



January 4, 2011

Larry M. Keeton, Director
Kitsap County Department of Community Development
619 Division Street MS-36
Port Orchard, WA 98366-4682

Dear Mr. Keeton:

Purpose: This correspondence raises significant questions and concerns about the process and the science being used by Kitsap County to identify and mitigate cumulative impacts in the county's Shoreline Master Program update.

Background:

WAC 173-26-201(3)(d)(iii) Addresses cumulative impacts in developing shoreline master programs. It states, in part, that "The principle that regulation of development shall achieve no net loss of ecological function requires that master program policies and regulations address the cumulative impacts on shoreline ecological functions that would result from future development and uses that are reasonably foreseeable from proposed master programs." This section also indicates that an appropriate evaluation will consider a number of factors including "effects such as the incremental impact of residential bulkheads, residential piers, or runoff from newly developed properties".

WAC 173-26-186(8)(d) states, in part, that "...master programs shall contain policies, programs, and regulations that address cumulative impacts and fairly allocate the burden of addressing cumulative impacts among development opportunities".

Historically, there has been confusion about how to evaluate and mitigate cumulative impacts. To help clarify this problem, EPA's Council on Environmental Quality provided definitive guidance in their 1997 Handbook on Considering Cumulative Impacts.

This handbook describes three components: 1) Scoping the actions and identifying potential cumulative effect issues; 2) Describing the affected environment; and 3) Determining the environmental consequences.

In the third step, identifying the environmental consequences, the key requirement is to identify the important **cause-and-effect** relationships between human activities and the ecosystem.

If there is no cause-and-effect, there can be no impact, cumulative or otherwise.

Discussion:

The county and the Department of Ecology, thus far, have failed to produce any credible science that demonstrates a clear cause-and-effect relationship between responsible residential shoreline development and the health of the nearshore environment.

This failure to document a cause-and-effect relationship suggests that there is no legitimacy to the cumulative effects approach described in a Department of Ecology PowerPoint presentation by Joe Burcar in the SMP Task Force's December 2 meeting.

In this presentation, Mr. Burcar said that the determination of cumulative impacts is based on the guideline's requirement for no net loss of ecological function, and that Ecology considers that there are three factors in this determination: 1) No net loss of habitat function; 2) No net loss of water quantity function; and 3) No net loss of water quality function.

The determination of water quality and water quantity, prior to and after proposed development, is a fairly straightforward process – involving measurements, engineering calculations, and the application of techniques such as Low Impact Development and other technology. There should be little difficulty in designing future development that maintains no net loss for these factors.

The main problem with Ecology's approach lies in their method of measuring no net loss of habitat functions. Ecology does not propose to measure habitat function directly but, instead, to employ "proxies", such as using the area that docks occupy as a proxy for loss of eelgrass and other habitat.

The flaw in this methodology is that the assumed link between structures such as small residential docks and harm to habitat functioning has not been clearly demonstrated. In fact, KAPO has provided information that shows there are no credible scientific studies of the Puget Sound that support such proxy relationships. Indeed, the statistical analysis of data from three major studies shows virtually no relationship between proposed environmental "stressors" such as docks or bulkheads and harm to the nearshore environment. (These studies are summarized below.)

For example, one of these studies, the Battelle Marine Science Laboratory's Bainbridge Island Nearshore Assessment, identified the location of features such as bulkheads and eelgrass beds along the entire periphery of Bainbridge Island. It found that approximately half the eelgrass beds, which are an extremely common measure of nearshore environmental health, were located in front of a bulkhead (a proposed environmental stressor). In fact, a statistical review of the assessment's data by Dr. Donald Flora

suggests “that 97 percent of the inter-reach variation in overall nearshore habitat welfare, as compiled by Battelle, is accounted for by non-structural, non-installed *natural* factors.”

Thus, in this study as well as the others, there is essentially no support for Ecology’s assumed relationships between proposed environmental stressors and harm to the environment. I have challenged Ecology to produce peer-reviewed studies supporting their “proxy” hypothesis – that measuring human-constructed shoreline features such as bulkheads is also a measure of environmental degradation -- particularly as it applies to residential shoreline development. None have been forthcoming.

Legal requirements for science:

It is instructive to compare some of the legal requirements for the science used to assess no net loss, with the studies that were actually carried out.

WAC 173-26-201(2)(a) states that: “... if any person, including local government, chooses to initiate scientific research with the expectation that it will be used as a basis for master program provisions, that research shall use *accepted scientific methods, research procedures and review protocols*”.

From a legal standpoint, it is also instructive to understand how the U.S. Supreme Court defined reliable, therefore, admissible science. The landmark 1993 Dowbert v. Merrell Dow Pharmaceuticals, Inc. decision established four criteria:

- 1) Is the evidence based on a testable theory or technique?
- 2) Has the theory or technique been peer reviewed?
- 3) In the case of a particular technique, does it have a known error rate and standards controlling the techniques operation?; and
- 4) Is the underlying science generally accepted?

The Battelle models that underlie the county’s scientific work do not appear to meet any of these criteria. Consider why this might be. It involves something Dr. Flora, who reviewed the Battelle studies, called “Strangely Transformed Data”. He described it this way:

“From various combinations and weights of stressors data, Battelle manufactured nine supposed “controlling factors” for each reach. Most are conditional sums such as, “if less than a third of a reach is bulkheaded, assign a negative score of 1; take off another 1 if it’s mostly concrete and another 1 if more than a third of the bulkhead encroaches”. The sum is a “controlling factor” called Wave Energy. Battelle acknowledged that these conditional, contrived elements have negligible basis in quantitative studies.”

These types of studies, cited by the county as support for aggressive shoreline regulation, represent little more than environmental speculation – with an unmistakable bias that suggests a serious compromise of scientific integrity. As the Battelle research shows, the authors of studies commissioned by the county are willing to perform activities

and discuss outcomes that their clients desire; however, they appear unwilling to acknowledge outcomes that their clients do not desire, even if those outcomes are supported by their own research.

The process used in this kind of non-peer-reviewed “science” generally involves conjecture and assumptions based on the author’s “professional judgment”. Rather than presenting data with clear statistical analysis, the results are often expressed as simplistic and misleading generalities – for example as maps of county shorelines that are colored red, yellow, or green to represent levels of development – with these levels of development presented as indicators of environmental harm – even when there is no evidence that this harm exists.

Although the county has not acknowledged them, there actually are some fairly rigorous quantitative studies of cause-and-effect relationship between bulkheads (which are the main shoreline structures identified by the county as an environmental stressor to the nearshore habitat in Puget Sound) and nearshore environmental health. Dr. Flora has reviewed them and his findings are as follows:

The North Sound — The San Juan Initiative, working with a consultant, selected case study areas on the four largest San Juan islands, totaling 651 parcels along 34 miles of shore. With that data a staffer at the Friday Harbor lab has determined that there is a slight *positive* association between bulkheads and eelgrass and between bulkheads and forage-fish habitat. (Coastal Geologic Services Inc. 2008. San Juan Initiative protection assessment - Nearshore case study area characterization. Bellingham.)

The Central Sound -- In their recent shoreline inventory Bainbridge Island’s staff divided Island shorelines into 201 “reaches”, with data collected for each reach on installed structures and other indicators of human occupation, and on measures of habitat presence and density. An analyst used this data in four kinds of analyses and found *near-zero* relationships between bulkhead intensity, eelgrass and forage-fish habitats. (Bainbridge Island Nearshore Habitat Characterization & Assessment, Management Strategy Prioritization, and Monitoring Recommendations. Sequim: Battelle Marine Sciences Laboratory.)

The South Sound -- That the sedimentary environment was *not affected* by shore protection was shown in a study of Thurston County beaches, where 29 profiles of bulkheaded sections were compared with nearby non-bulkheaded profiles. No statistically significant beach “coarsening” was found. Following adjustment of an analytical glitch, no statistically significant profile changes were shown. Both of these factors have implications for forage-fish habitat. Eelgrass differences were not examined. (Herrera Environmental Consultants. 2005. Marine shoreline sediment survey and assessment, Thurston County, Washington. Seattle.)

None of these studies showed statistically-significant negative cause-and-effect relationship between bulkheads and eelgrass or forage fish habitats.

The above discussion relates to a class of studies that document man-made shoreline structures and alterations along reaches of shoreline and the health of the corresponding nearshore as measured by indicators such as the presence of eelgrass -- and attempt to establish a relationship between the two.

However there is another class of cause-and-effect studies that more directly evaluates the transport of toxic substances in the environment and their effect on living organisms. These are known as “fate and effect” studies. They trace a pollutant from its source to its final fate in the environment, documenting its effect, if any, on the environment.

One might think that if governments are considering aggressive controls of private property, such as large buffers to protect the nearshore from pollution from single family residences, that someone would have designed a study to monitor and document the fate-and-effect of such pollution. Yet no one can produce such a study. Perhaps this is because it is fairly well known in the scientific community that the results of such studies would demonstrate a vanishingly small risk – something that would not support current policies.

In fairness, it is noted that there is one large-scale study that monitored and modeled fecal coliform in stormwater runoff into Sinclair and Dyes Inlets. It was conducted under the joint EPA/Ecology/Navy ENVVEST program. This study showed somewhat higher levels of fecal concentrations from developed land than undeveloped land. However, even this study is incomplete as it does not identify the source of the fecals – something that must be done before its results can be justified for application to land use controls. (Some people suspect that domestic animal poop may be a significant factor.)

Conclusion: The above discussion indicates that the county has not met the minimum scientific standards to identify and quantify impacts of responsibly conducted shoreline development on the nearshore environment. Worse, they appear to have chosen to ignore studies that indicate that man-made features such as bulkheads are not measurably impacting nearshore habitat for forage fish and eelgrass. These actions are not only wrong, but because they violate Washington State guidelines, they also may be illegal.

Request: Thus, it is requested that the county either provide documented evidence that the science being used to support the SMP update meets the minimum requirements established under law or, failing that, that the appropriate scientific studies be initiated. As always, KAPO would be glad to provide technical assistance in this endeavor.

Sincerely,

A handwritten signature in cursive script that reads "Bob Benze". The signature is written in black ink and is positioned below the word "Sincerely,".

Bob Benze

Copies to:

Kitsap Co. DCD – Charnas, Greetham

Kitsap Co. SMP Task Force – Norton-Arnold

Washington State Department of Ecology – Burcar