



DATE: October 14, 2005

TO: FSOC Distribution

FROM: Frank Young, Coordinator *Franklin R. Young*

SUBJECT: Notes by Pat Schille (WDFW) and Bryan Nordlund (NOAA Fisheries) for the September 20, 2005 Fish Screening Criteria Workshop in Nampa, Idaho.

Fish Screening Criteria Workshop
September 20, 2005
Nampa, Idaho

Draft Action Notes

Attendees: Bruce Heiner; Tom Stahl; Frank Young, CBFWA; Dale Gooby, USDA; Ryan Adelman, IPC; Jody Brostrom, IDFG; Virgil Moore, IDFG; Paddy Murphy, IDFG; Lynn Stratton, IDFG; John K. Johnson, NOAA Fisheries; Bryan Nordlund, NOAA/NMFS; Ray Hartlerode, ODFW; Bernie Kepshire, ODFW; Michael Lambert, ODFW; Michael Jensen, ODFW; Jim Cain, USACE; Alan Bittner, BLM; Steve Grabowski, USBR; Eugene Humbles, USBR; Dave Jennings, USBR; Phil Mann, USBR; Steve Montague, USBR; Janna Brimmer, USFWS; Doug DeHart, USFWS; Ted Koch, USFWS; Patrick Schille, WDFW

ITEM 1: Bubbler Screen – Basic Design Concept, Function, Operational Observations and the Status of Biological Testing

Discussion: Bubbler Screen design was developed by Dale Gooby of NRCS Idaho. This small screen design (i.e. 3 cfs range) is an adaptation of a design that NRCS historically used to eliminate debris and weed seeds from irrigation water. The purpose stated by NRCS for developing these screens is to provide a cheaper alternative to screens constructed to regional criteria (various cost numbers were discussed, and it is not clear that this is the case), and to provide a low maintenance system. The basic design as presented was a rectangular box three feet wide by four feet long with the water coming up through a standpipe in the center of the box. The test screen in the presentation video did not have a fish bypass. Paddy Murphy, a biologist with IDFG, worked with Dale in testing the prototype. The test consisted of placing fish in the bubbler screen box and leaving them for 48 hours then collecting them. The result was an 87% survival rate after 48 hours, which further degraded with time. The video of the fish and debris entrained in the bubbler screen showed a pulsating water component that although appearing to assist in keeping debris from plugging the screen, may have the potential to cause injury or stress, and because of the confinement, increased predation. A refinement to the current design is being considered that

Discussion: would have a circular wall section as opposed to rectangular and a fish bypass. The USFWS Abernathy Fish Technology Center is currently doing testing on the prototype. It was felt that until a number of issues with these types of screens (i.e. entrainment, predation, large fish migration both upstream and down stream) can be resolved that this style of screen will not be included the NOAA Fisheries guidelines. Because of high mortality rates (at least 8 to 13% higher than screens tested that meet regional criteria for anadromous fish), uncertain bypass conditions, lack of adequate bypass pipe diameter for passing kelts and noted accumulations of fish at particular points in the screen system, NOAA Fisheries currently does not accept these screens as conventional technology. If these problems can be rectified and comprehensive tests are conducted of the entire screen bypass system that suggest the technology provides similar protection to screens constructed to regional criteria, NOAA Fisheries will then consider them for use.

ITEM 2: Low Velocity Passive Screens - Basic Design Concept, Function, Operational Observations and the Status of Biological Testing

Discussion: NOAA Fisheries has accepted the new 3 cfs threshold for low velocity passive screening. This includes all types of screens that exhibit the following characteristics:

- 1) the site is not suitable for an active screen, due to adverse stream conditions, remote location, or other conditions upon approval by NOAA Fisheries;
- 2) uniform velocity can be demonstrated at the screen face;
- 3) the debris load is expected to be low;
- 4) the rate of diversion is less than 3 CFS;
- 5) sufficient ambient river velocity exists to carry debris away from the screen face;
- 6) a maintenance program is approved by NOAA Fisheries and implemented by the water user;
- 7) the screen is frequently inspected and debris accumulations are removed, with more frequent inspections as site conditions dictate;
- 8) sufficient stream depth exists at the screen site to provide for a water column of at least 1 screen radius around the screen face; and,
- 9) the screen can be easily removed for maintenance, and to protect from flooding.

Pacific Ag's passive low velocity screens have documented success at achieving the above criteria if properly installed at a suitable location. At this time, NOAA Fisheries does not want to go above the three cfs threshold and anything over this amount will require an exemption or have to go through the experimental screen review process.

ITEM 3: Coanda Screen – Basic Design Concept, Function, Operational Observations and the Status of Biological Testing

Discussion: Most of the discussion was on the Hood River East Fork Irrigation District (EFID) screens. The facility has been in service for about 9 years and has experienced wear to the profile bar screening material. This site deals with a

tremendous amount of silt deposit, upwards of 400 cu/yds per day. There has not been any testing that tracks the effects to fish from the point of diversion to the discharge of the bypass back to the river. It was felt that until these types of test can be done on this facility or other similar facilities that this style of screen will not be included in the guidelines, but will be considered on a site by site basis and will require biological testing. Limited tests performed at EFID indicated fairly good survival and low injury for the fish tested (chinook fry and yearlings and steelhead fry and yearlings).

ITEM 4: Horizontal Passive Screen Developed by Farmers ID – Basic Design Concept, Function, Operational Observations and the Status of Biological Testing

Discussion: Most of the discussion on this particular type of screen was positive. Some of the concerns were the amount of bypass flow needed and the whether a smaller version would function as well. Model testing done by the Bureau of Reclamation and field biological testing at the Farmers Irrigation Ditch (Hood River, Oregon) showed good results in terms of fish protection and non-injury, but not enough field testing on the actual facility has been done to evaluate the effects on fish diverted from the POD to the discharge point back to the river. In general, this style will be considered experimental, but could be installed under specific hydraulic conditions nearly identical to the existing prototype in Farmers Irrigation District canal in the Hood River. Until further tests are conducted or proposed for a particular site, designs that are outside of the hydraulic conditions tested will not be approved. NOAA Fisheries will participate in any design of these screens proposed for waters with ESA listed anadromous fish.

ITEM 5: Swim-thru Fishway – Basic Design Concept, Function, Operational Observations and the Status of Biological Testing

Discussion: This upstream fish passage concept was tested in an in-ladder fish trap at a brood stock collection site in Catherine Creek, Oregon. Several adult Chinook were killed in just a few days during this test, therefore this fishway will no longer be considered as an adequate or experimental passage technology in its current form.

ITEM 6: Update on the Status of NOAA-F Passage Criteria Document

Discussion: Bryan Nordlund indicated that the entire document has been revised based on regional comments (from about 20 agencies and consultants), and that some sections of the document would be released within the next few months. They are the screening, exclusion barriers, fishways, and fish traps.

ITEM 7: Formation of a Subgroup to Develop Criteria for Design of Roughened Channels

ACTION: A subgroup to develop criteria for the design of roughened channels was formed. The subgroup participants are; John Johnson NOAA, Tom Stahl ODFW, Bruce Heiner WDFW, TBA IDFW, TBA USFWS, Gene Humbles or Phil Mann BOR. The BOR is currently doing modeling on roughen channels concepts; results are expected to be out in the fall of 2005.