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May 3, 2005

MEMORANDUM

TO: Council Members

FROM: Mark Fritsch, Project Implementation Manager

SUBJECT: Council decision on funding recommendations for Updated Proposed Action (UPA) habitat proposals

PROPOSED ACTION:

Council staff recommends that the Council approve the MacPherson Side Channel, Marrachi Diversion and MSRF Side Channel proposals as reviewed. It is understood that Fiscal Year 2005 funds are not to exceed \$276,000 to implement the three projects.

SIGNIFICANCE:

Bonneville Power Administration (Bonneville) and Bureau of Reclamation (Bureau) implementation and funding of updated proposed action (UPA) habitat projects in the Wenatchee, Entiat and Methow subbasins. The UPA includes a program to improve the quality of tributary habitat to help provide "off-sets" to the impacts of hydro operations on the survival of certain listed anadromous species (Evolutionarily Significant Units or ESUs). Together, the Action Agencies have agreed to address specific limiting factors on the survival of these ESUs in specified areas of their passage, spawning and rearing habitats. The effects of the November 24, 2004 Updated Proposed Action were evaluated in a revised BiOp on the FCRPS issued by NOAA Fisheries on November 30, 2004 pursuant to section 7 of the Endangered Species Act (ESA).

BUDGETARY/ECONOMIC IMPACTS:

Council staff recommends that \$276,000 in Fiscal year 2005 funds be approved for the MacPherson Side Channel, Marrachi Diversion and MSRF Side Channel proposals. Bonneville had requested \$635,520 in Fiscal Year 2005 for the original package of eight proposals. On April 14, 2005 Council approved three other projects (i.e., Chewuch Diversion, Fulton

Diversions, and Hottell Headgate) for \$279,000. It is anticipated that the proposed projects will be completed during FY05. There will likely be additional projects implemented in FY06 in order to meet the Action Agencies' metric goals for these three subbasins. In addition, Bonneville expects to integrate the UPA habitat project implementation in Fiscal Year 2007 and beyond with the Council's Program as part of a future solicitation process.

BACKGROUND:

On March 15, 2005 Council staff recommended that the Council conditionally approve allocating Fiscal Year 2005 funds not to exceed \$635,520 for the Updated Proposed Action (UPA) habitat proposals submitted by Bonneville on March 8, 2005. The staff recommended that the condition of Council approval be a favorable ISRP review of the package of proposals.

Based on the presentation and the discussion the Council conditionally recommended that the two projects that needed an immediate decision (i.e., Fulton Diversion and Chewuch Diversion) be allocated up to \$268,000 of the \$635,520 requested in Fiscal Year 2005 funds, subject to (1) ISRP review and (2) Council confirmation of its recommendation following the ISRP review. It was intended that this scenario would expedite the Council review and final recommendation for those two projects. As part of this recommendation, the Council asked the staff to send the other projects in the package to the ISRP for review on an expedited basis, too, followed by Council review and recommendation at the Council's April meeting.

On March 15, 2005 Council staff submitted the project proposals to the ISRP as per the Council recommendation made earlier in the day. It was determined that the review by the ISRP could be accomplished by March 29, 2005 and that would meet Bonneville's needs for timely contracting, and on that basis the proposals were submitted as a package to the ISRP.

On March 30, 2005 the Council received from the ISRP their review of the UPA habitat projects (ISRP Document 2005-09). The ISRP stated that some of the proposed projects have biological merit, but that the proposals were not technically justified and therefore, were "not fundable" as submitted. The ISRP was very critical of the unique process for the development of these proposals, and the out-of-sequence review. After its critique of the overall package and the process, the ISRP did also provide specific comments for each proposal. While the overall summary comments from the panel were extremely critical, the staff recommended to the Council that the project-specific concerns could be addressed with more information from Bonneville and the sponsors.

The Council's decision regarding funding recommendations for Updated Proposed Action (UPA) habitat proposals at its meeting on April 14, 2005 in Boise, Idaho. This action continued Council consideration from the March 15, 2005 meeting.

On April 14, 2005 in Boise, Idaho the Council in response to the ISRP review and the staff recommendation, the Council approved only the Chewuch Diversion, Fulton Diversion, and Hottell Headgate proposals in a total amount not to exceed \$279,000.

For the MacPherson Side Channel, Marrachi Diversion and MSRF Side Channel proposals, the Council determined that its approval depends on the following conditions being addressed: (1) that the relationship of how each project is consistent with the applicable subbasin plan, citing

specifically the objectives, strategies, and limiting factors or key conclusions from the plans' assessments; and (2) that specific questions raised by the ISRP are responded to in writing. The proposals should be augmented to do this and returned to Council for an expedited review and final recommendation. We have scheduled a decision on these projects at the June Council meeting.

The remaining two projects (i.e., Entiat Wells and Whitehall Wells) were not addressed and will be dependent on a future submittal and favorable review and recommendation by the ISRP and the Council.

On April 22, 2005 responses to the question from the ISRP were received from Bonneville for the questions regarding MacPherson Side Channel, Marrachi Diversion and MSRF Side Channel proposals (see attachment 1).

ANALYSIS:

The responses received from Bonneville for the MacPherson Side Channel, Marrachi Diversion and MSRF Side Channel proposals were responsive to the questions that the ISRP raised as part of their review of the proposals (ISRP Document 2005-09). The staff believe that the responses of Bonneville and the Bureau adequately address the questions raised by the ISRP for the particular projects.

The McPherson Side Channel proposal (\$106,000) response addressed eight questions raised by the ISRP. The relationship to the Methow Subbasin Plan was adequately addressed in the review by the ISRP so was not part of this response. The Marrachi Diversion proposal (\$105,000) response also addressed eight questions that the ISRP raised and as with the McPherson proposal had adequately provided to the ISRP sufficient detail and considerations to the Methow Subbasin Plan. The MSRF Side Channel proposal (\$65,000) response responded to seven questions, including the link to the Methow Subbasin Plan, raised by the ISRP (as you may recall, the ISRP raised similar issues as was outlined for the McPherson Side Channel proposal).

Council staff determined that the responses received for the particular projects adequately addressed the specific questions raised by the ISRP and the MSRF Side channel proposal responses provided the information that demonstrates the consistency to the Methow Subbasin Plan. It was also noted by Council staff that it was evident that Bonneville and the Bureau had fully engaged in addressing the conditions raised by the Council.

As we have previously discussed, the proposed projects can all be defined as water optimization and/or passage projects (e.g., projects that address efficiencies regarding water usage and quantity in a particular basin) and should have early demonstrable benefits for fish.

Therefore Council staff recommends that the Council approve Fiscal Year 2005 funds not to exceed \$276,000 for three the habitat proposals as defined in the submittals received from Bonneville on March 8, 2005 and April 22, 2005.

Attachment 1: Email received from Bonneville Power Administration, on April 22, 2005, regarding the UPA habitat projects and responses to the questions for MacPherson Side Channel, Marrachi Diversion and MSRF Side Channel proposals (see attachments)¹.

-----Original Message-----

From: Furey,Chris H - KEWR [mailto:chfurey@bpa.gov]
Sent: Friday, April 22, 2005 9:46 AM
To: Fritsch, Mark
Cc: Maslen,Bill - KEW; Hermeston,Linda L - KEWL; Rowan,John H - KEWR
Subject: Responses for UPA projects

Mark:

BPA and Council staff have coordinated with the Bureau of Reclamation and others to obtain responses to the ISRP comments and questions for the three projects still needing Council recommendation. The responses for these three projects (McPherson Side Channel Reconnection, Marrachi Diversion and Piping, and MSRF Side Channel) are attached. Additional information is also attached for the three projects that received Council recommendation (Chewuch Dam Barrier Removal, Fulton Dam Barrier Removal, and Hottell Diversion Headgate and Fishscreen Protection). If you have any questions or need additional information, feel free to contact me. Thank you for coordinating the work to prepare this for a Council recommendation decision.

Sincerely,

Chris

<<McPherson ISRP.doc>> <<Marrachi Diversion Renovation and Piping ISRP.doc>> <<MSRF ISRP.doc>> <<Chewuch ISRP.doc>> <<Fulton ISRP.doc>> <<Hottel ISRP.doc>>

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¹ The submittals received from Bonneville on April 22, 2005 also include additional information (i.e., subbasin plans) regarding the Chewuch Diversion, Fulton Diversion, and Hottell Headgate proposals. This is not part of this attachment since these projects were recommended by the Council in April 2005.

McPherson Side Channel Reconnection, Chewuch River, Methow Subbasin

Response to ISRP Team

1. Provide justification for project expense. (This includes needs to provide winter rearing habitat, evaluation of project effectiveness potential)

The McPherson side channel restoration project is located in the lower Chewuch River drainage of the Methow Watershed. The objective of this side channel restoration project is to provide off-channel rearing habitat and restore floodplain connectivity. The project is to be implemented by the Chewuch Basin Council (CBC) in conjunction with other projects designed to increase stream flows and improve habitat conditions for listed fish species in the Chewuch Watershed.

The proposed project is an active restoration project that builds on actions previously implemented by the Skyline Ditch Company to enhance side-channel habitat and over-wintering refugia within the fish return channel extending from the Skyline screens to the Chewuch River. The existing return channel extends approximately 1,400 feet from the screen facility to the Chewuch River. The channel is an ancient overflow channel of the Chewuch River that has been isolated by a rip -rap dike for private land flood protection.

A water flow agreement was developed with the US Forest Service and the Washington Department of Fish and Wildlife (WDFW) in 2003 to evaluate the benefit of maintaining surface flows throughout the year in the side channel as an alternative to dewatering the channel at the end of the irrigation season. The proposed action seeks to extend the length of the side channel to include approximately 1,000 ft. of low gradient, meandering side channel habitat that flows from an historic diversion point on the Skyline Canal Company's return channel to the Chewuch River. This side channel runs through property currently protected under a WDFW conservation purchase. Restoring flow through the riparian area will add significant habitat value to the conservation property.

The McPherson project provides additional benefits to past passive protection acquisition projects completed by WDFW at the McPherson Ranch. This project will result in additional passive protection on adjacent private properties through proposed cooperative agreements as well as the active channel enhancement proposed on the WDFW property. The project will utilize an existing gravity flow water source to provide reliable water supply for increased habitat value.

The existing side channel has an average depth of 0.5 to 1 ft. and width of 3 to 5 ft. with an average gradient of 1%. The channel runs through a vegetated flood plain bench between the Chewuch River and former upland pasture. Riparian vegetation is intact and would benefit from

the additional flow through the channel. Enhancement of the side channel habitat will be accomplished by creating a more defined channel with excavation work. The placement of rocks and woody debris in the channel will develop pool formation and habitat complexity and provide cover. The project will also include creation of one deepened over-wintering rearing pond estimated to be 100 ft. by 200 ft. The increased side channel complexity and off-channel pools provided by this project specifically addresses subbasin plan recommendations for this reach of the Chewuch.

The gradient of the existing return channel at the confluence of the channel and Chewuch River currently prevents up-stream passage. A simple step pool fish ladder is proposed to allow for fish passage upstream into the channel. Fish passage down-stream occurs in conjunction with operation of the Skyline diversion.

The necessity to install fairly extensive “hardware” in the form of a fish ladder to allow fish passage upstream and downstream in the intake canal, replacement of an existing road culvert, installation of a water control structure midway through the system, and the construction of an exit fishway through an existing dike are all involved as part of this project. These costs involved are shared by several entities, and the actions will ultimately have value by providing refugial and rearing habitat in this reach of the Chewuch River.

2. Describe monitoring that will be done for the project.

The lower 8 miles of the Chewuch River have been extensively studied over the past 8 years. This has been in response to the listing of Upper Columbia River Steelhead and Spring Chinook Salmon and the subsequent Federal actions to curtail irrigation diversions by the Skyline Ditch Company. Habitat transacts, stream reach surveys, redd counts and vegetation studies have all been completed. The biological assessments prepared by the US Forest Service included review and assessment of the increased off-channel project supported by the Skyline fish return. This project was also included in the subsequent Biological Opinions issued by NOAA-Fisheries and US Fish and Wildlife Service.

Monitoring and evaluation of project success will be completed under the terms of the special use permit (SUP) issued to the Skyline Ditch Co. and the cooperative agreement with WDFW and the adjacent private landowners. Monitoring under the SUP is limited to visual observation of flow conditions at the Skyline screen and return structures. Monitoring by the CBC will include annual photo point documentation of riparian plantings and visual observation of fish usage. Additional fish usage observations may be collected by WDFW or other resource agencies if desired.

3. Discuss potential efforts to restore riparian vegetation along the channel margins.

Existing riparian vegetation between the return channel and the Chewuch River will benefit from the increased and reliable side channel flows. Additional riparian plantings using native species will be established adjacent to the enhanced channel and pond area as recommended by the WDFW. The additional plantings will be planted sufficiently close to the channel to avoid the need for supplemental irrigation. These plantings (and associated revegetation monitoring) will be described in detail in the Habitat Improvement Project Biological Opinion (HIP BiOp) Form 1

Site Restoration Plan as required by the HIP BiOp Terms and Conditions to satisfy ESA consultation requirements with NOAA Fisheries

4. Discuss methods for clearing accumulated sediment within the channel via flood type flows and food productive capacity in the channel.

Operation of the Skyline ditch can be controlled to vary flow through the return channel from a low of 2 cubic feet per second to as much as 8 cubic feet per second. Flow through the fish return is currently increased during the spring freshet to maintain channel conditions and flush sediment from the system. Use of the existing upper end of the fish return channel over the past decade has not resulted in any significant sediment accumulation under these operational conditions. Sediment accumulations in the new channel will be controlled by designing channel cross sections to maintain sweeping velocities. The intake structure is of sufficient size to introduce sweeping high flows (but not flood flows) periodically to mimic natural conditions and sustain nutrient inputs for food production capacity.

5. Address if winter rearing habitat would be created.

The lack of sufficient winter rearing habitat for juvenile salmonids is identified as a limiting factor in the Methow Subbasin Plan (p. 178-180). The proposed side-channel enhancement will include restoring sufficient winter flows through the channel to prevent winter freezing. Off-season (winter) flows are presently maintained between 2 – 4 cubic feet per second to prevent icing and sustain flow in the upper return channel and based on experience, similar flows in the new channel should prevent freezing. Observations of fish presence were conducted along the channel in the winter of 2004. Several age classes of salmonids were found in the pools and open channel areas during these observations. The proposed side-channel enhancement would include the creation of at least one area sufficiently deep to provide over-wintering refugia for juvenile salmonids.

6. Address whether the effluent is expected to be of sufficient quality for rearing.

The water from the Skyline return channel is not “effluent.” It is withdrawn from the Skyline Canal at a point immediately downstream from the headgate and before it enters the Skyline distribution system. During past canal operations it was used to “waste “ excess water – a much different connotation from the concept of effluent “waste water” runoff. This “wasting” (a common irrigation term) is now no longer necessary as a result of the automation of the Skyline headgate which now responds instantaneously to variations in river levels

7. Describe adaptive management information loop to evaluate claims of improvement.

The proposed project is active restoration of side-channel habitat that has been altered by human activities in the lower Chewuch River floodplain. This project will be implemented over at least three years to allow for observation of the effectiveness of the new channel and pond complex. Recognition of this need to move slowly and learn by observation is one of the reasons for the higher cost of this project compared to other approaches only one entry into the site.

Post-implementation monitoring of the project will determine if there is insufficient flow for winter rearing habitat, if the channel is becoming silted in, etc., if so then these problems can be addressed and the channel reconfigured accordingly.

8. Provide some idea of the kinds or magnitude of response this action might provide.

There is insufficient data to make a quantitative estimate of the magnitude of response in terms of increased production of juvenile salmonids in the affected reach or the Methow Subbasin as a result of the project. It is very difficult to separate out the effectiveness of a small side channel enhancement project from the overall variation in returning adult numbers as a result of out-of-basin effects. Several reports, including the Methow Subbasin Plan, have concluded that off-channel rearing habitat is a limiting factor for salmonids and that alterations to floodplains are the cause, therefore qualitatively it seems reasonable to assume that creation and reconnection of side channel habitat will be beneficial.

The ISRP stated that the project refers to the Subbasin Plan with sufficient detail and consideration.

Marrachi Diversion Renovation and Piping Beaver Creek, Methow Subbasin

Response to ISRP Team

1. Proposed Water Gains and Return Water Characteristics

Canal efficiency measurements were conducted by the USGS in 2002 as part of their overall assessment of canal efficiencies in the Methow Subbasin. Their findings (Konrad *et al*, USGS internal memo) indicated that seepage losses could range from 50 to 70% of the water introduced into the canal. Observation by Reclamation personnel of the Marrachi system indicated a total loss of approximately 1.0 - 1.5 c.f.s. over slightly more than a mile of canal. If the canal is totally piped, there will be very little to no loss during delivery of the water to the fields. Under Washington State laws, water cannot be wasted by over watering or “spread” to other areas, thus the saved water must legally remain in the stream.

Stream gages maintained for the past 3 years by Reclamation approximately 2.0 miles above the site and 4.0 miles below in addition to instantaneous flows taken near the diversion indicate that an average base low flow for the stream at this point approximates 8.0 c.f.s. This figure will be refined as additional years of record are added to the gage data. On the basis of this information, it is reasonable to assume that in most years at least 10% of the low flow in Beaver Creek at this point will be provided by saved water from piping the Marrachi/WDFW Diversion. These increased flows come at a critical time for ESA-listed salmonid fish passage and juvenile rearing.

The saved water will not be diverted from the creek and thus will have identical water quality characteristics as Beaver Creek itself. This proposal will not result in field or canal runoff being returned to the stream.

2. The efficiency improvements will provide increased instream flows

Low flows are the only time this water is biologically significant. Of the three water rights associated with this diversion, one is a Class Two right and thus is one of the last to be shut off in times of shortage. Even though there is very little water associated with this right, it takes the same amount of seepage loss or “transportation water” to get it to the end of the ditch as when all the rights are being transported in the ditch. If this transportation loss is eliminated through piping, junior users can take this saved water downstream while there are sufficient flows to satisfy the senior rights such as Class 2 rights. However at these flows that allow all users to divert, historically there has also been sufficient water in Beaver Creek to support juvenile rearing and adult passage. As flows drop, these junior users are shut off in order until only the senior rights approximately 4 miles downstream and on the Marrachi/WDFW Ditch can use the saved water. Water cannot be legally “spread” in an adjudicated basin because of the vigilance of Ecology, the Beaver Creek watermaster, and jealous neighbors who have been feuding for three generations. Thus, during critical low flows when flows matter most, the benefits of this water extends at least 4 miles downstream, over halfway to the confluence of Beaver Creek and the Methow River.

3. This project will remove the last significant barrier on the creek.

Reclamation replaced the Fort Thurlow diversion with rock v-weir fish passage last fall. Marrachi is the last significant partial barrier remaining on the creek after 5 years of work and nearly \$2.0 million in expenditures including the highway culvert on State Route 153. The Marrachi Diversion is expected to provide 21.8 miles of improved fish passage.

4. Primary Hypothesis – improved fish passage and flows

This project is intended to improve adult steelhead and adult fluvial bull trout passage and juvenile steelhead and Upper Columbia spring Chinook rearing by providing up to 21.8 miles of improved fish passage and increasing flows in the lower 6 miles of Beaver Creek. A primary function of the restored stream is increase low flow passage for adult fluvial bull trout, steelhead juveniles, and spring Chinook juveniles through the lower reaches of Beaver Creek up to the relatively pristine habitat that still exists on the National Forest above R.M. 8.0. Some steelhead and bull trout spawning will occur in these upper reaches.

5. Project is one of many incremental improvements on Beaver Creek

In general, all Beaver Creek projects must be viewed as incremental improvements to a highly degraded system. There is no one “silver bullet” fix, but each small benefit of the numerous projects initiated by landowners in the watershed including barrier removal, fish screening, ditch piping, and on-farm efficiency improvements has contributed to an overall improvement that should eventually lead to re-colonization of the Beaver Creek system and healthy salmonid populations.

6. Effects for bull trout and brook trout

One effect of this project will be to increase the number of bull trout in the system from fluvial migration.

Speculation by local biologists (Jennifer Molesworth, USFS, personal comm.) is that increased access to fluvial bull trout may decrease hybridization with introduced Eastern Brook trout by strengthening native bull trout populations. At present, resident bull trout inhabit the upper reaches of the stream generally leaving the warmer middle reaches to brook trout. Hybridization appears to be occurring as bull trout drop down into the middle reaches and are unable to move back upstream over low flow barriers such as the Marracci/WDFW diversion. Given introduction of additional fluvial bull trout and the ability for resident bull trout to return upstream to spawn, the remnant bull trout in the upper reaches might increase and eventually out-compete brook trout. A USGS pit tagging research project already under way in Beaver Creek combined with continued snorkel surveys on the National Forest will track the re-colonization of the Beaver Creek watershed. These studies will identify interactions between

Eastern brook trout and bull trout and allow for an adaptive management strategy to be implemented if brook trout/bull trout hybridization seems to be deleterious to the existing remnant bull trout population.

7. Describe monitoring and adaptive management information loop to evaluate claims of improvement.

Fish response to barrier removal and increased instream flows will be well documented by the USGS study and the ongoing Forest Service surveys. Adaptive management actions will be based on this information as well as continued monitoring of the structure by the WDFW as they regulate their portion of the water supply diverted by the structure. Deficiencies noted in the ability of the structure to pass fish at low flows will be corrected by modifying the structure as they are observed. Experience at other completed rock v-weir structures on Beaver Creek have shown that small problems can generally be mitigated with hand tools such as shovels and rock bars.

8. Provide some idea of the kinds or magnitude of response this action might provide.

Proponents state that the diversion renovation portion of this project to improve fish passage was part of the actions in Proposal #29010. The ISRP provided a final review and recommendation to “Fund” the actions in Proposal #29010 on June 7, 2002. It can be assumed that the passage improvements from barrier removal postulated in the proposal document would be augmented by increased instream flows resulting from piping.

The ISRP stated that the project refers to the Subbasin Plan with sufficient detail and consideration.

MSRF Side Channel (Methow)

Response to ISRP

1. Provide more detail about the project to clarify which three ponds are used for hatchery acclimation and which two would be for native fish, and how the two groups of fish would be segregated.

The proposed project is to restore seasonal flows through a blocked side channel on the floodplain of the lower Twisp River by replacing an existing perched intake to restore year-round flow. The side channel has been developed over the past two years into a series of five ponds that provide off-channel rearing habitat for juvenile salmonids. This project will reconnect surface water flow to each of the ponds providing valuable off channel habitat for native fish.

The project will increase the passive restoration values obtained through conservation acquisitions and easements previously completed on the MSRF properties by securing additional easements through adjacent properties to complete active restoration of surface flow through the side channel. Active restoration measures (construction of the new intake, rehabilitation of the intake ditch to include refugia habitat, and increased riparian plantings) will allow access to gravity flow throughout the year to more than double the available over-wintering habitat.

Two of the five ponds are currently used for experimental acclimation of hatchery juveniles under a cooperative agreement with WA Department of Fish and Wildlife. As designed, the project incorporates fish barriers between each of the ponds to prevent intermingling of hatchery and wild fish. The proposed project would restore free access to and through four of the side channel ponds for wild fish. The fifth pond will remain isolated from the other ponds by an approved fish screen and would continue to be utilized for acclimation purposes. Thus, although in close proximity, this project is not part of a hatchery acclimation program

The water supply sources for the five ponds currently include seasonal flows from the existing perched intake and supplemental water supplied from a pump in the Twisp River. The existing intake pipe was badly damaged by ice flows in January of 2005 and is currently non-functional. A flow management agreement was finalized between MSRF and WA Department of Ecology in February of 2004 authorizing use of the two water supply sources.

The present diversion intake is a culvert underneath an existing riprap dike that is approximately 10 feet high and several hundred feet long. The culvert elevation is perched above the ordinary river flow requiring maintenance of a gravel push up dam for diversion.

The rock dike will remain to protect a home immediately downstream of the intake structure. This project includes replacement of the existing culvert with a control headgate designed to operate throughout the year and provide fish passage through the diversion structure to the side channel. The present delivery channel to the first pond is a constructed ditch approximately 1,000 feet in length, 6 feet in width and 3 feet in depth that has very little sinuosity or habitat complexity. The project plan is to construct meanders and add depth and habitat complexity to the delivery channel including placement of woody debris and boulders for cover. Meandering

return channels will be constructed between the ponds to allow fish passage to and from the ponds to the Twisp River and allow fish to enter and leave the downstream end of the channel and pond system.

2. The project provides new winter rearing habitat.

The proposed restoration work is intended to restore connectivity to the floodplain/side channel complex and create new winter rearing habitat for juvenile salmonids.

Reconstruction of the existing diversion will result in the ability to maintain surface water flows through the side channel and pond areas throughout the year. Increased access to surface water flows will more than double the area currently accessible to native fish species for over-wintering habitat. The redesigned intake structure will function to allow fish passage from both the upper and lower surface water connections between the side channel and the Twisp River.

3. Provide any additional information to help predict the extent of gain in juvenile salmonid rearing or to evaluate the effectiveness of the project.

The extent to which juvenile salmonids will benefit from the increased side channel area is somewhat undefined. The limiting factors analysis identifies lack of side channel refugia as significant in the lower Twisp. The ice flow event in January of 2005 provided a graphic example of the refuge value of the side channel as ice scoured the full channel of the Twisp River along much of the lower reach above and below the MSRF site. A mixture of steelhead (pond 3) and Chinook (pond 4) over-wintered in the ponds and were unaffected by the ice flows in the main channel. Increasing juvenile access to and through the ponds will nearly double the refuge area available for juvenile rearing.

4. Provide available information regarding the effectiveness of ongoing side channel nursery work, adaptive management information loop to evaluate claims of improvement, and information monitoring and evaluation. (Include: Methods to restore riparian vegetation)

Experimental use of the site for acclimation of hatchery wild UCR steelhead was initiated in 2002 and continues under a cooperative agreement with WDFW. All acclimation fish are PIT tagged and tracked by WDFW to evaluate the potential benefits of side channel rearing versus scatter plant success. Initial evaluation of PIT results is encouraging. Return spawners were observed to spawn in the side channels in 2004. Increased return spawners are expected in 2005. Monitoring will be ongoing.

The MSRF site is actively managed as an on-going restoration project. Riparian revegetation efforts were initiated in 2003 with assistance from USFW through the Jobs in the Woods program. The riparian planting program is ongoing and will be expanded to include the new channel areas. Photo points were established in 2003 to evaluate re-vegetation efforts throughout the site. These points will be expanded to include re-vegetation areas adjacent to the new canal between the head gate and Pond 1. Project effectiveness in terms of fish access and use is currently monitored by visual observation of spawner activity within the return channels and seasonal snorkel observations within the ponds. Fish abundance is estimated from snorkel activity. This program will be expanded to include the upper channel areas following construction.

5. Discuss the linkage to the Subbasin Plan.

The Methow Subbasin Plan summarizes the major limiting factors for recovery of anadromous fish in the Methow subbasin. They include the alteration and reduction of riparian habitat, habitat connectivity, and instream and floodplain habitat degradation (p. 178-180). Loss of floodplain wetland habitat in the developed reaches of the Methow subbasin and tributaries, including the Twisp River, further reduces the already limiting over-wintering habitat for salmonids and reduces recharge potential of shallow groundwater in dry seasons.

The subbasin plan identifies the primary stressors affecting the lower 15 miles of the Twisp River as reduced levels of LWD, road placement, diking, bank hardening, and conversion of riparian lands to agricultural and residential uses that have altered natural conditions and resulted in a loss of habitat complexity and floodplain function (p. 50). The proposed project is an active restoration project that addresses the effects of these anthropogenic disturbances that have resulted in a loss of functional floodplain wetland habitat in the lower Twisp River.

The Twisp River provides spawning and rearing habitat for 20 to 30% of the spring Chinook population that inhabits the Methow watershed. Upper Columbia spring Chinook are considered to be “stream type” salmon. Stream type salmon juveniles rear for one year or longer in freshwater habitat before migrating to the ocean. Optimal conditions for rearing habitat occur in low gradient, meandering streams such as those that will be created by this project

Historically the Twisp River was considered to be a very productive system for native summer steelhead. Native populations have declined significantly over the past century and are now sustained with hatchery production. Steelhead juveniles rear for an extended period in freshwater, generally two to three years, but up to seven years is possible, before migrating to the ocean. Freshwater habitat is particularly important for this species because of the extended rearing period.

A watershed assessment for the entire Twisp River watershed was completed by the Pacific Watershed Institute (PWI) in 2000. The section of the Twisp River that the proposed project will occur is reach 2 (river mile 0.81 to 1.9) in the PWI watershed assessment and it is identified as a high priority reach for restoration. The PWI recommended strategy for restoration of this reach is to restore side channel habitat for high flow refugia and remove hydromodifications to allow for stream recovery from incision and side channel reconnection.

6. Explicitly state the primary hypothesis for the project.

This side channel project will provide off channel juvenile rearing and high water refugia for listed species. The proposed restoration work is intended to restore connectivity to the floodplain/side channel complex to provide increased juvenile rearing habitat and high flow refugia for Upper Columbia steelhead and Upper Columbia spring Chinook.

The proposal refers to the subbasin plan and other watershed assessments that state that the loss of off-channel rearing habitat from floodplain degradation is a major habitat issue in the lower

Twisp River. Implicit in the proposal is the assumption that projects that address this issue have obvious benefits if they are effective. This project will provide off-channel juvenile rearing and high flow refugia for listed fish species. The proposed restoration work is intended to restore connectivity to the floodplain/side channel complex and provide increased winter rearing habitat.

7. Discuss methods for clearing accumulated sediment within the channel via flood-type flows and food production capacity in the channel.

The flow plan allows for continual diversion of up to two cubic feet per second and peak diversion of up to 4 cubic feet per second for flushing and scouring flows. The ponds are designed to allow impoundment for surge release to scour sediment from the connecting channels. The intake structure is not of sufficient size for flood-type flows through the channel but will allow for periodic sweeping high flows and nutrient inputs for food production capacity in the system. Sediment accumulations can be controlled by designing channel cross sections to maintain sweeping velocities.