

# FSOC Fish Passage Training Outline - Draft

September 13-17, 2010

## Instructors (these may change):

Aaron Beavers – culverts and cross-stream passage structures  
Jeff Brown/Bryan Nordlund – screen and bypass design  
Bryan Nordlund/Jeff Brown – upstream passage systems

September 13, 1:00 PM - 5 PM

## Culverts, Boulder Weirs and Roughened Channels

Background  
Cover the basics  
Design  
Methods  
Outline design/project policies and procedures  
Outline NMFS Criteria  
Project Assessment  
Project Review  
Monitoring and O&M

September 14, 8:00 AM -5 PM

## Introduction to Upstream Fish Passage Systems

Safe, Timely and Efficient Upstream Fish Passage  
Upstream Passage Impediments and Barriers  
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

## Upstream Fish Passage Facility Design Phases

Conceptual Design Development - Site Data Requirements  
30%, 60%, 90% and 100% Design Review

## 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

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September 15, 8 AM to 5 PM

Screens and Bypass

- 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 16 – Field Trip (need some help here, depending on site)

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