

MEMORANDUM

TO: Oregon Ecological Flow Technical Advisory Group

FROM: E. George Robison – Technical Services Division - OWRD

SUBJECT: Outline of White Paper for EFTAG

DATE: January 13, 2010



Working Title: *White Paper: Ecological Flows; a framework for Oregon*

Outline in a nutshell:

Section 1: What are ecological flows?

- This section will go into definitions in which ecological flows will likely be characterized as an all encompassing term for base flows, elevated ecological triggering flows, and various types of stream and channel maintenance flows. Each of the key types of ecological flows will then be defined with references given for examples of them.

Section 2: What are the techniques available to determine ecological flows?

- This section will list and discuss techniques for determining ecological flows evaluating the accuracy and repeatability of methods for the various types of ecological flows such as base flows, elevated ecological triggering flows, and stream and channel maintenance flows.

Section 3: What options does the state have to protect ecological flows?

- This section will list and discuss various ways of managing ecological flow evaluations and protections when water is being appropriated including the idea of new instream water rights, conditioning, Division 33 process and guidance, as well as other mechanisms. Each of the options will be evaluated from a “technical feasibility” standpoint.

Detailed Outline:

Section 1: What are ecological flows?

- Brief Historical Background of protection of ecological flows in Oregon which includes mostly baseflow protection:
 - Instream flow protection Multnomah falls
 - Base flow protections 1950's
 - Basin studies 1960's and 70's – Oregon Method
 - Creation of habitat modeling and IFIM
 - Instream flow act (1987) and instream water rights
 - The FERC process and inclusion of flushing flows in re-licensing agreements.
 - Peak and Ecological flow guidance for division 33 water allocation review (2007).
 - Recent housebill and inclusion of range of ecological flows when considering storage projects for grant program as well as for the Integrated Water Resource Strategy.
- * Note this may be broken out into separate introduction and background sections.
- Concept of Ecological Flows
 - Tharme definition as encompassing full variability also backed up by recent Poff et al. (2010) definition.
 - NAS and IFC discussion of flow variability in various contexts
 - Types of Ecological flows – Building block concept NAS
 - Ecological flows and hydrological alteration criteria Poff, Richter and others.
- Chosen definition all encompassing with different types of ecological flows broken out
 - Base and subsistence flows – analogous to minimum and optimum Oregon Basin report type flows as well as DEQ mixing flows
 - Ecological triggering flows for life stage development such as juvenile flushing flows or triggers that induce spawning or migration.
 - Elevated habitat maintenance flows including “flushing flows,” channel maintenance flows, riparian vegetation maintenance flows etc...

Section 2: What are the techniques available to determine ecological flows?

- Method types as per IFC and others for baseflow determination:
 - Hydrological regimes based on percent of hydrograph or annual average flow.
 - Hydraulic parameter vs. flow
 - Habitat index methods such as weighted usable habitat vs. flow using one or two dimensional modeling or habitat mapping vs. flow level.
 - Empirical/Statistical relationships habitat vs. flow for given stream types

* For each discuss accuracy and repeatability and general acceptance of methods and situations when different types of methods may be more appropriate.

- Method types for ecological triggering flows:
 - Hydrological regime methods based on percent of hydrograph or annual average flow or indicators of hydrological alteration. Also includes methods that trigger conservation when certain flow targets are reached.
 - Empirical studies of ecological triggering flows based on observations of behavior change or correlation between different flow levels and overall indicators of species survival or abundance.

*For each discuss accuracy and repeatability and general acceptance of methods and situations when different types of methods may be more appropriate.

- Method types for elevated habitat maintenance flows:
 - Hydrological regime methods based on percent of hydrograph or annual average flow or indicators of hydrological alteration. Also includes methods that trigger conservation when certain flow targets are reached such as a percent of bankfull flow for different channel types.
 - Studies of when bed movement will begin for a certain bed type using modeling or empirical monitoring.
 - Criteria based on extrapolation of studies of similar streams when channel maintenance occurred at given flows

*For each discuss accuracy and repeatability and general acceptance of methods and situations when different types of methods may be more appropriate.

Section 3: What options does the state have to protect ecological flows?

- Pros and cons of establishing elevated flow instream water rights along with baseflow ones.
 - Using conditioning language (with or without rules) to work in evaluation and protection measures when allocating new water.
 - Using criteria for instream ecological flows in revising basin plans
 - Creating guidance to aid in Division 33 review of water right applications
 - Standards for grants in recent house bill what level of rules if any should be involved to create standards for evaluation and protection.
 - What can we learn from Poff et al. 2010 or other examples in regards to regional setting of ecological flows. Can we set a statewide level for flows based on certain channel characteristics
- * The scope of our evaluation will focus on technical applicability of the various methods above and how they can be used within these frameworks.