No Net Loss in Clallam County – An Enhanced Approach
No Net Loss Work Group Meeting #1

Introduction

This paper describes initial work by Clallam County's SMP consultant team to enhance the County's approach and strategy for meeting the state's mandate to achieve no net loss (NNL) of shoreline ecological functions. This new approach/strategy is intended to create a systematic way of identifying shoreline ecological conditions and examining changes caused by expected shoreline use and development. Establishing a systematic approach has been a desired outcome of the SMP update process but jurisdictions have struggled to link land use changes to ecological conditions in a way that is spatially explicit, informs decision-making and provides accountability.

To put Clallam County in a better position to tackle this challenge, the consultant team is attempting to:

1. Quantify and document shoreline conditions using indicators of ecological function that are linked to SMP decisions;

2. Evaluate potential land use changes in a systematic way;

3. Identify where and to what degree existing functions might be lost as a result of planned land use changes;

4. Tailor SMP policies and regulations based on type and level of potential loss and associated uncertainties; and

5. Show how indicators can be used to assess the effects of SMP decisions on shoreline functions to improve accountability for no net loss.

The NNL approach as we envision it would allow the County to track shoreline changes over time and evaluate how those changes relate to or stem from shoreline management decisions (permit decisions, restoration decisions, decisions to provide education and outreach, etc). The approach will also build from the parcel scale allowing a comprehensive look at how individual parcels fit into a larger ecological context for both planning and implementation purposes. Here's a brief summary of how this no net loss framework might work:

Ecological Condition – By assessing shorelines in terms of predefined indicators (see below for more information), we can potentially quantify current conditions and establish a rating for each shoreline reach using readily available GIS data sets. This is similar to the approach taken by PSNERP to assign *process degradation* scores to all of the drift cells across Puget Sound.

Land Use – Concurrent with a better understanding of ecological conditions, it is important to identify parcels and aggregates of parcels where actions known to impact

ecological functions are likely to occur or already have occurred. This requires a look at the level and type of existing development along the shoreline and an assessment of how each shore segment is likely to change if build-out occurs as planned. This assessment would allow us to categorize the level of change and document the specific types of changes in a GIS format that can be layered with the ecological conditions noted above. The level of change on each reach could be rated as low, moderate or high. The rating could be designed to take into account the type of change, intensity of use and a variety of the factors that help us understand potential effects on functions.

Functional Loss – We would try to assess or categorize the potential that the expected land use changes (from above) are going to contribute to or cause loss of ecological functions. This could be accomplished by asking a series of questions such as:

1. Will future development occur in high function areas?
   - ❖ No – go to question 2
   - ❖ Yes – go to question 3
2. Will future development occur in unaltered areas?
   - ❖ No – Risk of loss is low
   - ❖ Yes – go to question 3
3. Is the type of future development likely to cause impacts (clearing, armoring, septic systems, etc)?
   - ❖ No – Risk of loss is low
   - ❖ Yes – Risk of loss is high

The level of 'risk' to shoreline functions caused by shoreline development could then be summarized (e.g., high, moderate, or low) to allow us to hone in on key policy issues in areas of greatest concern.

Tailored SMP – Once the risks to shoreline functions are understood in a spatially explicit way, we can tailor SMP policies, designations and regulations to address specific risks to specific functions at specific locales. As an example, a jurisdiction might chose to limit or prohibit certain uses in places that support extensive eelgrass beds but allow those same uses in places where eelgrass is unlikely to occur. Overall, this allows for a more informed SMP wherein protection and restoration are geared to the level of risk and where management standards are designed to reduce the potential for future development to adversely impact specific resources.

Track Effects – We can also track and evaluate how the County's administration of the SMP is affecting shoreline conditions---and hopefully segregate those effects from other non-SMP-related actions.

Indicators

Resource managers around Puget Sound have put considerable thought and effort into the concept of using *indicators* to track the status of species and habitats that we care about. Ecology has developed a list of indicators they recommend be used to assess shoreline

condition. The consultant team reviewed Ecology's list to see how the suggested indicators might be used in our NNL approach. Tables 1 and 2 show the indicators suggested by Ecology and some of their key attributes.

Table 1 – Attributes Related to Ecology's Suggested Indicators – Marine Shores

Indicator	How Linked to SMP Functions?	How Linked to SMP Management?	How Linked to Restoration?
Nearshore forest cover	Effects on water quality - sediment storage & retention; nutrient/toxicant filtration & retention; and temperature	Relates to decisions about vegetation management, beach access structures, buffers/setbacks, clear/grading, LID, and allowed uses	Areas / opportunities for vegetation enhancement
Condition of shellfish harvest areas	Effects nutrient/toxicant filtration & retention; temperature	Relates to decisions about stormwater management, buffers, mooring buoys and boating facilities and other allowed uses	Areas / opportunities for stormwater retrofits, OSS management, stream and wetland restoration, vegetation enhancement
Pervious surface	Effects runoff rates and quality which impacts of receiving waters; effects nutrient/toxicant filtration & retention; temperature	Relates to decisions about buffers, allowed uses/use compatibility, development density	Areas/ opportunities for vegetation enhancement
Armored shoreline	Affects availability of habitat for intertidal organisms (forage fish); affects sediment delivery and transport	Relates to decisions about bulkheading, buffers/setbacks, incentives for expansion or redevelopment of existing uses, and allowed uses	Areas / opportunities for bulkhead softening, beach nourishment
Feeder bluffs	Affects sediment delivery	Relates to decisions about allowed uses, stormwater, beach access structures, buffers/setbacks	Areas / opportunities for bulkhead softening, beach nourishment
Wetland/ Salt marsh habitat	Affects habitat availability for shorebirds; affects primary productivity	Relates to decisions about flood control, channel migration, and allowed uses	Areas / opportunities for dike removal, floodplain reconnection, wetland enhancement
Over-water / in-water structures (docks, piers)	Affects light availability for eelgrass and other species; affects predator/prey relationships	Relates to decisions about dock/pier allowances/dimensions, marinas, and allowed uses	Ares / opportunities for dock retrofits
Cross-shore structures (groins, seawalls…)	Affects sediment transport; affects intertidal and subtidal habitat availability	Relates to decisions about shoreline stabilization and allowed uses	Ares / opportunities for restoration of sediment processes
Aquatic	Affects salmonid prey base	Relates to decisions about	See above

Indicator	How Linked to SMP Functions?	How Linked to SMP Management?	How Linked to Restoration?
vegetation (eelgrass, kelp, etc)		dock/pier allowances/dimensions, marinas, and allowed uses	

Table 2 – Attributes Related to Ecology's Suggested Indicators - Freshwater Shores

Indicator	How Linked to SMP Functions?	How Linked to SMP Management?	How Linked to Restoration?
Riparian forest cover	Effects water quality - sediment storage & retention; nutrient/toxicant filtration & retention; and temperature	Relates to decisions about for vegetation management, buffers/setbacks, clear/grading, LID, and allowed uses	Areas / opportunities for vegetation enhancement, levee setback/ removal, floodplain reconnection, wetland enhancement
Channel bank condition	Affects availability of refuge habitat; affects in-stream habitat complexity; affects floodplain connectivity	Relates to decisions about bank armoring, flood control, channel migration, and allowed uses	Areas / opportunities for vegetation enhancement, levee setback/ removal, channel enhancement, floodplain reconnection, wetland enhancement
Floodplain condition	Affects habitat connectivity; affects area for nutrient transformation and cycling; affects sediment storage	Relates to decisions about allowed uses, flood control, channel migration	Areas / opportunities for levee setback/ removal, channel enhancement, vegetation enhancement, floodplain reconnection, wetland enhancement
Riparian condition	Affects shading/stream temperature; affects LWD inputs	Relates to decisions about for vegetation management, buffers/setbacks, clear/grading, LID, and allowed uses	Areas / opportunities for vegetation enhancement, levee setback/ removal, channel enhancement, floodplain reconnection, wetland enhancement
Drainage network	Affects routing of contaminants;	Relates to decisions about transportation facilities	Areas / opportunities for channel and riparian enhancement
Fish access	Affects availability of spawning, rearing habitat	Relates to decisions about transportation facilities	Areas / opportunities for channel enhancement, culvert removal
Riparian wetlands	Affects nutrient and sediment storage and transformation; affects habitat availability for numerous wildlife species	Relates to decisions about for vegetation management, buffers/setbacks, clear/grading, LID, and allowed uses	Areas / opportunities for floodplain reconnection, wetland enhancement

Indicator	How Linked to SMP Functions?	How Linked to SMP Management?	How Linked to Restoration?
Undeveloped land	Affects habitat availability for numerous wildlife species	Relates to decisions about for vegetation management, buffers/setbacks, clear/grading, LID, and allowed uses	Areas / opportunities wetland and vegetation enhancement

The consultant team is tasked with determining which of these [or other] indicators would best support the NNL approach described above. In this context, we view indicators not as direct measures of function, but as indirect surrogates for functional measurement that can be used to:

1) Help craft SMP policies and regulations (this happens now during the SMP update process) and
2) Assess whether SMP decisions are having positive or negative effects on function over time (this happens as the SMP is implemented).

Indicators play a vital role in both contexts, and it is helpful to approach the subject of *indicator selection* from both standpoints.

In Clallam County there are numerous SMP policy decisions that are linked to human actions which [are believed to] directly affect shoreline ecological functions. Some of these key SMP decisions are:

- Which areas of the County are most vulnerable to shoreline development?
- What types of uses should/should not be allowed on the shoreline?
- When and where should docks, piers and mooring buoys be allowed?
- Where and when should shoreline armoring be allowed?
- Where and how should the County accommodate aquaculture uses?
- How far from the water's edge should upland uses be located?
- Where is it possible to accommodate additional marina slips?
- What areas are most vulnerable to vegetation clearing?
- What areas are most vulnerable to the flooding, erosion, and/or channel migration?
- Where and when should new shoreline access be allowed/provided?
- What steps should the county take to manage stormwater runoff in shoreline areas?

This is a subset of the full suite of shoreline management decisions that the County will need to make during the update process [and later as they administer the SMP], but it encompasses a range of topics which the County will need to consider in light of the no net loss mandate. As a result, these questions have direct bearing on the types of indicators we choose to use in the NNL approach.

One way to answer these questions is to inventory the shoreline and characterize its condition relative to certain features or attributes. For example, we can inventory and map features such as feeder bluffs or eelgrass beds to help us understand which resources need to be protected and where. We can even relate these features/attributes to ecological functions by saying that feeder bluffs are an *indicator* of sediment supply functions or eelgrass is an *indicator* of primary productivity or food web functions. In this context selecting eelgrass or feeder bluffs as indicators could be helpful in making SMP policy decisions.

However, if we want to track the effects of the SMP on ecological functions over time simply measuring the amount of eelgrass or the number of feeder bluffs will not tell us much. To achieve that goal we must examine the linkages and spatial relationships between shoreline attributes and SMP decisions and use those linkages as **indicators of performance**. **[Note:** the County is required to inventory and characterize a long list of shoreline attributes such as eelgrass and feeder bluffs as part of their shoreline inventory; we are not suggesting skipping that step but rather supplementing it with a more robust quantitative analysis using indicators as we define them here**].**

In other words, if we want to understand the effect that shoreline armoring decisions have on ecological functions we could measure:

   a) The amount of shoreline that is armored *or*
   b) The amount of armoring in key sediment supply areas (feeder bluffs) or forage fish spawning areas

Both measurements potentially allow us to detect a change between existing conditions and future conditions (created through SMP decisions), but the second assessment (b) provides more robust information about potential effects of the armoring decision on shoreline functions. We suggest that the second assessment is an *indicator of performance*. In other words, if we want the ability to assess whether the County's bulkhead decisions are achieving no net loss, we could select one or both of the following as the performance indicator:

Amount of feeder bluffs with / without bulkheads
Amount of forage fish habitat with / without bulkheads

With this in mind, we have identified a list of potential performance indicators we believe are well correlated with SMP policy issues and SMP management decisions in Clallam County. We specifically selected performance indicators that we believe meet the following criteria:

   • There is a documented correlation between the indicator and shoreline functions;
   • Electronic data concerning the indicator are reasonably available to Clallam County / other counties;
   • Clallam County / other counties are likely to have future access to data concerning this indicator;

- Indicator reflects longer term environmental trends as opposed to widely variable seasonal changes (*or something along these lines*);
- Indicator can be tallied/measured with reasonable accuracy at the parcel and reach scales using remote techniques; and
- Indicator reflects local conditions that are important to citizens of Clallam County.

This following list of performance indicators is intended as a starting point for discussion and consideration. Ideally, we would narrow the list below to a select few and then proceed with testing and additional vetting. The consultant team will have a chance to elaborate on this list, obtain feedback, and solicit ideas at the December 13 meeting. Considerable additional work will be done over the next three months to determine if and how these [or other] performance indicators work to achieve the desired outcomes.

For marine shores the potential performance indicators are:

- Amount of feeder bluffs (highly erodible bluffs) with / without bulkheads
- Amount of bluff-backed beach with/without mature forest cover
- Areas that support submerged aquatic vegetation with/without overwater structures
- Defined sediment transport zones with/without overwater structures
- Public tideland subject with/without shellfish harvest closure

For river shores, the potential performance indicators would be:

- Amount of 100-yr floodplain with/without mature forest cover
- Amount of 100-yr floodplain with/without structures
- Length of stream channel with /without dams or levees

We look forward to discussing this work and getting your feedback and input on the performance indicators we have selected at the meeting on the 13th. Following the meeting we will prepare an initial assessment of shoreline conditions using the selected indicators for your review and comment.