Revised Bioassessment Policy from Washington Dept. of Ecology

Excerpted from Water Quality Program Policy 1-11
Revised September 2006; pp. 23-25
[Comments in brackets & italics added by Streamkeepers]

8. Specific Submittal and Assessment Criteria

b. Bioassessment

Beneficial Uses: Aquatic life
Narrative Criterion: WAC 173-201A-070 (1)

Assessment Information and Specific Data Requirements

Water column measurements of chemical and physical components for rivers and streams may not provide sufficient information to detect or resolve all surface water problems. Biological evaluations may detect physical habitat-related impairments for which there are no criteria. For this reason, bioassessment methods are being used more frequently to identify the biological health of the waterbody. Although the state water quality standards do not have numeric biocriteria limits, Ecology endorses and uses the River Invertebrate Prediction and Classification System (RIVPACS) multivariate model to help identify impairments of the biologic community. *[Streamkeepers note: However, DOE does accept other bioassessment methods such as B-IBI; see "Assessment Methodology for Other Bioassessment Model Information" on following page.]*

Assessment Methodology for RIVPACS Model Information

Ecology prefers RIVPACS over other bioassessment models because it uses established reference site information to determine a score from the presence of taxa relative to taxa expected to occur. These expectations are based on a set of "predictor variables" that are not affected by human activities. This value identifies, with a specified level-of-confidence, impairment beyond that which can be attributed to natural conditions. This biological assessment method supplements water column data as a direct measure for a beneficial use and to arbitrate in assessments where water chemical information does not provide a definitive conclusion or criteria are not available. The use of biological assessments can be used effectively in TMDL studies to directly assess attainment of the aquatic life use in a waterbody segment.

Ecology strongly encourages the collection of supplemental data during biological sampling events, especially conventional and chemical pollutant parameters that may be associated with sources present in the waterbody. This information is important in determining what may be causing an impaired biological community, and is important for confirming the appropriate category determination.

Ecology has compiled the following information, including field collection protocols, taxonomic reference, and data analysis protocols for using RIVPACS models and interpreting scores:

Field Protocols and Laboratory Specifications: Plotnikoff, R. and C. Wiseman. Benthic Macroinvertebrate Biological Monitoring Protocols for Rivers and Streams: 2001 Revision. www.ecy.wa.gov/biblio/0103028.html

The Pacific Northwest Aquatic Monitoring Partnership (PNAMP) protocol may be used as an example for the variety of 8 ft^2 sampling strategies that can be used in Pacific Northwest rivers and streams for collecting benthic macroinvertebrates. The RIVPACS model for Western Washington can be used with any of the permutations for sampling. The PNAMP protocol document may be found at the following web page:

http://www.pnamp.org//web/workgroups/General/documents/General/2006_0518PNAMPmacroinvertdraft.doc

Taxonomic Effort: PNW Standard Effort is located on Xerces Society web page: www.xerces.org/aquatic/standard.htm

Data Analysis: The Utah State University's Western Center for Monitoring and Assessment of Freshwater Ecosystems provides publicly available tools for calculating RIVPACS scores at the following website: http://129.123.10.240/WMCPortal/DesktopDefault.aspx?tabindex=0&tabid=1

Data submittals should include the RIVPACS model score, the raw macroinvertebrate assemblage counts, an environmental matrix reporting data for predictor variables, and any other applicable information detailed in section 4 of this policy.

Assessment Methodology for Other Bioassessment Model Information

Benthic Index of Biological Integrity (B-IBI) or other multimetric models will be evaluated to determine their reliability as an indicator of biological impairment prior to using the information for assessment purposes. If the methodology does not include established reference sites that allow a level of confidence in the taxa results, Ecology will require a minimum of three years of monitoring at the site to ensure that consistent results are being achieved. Detailed information is required at the time of data submittal that describes how the data are assessed to determine whether a waterbody segment is impaired, degraded, or unimpaired. This is especially important if the methodology does not have numeric scores associated with the impairment status (similar to RIVPACS).

[Streamkeepers note: Per DOE's Susan Braley, Chad Brown, and Ken Koch, the 10-metric genus-level B-IBI for the Puget Sound Lowlands has already been evaluated by DOE's Rob Plotnikoff in 2004 as part of Streamkeepers' 2004 data submittal, and found to be acceptable for DOE's use in water quality assessment. Therefore, the three-year minimum described above does not apply to data collected and analyzed under this B-IBI protocol.]

Category 1 Determination

RIVPACS Model

A waterbody segment will be placed in Category 1 based on a bioassessment when the RIVPACS score from the most recent year of available macroinvertebrate assemblage data is equal to or greater than 0.86.

Other Models

A waterbody segment will be placed in Category 1 when at least three years in the most recent five years of bioassessment monitoring using the methodology show no impairment.

[Streamkeepers note: Per our note above, the three-year rule does not apply to our B-IBI data.]

Category 2 Determination

RIVPACS Model

A waterbody segment will be placed in Category 2 based on bioassessment of the benthic macroinvertebrate community when a RIVPACS score from the most recent year of available data results in a score less than 0.86 and at least 0.73.

Other Models

A waterbody segment will be placed in Category 2 when at least three years in the most recent five years of bioassessment monitoring using the methodology show a level of degradation that indicates the uses in the waterbody are not impaired but starting to be degraded.
[Streamkeepers note: Per our note above, the three-year rule does not apply to our B-IBI data.]

Category 3 Determination
A waterbody segment will be placed in Category 3 when the available data are insufficient for any other category determination. This information will be maintained in Ecology's assessment database for future use. As additional data and information become available, Ecology will again assess all available data to make a new category determination according to this policy.

Category 4 Determination
A segment will be placed in Category 4a when EPA has approved a TMDL for pollutants identified as stressors to the macroinvertebrate community. A segment will be placed in Category 4b when EPA approves use of a pollution control project for pollutants identified as stressors to the macroinvertebrate community. Placement of a waterbody segment in Category 4c for either RIVPACS or another model will be based on pollutant data and information that show the impairment is likely not the result of pollutant sources but from pollution.

Category 5 Determination

<u>RIVPACS Model</u>
A waterbody segment will be placed in Category 5 as biologically impaired when the RIVPACS score calculated for the most recent year of available macroinvertebrate assemblage data results in a score less than 0.73 (two standard deviations in the reference distribution of scores).

<u>Other Models</u>
A waterbody segment will be placed in Category 5 as biologically impaired when at least three years in the most recent five years of bioassessment monitoring using the methodology show a level of degradation that indicates the uses in the waterbody are impaired.
[Streamkeepers note: Per our note above, the three-year rule does not apply to our B-IBI data.]