Disposition Report on ISRP Review:

Dated: 4-20-2009

Project Number	200830100
Project Title	Deschutes River Restoration Program
Proposer	CTWSRO
Short Description	This program will focus on projects aimed at improving instream habitat along with holistic watershed restoration directed at factors limiting salmonid production. Projects will target four broad limiting factors including habitat complexity and quantity, fines sediment, waters temperature and altered hydrology.
Province(s)	Columbia Plateau
Subbasin(s)	Lower Deschutes
Contact Name	Scott Turo
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ISRP Review History:

Narrative submitted: November 01, 2008
ISRP Review Comments Received: December 15, 2008
ISRP Recommendation: Response Requested – Does Not Meet Criteria

ISRP Review results: *[Check appropriate box]*

☐ Meets scientific criteria.

☐ Meets scientific criteria (qualified).

☐ Response requested - meets scientific criteria (qualified).

X Response requested – does not meet scientific criteria.

Response to ISRP Summary: [P*lease check appropriate box and respond below in: Response to ISRP Comments]*

☐ The narrative will be revised and resubmitted by (insert target date).

X A response to ISRP comments are provided in this document below.

[*Your response should include 1) areas of agreement with ISRP comments, i.e. additional information, and/or any changes in the project scope of work and, 2) areas of disagreement, i.e. state why you believe there is sufficient data or sound science to proceed, and/or provide additional information which supports your perspective].*

Response to ISRP Comments

Comments:

As stated in the project description the Deschutes River Restoration Program (DRRP) will ***"focus on projects aimed at improving instream habitat along with holistic watershed restoration directed at factors limiting salmonid production. Projects will target four limiting factors including habitat complexity and quantity, fine sediment, water temperature and altered hydrology."*** The ISRP response requested that the DRRP ***"build on habitat inventories and limiting factor analyses already completed for the Deschutes subbasin to demonstrate that proposed actions are appropriate and likely to succeed in the area of interest."***

Four general areas of concern were taken from the ISRP comments and will be addressed in the discussion that follows:

Limiting Factors

ISRP Comment: *Given the existing inventory of habitat condition and restoration prioritization that has already been completed in the Deschutes Subbasin, the ISRP believes an effective restoration proposal for the Warm Springs Indian Reservation should build upon this work by demonstrating how the proposed actions would address previously hypothesized limiting factors in priority locations. The Beaver Creek restoration work, for example, is one of the priority sites identified in the subbasin assessment.*

The proposal in its current form, however, does not make a compelling argument that the best available information was used to identify needed restoration actions and site them where they will do the most good. The limiting factors identified in the proposal are very general and could be applied to almost any watershed in the Columbia Basin. Explicit reasons should have been given as to why four potentially limiting factors – habitat complexity and quantity, fine sediment, water temperature and altered hydrology – were chosen to be addressed

Comment 1

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The original narrative stated that work through this Program will be tiered to the direction and guidance found within the Mid-Columbia Steelhead Recovery Plan and the Deschutes Subbasin Plan. Direction provided in the two documents mentioned above was used to support the limiting factors chosen. In addition, the Tribes Integrated Resources Management Plan will direct restoration efforts at the watershed scale.

The outline of proposed work is a 10 year plan of action to address these limiting factors by watershed across the Reservation. It is important to note that the funding provided through this

contract (# 200830100) will be used to develop and support a Habitat Restoration Program. Annual funding will be used to maintain the operational and administrative functions of the Program along with subcontract funding to cost share the design and implementation of restoration projects. Additional implementation funding will be secured through grants and agreements outside of this BPA contract.

Both the Recovery Plan and Subbasin Plan documents describe limiting factors in detail. These documents provide the 'explicit reasons' why the four limiting factors where chosen to be addressed through this Program.

The following section presents the highlights from the Mid-Columbia Steelhead Recovery Plan concerning limiting factors and the Westside Deschutes River steelhead populations.

Section 8.1.1 of the Mid_C Recovery Plan lists land use as the most significant threat to steelhead recovery. The concerns attributed to land use include:

- impaired upstream and downstream movement of juvenile and adult steelhead;
- **impaired physical habitat quality**;
- **impaired water quality due to elevated water temperatures** and agricultural chemicals;
- reduced water quantity and/or **modified hydrologic processes**.

Listed as secondary concerns for all populations were the **impacts of fine sediment on steelhead eggs and alevins,** and the impact of predation by birds on pre-smolts and smolts in the estuary as a result of habitat conditions resulting from the creation of dredge spoil islands.

In section **8.1.2 the Mid-C recovery planning team** identified the following limiting factors and threats to the Deschutes River Westside steelhead population:

- **Primary Limiting Factors**:
  - *Tributary Habitat*: **degraded riparian condition, low flows, high water temperatures, degraded channel structure/complexity and floodplain connectivity,** impaired fish passage;
  - *Hatchery*: effects of naturally spawning stray hatchery fish on viability;
  - *Hydro*: mainstem passage.

- **Primary Threats:** Hatchery management that results in high proportions of stray hatchery fish in natural spawning areas; **current land use practices (grazing, roads, residences, forestry and agricultural practices that simplify habitats** and irrigation withdrawals); the Columbia River mainstem hydropower system.

- **Primary Life Stages Affected:** Spawners, fry, summer parr, winter parr, smolts.

- **VSP Characteristics Impacted:** Abundance, productivity, spatial structure, diversity.

Section 8.2.3 describes the primary tributary habitat limiting factors identified by the Recovery Planning Team for the Deschutes Westside steelhead population as:

- **degraded channel structure and complexity**
- **altered sediment routing**
- **high water temperature**
- low flows and lack of fish passage over Pelton-Round Butte Complex

Further discussion in this section centered on a more descriptive presentation concerning habitat limiting factors listing specific watersheds on the Reservation.

Degraded riparian communities and large wood recruitment

Both lower Shitike Creek and the Warm Springs River have experienced moderate losses of riparian vegetation due to grazing, roads, and other related land uses. The loss of riparian vegetation in lower Shitike Creek has reduced the long term recruitment of large wood to the stream channel.

Degraded floodplain connectivity and function

In the Warm Springs drainage and many small tributaries in the area, loss of connectivity with the floodplain has reduced groundwater discharge, further exacerbating problems of low flow and high water temperature. This is especially true for the lower four miles of Shitike Creek and segments of Beaver Creek where Hwy 26 has reduced floodplain connectivity.

Degraded channel structure and complexity

The results of EDT analysis identified lack of habitat diversity and complexity as major limiting factors for the Deschutes River above Trout Creek, and for several reaches on Shitike Creek and the Warm Springs River system. On lower Shitike Creek and the Warm Springs River, channel simplification and land use practices have accentuated flashy flows that scour the channel and reduce habitat complexity (NPCC 2004b). Channelization and loss of large wood along the lower four miles of Shitike Creek have reduced channel and fish habitat heterogeneity (e.g. side channels, substrate diversity, etc.). Loss of floodplain connectivity has resulted in increased water temperatures and the loss of off-channel juvenile rearing habitat and winter high flow refugia.

Degraded water quality

The lower Deschutes River and several westside tributary reaches are included on the 2002 ODEQ 303(d) list of water quality limited streams (NPCC 2004b). Water temperatures in lower reaches of Warm Springs River and Shitike Creek can exceed 70°F from mid to late summer. EDT results identified water temperature during incubation and juvenile rearing as a major limiting factor in lower Shitike Creek, Beaver Creek, and several other reaches (NPCC 2004b). Suspended sediment further reduces water quality in smaller tributaries to the Deschutes River and in Quartz and Coyote creeks in the Warm Springs River system..

Altered hydrologic processes

Lands in watersheds that support the Deschutes River Westside steelhead population have generally been degraded through grazing, agriculture, forest practices, and roads, and are not able to capture and slowly release precipitation as efficiently as they did historically. Headwater channel scour has reduced water storage and lowered the water table (NPCC 2004b). This is especially true for Coyote, Quartz, Tenino, Skookum, Eagle, and Nena Creeks. It is also the case on upper Beaver Creek where the creek has been channelized along Hwy 26. Flows, which are dominated by snowmelt, peak in spring and taper off through the summer to base levels in August or September. Small tributary flows are often intermittent, limiting habitat availability in the summer. EDT results identified reduced stream flows as a major limiting factor in this area.

Altered sediment routing

Fine sediment levels in spawning substrate are a concern in Shitike and Warm Springs systems and small tributaries to the Deschutes River. Several drainages, including Quartz and Coyote creeks in the Warm Springs system, contain highly erosive soils that have become more unstable due to extensive grazing, construction of logging roads, and conversion of land for tilled agriculture (NPCC 2004b). Excessive sediment loads also occur occasionally in the Warm Springs River, primarily due to runoff from lower tributaries, including Coyote and Quartz creeks in the Beaver Creek drainage, and from Charlie Canyon.

The small tributaries to the Deschutes River have become incised and lost some of the steelhead spawning gravel that was historically abundant. In-channel large wood has also been reduced throughout the area which has decreased the ability of streams to sort and store spawning gravels (NPCC 2004b). Increased fine sediment in small tributaries results from cropland and rangeland runoff. Substrates contained less fine sediment before European settlement due to stable vegetation conditions (NPCC 2004b).

A tabular presentation of these limiting factors and their effect on the production of steelhead by sub watershed on the Reservation is presented below in Table 8-17 taken directly from the Mid Columbia Steelhead Recovery Plan.

The comment that the limiting factors chosen for this project seem rather general and applicable anywhere in the entire Columbia Basin, is true and a review of the scientific literature would support it. Besides hydro power and hatcheries these are the main factors limiting salmonid production in the Columbia Basin, and after 50-100 years (or more) of land use and development these factors have reached chronic levels and exist at a region wide scale. These limiting factors are very common throughout the Recovery Plan and encompass many of the resource concerns focused habitat and watershed restoration.

Water chemistry and the reduction of total nutrients, especially marine derived nutrients in the spawning and rearing streams across the Northwest is an often overlooked factor critical to recovery as well.

The Deschutes Subbasin Plan also provides summary of the habitat conditions and prioritized needs based on the same suite of limiting factors. This information can be referenced from the original Project Narrative and the Subbasin Plan, and it is safe to say that the limiting factors presented in the subbasin plan are very similar (if not exactly similar) to those presented in the Mid-Columbia Steelhead Recovery Plan

Overall, I feel the limiting factors are pretty straight forward and inline with the resource needs observed on the ground here in the Deschutes Basin. Rather than defend why the limiting factors were chosen for this project I would like establish some objectives linked to each limiting factor and tie these to the outline of the 10 year work plan.

Habitat Quantity and Complexity

> **Objective** Increase the quantity and quality of habitat with the spawning and rearing reaches of salmonid streams in priority watersheds on the Reservation in the next ten years, and/or complete the highest priority restoration projects in each watershed.

There is approximately 500 miles of anadromous and resident fish habitat on the Warm Springs Reservation. Shitike Creek and the Warm Springs River Watersheds are priority watersheds for steelhead, chinook, bull trout and lamprey and they represent the last reaming stronghold for wild stocks in the Deschutes Basin. Approximately 280 miles of anadromous habitat exists within these two watersheds with Mill, Badger, Beaver, Coyote, and Quartz Creeks being the main sub watersheds within the Warm Springs River watershed

The recovery and planning documents used to determine the limiting factors chosen for this project stated that the addition or restoration of large wood was prioritized as a restoration action in both Shitike Creek and the Warm Springs River. Habitat survey data collected in 1996 report that pieces of large wood (>12 inches in diameter and >35 feet in length) for the Warm Springs River range from five to fifty five pieces per mile and range from one to one hundred twenty pieces per mile in Shitike Creek. In addition the presence of key pieces (> 20 inches in diameter) are severely reduced with an average of less than five key pieces per mile. Over 50% of the stream reaches in both Shitike Creek and the Warm Springs River are below the federal guidelines (matrix of pathways and indicators) used to make Endangered Species Act determinations for properly functioning with a large wood count of greater than 20 pieces per mile.

Further investigation along many stream corridors within the forested ecotone reveal evidence of the harvest of large ‘late seral’ pine and fir trees within the recruitment zone. Houslet (2004) investigated the recruitment rates of large wood in the Metolius River (next major watershed to the south) and determined that current densities of large wood were approximately 20% of the desired condition for properly functioning habitat.

The DRRP will plan and implement large wood placements and additions to an expected 10 miles of stream channel on Shitike Creek, Warm Springs River and Beaver Creek over the Accords agreement period. Large wood additions will consist of both engineered placement and natural placement to mimic natural recruitment processes.

Habitat quantity and complexity will be increased by implementing stream channel restoration projects. These projects will use techniques to reconnect floodplains, create side and off channel features that provide velocity and thermal refugia. Along with techniques that create and enhance pool, spawning, and rearing habitats.

Mill Creek from the mouth to Old Mill Camp was highlighted in the Recovery Plan (Table 8-17) as a stream reach where habitat quality (complexity) was limited due to degraded floodplain and channel structure. More specifically element is focused on the old Potter's Pond Mill site. Where an old mill pond was created to store and deck logs. The pond is long gone, but the aquatic habitat has been slow to recover. This reach lacks a well connected floodplain, side and off channel habitat that would be appropriate for this low gradient reach. Large wood elements are virtually devoid from this reach due to use as an old mill pond and channelization has caused a reduction in the amount of available spawning habitat. A restoration project will be implemented through this Program that will actively restore complex habitat, and a well connected floodplain.

In addition to the larger stream channel restoration projects, Mill, and Badger Creeks along with the Warm Springs River have been impacted by roads that parallel or cross stream channels reducing habitat, disconnect floodplains, and contribute chronic levels of fine sediment. Projects will be planned and implement through this Program to remove unneeded road grades and restore aquatic habitat. Benefits will include increased habitat, improved floodplain connection, and reduced sediment delivery.

Re-collecting the habitat data for all fish bearing streams on the Reservation will be cost shared through this Program to support restoration planning and monitoring along with environmental documentation and compliance. This will provide the current data necessary to determine and prioritize the reaches where large wood addition will occur.

In 2009 a restoration project will be implemented on lower Shitike Creek to improve critical habitat for all salmonids using active restoration. The addition of large wood elements, the construction of side channels and off channel ponds and alcoves along with the reconnection of the floodplain are all limiting factors that will be addressed tiered to the Recovery Plan.

Table 8-17. Habitat limiting factors summary for the Deschutes River Westside steelhead population.

Population MaSA and MiSA	Major Limiting Factors	Sites Affected*	VSP Characteristics Impacted	Potential Causes/Threats	Life Stages Affected
DESCHUTES WESTSIDE POPULATION					
Deschutes River Westside Population	Degraded riparian communities; degraded floodplain and channel structure (complexity, side-channel habitat, diversity); water quality (temp); altered hydrology (low flow); altered sediment routing; blocked and impaired fish passage	MaSAs and MiSAs	Abundance, productivity, spatial structure, diversity	Primarily livestock grazing, roads, residential development and agricultural practices that simplify habitat, irrigation withdrawals, forest practices, dams and other barriers	All life stages
Lower Warm Springs MaSA	Degraded floodplain and channel structure (complexity, loss of LWD); degraded riparian communities; degraded water quality (temp); altered hydrology; altered sediment routing	Beaver Creek [R, F, CS, T, S (mouth to Wilson Cr.)]; Warm Springs R. [(F, CS and R in Ka-Nee-Ta resort area), S, R (mouth to Schoolie Cr.)]; Quartz and Coyote creeks [F, CS, S]	Productivity, abundance, spatial structure and diversity	Confinement and runoff from Hwy. 26, livestock grazing, bank armoring and confinement in Ka-Nee-Ta area	All life stages
Middle Warms Springs MaSA	Degraded riparian communities; degraded floodplain and channel structure; altered sediment routing	Badger Creek	Productivity, abundance, spatial structure and diversity	Primarily livestock grazing, roads, and agriculture practices	All life stages
Upper Warm Springs MaSA	Degraded channel structure; water quality (temp)	SF Warm Springs and Upper Warm Springs Rs	Productivity, abundance, spatial structure and diversity	Loss of LWD	All life stages
Mill Creek MaSA	Degraded floodplain and channel structure (channelization, complexity)	Mill Cr. [mouth to Old Mill Camp]	Productivity, abundance, spatial structure and diversity	Channelization	All life stages
Shitike Creek MaSA	Degraded floodplain and channel structure; degraded riparian communities; altered hydrology; degraded water quality (temp, pollutants); altered sediment routing	Shitike Cr. [F, CS, R (mouth to upper road crossing, City of Warm Springs, near Hwy. 26); WQ (Warm Springs mill site and sewage lagoons)]	Productivity, abundance, spatial structure and diversity	Livestock grazing, riparian degradation and confinement through Warm Springs, Hwy. 26, Warm Springs mill site and sewage lagoons, channelization	All life stages

* Abbreviations for limiting factors: degraded floodplain connectivity and function (F), degraded channel structure and complexity (CS); degraded riparian communities (R); altered hydrology (H); degraded water quality (WQ), high water temperatures (T); altered sediment routing (S); man-made block to migration (BP); impaired fish passage (IP).

Although the projects listed in the narrative submission are not a comprehensive list of all the work to be completed under this contract, many of the projects listed are mentioned in both the Deschutes Subbasin Plan and the Mid-Columbia Steelhead Recovery Plan. The project proposal presented specific tables for the watersheds on the Reservation from these planning documents with the intent to insure the reviewers that the direction and focus of the proposed work was directly in line with key regional planning documents. A redundant review and restating of this limiting factor analysis and planning work seemed unnecessary.

The four limiting factors discussed in the project proposal where chosen using a review of regional planning efforts mentioned above, combined with local knowledge of the Reservation and the resource issues present. Fritsch and Hillman[1] provide a summary of the factors that were identified as limiting production over a decade ago on the Reservation. These limiting factors could be summarized into three areas; habitat diversity, erosion/sedimentation (bank stability), and fish passage. Restoration actions were implemented through this project over a decade ago, but many of these habitat improvements cannot be found today and were likely lost or compromised during flood events. This supports philosophy that restoration should occur at the watershed scale; the whole watershed restoration concept.

Not only do we need to address the limiting factors but the projects should also address the threats that created the limiting factors. An extensive road network is one such threat that can alter hydrology. An extension of the hydrologic system through roads creates significant changes in the timing and magnitude of run off events, ultimately impacting the effectiveness of restoration actions. These changes in the local hydrology have resulted in over widened channels, with low base flows, armored beds, and reaches high in fine sediment. Streams become entrenched and downcut resulting in disconnected floodplains and reduced wetlands. These features are storage mechanisms in the hydrologic network of a watershed. Visual evidence of 'lost' or degraded wetland features is apparent in many watersheds within the Reservation, and is common throughout the Columbia Basin.

This altered hydrology theme exists throughout the regional planning documents. The DRRP will address threats such as roads, grazing, and vegetation management that if left alone endanger the long term success of projects that simply focus on the limiting factors.

To improve aquatic productivity a reduction in the delivery of fine sediment to stream channels must be addressed at the watershed scale. These issues were addressed by Fritsch and Hillman only at the reach scale with bank stabilization projects and riparian vegetation protection. The impact of elevated levels of fine sediment is well documented in the project proposal. Both the subbasin and steelhead recovery plans address this as well. In particular Quartz and Coyote Creek watersheds both contribute high levels of sediment due to extensive road networks, altered upland vegetation, poor grazing management, and timber harvest. Although the watersheds have minimal fish habitat the fine sediment contribution from these watersheds is substantial enough to limit production downstream in Beaver Creek.

Partial funding has been secured to complete projects in Beaver, Coyote and Quartz Creeks through a recent settlement[2] from gasoline spill that occurred on Highway 26 into Beaver Creek. The settlement discusses in detail both the production lost from the actual gasoline spill and the actions to be funded through the settlement fund and there intended mitigation. Several projects

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[1] Fritsch, M.A., and Hillman, T.A. 1995. **Habitat Quality and Anadromous Production on the Warm Springs Reservation.** Project number 81-108.

[2] **DRAFT RESTORATION PLAN and DRAFT ENVIRONMENTAL ASSESSMENT for the MARCH 4, 1999 AMERICAN TRANSPORT, INC. GASOLINE SPILL into BEAVER BUTTE CREEK WARM SPRING RESERVATION, OREGON**
Prepared by: National Oceanic and Atmospheric Administration, Confederated Tribes of the Warm Springs Reservation of Oregon U.S. Fish and Wildlife Service, U.S. Department of the Interior

where chosen with two general themes; reduce fine sediment and increase habitat. Significant restoration will occur in these watersheds over the life the MOA using implementation funding from this settlement fund and planning dollars from BPA. Coyote and Quartz actions will be focused on changing sediment delivery and changes in hydrology, while the Beaver Creek work is directed at habitat projects. These projects were reviewed by spill settlement advisory group and represent significant portion of analysis and planning.

I could not find a description of the Beaver Creek Instream and Riparian Improvement or the Lower Deschutes River Instream and Riparian Habitat Improvement Projects in the subbasin plan other than in the list of '*Priority Reaches and Project Areas'* section. I can add that the current Habitat Program on the Reservation manages over 70 miles of riparian protection fence much of which is located along the lower Deschutes River and in the Beaver Creek watershed. Continuation of this work is expected indefinitely. Furthermore it is expected that significant habitat projects will be implemented in Beaver Creek over the life of the MOA. Much of the seriously impacted habitat is associated with the reach adjacent to Highway 26. Planning is ongoing to realign the highway and eventually improve the aquatic habitat. In the meantime projects will be implemented in Beaver Creek to compliment this work when it occurs.

The ISRP outlines concerns about this project not directly linking the actions to be implemented to identified planning documents, and why CTWSR chose the subset of limiting factors (*habitat complexity and quantity, fine sediment, water temperature and altered hydrology)* to focus on. The response above provides more detail into the plans the Tribe is using to prioritize their work, however the link between identified actions and plans is not clearly stated (though I do believe it is implied). An effective way to show the link between proposed actions and planning documents would have been to add an additional column to there proposed activity table (table 7) that included what planning document was used to identify the work as a priority and where in the document it is identified.

If a table was prepared, it may be helpful to note all of the limiting factors listed in the Deschutes subbasin plan and then provide the rational/prioritization behind the four limiting factors you chose for the project and the biological benefit expected from the proposed work.

The ISRP also commented on (and it is not reflected in this response) that there was not enough detail to determine technical adequacy of project design (comment made under sect f of narrative). Below are the comments we provided regarding this concern during our initial review:

Since this is a 10 year proposal it is difficult to identify specific implementable projects (actions) for that time period, however the Sponsor should speak to their prioritization process and selection strategy for choosing project work. i.e. SB plan identifies working in core areas on specific limiting factors (where do activities identified for implementation fit within those areas and limiting factors). Sponsor should provide the project (activity) evaluation criteria that will be used to determine whether a project (activity) meets those limiting factors in a priority area and how they are evaluating the adequacy of the restoration activity to address the limiting factors. Additional detail as to why the Sponsor has chosen particular limiting factors & areas to focus would also be useful.

Benefits of the work

ISRP Comment: *There was also little information about the expected benefits of these projects to the focal species at these sites other than in a very general way (e.g., fine sediment increases incubation mortality, therefore reducing fine sediment will be beneficial).*

The expected benefits of the projects implemented under this program are no different than any other habitat project funded in the Columbia Basin, or anywhere else in the Pacific Northwest. The projects target species that are culturally significant to the Tribes which include spring Chinook, steelhead, Pacific lamprey, bull trout, and redband trout. The benefits to these species are both direct and indirect. For example, restoring large wood elements to the priority watersheds will have the direct benefit of increased habitat in the form of overhead and hiding cover, engineered placements will come with pre-excavated pools while natural placements will scour new pools as the hydrology dictates. Indirectly large wood captures fine sediment in some stream channels and in others it captures coarse bedload material usually spawning size gravels. Increased roughness in the channel will dissipate hydraulic energy, provide additional velocity refugia for both juveniles and adults and reduce excessive scour and degradation of stream bed and over time result in more connection to the floodplain. I think as scientists we are all familiar with lengthy bibliography of the keystone process large wood elements provide to fluvial processes.

Channel restoration projects have both direct and indirect benefits as well. The objective of most channel restoration projects will be to increase habitat. The direct benefits of this will be increased pool, spawning, and rearing habitats along with velocity and thermal refugia. Each project will quantify the current (before) available habitat along with the post project habitat.

Sediment reduction and routing along with projects directed towards altered hydrology will have expected benefits that will be realized over the long term rather than immediately. A reduction in fine sediment will over time increase the survival rate of incubating eggs. Fry and parr survival will increase overtime because aquatic invertebrate densities will increase creating more food availability.

More specifically over the last 10 year approximately 5-35% of the spring Chinook redds in Beaver Creek were located downstream of the confluence with Coyote and Quartz Creeks. It is well documented in both the Subbasin and Mid-Columbia Steelhead Recovery Plans that a reduction in the delivery of fine sediments input from these watersheds are a high priority restoration action. Modeling using the GEO WEPP software in both the Coyote and Quartz Creek watersheds has shown that changes in sediment yield, soil loss and runoff have increase between three to five orders of magnitude from historic conditions. A reduction of these factors and the restoration of more appropriate process will greatly benefit the entire aquatic ecosystem in Beaver Creek.

Restoration practices aimed at altered hydrology will have the long term benefits of reduced fine sediment input, and reduced erosion of the streambed and bank. Most importantly restoration

practices aimed at altered hydrology will attenuate the hydrograph overtime and effectively capture, store, and safely release water. This will result in higher and cooler base flows over an extended time period. The land use impacts that have resulted in the current altered hydrological situation are a result of changes in the vegetation composition (i.e. reduced perennial grass component) creating increased overland flow, an increase in the amount of compacted surfaces in the watershed (i.e. skid trails, roads, and landings), and road density and location.

All these factors listed above have combined to reduce the effectiveness of wetland features in the Coyote and Quartz watershed specifically. As a result these watersheds do not capture store and safely release the annual precipitation that falls. Operating as a partner this Program will cost share the planning, analysis and implementation of projects to address the reduced capacity of these two watersheds to capture store and safely release water.

The Tribes agree with the restoration strategy presented in the Deschutes subbasin plan that suggests the most effective approach would be to target core populations and core habitats first. The plan lists the key elements of this restoration strategy with the intent of focusing restoration at the core habitats. This list is presented below:

- *Core habitats will be expanded downstream to build on the benefits of preceding restoration work.*

- *In areas where headwaters are degraded — or where the system is influenced by flashy or uncontrolled stream flows — habitat restoration for focal fish populations will take place progressively from the upper-most degraded reaches downstream, and restoration projects will include upland restoration work to maintain a ridge top-to-ridge top approach.*

- *Where headwater areas are in good condition, habitat restoration will begin in at the upper end of a degraded priority reach and work progressively downward.*

- *In areas where the system is hydrologically stable and habitat restoration is not at risk of loss from an uncontrolled flow situation, the most cost effective habitat restoration opportunities for restoring core fish populations may exist in lower watersheds. In such cases, these projects should be pursued, especially when opportunities become available to work with cooperating landowners.*

Planning through the DRRP will incorporate these ideas. However, other elements factor into this strategy and include funding availability, permitting, coordination with other resource programs, and landowner cooperation. For example, a significant opportunity for funding large projects will become available in 2013 through the new operating agreement for the Pelton-Round Butte Hydro-electric Facility. The ISRP can be assured that this program will be ready to request implementation funding for large scale instream restoration project on that timeline. That project will likely occur in the Warm Springs River Watershed where the strongest wild spring Chinook runs exist.

Other Tribal departments will be working on other restoration projects and the DRRP will leverage their work to complete whole watershed restoration when possible. These two factors may cause restoration work to occur outside the core habitat philosophy in some minor instances.

However the Warm Springs River is the largest watershed on the Reservation and its tributaries provide the tremendous restoration potential.

CTWSR has adequately addressed this concern. There is enough documentation through subbasin plans and recovery plans that if actions identified within those plans are implemented, then results are expected within fish populations. Monitoring fish response at a more in-depth level than already proposed in the narrative is outside the scope of this project, and should be captured under RM&E projects in the basin.

Monitoring

ISRP Comment: *The discussion of monitoring and evaluation was very short and left the impression that M&E was not a priority. The proposal suggests that funding would be used to develop a monitoring plan. Table 6 indicates that there are ongoing monitoring efforts, mostly of fish populations, that do include the project area and that this information will be used to assess the effectiveness of the program as a whole. The ISRP believes it is optimistic to assume that fish census data will be collected in a manner that will enable population response to restoration projects to be evaluated, especially given that the actions will apparently affect a relatively small proportion of the drainage network in the project area. Fish abundance not only at the project sites but also at other locations (including un-restored reaches) is needed to draw conclusions about the effect of restoration actions.*

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The current project funding does not allow for detailed monitoring. This is a restoration program and funding will be focused towards the design and implementation of restoration projects. Monitoring will be established and implemented on a project by project basis to determine effectives and track the long term performance of engineered structures. The ISRP comment above asks the Tribes employ a BACI type statistically valid monitoring associated with each project. Concerns immediately arise associated with sample size and the replication required to scientifically prove effectiveness. This is a restoration project focused on restoring critical habitats that support tribal significant species and allow the Tribes to exercise their treaty rights in perpetuity.

Monitoring of fine sediment along with hydrologic process will occur in a few watersheds and under this 10 year agreement the establishment of a data set will be the foundation of the long-term monitoring of the projects to address fine sediment and altered hydrology.

Fish and population monitoring is ongoing and conducted by another Program within the Tribal Fisheries Department under a separated BPA contract.

It is fair to say that a synthesized analysis of the data explaining the extent and affect of these limiting factors is incomplete at this time, and that the work conducted under this project will be aimed at addressing this issue. The four limiting factors presented in the project proposal were chosen instead of the others suggested such as; lack of nutrients and riparian vegetation because they represent areas where the greatest restoration benefit could be achieved. For example, the

delivery and routing of fine sediment to the hydrologic network and eventually fish bearing stream reaches is greatly influenced by the placement and density of roads within the watershed and the condition and health of the uplands in any given watershed. Restoration projects will focus on eliminating roads and related compacted surfaces that assisting this sediment delivery. The project will use the Geomorphic Road Assessment and Inventory Package (http://www.fs.fed.us/GRAIP/index.shtml) model developed by the U.S. Forest Service to predict sediment delivery from road networks.

Before and after scenarios will be modeled to document changes. Existing sediment data will be analyzed and monitoring will continue to document trends in fine sediment composition within the streambed. Additional monitoring will be developed to address delivery of fine sediment form the uplands to stream channels. This work will be implemented in conjunction with the Tribal soils program. Habitat surveys will be initiated to be used for project planning and prioritization of projects to support the 'core population' philosophy.

All monitoring will be developed to show funders that the work being implemented is effective in address the objectives and limiting factors.

Beaver Ponds

ISRP Comment: *There is one approach in the proposal that should be viewed as experimental. The concept of mimicking the effect of beavers by building simulated beaver ponds is a relatively new restoration technique, although we believe it does hold promise. Beaver pond construction should be structured as an experiment with careful evaluation of the on-site and downstream impacts of pond construction on physical, chemical, and biological attributes of the stream using treatment and control reaches. Complicating the experiment is the suggestion that hatchery-reared fish will be released into these simulated beaver ponds. As a restoration action, it would be anticipated that constructed ponds would be naturally colonized, and growth and survival would be enhanced for these natural juveniles. Colonization of the ponds is as critical an element to this strategy as improved survival and growth. By stocking the ponds, an important uncertainty is not being investigated. Furthermore, the impact of the release of hatchery fish into the pond habitats on native fishes is not considered. Because the number of hatchery fish released is often quite substantial, the impact on native fishes could be significant and large numbers of supplemented fish could compromise the ability of the pond construction projects to contribute to the recovery of wild populations and other non-target species. Comprehensive evaluation of the impacts of constructed beaver ponds, with and without hatchery releases, should be conducted at several locations before this approach to restoration is included as a routine component of the restoration strategy.*

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The sponsor will remove any intention to 'stock' any of the constructed beaver ponds with supplemental fish. These ideas will be presented in other proposals. No hatchery fish will be stocked through this project.

Restoration techniques used in this program will develop off channel habitats, including simulated beaver ponds where appropriate.

The use of artificial beaver ponds will serve two functions for the work proposed under the DRRP contract. First will be the use of constructed beaver dams in much the same way they have been used in the Bridge Creek IMW effort near Mitchell, OR. Personal communication and a tour of the Bridge Creek Project with Dr. Pollock lead to the inclusion of this technique in the project proposal. Similarly a review of Pollock et al. (2007)[3] shows that beaver dams, whether they were natural or constructed, served several ecological functions including; trapping sediment, raising stream bed elevations (aggradation), reconnecting floodplains, enhance riparian vegetation, and create a localized cooling effect. This technique will be used where appropriate in both fish bearing and non-fish bearing stream reaches to target the limit factors stated above.

From a fish habitat standpoint it is possible that beaver dams are the missing link to recovery of listed species such as Mid-Columbia summer steelhead in watersheds east of the Cascades. Steelhead were observed overwintering in beaver ponds on Bridge Creek (personal communication with Dr. Pollock) and may provide a critical habitat element that has been over looked in the larger context of recovery and restoration.

The second function of constructed beaver ponds will be their inclusion into a larger supplementation program in the Warm Springs River basin. To meet the needs of the Tribes and their culture increased production of chinook and steelhead will be required. Beaver ponds may play a crucial role as 'natural acclimation' sites. The ISRP would like to see this idea developed in greater detail under a true experimental design. To the greatest extent possible beaver ponds and restoration actions that encourage beaver re-colonization will be implemented. On a parallel track a project will be initiated to increase wild production through natural acclimation. The experimental design along with additional details will be expressed in this proposal. The DRRP will be responsible for the engineering and construction of these natural acclimation sites.

Within the response the CFWSR have provided enough background information that they are coordinating with the ISMP project and using the most up to date science in implementing construction of the ponds and the benefits to that action. However, within the original narrative it states: *In some systems where natural production is low constructed beaver ponds and off channel oxbow ponds may be used as acclimation and release sites for supplementation actions.* This was a major concern within the ISRP comments and is not addressed in their response. If stocking & acclimation of hatchery fish is to occur at the beaver pond sites, it should be coordinated with hatchery management plans in the basin or other such plans that have identified the effect of this action on native (listed) fish. Additional information on whether they intend to stock beaver ponds with hatchery fish, and if so identification of what management plans they are using to minimize effects to listed species by this action should be included.
The ISRP might have concern with the potential of introduction of stock into the ponds. A statement should be made to indicate hatchery stock will not be introduced by this project.

[3] **Geomorphic changes upstream of beaver dams**