	$363,965	
December-03	RAT support for design visit (USFS)	$200	1	$200		$363,765	
December-03	Provide survey data, review admin. (Stillwater)		1		$729	$363,036	
January-04	NEPA for construction (USFS)		1		$11,544	$351,492	SA 8.3 proportion (by cost) of total 8.3/7.2 NEPA estimate
January-04	Design review+Jan 15 conf. call (Stillwater)	$1,000	1	$1,000		$350,492	
March-04	DSL permit application fee for construction (DSL)	$425	1	$425		$350,067	expires every 3 years, or when fill/removal volumes are used up
July-04	Baseline habitat survey	$10,000	1	$10,000		$340,067	Stillwater estimated $6400
August-04	boulder fees (USFS; royalty and road use fee; 100 boulders)	$3	100	$300		$339,767	
August-04	RAT support for construction oversight (USFS)	$500	1	$500		$339,267	verify with Pam
August-04	construction (lower pool weirs)	$55,000	1	$55,000		$284,267	Weekly estimate based on modified USFS RAT design
August-04	gage relocation (construction only)	$8,000	1	$8,000		$276,267	construction only, assumes same pool
August-04	construction (upper pool weir)	$8,000	1	$8,000		$268,267	new logs and boulders
July-05	assess need for modification / maintenance	$0	1	$0		$268,267	assumes agencies/PacifiCorp do without charge
August-05	modify structures IF necessary	$20,000	1	$20,000		$248,267	contingency item, last chance before flows rise to 275 cfs
September-05	repeat baseline survey at 275 cfs	$10,000	1	$10,000		$238,267	Stillwater estimated $6400
Annual	annual visual inspection (April, and post high-flows)	$0	35	$0		$238,267	agencies and PacifiCorp, casual inspection
Periodic	periodic habitat survey / monitoring	$1,400	10	$14,000		$224,267	measure spawnable area and quality
Periodic	periodic maintenance (gravel delivery, 400 cy)	$10,000	10	$100,000		$124,267	assumes $25/cy commercial cost
Periodic	periodic maintenance (gravel placement, 400 cy)	$2,000	10	$20,000		$104,267	assumes $5/cy target placement
Periodic	periodic structure modifications / repairs	$10,000	8	$80,000		$24,267	assumes each weir may need 2 major repairs/rebuilds
Periodic	NEPA for maintenance (USFS)	$3,000	7	$21,000		$3,267	verify
Periodic	DSL permit application fee for maintenance (DSL)	$375	7	$2,625		$642	fixed application fee, permit expires every 3 years
	Ending Balance:					$642	

Services Donated:

PacifiCorp	technical assistance in design, plan writing, baseline survey, monitoring, maintenance planning and permitting
Agencies	technical assistance in design, plan review, baseline survey, monitoring, maintenance planning (current level)
PacifiCorp	engineering / drafting of construction drawings (if needed)
Agencies	technical effort associated with gage relocation
PacifiCorp	technical effort associated with gage relocation
PacifiCorp	comtech labor associated with gage relocation (make equipment and communications work)
PacifiCorp	hydrology services required to re-rate new gage location
USFS	RAT support for design (and construction oversight?)
USFS	logs for weirs
PacifiCorp	AFUDC and capitol surcharge (internal fees)

Note: gravel for upper pool weir (400 cy 7 times over license term) funded by SA 7.2.