COLUMBIA CASCADE PROVINCE PUMP SCREENING

PROJECT ID: 29025

WASHINGTON DEPARTMENT OF FISH & WILDLIFE
YAKIMA SCREEN SHOP (YSS)

The following represent YSS's response to concerns identified in the ISRP "Preliminary Review of Fiscal Year 2003 Proposals for the … Columbia Cascade Provinces", ISRP 2002-2, March 1, 2002.

CONCERN 1: CONTRAST THE COST AND BENEFIT OF CONVENTIONAL PUMP SCREENING VERSUS INFILTRATION GALLERIES.

RESPONSE: <u>COST</u>

The WDFW, Yakima Screen Shop (YSS) does not have a history or extensive experience in the use or effectiveness of infiltration galleries. There are a few being used in the State of Washington, but they have had a high rate of failure (Ken Bates, "Draft Fish Protection Guideline for Washington State, June 2001). Because of reliability issues, infiltration galleries have not been an accepted means of screening in Washington State. The following cost comparison is based on conversations with Soil and Water Conservation District (SWCD) personnel from Oregon, Natural Resource Conservation Service (NRCS) personnel from Oregon, and from Oregon Department of Fish and Wildlife (ODFW) screen shop personnel. The following costs are estimates provided by those with actual experience installing infiltration galleries:

1. Greg Card, NRCS, Redmond Oregon – 25 installations of 2 cubic feet per second (cfs) or less at an average cost of $25,000 to $28,000 each;

2. Ken Delano, Grant County SWCD – 6 installations of 2 cfs or less at an average cost of $8,000 to $13,000 each;

3. Brad Fuss, ODFW Central Point screen shop manager – 2 installations of 2 cfs or less at a cost of $15,000 and $21,000, respectively.

The apparent difference in costs between the SWCD and NRCS has to do with the type of installation. The mean cost from these estimates for infiltration galleries is **$21,757** per site.

An average for conventional pump screen corrections at an estimated 181+ sites contained within this proposal is **$5,061** per site.

BENEFIT

Based on conversations with Ken Delano, Greg Card, Jeff Peterson of BOR's Water Resource Group, Steve Allen with ODFW John Day screen shop, Brad Fuss, and Gene Humbles, a BOR design engineer assigned to the John Day Basin, everyone agreed that the primary benefit of infiltration galleries is the elimination of push-up dams. They were also in agreement that this would be the primary consideration for selecting this type of conventional screening alternative. All, except Greg Card, stated they would not even consider the use of infiltration galleries if there was not an associated push-up dam. Greg did state that over 90% of their installations were associated with push-up dams. They were also all in agreement that infiltration galleries are extremely site specific and necessitate a thorough geological evaluation of the drainage. Claims have been made that one of benefits is lower long term O&M costs compared to conventional screening. The ODFW personnel, however, stated that that is not necessarily true. They are finding expensive maintenance problems associated with these units. Another benefit, which has been proposed, is the positive exclusion of fish. New studies showing that emerging fry migrate through the hyporheic zone (Dr. Jack Stanford, et al) would indicate a need to verify that fish are being excluded by this means of screening.

Pump screening, both passive and self-cleaning, have a long history of successful use by both Washington and Oregon fish screening programs. One primary benefit is the low cost for the screens, which typically range from $350 to $2,500 each. Easy retrieval, and the ability to inspect the pump and connection for integrity and proper operation, is another key benefit. Screens can easily be sized to achieve any approach velocity or mesh size desired by the irrigator, and/or required by state or federal screening criteria. New materials and technologies have reduced long term O&M costs to $150 to $200 every 5 years, (vendor estimated rebuild costs for a 450 gpm self-cleaning pump screen). Pump diversions typically do not require in-water work, and as such, do not require the necessary permitting associated with in-water diversions. An evaluation of pump screen inventory information on 61 sites in the Entiat Basin indicated that only 3 utilized push-up dams.

CONCERN 2: FROM AN ENGINEERING PERSPECTIVE, HOW WILL THESE SCREEN DESIGNS PERFORM COMPARED TO INFILTRATION GALLERIES?

RESPONSE: Engineering design of fish screens is, or should be, based on current state and federal fish screening criteria. The primary design difference between pump screens and infiltration galleries is that galleries are

gravity fed (infiltration), and pump screens have suction applied to them. Both systems have the potential for failure if they become plugged. If a pump screen becomes plugged, the worst-case scenario would be that the screen mesh would collapse and have to be replaced. If an infiltration gallery plugs, it will need to be back flushed (if so designed), and/or dug-up (in-water work) and have the gravel cover replaced. Cleaning systems that return fine sediment to the water during low flows are not an acceptable alternative to restoring infiltration capacity due to the adverse effect on habitat and fish life (Ken Bates, WDFW, "Draft Fish Protection Screen Guidelines for Washington State, June 2001"). Therefore, in terms of design performance, infiltration galleries appear more complex and site specific than pump screens.

CONCERN 3: CLARIFY SOURCES OF FUNDING FOR OTHER SCREENING WORK. WHY IS BPA FUNDING NEEDED? THE SHIFT IN FUNDING SOURCES SUGGESTS THAT THE STATE MAY SEE THIS AS A LOW PRIORITY. IS THIS TRUE?

RESPONSE: The WDFW, Yakima Screen Shop (YSS) has received funding for fish screen fabrication and construction from a variety of sources, including state capital construction, BPA, NMFS Mitchell Act funding, and Salmon Recovery Funding Board (SRFB) grants. The primary funding sources over the past 12 to 14 years has been state capital construction and BPA. The states allotments paralleled BPA funding and were used primarily for screening projects in the upper Columbia River Basin (Methow River, Entiat River, and Wenatchee River subbasins). These capital resources are no longer available to the state-screening program. To date, the WDFW, YSS has contributed significantly to screening efforts in the Columbia Cascade Province, having complete over 35 screen replacements or upgrades in the Methow, Entiat, and Wenatchee subbasins during this 12 – 14 year period. WDFW is asking BPA to assist in this continuing effort by funding the re-inspection and correction of pump screens in the Columbia Cascade Province.

CONCERN 4: HOW WILL LONG TERM CUMULATIVE EFFECTS OF THESE IMPROVEMENTS BE MONITORED? HOW WILL IMPROVEMENTS IN LOCAL RUNS THAT MIGHT BE ATTRIBUTED TO THESE SCREENS BE DOCUMENTED?

RESPONSE: Long-term cumulative effects of these improvements on fish populations in these drainages will be monitored, to the extent possible, through existing monitoring efforts of local, state, tribal, and federal agencies and groups. The reality of being able to document the long-term benefits of these pump screen mitigation efforts is remote. The people involved in fish protection and recovery throughout the region have long recognized the need and value of screening water withdrawals, as evidenced by the enactment of State screening

laws dating back to the early 1900's. As pump screen correction is completed in each section (upper, middle, lower) of a subbasin, the WDFW, YSS will forward the information to local, state, tribal, and federal agencies and groups that conduct monitoring activities. These entities will be asked to consider, and to look for, possible effects of these corrections in their monitoring efforts. In terms of individual site monitoring, the WDFW, YSS has an on ongoing screen inspection program which will periodically inspect these pump screens. The WDFW, YSS also offers individual irrigators the option of a service contract for maintenance of their screen. It is the intention of the WDFW's state screening program to monitor individual pump sites to ensure they are being operated and maintained according to current fish screening criteria.

CONCERN 5: IS THERE A REGIONAL MONITORING PROGRAM THAT WILL BE USED TO MEASURE SUCCESS?

RESPONSE: Not at this time. There are a number of individual monitoring efforts by a variety of agencies and groups. These efforts include adult and smolt counts, redd surveys, and watershed inventories and assessments. There is currently an effort by the Upper Columbia River Salmon Recovery Funding Board, through the Governors Salmon Recovery Office, to coordinate all of these monitoring activities in order to develop a standardized framework to coordinate all regional efforts, to improve consistency in approaches, and to guide future assessment and corrections.

CONCERN 6: WHY WAS THE METHOW CHOSEN FIRST IN THE SEQUENCE AND THE WENATCHEE LAST?

RESPONSE: The Methow River subbasin was chosen first because:

1. The Methow was specifically identified within the NMFS 2000 Biological Opinion & Reasonable and Prudent Alternatives (RPA) #149 as a priority area;

2. The RPA further states that the Entiat River and Wenatchee River subbasins should be addressed in 2003 and 2004, respectively. Therefore, this is the logical sequence for pump screen correction in these subbasins.

CONCERN 7: THE RELATIONSHIP OF THIS SCREENING PROJECT TO OTHER SCREENING PROJECTS COULD BE BETTER EXPLAINED.

RESPONSE: The other screening project proposed for the Columbia Cascade Province is proposal #29028; Fabricate and Install Three New Fish Screens on Wenatchee River Diversions. The proposal addresses the screening of two small-unscreened gravity diversions, and the up-grade of an existing gravity diversion on the Wenatchee River and tributaries. These projects are similar yet separate from this proposal (gravity screening versus pump screening) which regional fisheries personnel and local assessment groups felt were a high priority for correction.