King County
Department of
Natural Resources and Parks
Director's Office
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November 8, 2018

Mary Verner, Program Manager
Water Resources
Department of Ecology
PO Box 47600
Olympia, WA 98504-7600

Re: King County Comments on Interim Guidance for Determining Net Ecological Benefit (Publication 18-11-009)

Dear Ms. Verner:

Thank you for the opportunity to comment on the Washington State Department of Ecology's Interim Guidance for Determining Net Ecological Benefit (NEB). King County has a long-standing commitment to water quality and healthy habitat aimed at salmon recovery.

We feel that the strength of the final NEB determination will be in the details that emerge out of the watershed restoration plans required from the Section 203 planning groups. We believe active engagement with stakeholders and tribes will increase the likelihood that final plans reflect land conservation and clean water that will deliver on the stated ecological goal of improved streamflows.

As articulated in our comments on the Streamflow Restoration Grants Interim Funding Guidelines, submitted on October 28, 2018, King County supports inclusion of projects such as floodplain restoration/levee removal, off-channel storage, wetland restoration and other habitat projects when evaluating and determining NEB. Additionally, land acquisition that retires water use – whether the water is an actual right or from a permit-exempt well – should be factored into NEB considerations. For example, over the five years from 2013 to 2018, King County acquired 219 properties, of which 107 had homes. King County would like to work with Ecology on how to accurately account for such retired water use.

Clearly, there remain salient questions about the interrelationships of ground/surface flow and stream-related habitat restoration projects. Linkages are poorly-understood in western Washington streams, as compared to streams in central/eastern Washington where instream flows have been a limiting factor for some time. King County encourages Ecology to include funds for studies that will inform the future success of streamflow restoration in western Washington.

Until more quantifiable approaches are developed, King County suggests using a logic model or approach similar to Ecology's 'credit-debit' method for wetland mitigation (see attachment for more detail). We encourage development of a transparent and pragmatic system for the evaluating and prioritizing offset projects (e.g., as applied in King County's Mitigation Reserves Program). Over time, as a stronger empirical foundation is established for Western Washington streams, the credit-debit system could transition to a ledger based system.

Given that determining NEB is a work in progress and evolving science, Ecology will need to make policy calls. To inform such discretion, and to create a broader understanding of actions that contribute to NEB, we encourage Ecology to begin building a compendium of projects throughout the state and evaluate lessons learned from such efforts. Specific efforts we believe worth assessing include:

- Dungeness Water Exchange, which describes mitigation for all new groundwater uses to mitigate the impact of use;
- The Kittitas and private water banks in the Yakima basin to assess their effectiveness and accounting systems; and,
- The Chelan and Tucannon large wood projects that contribute to improved streamflow.

Finally, we would like to again reference King County's comments submitted on October 28, 2018. Specifically, we want to emphasize some of the primary themes in those comments, which we also believe are pertinent to determining NEB, including:

- ***Ensure "higher priority" project categories recognize all project types that create stream flow benefits,*** including restoration projects that restore hydrologic function and acquisitions (development rights or fee simple) that retire or prevent future water use.
- ***Reward efforts to achieve intent of Growth Management Act*** to ensure restoration plans and project funding do not incentivize rural growth in contravention of GMA intent. Determining NEB should be assessed with an expectation that additional, future water use is minimized through consistency with state and regional growth management policies
- **Move beyond mitigation to emphasize restoration** to more assertively reinforce policies, plans and projects that focus growth in urban areas while promoting broader watershed restoration.
- ***Align funding program with orca and salmon recovery*** to create synergies and efficiencies by focusing stream flow restoration efforts and enhancement in streams/geographies identified in the WRIA Salmon Habitat Recovery Plans (see appendix for WRIA 10 SHRP excerpt example).
- ***Designate a portion of the funding to strengthen scientific underpinnings of project funding.***
- ***Consider distinctions between urban and rural watersheds in allocations***, including the emphasis on restoration and higher implementation costs in urban counties.

Again, we feel that the strength of the NEB determination can emerge out of the watershed restoration plans required from the Section 203 planning groups. Thank you for the opportunity to provide these comments on determining NEB. King County looks forward to working with Ecology on the watershed restoration plans to improve water quality and habitat.

Sincerely,

Christie True
Director

cc: Josh Baldi, Division Director, Water and Land Resources Division, Department of Natural Parks

Appendix

A. Logic Model and other Considerations

As mentioned in the general comments, King County suggests using a logic model or conceptual basis similar to Ecology's 'credit-debit' method for wetland mitigation. The idea is to provide guidance for estimating functions and values lost to groundwater and streamflow depletion by consumptive uses and in estimating the gains that result from the offset project. The current credit-debit method scores wetlands according to three functions valuable to society and incorporates the potential of the site and the landscape. Debits are estimated as the loss of function, multiplied by the size of the impact. Credits (in 'acre-points') are estimated as the increase in function multiplied by the area, factoring temporal loss and risk of failure. In a streamflow application, logic models could be designed to ask: "What are the processes and factors affecting the timing, location, and rates of streamflow depletion at your project reach, and how does your proposed approach reduce depletion or increase recharge?" (USGS Circular 1376).

Methods and metrics for demonstrating project benefits should be realistic, standardized (if possible) and scaled to phase: e.g., estimate project benefits using an Ecology-approved conceptual model or logic-model based at the planning and grant phase, with more robust (but feasible) hydrologic metrics later in project development. For example, applicants could be asked to use the logic model to substantiate the basis for the project, and establish its potential to improve functions valuable to society instead of a precise ledger of inputs and outputs (for which most parameters may be currently unknown), and submit a monitoring plan with the application. After implementation, grant recipients could provide Ecology with the quantitative monitoring results to begin evaluating the actual project benefits and inform future project prioritization.

Modeling NEB through programs such as RiverFlow2D and MODFLOW are feasible at the planning level to model point source withdrawals and project benefits. Modeling can (and should) also incorporate future projections in precipitation patterns to forecast seasonal flow changes projected through a range of climate scenarios. In-stream flow targets could be monitored post-project through the installation of monitoring wells where feasible, with projects subject to adaptive management actions where needed to meet flow targets, as is done with other monitoring elements.

Of course, even with modeling, there is considerable uncertainty and assumptions inherent in estimating streamflow impacts from groundwater use at sub-basin scales, and linking it to fish impacts is even more challenging. Ecology should direct planning groups on what to do about

uncertainty. It seems reasonable to document the assumptions made in estimating streamflow depletions and recognize that this is not a precise or simple exercise. Project submittals will include more detail, with fuller modeling and hydraulic analysis at the 30-60% design phase.

Other tools and concepts (including specific publications available upon request):

a) Analytical models of streamflow depletion (e.g., Glover solution; highly simplified, conditions not often met but widely applied). Likely to be useful in the planning phase of a project.

b) Numerical models of streamflow depletion (e.g., MODFLOW; most robust and powerful; suitable where you have irregular geometry in aquifers, streams, complex aquifer properties, complex pumping patterns). Rely on response functions that show how a project at one location may affect streamflow nearby. The only effective method for determining basin-wide water budgets. Unrealistic to expect this of grant applicants in early years of program.

c) Temperature and water quality can also be proxies, groundwater temperatures being more constant versus fluctuating surface temperature suggests temperature could be a proxy for volume.

d) Also need to know changes in flow between stream and aquifers that may be affected by projects and/or depletion by wells. Best result are from studies of changes in pumping stress or aquifer conditions over long reaches spanning years to decades. It may be very difficult to detect effects of individual projects owing to delays and damping effects. Also, effect size may be smaller than the measurement error unless a project is very large in scope. May be able to detect changes from projects using seepage runs made simultaneously at multiple locations along the stream, using piezometers, observation wells, temperatures, geochemical constituents, or tracers.

e) The water code doesn't align well with adaptive management techniques. Water projects that involve recreating natural storage in watersheds can be dynamic and there should be some guidance on how these kinds of water offset projects meet the certainty needed under the water code while providing flexibility for adaptive management.

B. Identify opportunities to work with existing plans designed to address low flows

For example, an excerpt from the WRIA 10 SHRP (2018) Climate Issue Paper (draft) includes these actions for addressing low flow:

1.1.1 Key Actions: Low Flows

- Implement low impact development practices and green stormwater infrastructure in urban areas, including runoff dispersion and infiltration, where soil conditions allow and where it will not increase risks of landslides or flooding downslope. Increasing infiltration can replenish groundwater and maintain stream flows during warm, dry weather.

- Research and implement innovative restoration practices (e.g., beaver introduction, wetland restoration) where appropriate to dampen the effects of shifting hydrology. Work toward resilience by encouraging natural processes that may moderate expected shifts.
- Identify how habitat boundaries, such as floodplains, are changing. Protect shorelines at risk of being armored as climate change advances. Protect habitat outside current habitat boundaries. Secure land that will be inundated by increased flooding and sea level rise.
- Headwaters are critical to providing cool, plentiful water. Monitor land use closely to minimize impacts to hydrology. In particular, where headwater streams are disconnected from their floodplains, work on reconnection to restore processes of water storage.
- Restore areas that provide flood storage and slow water during frequent, "ordinary" flood events (e.g., those that occur every one to five years) by reconnecting the floodplain (e.g., removing/setting back levees). This will be important above and adjacent to spawning grounds to counter the increased risk of higher flows scouring spawning areas.
- Remove and fix barriers like culverts and floodgates to ensure access to tributaries.
- Culverts have a life span of 50 to 100 years. For new culverts or as culverts are replaced increase the size to accommodate expected flows in 50 to 100 years so new fish passage barriers are not created.
- Work with water supply and dam operators like the U.S. Army Corps of Engineers and Tacoma Public Utilities to use reservoirs to ameliorate hydrologic impacts, especially during low flow periods.
- Undertake an evaluation of water rights in the basin. Consider creating a follow up program to acquire water rights to rededicate back to the river, and support efforts to retain sufficient flows for fish.
- Support expanding outreach programs that reduce water usage in order to have more water available for streams and rivers (e.g. basic education, incentives for residences to upgrade to low flow devices, improve efficiency of irrigation systems).
- Consider placing more importance on increasing amount of a large wood in rivers in streams to improve hyporheic exchange.