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To: People conducting PHABSIM instream flow studies that are reviewed by ODFW

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Subject: Standard Review Checklist for PHABSIM Modeling

ODFW is charged with the review of the results of flow modeling using tools such as PHABSIM for various reasons such as FERC re-licensing or review regarding instream water protection. What follows is a checklist of information that will aid in helping us review your work. These guidelines may also be helpful in creating documentation for flow modeling reports based on PHABSIM or RHABSIM type modeling. ODFW requests digital copies of the original PHABSIM formatted files because our section has an informal policy of trying to keep archives of all instream flow habitat studies done in Oregon. Our section has copies of RHABSIM, PHABSIM (Fort Collins) and PHABSIM WIN 2002 (Hardy) software so just about any PHABSIM based format can be read with our software.

Hydraulics

1. Mapping Criteria Coding for Habitat
   a. Results (Map)

2. Cross Sections Chosen for measurement and analysis
   a. Selection Criteria for Cross-sections (rationale why chosen)
   b. Number of Cross-sections and locations

3. Hydrology
   a. Hydrologic records (time series; especially any synthetic flows used)
   b. Flow duration curves (if available)
   c. Unimpaired vs. Existing conditions (if available)

4. What were the calibration flows for water surface elevations and velocity data sets
   a. List the flows

5. Water Surface Elevation Model
   a. Calibration parameters (or the PHABSIM or RHABSIM files.)

6. Velocity Model
   a. Calibration parameters (or the PHABSIM or RHABSIM files)
7. Plots of observed vs. predicted at all Calibration flows for water surface elevations and
   Velocities
   a. Plot of WSEL should be long profile if spatially connected (i.e. collected
eendently) or cross-sectional if not spatially connected
   b. Plot of velocity should be cross-sectional
   c. PHABSIM or RHABSIM files if you did not do all these plots so staff can at least
go back and recreate needed plots as needed.

Habitat Criteria and Modeling

8. Channel Index Coding Scheme (your field method for coding cover, substrate and/or
   escape cover)

9. Habitat Suitability Curves:
   a. Document them by providing PHABSIM files or electronically plot the variables
      depth, velocity, substrate/cover vs. habitat suitability.
   b. Document the agency/public participation on how the curves were decided upon
   c. List of studies that were done to support the criteria chosen
   d. Results of any local based studies of habitat criteria that were done to support the
      modeling effort

10. Plots of Weighted Useable Area vs. Discharge (for each cross-section, habitat type as
    well as the cumulated overall curves for each life stage and habitat issue):
    a. This is done to make sure that we are not combining certain habitat types together
       and canceling out signatures. For instance, perhaps rapid channel habitat unit
       type cross-sections show a distinct optimum in habitat at 200 cfs for given river
       but for another set of cross-sections for another type the habitat is suppressed at
       200 cfs causing the cumulative combined value to show no real response.
    b. Important that you document any curve smoothing that was done in curve fitting
       for both WUA curves and these duration curves

11. Special Cases (Plots that highlight critical or limiting habitat issues):
    a. Example: Coho Pools in Winter (WUA plots vs. discharge for pools only for flow
       range in winter noting the winter hydrology)
    b. WUA vs. stream flow for relatively unconstrained transects only in a channel
       segment that has mostly constrained areas because they may represent critical
       habitat.

12. Other information that may be critical including but not limited to:
    a. Any information on validation of habitat suitability criteria such as noticing redds
       on cross-sections to compare with habitat suitability values determined for those
       spots.
    b. Islands and bars and how the flow splits and comments on how cross-sectional
       transects work in light of this.
    c. Plots of how much habitat is available under different flow management scenarios
       (or alternatives) using a time series of flow duration can be very helpful in
       negotiating flow levels with a group of stakeholders.