ISRP Response

Project ID 29002 : Conjunctive Use and River Enhancement (CURE) for the Upper Methow River

Project Sponsor : CBC
Sub-basin : Methow

Overview of project proposal

Based on the ISRP's questions and comments on this project, the CBC wishes to emphasize several key points.

First, the FY03 funding request is for a pilot test of the project only. By committing to fund the test, the Council's commitment to fund Phase I of project development is conditioned on the pilot test showing the project is feasible. The CBC is willing to work with the Council to develop a definition of "project feasibility" that is sensible for all concerned.

Second, issues raised in several of the ISRP's questions are precisely what prompted the CBC's desire for a pilot test of the project before proceeding with full-scale design, permitting and development. If the pilot test reveals unacceptable hydrologic conditions or environmental impacts, the project will not proceed beyond the pilot phase. There are no pre-supposed outcomes from the pilot test. As noted in the ISRP's comments, however, there already exist pump testing data supporting the CBC's basic premise that groundwater can be pumped from the aquifer to augment stream flows without adversely affecting either stream stage or static levels in private wells above the wellfield. The pilot test will complement and refine this data to determine if the premise is correct and will stand up to pumping of the quantities projected. If so, the project would seem to be a smart way to provide sufficient water for fish and people.

Third, the project will not merely redistribute water, but is truly adding new water to the Upper Methow River from groundwater storage. Currently, water management in the Methow basin is essentially "run-of-the river". Storage is a highly valuable component of any managed water system, and access to the storage envisioned via the CURE project provides an additional tool for water managers and stakeholders to better manage water resources for fish and people. Moreover, storage is encouraged in state and regional policy, and utilizing existing underground storage that does not require construction of expensive surface facilities is a smart choice.

Finally, the ISRP offered that credible watershed restoration projects need to include physical criteria by which the relationship between "watershed health" and fish production will be measured. We agree that these criteria are needed, but have assumed that increases in flow will improve watershed health and fish production. Quantifying the improvement in terms of fish population is very difficult, and is one of the chief reasons why the federal services' HCP Handbook encourages HCP's to measure benefits to listed

species in terms of habitat units instead of species population. Flow is the only criteria of significance in the realm of water allocation, and becomes the default criteria in the absence of other information. The reluctance to prioritize other criteria relative to flow, and its intrinsic relationship to water allocation, would suggest that projects addressing flow will always be credible restoration projects.

Specific ISRP Comments and response :

1. Potential benefits to spawning areas in the Upper Methow

Measurable increases in flow and habitat area, are expected between Weeman Bridge and Winthrop when the CURE project is fully implemented. Measurements at Weeman Bridge during 2000/2001 indicated flows of 64 and 40 cfs respectively on September 1. Thus the addition of 10 top 20 cfs will improve flows by 15 to 50% at the upstream portion of the CURE reach. Measured flows at Winthrop are typically less than 200 cfs during dry years. Thus an improvement of 5 to 10% would occur at the downstream portion of the CURE reach. Wetted perimeter transects are needed to quantify potential habitat area increases, but it is expected that the percent improvement in wetted perimeter will be less than the percent improvement in flow. Summer water temperatures in the Methow River above Winthrop generally range between 11 and 12 degrees centigrade. Although groundwater quality data exist adjacent to Weeman Bridge, no temperature data is available. Other chemical constituents in the groundwater, however, are very similar to surface water.

2. Potential impacts (e.g., decreased upwelling of cool water in this reach)

Characterization of potential impacts from pumping is the primary reason for a pilot test and the overall phasing of the project. At this stage, potential impacts can be identified conceptually, but are not quantified. The potential impact to stream habitat from pumping of the aquifer is related to baseflow reduction. Downstream and upstream impacts are discussed below.

<u>Downstream Impacts</u>

Downstream of the wellfield, groundwater pumping will reduce groundwater discharge to the Methow. Initially, discharge reduction will be a small percentage of the pumping rate. The reduction in groundwater discharge will not reduce streamflow, since the water is returned to the stream with an additional amount of groundwater storage. This increases the flow in the river over and above what would occur naturally. Initially, the additional storage will be a high percentage of the pumping rate. At no time is there a reduction in streamflow, since the water pumped from the well is returned directly to the river.

The physical characteristics of water in the Methow (e.g., temperature) during augmentation are not expected to change. During the late summer, flow in the Methow River is nearly entirely composed of groundwater. Therefore, we do not anticipate that

the physical characteristics will change significantly when the water enters the river as direct discharge via a well instead of via groundwater discharge to the river. It's the same water, but it gets to the river by a different route – pumping vs. underground migration. The pilot test will specifically monitor this potential impact.

The impact to the hyporheic zone (the zone connecting the surface and ground water systems) is undetermined at this time. The pilot test will specifically address hyporheic zone effects. Conceptually, we do not expect significant impacts. We expect that the hyporheic zone downstream of the wellfield is normally sustained by a combination of deep upwelling groundwater and shallow horizontal sub-flow along the profile of the riverbed. Although the withdrawal of deeper groundwater will reduce the amount of deep groundwater entering the hyporheic zone, that same groundwater will enter the hyporheic zone as surface water co-mingling via horizontal sub-flow.

Upstream Impacts

Upstream impacts will likely relate to how the streambed and groundwater table intersect. This intersection point is called a hinge point, and becomes most important during the late summer. Upstream of the hinge point, groundwater levels are below the level of the streambed. In many summers, all streamflow upstream of the hinge point infiltrates to the groundwater, resulting in a dry streambed. Downstream of the hinge point, groundwater levels are above the level of the stream bed, and there is flow in the river even during the late summer.

By design, the location of the CURE wellfield is coincident with the location of the hinge point. For illustrative purposes, assume that the hinge point is 1,000 feet upstream of the wellfield, and that normally the reach above the hinge point dries up on August 20. Pumping may cause the reach above the hinge point to dry up earlier than normal, or it may cause the location of the hinge point to move downgradient. The pilot test intends to quantify this response. Preliminary groundwater modeling suggests that this shift in timing and location of the hinge point will be on the order of days and tens of feet, not months or thousands of feet.

3. **Provide evidence that water will stay in the Chewuch and provide estimates of increase production of anadromous fish in the Chewuch River**

If the pilot test successfully demonstrates that the CURE concept is feasible, then it will be incorporated into a Habitat Conservation Plan (HCP) for the Chewuch River irrigators. The HCP and implementing agreement with NMFS will bind the irrigators to diversion rates and flows that will "stay" in the Chewuch River. Flows will be monitored at the gage near the confluence with the Methow River, and readings at the gage will be critical compliance and enforcement features of the HCP. The CBC will not be able to meet its HCP requirements if the water is not left in the river. This is a guarantee the water will remain in the channel to benefit fish.

It is difficult to estimate increased production of anadromous fish that would be attributed to increased flows in the Chewuch River. There are limited data specific to production of salmonids in the Chewuch Sub-basin. The highest documented redd count below irrigation diversions was 96 in 1988. The lowest documented redd count below irrigation diversions was 0 in 1995 (a relatively wet year). The HCP is expected to address multiple habitat factors that contribute to the currently depressed population, and will, in conjunction with increased flows, provide significantly improved habitat conditions for returning salmonids. The HCP follows a habitat unit approach to measure benefits to listed fish species. This approach assumes that increasing wetted habitat acres will improve conditions for fish, but quantifying that improvement in terms of fish population is very difficult. This difficulty is one of the chief reasons why, in fact, the federal services' HCP Handbook encourages HCP's to measure benefits to listed species in terms of habitat units instead of fish population.

4. Provide evidence that the project has a high priority in a watershed assessment, in comparison to other potential means to provide increased flows, such as water rights purchase or conservation

The CBC has taken technical assessments of agency biologists in the Methow Subbasin Summary (WDFW, 2001) and Methow Limiting Factors Analysis (WSCC, 2000) as sufficient evidence that increased streamflows in this reach of the Methow River is critical to salmonid populations in the Methow. Both of these studies indicate that:

- Protecting functioning floodplain, riparian and side-channels is "critical to sustaining naturally producing spring Chinook in the Methow watershed"; and
- Sustaining flows in this reach throughout the year (including the winter) during dry years should be "given the highest priority."

Other methods to increase flows in the Upper Methow were considered, but deemed unfavorable in relation to the potential benefits of the CURE (if successful). Diversions from the Methow River upstream of Winthrop (excluding Wolf Creek) currently support approximately 4,000 acres of irrigated agriculture (primarily alfalfa). Peak consumptive irrigation use for alfalfa during August and September is on the order of 8 inches or 2,666 acre-feet for all irrigated lands in the Upper Methow. Over a two-month period, this is equivalent to about 22 cfs of consumptive use. Typical irrigation efficiencies are on the order of 50% or 11 cfs. The cost of returning the 11 cfs of irrigation inefficiencies to the river will be high, and simply lining or piping of ditches will not be entirely successful because on-farm practices also play a role in inefficiency. Retiring water rights and associated irrigated lands will incur a very high cost, both economically and politically.

The CURE could potentially offset all of the irrigation inefficiencies in the Upper Methow and 50% of the consumptive losses. It also provides a benefit to the Chewuch sub-basin by reducing diversions there. In addition, it also provides the opportunity for

direct streamflow enhancement in the winter, which cannot be accomplished through water rights purchase or conservation.

Again, the objective of the pilot test is to conclusively determine the feasibility of the concept. If it is technically feasible, the CBC believes that, in comparison to other potential means to provide increased flows, it would be more desirable and cost-effective.

5. Could they leave water in the Chewuch and pump it back from the confluence with the Methow?

The CBC considered this alternative, but determined that it was not feasible from a permitting standpoint. Streamflow in the Methow River at Winthrop and Twisp frequently drop below flow levels set in the Washington Administrative Code during the period when the water is most needed for irrigation. From a water management perspective, conjunctive use and effective use of storage is preferable to simply shifting points of withdrawal. There are also certain risks to water rights held by the private irrigation ditches inherent in applying for changes in points of diversions, and few irrigators in the Methow are willing to subject their rights to these risks. Thus, this alternative is politically and practically prohibitive.

6. Consideration of coordinated water management in the entire Upper Methow and watershed assessments

"Coordinated water management" is an elusive concept in nearly every river basin in the United States. The multiplicity of stakeholders, legal jurisdictions, purpose and timing of use, and so forth creates a difficult environment to coordinate. The CURE is not intended as a "silver bullet" to substitute for coordinated water management, but, in fact, is an elegant technical concept that provides an additional "tool in the toolbox" for water managers and stakeholders.

As described above (response #3) the volume of water under consideration for the CURE is nearly equal in magnitude to the volume of water that might be "managed" through other means in the Upper Methow basin. The objective of the pilot test is to conclusively determine the feasibility of the CURE concept. If it is technically feasible, we think that, coupled with the duplicate benefit of reduced diversions in the Chewuch sub-basin, the potential value of a successful pilot test for water management planning could be significant. The value of the pilot test to coordinated water management may also be realized in other basins in Washington State where conditions suitable for a CURE concept may also exist.

7. Detailed M&E Plan, including baseline pre-project monitoring

The pilot test plan described in the proposal will include a detailed M&E plan, developed in coordination with local agency biologists. Habitat and biological monitoring will include protocol considerations reviewed in the Washington Department of Fish and Wildlife's "Inventory and Monitoring of Salmon Habitat in the Pacific Northwest." This

document lists and summarizes accepted habitat assessment and monitoring protocols for specific project types. Suggested habitat monitoring protocols include Schuett-Hames et al., 1999; Oregon Department of Environmental Quality, 1999; USDA Forest Service, 2000; and Moore et al, 2001.

Monitoring frequencies and locations before, during and after augmentation, will be specified in the pilot plan. A database will be developed for the monitoring data collected during the pilot project.

8. Relative costs of alternatives

The relative cost of implementing the CURE program as an alternative to other conservation and purchase options has not been formally evaluated, but would be conducted if the technical feasibility of the project is confirmed with the pilot test. Preliminarily, we would offer the following "ballpark" costs assessment:

- There are over 14,000 AF of water allocated in the Upper Methow basin. Annual leases for 15% of these water rights (2,000 AF) could range up to $500 per AF per year, with a one-year cost of $1,000,000

- Outright purchase of these water rights (2,000 AF) could range up to $3,000 per AF, with a one-time cost of $6,000,000

- Lining of one mile of an irrigation canal would cost approximately $1,000,000, potentially reducing inefficiency by about 2,000 AF of water. However, these inefficiencies may already be returning to the river, so the net benefit may be considerably less.

- The CURE provides 2,000 AF of water to the Methow during the period when it is needed most for a similar one-time capital investment for the wellfield.

- The estimated net present value (NPV) of utilization of this water on an annual basis by irrigators in the Chewuch Basin (pumping the water up to irrigation headgate) is between $300 and $400 per AF.

These preliminary cost assessments would suggest that the potential value of the CURE, relative to other alternatives, is attractive and affordable. Also, the relative cost of the pilot project, which is all that is "at stake" at this stage, is both reasonable and cost-shared by the stakeholders. These factors in conjunction with the potential benefits of the project could go a long way toward resolving streamflow challenges in the Methow, a priority basin in the Northwest.

Additional responses to this project:

Letter in opposition from Okanogan County Farm Bureau
Letter in opposition from USFWS
Letter in opposition from Okanogan Wilderness League