

**Target Setting
February 3, 2011 Ecosystem Coordination Board
Agenda Item 06**

Prepared and Presented by: Scott Redman

Proposed Action

Members commit to gathering stakeholder perspectives on possible Partnership ecosystem recovery targets for shellfish beds reopened and eelgrass so stakeholder analysis can be provided to Leadership Council in advance of their February 17 decision on these two ecosystem recovery targets.

Background

The Partnership will adopt ecosystem recovery targets for its Dashboard of ecosystem indicators and for reductions in key ecosystem pressures as part of the 2011 revision of the Action Agenda (attachment 1).

Technical analyses have been prepared for two indicators to support target setting: shellfish beds reopened (attachment 2) and eelgrass (attachment 3). These technical analyses and stakeholder perspectives on appropriate targets will inform the Leadership Council's target setting for these indicators. ECB members can support Partnership staff in developing a stakeholder analysis by sharing the attached materials with interested parties and inviting them to share insights and perspectives with the Partnership before February 10, 2011.

Additional targets will be adopted through spring 2011 for presentation in this summer's draft Action Agenda. Technical analyses for all other topics for target setting will be prepared in late March and available for review and discussion through April and May. These targets will be discussed at the April 1 ECB and April 28 Leadership Council meetings. Scientific review and stakeholder analysis will be completed in early June to prepare for adoption of the full suite of targets at the June meeting of the Leadership Council.

Action Agenda Consistency

Strategic Priority E.1.1 of the Action Agenda calls for the establishment of measures and benchmarks for assessing progress in the ecosystem as one of five major components of the Partnership's performance management system. Elements E.1.1.3 and E.1.1.4 of this strategy call for identification of targets for ecosystem indicators and identification intermediate outcomes with measurable targets and benchmarks, respectively. Per near-term action E.1.1 (parts a and b), these steps were scheduled to be done by November 1, 2009. Sub-element E.1.1.5 calls for refinement of intermediate outcomes to reflect advancements related to the ecosystem goals, outcomes, and indicators.

Stakeholder Input

The scope and general approach to Partnership target setting were discussed as part of the science-policy workshop convened on December 14, 2010.

The proposed targets for shellfish beds reopened and eelgrass were presented to the Leadership Council at its meeting on November 19, 2010. Information about stakeholder perspectives on these proposed targets has not been gathered and is needed in advance of Leadership Council adoption of targets for these topics.

Consequences of Delay

Information on stakeholder perspectives provided to the Partnership before February 10 will support Leadership Council decisions about targets for shellfish beds reopened and eelgrass at their February 17 meeting. A delay in development of stakeholder analysis might shift adoption of these targets to a later Leadership Council meeting.

Attachments:

1. Setting recovery targets for the Puget Sound ecosystem (January 7, 2011)
2. Shellfish beds reopened brief sheet
3. Eelgrass brief sheet

Puget Sound Partnership

our sound, our community, our chance

Setting recovery targets for the Puget Sound ecosystem

Gerry O’Keefe – Acting Executive Director, Puget Sound Partnership

January 7, 2011

Consistent with direction provided by the Puget Sound Partnership Leadership Council throughout 2010 and advice from the Partnership’s Science-Policy discussion on December 14, 2010, Partnership staff will support adoption of at least 20 targets for ecosystem recovery as a key feature of the first biennial revision of the Action Agenda in 2011.

What Is Target Setting?

For the Puget Sound Partnership, ecosystem targets articulate a vision of a healthy Puget Sound ecosystem and conditions we expect to achieve by 2020.¹ The Partnership’s ecosystem targets are expressions of desired future conditions: healthy status (the ultimate objective) and/or the objectives for 2020 (desired status on a trajectory toward healthy status).

The Partnership will develop two types of targets.

- For ecosystem components, targets describe desired future conditions of human health and well-being, species and food webs, habitats, water quantity, and water quality. Targets for ecosystem components will help the Partnership and others to interpret information about the status of the ecosystem and to understand the gap between observed and desired conditions. In 2011, the Partnership will adopt targets for
 - Each of our Dashboard of Ecosystem Indicators
 - Acres of restored estuary (an Environment Protection Agency indicator for National Estuary Programs including Puget Sound).
- For pressures on the ecosystem (i.e., sources of stressors and stressors that degrade the status of the ecosystem), targets describe desired reduction in the level of pressure. These targets will guide revisions to Action Agenda implementation strategies, the priority of near-term actions, recommendations for allocation of funding and other resources to specific strategies and actions, and the evaluation of the success of Action Agenda implementation. The Partnership intends that other implementing agencies will use these targets to identify and design activities that contribute

¹Per Washington State statute RCW 90.71.310(1)(c): “the action agenda shall include near-term and long-term benchmarks designed to ensure continuous progress needed to reach the goals, objectives, and designated outcomes by 2020.”

to achieving these targets, to align their allocation of funding and other resources to these outcomes, and to evaluate the effects of their investments and activities

Role of Science

The Partnership will adopt ecosystem targets as policy statements informed by science. One important scientific consideration is the amount of time required for the ecosystem to respond to our actions. For example, the recovery targets for healthy orca or salmon populations will likely not be realized until well beyond 2020 even under the best possible actions. Consequently, the Partnership's targets will describe the desired status for 2020 and where it is different, the ultimate desired status beyond 2020.

Another scientific consideration is the linkages and relationships among ecosystem components (such as food webs). To the extent possible, we will set targets based on the levels necessary for suites of ecosystem components to work together in a functioning ecosystem. Finally, scientists will consider the uncertainty in the data and information. For example, differences in the availability and quality of information or scientific models means that the targets will be uneven in how certain we are that they represent the desired self-sustaining, healthy state or in the policy consensus about the targets.

How Do We Get The Work Done?

We will need Partnership staff and many others to be engaged in scientific assessments and policy discussions to support the adoption of the proposed topics for ecosystem recovery targets (Table 1). Because pressure reduction targets are central to the 2011 revision of the Action Agenda, we will focus detailed attention on five pressure reduction targets (Table 1, center). We will also need Partnership staff and the "Indicator Champions" from the different agencies and tribes who have been refining the Dashboard of Ecosystem Indicators to help provide the analyses to set targets for those indicators. We will need our boards and councils to review the targets and provide guidance. Your enthusiasm to help, which you showed so strongly at Partnership's Science-Policy discussion in December, is essential for us to succeed.

Then What?

We will continue to set additional targets to reflect objectives of the suites of strategies and actions we are engaged in. We will also continue to improve existing targets based on better scientific understanding. Learning from what we are doing and adapting targets and associated strategies to reach the targets is central to the Partnership's commitment to science-based, adaptive management and a developing a Sound-wide culture of learning and continuous improvement.

Table 1. Topics for Puget Sound Partnership target setting for 2011

Ecosystem recovery goal	Key pressure or strategic focus	Dashboard indicator
Human health & well-being		Shellfish growing areas Swimming beaches Commercial fish harvest Recreational fishing licenses Quality of life index Sound behavior index
Species and food webs		Orca Salmon Herring Birds
Habitats	Land development Shoreline alteration Nearshore restoration	Land use/land cover Shoreline alteration Estuary restoration* Eelgrass
Water quantity & quality	Stormwater (runoff from built environment) Wastewater (on-site & treatment plants)	Water availability Toxics in fish Toxics in sediment Marine water quality index Freshwater quality index
(Programmatic)		Funding for Puget Sound Action Agenda engagement

* Not a Dashboard indicator but a key Environment Protection Agency performance measure for Puget Sound and National Estuary Program evaluation and reporting.

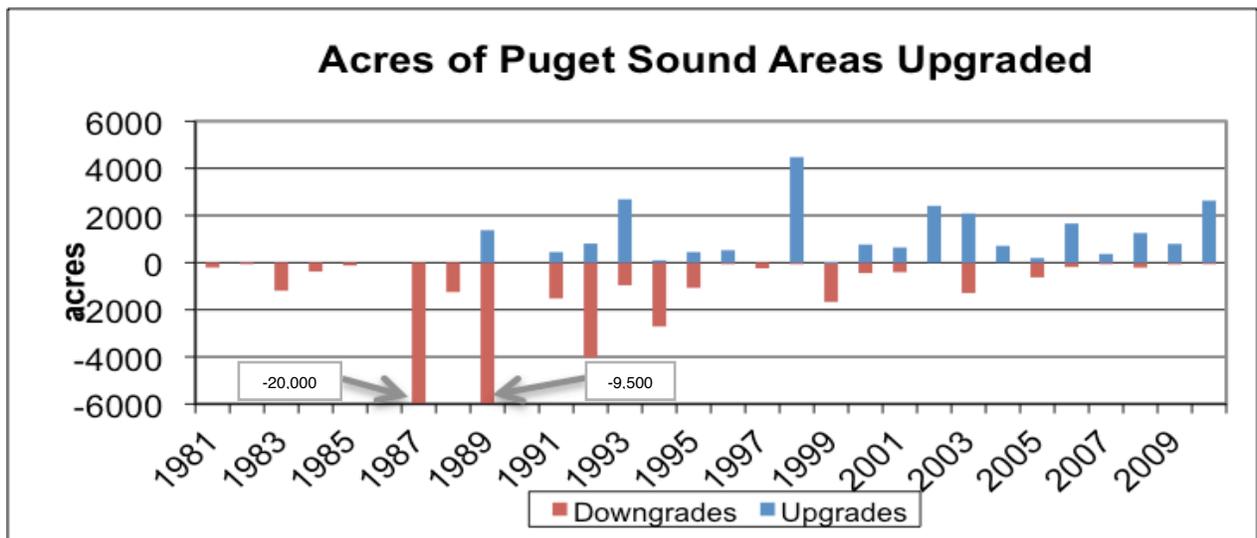
Puget Sound Partnership – Setting Targets for Dashboard Indicators

Indicator: Shellfish beds reopened

Authors: Scott Berbells, DOH; Scott Redman, PSP; Duane Fagergren, PSP

What are current and historic conditions of commercial shellfish growing areas?¹

Department of Health classifies 91 different commercial shellfish growing areas in Puget Sound, covering 194,000 acres. Over 41,000 acres of shellfish harvesting areas are classified as prohibited due to the proximity of pollution sources or poor water quality. Recreational and commercial harvest from these areas is not allowed. From 2007 through 2010 improved sanitary conditions resulted in net upgrades in classifications (e.g., reduced restrictions on harvest) totaling approximately 4,700 acres.



Since the late 1980s we've seen an improving trend. This improvement can be attributed to the work of state and local government agencies, shellfish harvesters, Tribes, and upland property owners. Significant actions that have resulted in harvest area changes Puget Sound-wide include:

- 1987 – Marine water sampling increased;
- 1988 – Department of Health Restoration Program begins;
- 1992 – Shellfish Protection Districts become mandatory;
- 1997 – Department of Health “Early Warning System” implemented.

How much shellfish harvesting acreage is needed for a functioning, resilient ecosystem? Or what is the acceptable range of variation of shellfish harvesting acreage in Puget Sound?

No scientific or technical assessment has defined a threshold number of shellfish harvesting acres for Puget Sound.

¹ This information is a synopsis of information collected by DOH through December 2010.

What are some of the key ecosystem relationships for shellfish harvesting acreage?

The ability to harvest shellfish for human consumption is a key benefit of the Puget Sound ecosystem. Shellfish growing and harvesting require excellent water quality and pollution control. Shoreline and upland on-site sewage systems, wastewater treatment plant collection systems and outfalls, marinas, animal-keeping activities, and wildlife can impact shellfish growing areas through direct discharges to the marine environment or through stormwater discharges. The extent of approved shellfish harvesting areas in Puget Sound reflects a clean Puget Sound.

How might population growth and climate change affect shellfish harvest acreage?

Projected human population growth in the Puget Sound region might contribute to increased discharges from existing point sources, development of new discharges (from new outfalls from existing plants or from new plants), and/or additional contributions of non-point pollution (e.g, runoff from areas converted to residential or commercial land uses to accommodate a growing human population; discharge from additional on-site sewage systems).

Chapter 3 of the Puget Sound Science Update identifies precipitation pattern shifts, ocean acidification, and sea level rise as anticipated impacts of climate change in the Puget Sound basin. Shifts in precipitation pattern — especially a shift to increased precipitation in the fall -- may lead to downgrades in shellfish harvest classifications and/or increasing closure of areas classified as conditionally approved for harvest. Ocean acidification and sea level rise are not anticipated to have effects on growing area classifications but may affect the productivity of growing areas.

What strategies and actions would most affect shellfish harvest acreage?

- Sustainable pollution identification and correction programs are integral to protecting existing commercial and recreational shellfish harvesting areas and upgrading those areas impacted by nonpoint pollution sources.
- Future planning and development aimed at reducing the impact to the marine environment.
- An evaluation and enhancement of wastewater treatment and discharge locations at many wastewater treatment plants.

What are the potential and/or projected future conditions of shellfish harvest acreage?

DOH's 2007-20 Restoration Upgrade Potential worksheet (unpublished data) identifies potential reclassifications (from 2007 through 2020) for 40 commercial shellfish growing areas. Updated in 2009, this analysis identifies approximately 7,600 acres of potential upgrades to approved status and approximately 3,000 acres of other upgrades (e.g., from restricted or prohibited to conditionally improved).

DOH's assessment of potential future conditions incorporates information about the known or suspected causes of harvest restrictions and an area-by-area evaluation of the feasibility to address these causes.

What issues about recovery timeframes and sequencing might affect Partnership decisions about targets?

DOH's assessment of potential future conditions incorporates information about area-specific timelines to address pollution concerns and achieve upgrades. The DOH restoration assessment worksheet includes the stretch-goal completion timelines of 0-5, 5-10, and 10-15 years.

What issues about geographic distribution of shellfish growing areas or influencing factors might affect Partnership decisions about targets?

Commercial shellfish growing areas are geographically distributed throughout Puget Sound, with the exception of the I-5 corridor between Tacoma and Everett. DOH has a harvest advisory along this stretch of unclassified area based on the potential impacts from wastewater treatment plant outfalls, combined sewage overflows, and stormwater. DOH is currently evaluating portions of this area for commercial shellfish harvesting.

What are the key uncertainties for recommendations of target setting for shellfish harvest acreage?

Every year commercial shellfish growing area acreage is downgraded based on marine water quality conditions. Even though a thorough, ongoing analysis can help predict that a growing area is trending towards a downgrade the actual change in classification can be unpredictable. Once a downgrade has occurred it is difficult, time consuming, and expensive to improve the conditions in the area.

- Will adequate pollution control continue to be funded at the local and state level?
- Will future planning and development focus on the protection of the marine environment?

What scientific review has occurred or is planned for this information?

This document will be reviewed by one or more Science Panel members in advance of presentation to the Leadership Council. In 2008, DOH consulted with representatives from Ecology, Agriculture, DNR, Conservation Commission, WDFW, CTED, and State Parks to review the restoration assessment worksheet.

What existing targets have been established related to shellfish harvest acreage?

DOH currently reports on a Natural Resources GMAP with primary focus on shellfish acres upgraded. DOH developed the target of a net increase of 10,000 harvestable shellfish acres in Puget Sound by January 1, 2020 for this GMAP. The GMAP target is based off of the restoration assessment worksheet.

EPA has selected a shellfish measure as their only Puget Sound related performance measure, to date. Currently, they have a target of a net increase of 500 harvestable shellfish acres in Puget Sound each fiscal year.

Options for Puget Sound Partnership targets

DOH recommends that the Partnership adopt the Natural Resources GMAP target: a net increase of 10,000 harvestable shellfish acres in Puget Sound by January 1, 2020

DOH has not developed options for possible Partnership target setting for shellfish harvest acreage. As part of stakeholder analysis, Partnership staff will solicit stakeholder input about options for Partnership targets different from the already established targets.

Stakeholder Analysis

[To be completed by Feb. 9 for Leadership Conference meeting materials]

Puget Sound Partnership – Setting Targets for Dashboard Indicators

Indicator: Eelgrass

Authors: Pete Dowty, Helen Berry, Jeff Gaeckle, DNR Aquatic Resources Division

Version: 25Jan2011

1. What is the current and historical condition of eelgrass in Puget Sound?

The available information suggests that there have been significant eelgrass losses relative to historical conditions and losses are continuing today. This is based on the global pattern of seagrass decline, the extensive alteration of the Puget Sound nearshore (overwater structures, dredging & filling), and the evidence of decline in the contemporary monitoring record. The overall magnitude of change since historical conditions has not been quantified.

2. What is considered a good condition for Puget Sound eelgrass as a whole?

Two broad options were considered for defining good condition for eelgrass: stable or increasing total eelgrass area. Given the likelihood of past eelgrass declines, an increasing trend is needed for Puget Sound restoration. A stable trend would protect from future losses but would not address past declines. Question 6 further discusses more specific point targets for consideration as targets for performance management.

3. Hypothesized impacts of low and high population and climate change scenarios on eelgrass

In the long-term, climate change is anticipated to lead to greater stress on eelgrass followed by decline. In some specific cases, there are likely to be initial benefits from climate change and declines may not be observed for more than 100 years, although it is not known how extensive these cases will be. Hardened shorelines will be particularly problematic for eelgrass as sea-level rises. Population growth is likely to increase stressors on eelgrass, but there is a greater potential for mitigation of these effects than for those of climate change.

4. Initial conceptual model: What affects this ecosystem component

There are many documented stressors that affect eelgrass. They fall into two broad categories: (1) Stressors that affect basic physiological requirements of eelgrass (e.g., light, temperature, oxygen, nutrients, sediment); (2) Activities in the nearshore that create direct physical stress to the plants (e.g., dredging, filling, propeller wash, boat wakes, in-water construction). Eelgrass provides key ecosystem services to a wide range of species.

5. Based on scientific understanding, how much eelgrass is needed for a functioning, resilient ecosystem?

We suggest three broad alternatives for consideration as provisional point targets for total eelgrass area for performance management:

- 20% increase over 10 years - This target reflects the average percentage increase seen in other estuaries in the United States that have established aggressive restoration programs. It is the preferred alternative because it most fully considers the Partnership's restoration goals, restoration results in other regions, and gaps in scientific knowledge in Puget Sound.
- Stable – This target strives to protect current habitat against future stressors, which are likely to increase. However, it is inconsistent with the Partnership's mandate to recover Puget Sound in the face of past declines.
- 100% or greater increase. This scale of increase would be needed for eelgrass area to equal published sources to historical levels. However, these published sources are based on flawed

information, and therefore a 20% increase over 10 years is the strongest alternative (see also question 2).

6. Restoration potential/opportunity, including geographic/spatial information; or other projections

Restoration of eelgrass in Puget Sound, primarily conducted as compensatory mitigation, has proven to be challenging. Successful projects have demonstrated that there is potential for restoration and habitat creation. Restoration of nearshore processes may also lead indirectly to eelgrass restoration, for example, as anticipated with the Elwha River dam removal.

7. Considerations related to policy

a. Aspects of geographic distribution that might affect policy setting

The sub-basins within greater Puget Sound are ecologically distinct in terms of eelgrass bed characteristics, the functions they provide, and the combination of stressors that are likely to be most important. Initially, only a single soundwide eelgrass target will be ready for consideration. Given these unique considerations, indicator setting and tracking would be most effectively applied at the sub-basin scale.

b. Timeframes and sequencing related to anticipated results

To reach the goals, it will be important to pursue both protection of existing beds and restoration of impacted areas. Protection of existing beds and the habitat conditions is critical to preventing further losses, and can be achieved through first fully enforcing existing regulations and second addressing gaps in protections. Timeframes and sequencing related to restoration actions depend on the nature of the opportunity. Short term opportunities (for rapid restoration success) are limited primarily to areas where eelgrass propagules are needed to establish beds or habitat conditions can be improved rapidly (such as removal of structures that block light). Projects that improve habitat conditions through water quality improvement or nearshore process restoration generally require long time frames, both for project implementation and subsequent bed establishment. Stakeholder motivation and interest will have the greatest influence on development and implementation of eelgrass restoration over specified timeframes.

c. Conceptual model part 2: information on strategies and actions (and implementers) expected to have the most direct and timely effect on changing the conditions/achieving the targets

Given the diversity of eelgrass stressors in Puget Sound, the preferred approach is to pursue multiple strategies concurrently. Strategies are needed that explicitly address both protection and restoration. Examples of specific management actions that will contribute to achieving the target include enforcement of Hydraulic Project Code provisions that protect eelgrass, adding specific eelgrass protective measures to DNR leases through implementation of an Aquatic Lands Habitat Conservation Plan, and strengthening eelgrass protection in local Shoreline Master Plans. Supporting technical work should include habitat suitability modeling in concert with transplanting, and synthesizing available information on success of management actions from Puget Sound and other regions.

d. Scientific review: How has/can information be reviewed/vetted?

Much of the information reported here was drawn from a science report DNR prepared to support the target-setting process for eelgrass (Dowty et al. 2010). This report passed through an anonymous peer review process that was refereed by the chair of the Partnership's Science Panel, Tim Quinn. DNR provided a list of potential reviewers for that report and the same list could be considered for review of summaries provided in this document.