

# FSOC Fish Passage Training Outline - Draft

September 17-20, 2012

## Session 1: Resolving Upstream Passage Impediments in Smaller Streams

September 17, 1:00 PM – 5:00 PM

### Instructors

~~Ken Bates~~

USBR?

Aaron Beavers (NMFS)?

Bob Barnard, Gina McCoy or Bruce Heiner (WDFW)?

### Approach

Background

Project Assessment (choosing the right passage structure)

Design data requirements

Species, Life Stage

Methods

Procedures

Criteria

Project Review

Monitoring and O&M

### Types of Passage Structures

Culverts

Roughened Channels

Stream Simulation

Cross-stream Weirs

## Session 2: Resolving Operational Problems in Passage Systems

September 18, 8:00 AM – 11:30 AM

### Instructors

Ray Gilmore (WDFW)

IDFG

NMFS

### Design Issues at Screen Installations

Sediment handling

Unbalanced Approach Velocity

Low Flow Operations – Bypass and Instream

## Session 3: Introduction to Upstream Fish Passage Systems

September 18, 1:00 PM – 5:00 PM

### Instructors

Nordlund, Brown?

### Overview

Safe, Timely and Efficient Upstream Fish Passage

Objectives of Upstream Passage Instruction

Take home introductory message

Fish Passage Definitions

### Calculations

Fish Passage Design Flows

Basic Fish Passage Hydraulics (Continuity Equation, Velocity Head, Weir equation, Orifice equation)

Fish Passage Math (Handy Conversions, Significant Figures and Matching Units)

Fish Passage Physics and Biomechanical Ability (Cruising, sustained and burst speed)

Integrating Biomechanical Ability into Fishway Designs

Calculating fish jump height

#### Features of an Upstream Fish Passage System

Fishway Entrance

Auxiliary Water Systems

Transport Channels

Fish Ladder Design (Vertical Slot Ladder, Pool and Weir Ladder, Weir and Orifice Fish Ladder,

Pool-Chute Fish Ladder, Denil, Steeppass)

Counting Stations, Counting Window

Fishway Exit Section

Fishway Exit Sediment and Debris Management

Coarse Trash Rack

Session 4: Juvenile Fish Screen and Bypass Systems

September 19, 8 AM to 5 PM

#### Instructors

Swenson, Beavers?

#### Overview

Purpose of screening

History of fish screening

Guiding principles forming foundation of screening criteria

Fish biology and behavior as applied to screening

Screen types (descriptions, criteria elements, benefits, disadvantages and appropriate uses)

Screen Design (hydraulics, materials, sediment and debris management, cleaning systems)

Bypass Design

Monitoring, evaluations and O&M

September 20 – Field Trip (need some help here- sites, lead?)