



DATE: March 17, 2017

TO: Washington State Department of Ecology (Ecology)

FROM: Pierce County Surface Water Management

RE: Comments Concerning the Update to Water Quality Policy 1-11

Dear Susan and Patrick,

Pierce County sincerely appreciates Ecology's opening of Water Quality Policy 1-11 to an alternatives scoping, review and comment process. It is important for Permittees and stakeholders to have an opportunity to submit their constructive revisions and clarifications for policy's that will have a direct effect on their programs. We believe our comments represent the constructive dialogue and contributions Ecology intended to solicit through this open process.

There are several overarching themes we would like articulate for the record regarding the alternatives presented by Ecology for updating Water Quality Policy 1-11. These comments are focused principally on the Bioassessment alternatives but also include some additional comments relating to the proposed changes for conventional water quality parameters too. More importantly, the County wants to emphasize a couple of very important points as a preamble to the following discussion. We strongly encourage the State not to adopt any new language as standing guidance. The County wants Ecology to formally adopt any and all new language as regulation, which preserves the public's right to due process and legal appeal. Additionally, the County wants to encourage the State to use this opportunity to abandon the General NPDES Permit approach in favor of a watershed-based NPDES Permit approach. This change would require Stormwater Management Plan's (SWMP) to be developed and coordinated between jurisdictions and municipalities co-operating under a single watershed Permit.

Comments Relating to the Proposed Bioassessment Alternatives

The following comments and supporting narrative are in response to the proposed Bioassessment alternatives issued by Ecology and presented at the Policy 1-11 Workshops. Pierce County supports the use of B-IBI as a singular tool that contributes to a multiple line of evidence approach to determining the health of aquatic systems. However, the County is of the opinion that several legitimate issues still remain unresolved which would complicate the use of B-IBI as it is being proposed for the Water Quality Assessment. In combination with other methods, Bioassessment can be appropriately used as an indicator of watershed health trends. However, Pierce County strongly opposes using B-IBI scores alone as a singular justification for assigning a Category 5 listing on Washington's 303(d) list.

Page 1: Use of samples with less than 500 organisms. Pierce County was operating under the impression that Ecology's Bioassessment QAPP (Instream Biological Assessment Monitoring Protocols: Benthic Macroinvertebrates) dictated the accepted methodology for gathering benthic communities. However, from discussions at the January 17th Policy 1-11 Workshop, it was mentioned how the USGS uses 300 organisms as their method's organism count goal. Pierce County recommends Ecology develop a cross-walk consistency between its established protocol (500 organisms) and the USGS organism count requirement of 300 organisms (within a single composite sample). That being said, why did Ecology decide to depart or establish a method different from the USGS standard when they developed their Bioassessment Program QAPP?

Pierce County maintains there should be a justifiably unified approach that is chosen because it represents the most optimal method for making statistically credible interpretations. Furthermore, sampling data for a stream segment or water body with sub-optimal organism counts should justify their being placed in Category 3, at least until additional analysis can be done to soundly determine (confirm) the representativeness of the sample and/or sampling site.

Page 1: "Recent analysis have indicated that B-IBI scores fluctuate inter-annually (on average) by approximately 10%". Pierce County recognizes that inter-annual fluctuations at sites may vary due to physiographic differences between Ecoregion or because of other confounding hydrologic or instream hydraulic (active channel) reasons. Pierce County recommends Ecology further investigate to more confidently confirm whether 10% is truly an accurate depiction of the variability that exists between years and between seasons. Any substantive variability that exists between years must be evaluated (and confirmed) with methods specific to each Ecoregion.

At present, the County is still unclear as to how Ecology arrived at the 15% decline threshold? The County recommends stream segments (waterbodies) showing a decline but still above the threshold be placed in Category 2. What was this proposed version (or application) of an antidegradation threshold trigger based on? --Why was it not 5% or 20% for that matter? The County's position is the State must have a statistically sound rationale to support the selection and future use of this approach for making Category 5 determinations. The other concern the County has with this specific proposal is, if a score does seem to be steadily declining, it would make better sense to re-examine the individual metrics to more closely determine if the decline is due to some particular factor which may then be traceable to a confirmable cause (stressor). It would seem more prudent to work on addressing the cause *before* the score declines enough to whereby the State requires the waterbody to being listed based on a statistically implied trend.

Page 2: The following statement, "Under the current proposals it would be possible to move from a Category 5 to a Category 2 or Category 1 based on data assessed within the ten year window", warrants the following comments. At present, Ecology does not allow for a re-designation of a water body from a Category 5 to a Category 2 for other conventional water quality parameters. However, as previously stated, Pierce County does agree listing decisions should be based only on data from within the 10 year window. The County's position is this policy should be consistent across all water quality parameters and Bioassessment as well.

Page 4: Proposed Use of a "Safety-Net" Statistical Approach to Determining Category 5 Listings

- Pierce County does strongly disagree with introducing a "safety net" threshold into the Bioassessment policy. The County does not support amending Policy 1-11 to include an administrative clause which allows for a Category 5 listing to be assigned to a waterbody based

on applying “a valid statistical methodology indicating the water body is not expected to meet applicable water quality standards by the next assessment cycle.” (pg.18)

- Pierce County recommends Ecology further investigate the statistical appropriateness of the 15% decrease as the indicator threshold between historically recent (within 10 years) and current B-IBI scores. This is a particularly important detail given the inter-annual variability of B-IBI scores can be ~10%. The County maintains a 15% decline in scores may not represent a statistically significant departure from a non-impairment score and this method is not sound or robust enough to determine if an apparently negative trend will continue to persist into the future.
- Based on Pierce County’s experience, the year-to-year variation in scores are issued without any explanation as to what was causing the change. There must be a more confirmed analysis of trend to list a waterbody to Category 5 based on 2 years of historic data and the two most recent B-IBI scores. Significant trends of decline or recovery, in Pierce County’s experience, can only be explained specific to a distinct waterbody, and an overall trend line would not be appropriate or meaningful enough to initiate a programmatic response (e.g. project and program investments).
- There has been substantial changes to field protocol and data retrieval methods making historic B-IBI data virtually incomparable to currently retrieved data. Pierce County’s recommendation is to define appropriate, statistically sound, “safety net” values by Ecoregion. And more importantly, the Puget Sound Lowlands Ecoregion is much too large and diverse of an area (physiographically and geomorphically) to treat it as one coherent and homogenous unit when applying Bioassessment as means to determine a waterbody’s beneficial use impairment.

Page 6: Proposed Use of Ancillary Data

- For all three (3) proposed Bioassessment Alternatives provided, Ecology proposes using ancillary community metrics to “determine if category modification is appropriate”. Pierce County’s position is the local municipality or jurisdiction must be involved in the process of selecting which ancillary metrics are to be used. Additionally, the County must agree the metrics chosen capture the supplementary information that needs to be considered, as part of the probable stressors analysis.
- When comparing ancillary metrics, how does Ecology define the “difference” between candidate Category 5 waterbodies and the reference conditions they are being compared too? Does this method factor in the roughly 10% inter-annual variation?
- Where are the descriptions and protocols for choosing and conducting the ancillary metrics? An example of three (3) (e.g. ...generate additional community metrics such as: Fine Sediment Sensitivity Index, Hilsenhoff Biotic Tolerance Index and the Metals Tolerance Index) were provided at the January 19th Workshop. The development of a biotic index using stream macroinvertebrates to assess stress from deposited fine sediment is not going to help correct a protocol developed for lower montane erosional settings (low gradient riffle-pool channel types). The Fine Sediment Sensitivity Index will not help clarify the cause of low B-IBI scores in lower Puget Sound Lowlands where fine sediment substrates are due to natural physiographic and geomorphic conditions. This particular ancillary test helps identify only where excessive fine-grained sediment is creating an impairment due to anthropogenic reasons, however it

would preclude its usefulness for providing any additional or meaningful insight as to why a B-IBI score would be low in a naturally occurring fine sediment substrate. Chad Larsen of Ecology described there is a menu of close to 100 of the additional community metrics. This important revelation of the number and variety of ancillary tests available provoked the following questions:

Where can the County locate and examine the entire list of ancillary metrics?

Where can the County locate the descriptions of which metrics are relevant or applicable to each specific ecoregion?

Which entity determines which ancillary metrics are to be used? (...or combination of entities... would it be Ecology, EPA, jurisdictional Permittees and/or third party stakeholders?)

What criteria drives their selection, would the decision be driven by physiographic setting (ecoregion), level of urbanization and hydromodification or some other unique system wide alteration or legacy condition a County or City may have?

How are the additional indices used and how are they integrated together to assist in further clarifying the meaningfulness of a B-IBI score?

When it is warranted to develop more than one additional metric?

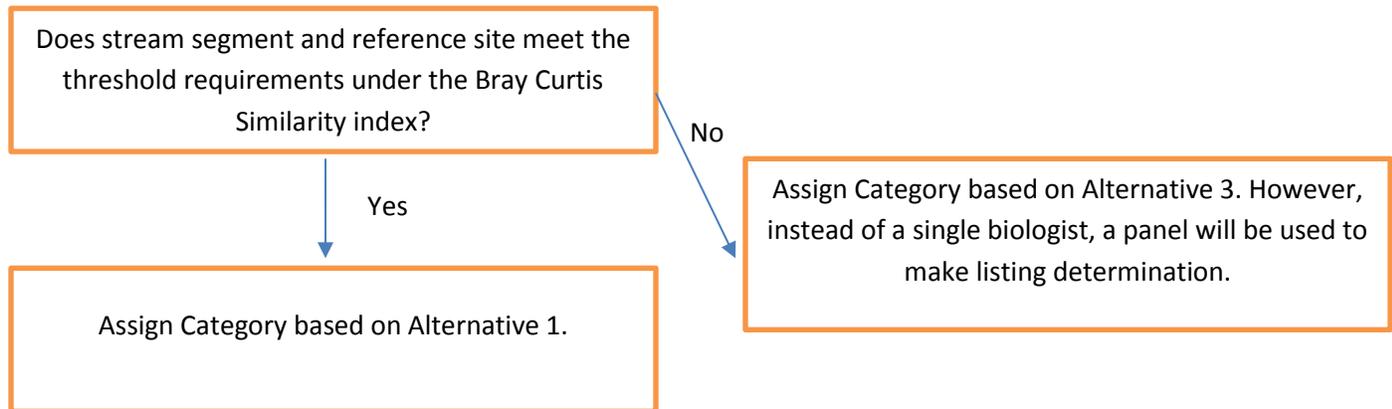
Page 8: Alternative C and the Use of Community Characteristics

- The Puget Sound Stream Benthos (PSSB) program captures habitat characteristics and other stream data collected as part of the B-IBI sampling methodology. This information is not captured in EIM, nor are submitters required to include any of the “metadata” associated with sample collection. Pierce County requests B-IBI data submittals generated from PSSB or submitted to EIM, be required to also submit all the retrieved field information produced regarding the description of habitat characteristics. The County’s recommends this data management refinement as a means for providing more valuable information across all the proposed Bioassessment Alternatives and as a measure to prevent unrepresentative sampling efforts from being included in the Water Quality Assessment process (Type I errors).

Pierce County’s Alternative Bioassessment Recommendation

To reiterate, Pierce County is of the opinion that the singular use of B-IBI scores to make Category 5 listing decisions is inappropriate. However, faced with the options being presented, the County recommends using a hybrid of Alternatives 1 and 3 in order to provide a level of redundant pragmatism to the Water Quality Assessment process.

The County also recommends measuring the physical co-variates between reference and candidate listing sites to assure similarity and comparability. If sites prove to be dissimilar, then we propose Alternative 3. However, to reduce the risk of inconsistency which may arise from a single biologist’s determination, we propose having an expert panel of biologists determine the appropriate category listing based on the community metrics and/or characteristics as independent lines of evidence. If sites are determined to be similar, we propose using Alternative 1 to assess their listing category. Below is a dichotomous flowchart is provide to illustrate the County’s recommended hybrid approach.



Additional Comments from the Policy 1-11 Workshops

The ever present message consistently articulated from Permittees and stakeholders during recent Workshops was transparency and the need for greater levels of confidence in the waterbody impairment determinations being made by the State. Permittees and stakeholders seek transparency in the development of the water quality assessment process, and in the procedures for prioritizing TMDLs, and delisting procedures. Stakeholders need to feel confidence in the data used in the assessment. Particularly the link between the pollution and the pollutant, and the program implementation pathway back from an alleged impairment. Pierce County believes this workshop series represents the first step towards working for a more open and collaborative process.

The five (5) high priority topics addressed during this workshop series barely scratched the surface of what the County believes is needed to be discussed in order to improve the Water Quality Assessment process and Policy 1-11. It is encouraging to hear sections outside the above focus areas are being analyzed for statistical improvements by Ecology staff. However, it is disheartening to hear that Ecology staff are working without concurrent input from stakeholders; going against what the County maintains should be a transparent process.

Over the last 4 months, the conversation around each high priority topic has moved from reiterating the problems to developing plausible solutions. The County looks forward to the release of a draft version of the updated Policy 1-11 and we are looking forward to commenting further on its development and refinement. Below captures what Pierce County believes are critical comments that warrant representation in the upcoming re-draft of Policy 1-11.

Data used in the Assessment

- Stakeholders must be able to confirm the quality of data being used to make listing decisions. Studies, raw data, and other supplemental documents (QAPPs) should be readily available to stakeholders (e.g. electronic postings and archival files) as a standard operating procedure, and certainly as part of the comment period associated with the water quality assessment process.

- EIM data submitters should have full confidence when assigning a QA level to their data. Ecology should consider developing a flow chart/decision tree to assist in this process. Ecology should also add a data quality self-validation step to the EIM submittal process.

Natural Conditions

- To be more transparent, Ecology must document the level of historic and current data needed for a stakeholder to demonstrate a waterbody's impairment is due to natural conditions. This data review opportunity removes the uncertainty associated with best professional judgement or a determination based on a case-by-case basis.
- Ecology considers natural conditions only when there is a lack of human presence. Ecology should widen their interpretation of natural conditions to encompass the impacts of climate change.
- During the Policy 1-11 workshops, Ecology referred to a *natural conditions determination* as a precursor to Use Attainability Analysis (UAA). In Policy 1-11 Ecology should clarify the linkage between a UAA and a natural conditions determination including its role in the reassignment or confirmation of designated (existing) beneficial uses.

TMDL Prioritization

- It would be beneficial for all Permittees and stakeholders if Ecology adopted a clear, predictable and consistent TMDL prioritization process that transcends Ecology's regional offices and the use of their own idiosyncratic methods.
- Pierce County recommends Ecology develop a new waterbody impairment listing approach when considering the very real implications a Category 5 listing has on permittees and/or its stakeholders. During the Policy 1-11 workshops, two reasonable alternatives were discussed. The first is to create a more discriminating set of Category 5 subcategories to further clarify the TMDL prioritization process. If Ecology chooses to pursue this option, the State needs to include Permittees and stakeholders in the development of the subcategories. The second approach was to develop a two-tiered Category 5 listing and appeal process with an emphasis on using Category 2 when it has been decided more data is needed to make a final impairment determination. Both of these program adjustments are reasonable and attractive and could provide some of the needed refinements necessary for improving the existing TMDL program as it operates today.
- Ecology should encourage the use of third party TMDLs. TMDLs or alternative water quality cleanup plans should be developed by the Jurisdictions and municipalities responsible for their implementation (i.e. Permittees develop TMDL analysis with the oversight and collaboration of the State). Permittees should have tiered levels of involvement, but they should be empowered to take the lead role of being the "doer" instead of being relegated to just a "reviewer". This approach would likely promote a more robust level of analysis and assembly of information

which would ultimately result in a more confirmed, appropriate and affordable set of recommendations (i.e. committed programmatic remedies and investments)

- EPA Region 9 generally encourage the States responsible for administering NPDES in their area to require jurisdictions and municipalities to perform *Reasonable Assurance Analysis (RAA)* as mandatory part of their TMDL Implementation Plans. The RAA process helps confirm there is a programmatically efficient, technically feasible and economically affordable pathway back to delisting a water body and assuring the protection of beneficial uses. Ecology should take leadership on developing a RAA process in collaboration with its Permittees and EPA Region 10.

Delisting Protocols

- Currently, Ecology relies on the discretion of a TMDL Lead to delist a category 4a waterbody. Instead, Ecology should establish consistent procedures for delisting that do not require the use of best professional judgement or a determination on a case-by-case basis.
- Ecology should clarify the pathway from a category 5 listing to a category 1 outside of the TMDL process. The pathway should be clear, consistent, and documented between regional offices. Pierce County supports using discrete sample data for justification to delist a waterbody. In order to provide the level of confidence that a waterbody will consistently meeting water quality standards, Ecology must provide the number of discrete sampling events and the critical period for each parameter.

Bioassessment Protocol Suitability

The following represents the County's current position on the State's Bioassessment process. The subsequent narrative resulted from the County's direct experience in conducting Bioassessment as part of its Ambient Monitoring Program, and through conversations that took place between Pierce County staff, Bob Weisman and Celeste Mazzacano, Ph.D. (Private Bioassessment Consultants)

Substrate is recognized as the principal driver of benthic macroinvertebrate community development and composition (Hynes 1970). The scientific literature for the last century is replete with findings and descriptions associating specific taxa to specific substrate types. The primary division by substrate association that is widely recognized in lotic ecosystems is between fine sediments (fines, sand and small gravel) and coarse sediments (coarse gravel, cobbles, boulders, bedrock). A long-standing and major distinguishing attribute used for classifying benthic macroinvertebrates is whether they are associated with erosional habitats with coarse sediment versus depositional habitats with fine sediments (Merritt et al. 2008).

The original development of the Karr B-IBI was principally based on targeted riffle samples from moderate to high gradient streams (Karr & Chu 1997, Fore et al. 1996, Morley & Karr 2002). This implies that index development was primarily based on benthic macroinvertebrate communities

from coarse substrates. Karr's multi-metric B-IBI was updated in 2014 for the Puget Sound Lowlands Ecoregion and is proposed for use in water quality assessment process to make determinations regarding whether a stream is impaired, not-impaired, or inconclusive categories by the Washington State Department of Ecology. The County believes this update was based primarily on targeted riffle samples with coarse substrates. Dorfmeier 2014b did not consider stream gradient and substrate in her examination of the influence of natural site features on the B-IBI. When the impact of physical habitat on BIBI scores was evaluated "The results indicated that poor substrate quality parameters, specifically sedimentation (percent fines...) and embeddedness have a strong association with poor B-IBI scores" (Dorfmeier et al. 2014a).

"Poor" substrates (read fine sediment) are the dominant natural substrate for many stream miles in the glaciated trough that forms the Puget Sound Lowlands. Pierce County landforms are primarily permeable river outwash deposits in the valleys and less permeable glacial till capped plateaus, where low gradient/fine substrate stream reaches dominate (Booth et al. 2003). The current riffle/coarse substrate based BIBI is unsuitable for assessing low gradient, fine sediment dominated streams (alluvial settings or depositional reaches) because the natural communities which develop on these divergent substrate types are composed of substantially different taxa with different responses to differing environmental gradients.

The Puget Sound B-IBI is composed of 10 metrics that examine different aspects of the benthic community. Contrasts between coarse and fine sediment communities and their associated taxa are highlighted. EPT populations are almost always highest in cobble riffles because of the structural complexity, flow complexity, aeration, diversity of food resources, and many other factors. Ephemeroptera (mayflies) are typically rare and represented by few taxa in mid-channel (where samples are taken) fine sediment habitats. Plecoptera (stoneflies) are typically absent from mid-channel fine sediment habitats. Trichoptera (caddisflies) may be a little more diverse on fine sediments, but nowhere near the potential diversity found in riffles. Fine sediments may be naturally dominated by tolerant taxa, since these are the taxa that can naturally withstand lower D.O., higher stream water temperatures and specialize in food resources found in and on fine sediments. Benthic communities in/on fine sediment are often either predator poor or dominated by fewer, larger predators, thus having a lower percent predator than would be found in riffle communities. There is little to cling to in fine sediment dominated habitats, and thus, these settings or habitats are avoided by clingers.

Expected individual metric scores for fine sediment dominated habitats in any ecoregion is either a 1 or 3 out of a potential 5. We would not expect a 5 score for any metric regardless of the level of human disturbance. Low gradient streams in the Puget Sound Lowlands in which Bob Weismann conducted Bioassessment surveys on typically scored 24 or lower on the 10-50 scale of the BIBI. This average score applied to the least impacted sites up to the highly disturbed ones. That's quite a handicap to recognize and account for when conducting a Bioassessment process that can be used to determine a waterbody's impairment and category

listing. It's neither just nor defensible to apply the riffle based B-IBI protocol to low gradient, naturally soft-bottomed stream segments for determining beneficial use impairment. The County's recommendation is to develop a separate B-IBI protocol for low gradient streams (e.g. glides and runs) specific to the Puget Sound Lowlands region.

Recently, the County has reexamined the Puget Lowlands B-IBI Reference Sites memo authored by Gretchen Hayslip of the EPA (2013). This memo cites the following stream reference sites as representing the State's relatable (comparable) standard for classifying the B-IBI scores generated in the lower alluvial reaches of Clarks Creek to a Category 5 listing for impairment. The lower reaches of Clarks Creek meander through the fine sediment deposits of the broader Puyallup River floodplain. In addition, the confluence of Clarks Creek and the Puyallup River are located just upriver from the Milroy Bridge (66th Ave East). The Milroy Bridge represents the known extent of the daily tidal influence (salt wedge) originating from Commencement Bay, which indicates just how low-lying and naturally depositional Clarks Creek is. However, the following Puget Sound Lowland reference streams, which are relied on for determining aquatic use impairment, don't share this type of geomorphic setting. The cited reference streams are more erosional, low gradient riffle-pool complexes (fluvial systems) which are distinctly different than the low-lying, meandering fine sediment dominated systems of the central and south Puget Sound. None of the following B-IBI reference streams are predominantly alluvial systems nor are they indicative of naturally low-lying (fine sediment) depositional systems. The County is of the opinion this limited suite of reference streams fail to represent a comprehensibly suitable set of benchmarks or estimates for what one would expect to find (regarding benthic macroinvertebrate scores) if little human impact had occurred (i.e. natural conditions).

Big Beef Creek and Coulter Creek are located in Kitsap County, Chuckanut Creek and Oyster Creek are in Whatcom County, Coal Creek is in King County, Crandall Creek is near Sultan in Snohomish County, the Dewatto River is in Mason County and Surveyor Creek near Port Angeles is in Clallam County. None of these cited reference streams are located anywhere near Pierce County or Thurston County in the South and Southeast Central portions of the Puget Sound Lowlands. And as a result, the County believes they can't fully (defendably) capture the average condition (B-IBI score) when it fails to include any representative stream condition from the South or Southeast (central) Puget Sound.

The previously cited reference streams fail to symbolize (represent) a relative homogeneous sampling of the Puget Sound Lowland's streams and rivers based on soils, geology, inclination (slope) and elevation. The Puget Sound Lowland Ecoregion is too large and geomorphically diverse for the previously cited reference streams to form a basis for classification of waterbodies with similar biological (B-IBI scoring) expectations. The County would like to cooperate with the State to find a least impacted set of reference streams to provide a suitable basis for being geomorphically (and biologically) compared to the majority of streams we have in our jurisdiction. Additionally, the Biological Condition Gradient effort currently underway in the Puget Sound Lowlands will help improve the distinction between low and higher gradient

streams and the B-IBI scores one would expect as a means for comparison. Other states use separate MMI indices for low and high gradient streams and RIVPACS and Predator also incorporate watershed slope into their modeling (scoring) algorithms.

Finally, there are obvious limitations associated with Bioassessment models that were developed based on riffle habitat only. Frankly speaking, even a healthy low-gradient stream, or a fluvial system that has bottom substrates that are naturally high in fine sediments (e.g. due to glacial silt or till originating from the headwaters) will inevitably score low on a riffle-dependent B-IBI or probability-based model such as RIVPACS. This programmatic approach could feasibly leave the County with a 303d listing on a stream with no feasible way to ever remove it from the impaired waters list because due to its very nature, it cannot "improve" its score (and that's a situation the County thinks the State would want to work with the County to avoid).

In closing, the County would like to thank Ecology staff for the opportunity to provide its comments and we look forward to a continued coordination and dialogue with the State regarding the updating of Policy 1-11.

References

Booth, D.B., R.A. Haugerud & K.G. Troost 2003. The Geology of Puget Sound Lowland Rivers. In: Restoration of Puget Sound Rivers, Montgomery et al. (editors). University of Washington Press, Seattle, WA pages 14-45.

Dorfmeier, Elene et al. 2014a. Updating the Benthic Index of Biological Integrity (B-IBI): Outcomes and key findings. King County Department Natural Resources
http://pugetsoundstreambenthos.org/Projects/EPA_Grant_2010/TechDocs/Final/BIBI_Update_OutcomesAndKeyFindings.pdf

Dorfmeier, Elene 2014b. Examining the influence of natural site features on B-IBI. King County Department Natural Resources
http://pugetsoundstreambenthos.org/Projects/EPA_Grant_2010/TechDocs/Exploratory/BIBI_NaturalFactors_FINAL.pdf

Fore, L.S., J.R. Karr & R.W. Wisseman 1996. Assessing invertebrate responses to human activities: evaluating alternative approaches. J. N. Amer. Benthol. Soc. 15: 212-231.

Hayslip, G. 2013. Memo from Gretchen Hayslip, EPA, to Jennifer Wu, EPA, re: Puget Sound Lowlands Reference Sites.

Hynes, H.B.N. 1970. The Ecology of Running Waters. University of Toronto Press, 555 pages.

Karr, J.R. & E.W. Chu 1997. Biological monitoring and assessment: using multimetric indexes effectively. University of Washington, Seattle, WA EPA 235-R97-001.

Merritt, R.W., K.W. Cummins & M.B. Berg 2008. An Introduction to the Aquatic Insects of North America. Kendall/Hunt Publishing Company, Dubuque, Iowa, 1158 pages.

Morley, S.A. & J.R. Karr 2002. Assessing and restoring the health of urban streams in the Puget Sound Basin. Conservation Biology, 16: 1498-1509.

Wilhelm et al. 2014. Recalibration of the Puget Lowland Benthic Index of Biotic Integrity (B-IBI). King County Department Natural Resources
http://pugetsoundstreambenthos.org/Projects/EPA_Grant_2010/TechDocs/B-IBI_Recalibration.pdf