

Action Agenda Questions

1. What is the current status of Puget Sound?
What are the biggest threats to it?
2. What is a healthy Puget Sound?
3. What actions must we take to move from where we are today toward a healthy Puget Sound?
4. Where should we start?

Status and Threats Analysis

- Purpose: Inform strategies for the Action Agenda
- NOAA Fisheries Initiated
 - Part of longer-term Integrated Ecosystem Assessment
 - Steering committee, expert review workshop

Status and Threats Analysis

Qualitative synthesis now; moving to quantitative over time. Given existing information, we are:

- 1) Estimating the current status of each of the ecosystem goals
- 2) Conducting a threats assessment to determine degree of threats facing each goal

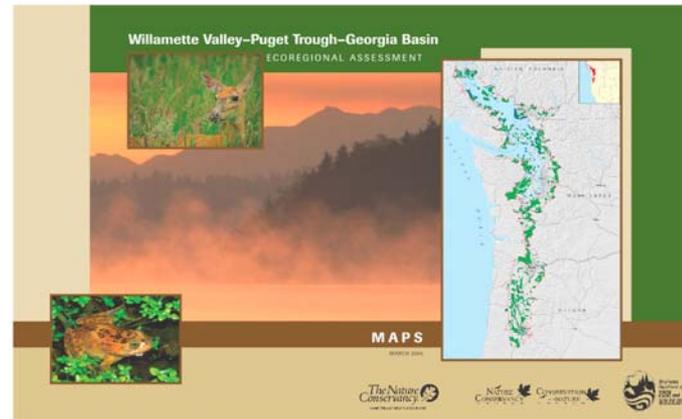
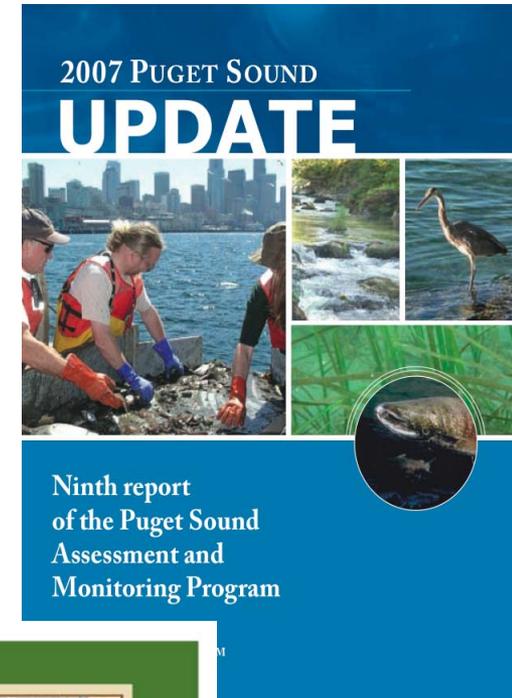
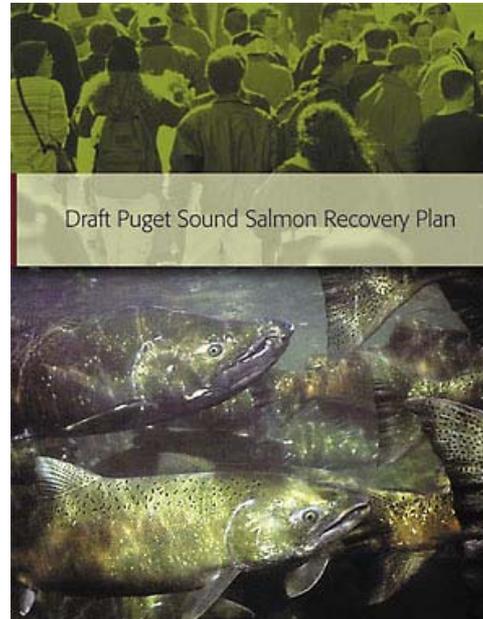
6 ecosystem goals by 2020

- Healthy people supported by healthy Puget Sound
- Quality of human life sustained by a healthy Puget Sound
- Puget Sound species and the web of life thrive
- Puget Sound habitat is protected and restored
- Puget Sound rivers and streams flowing at levels that support people, fish and wildlife and the environment
- Puget Sound marine and freshwater are clean



Sources for qualitative risk analysis

- Existing sound-wide assessments
 - Upland
 - Marine
- Simple spatial analyses



Overview of Methods

- Amass and summarize status and threats information from existing assessments
- Agree on common set of status, threats definitions and risk categories (e.g., H, M, L)
- Present summary results in table and map form
- Initial work guided by steering committee; peer-review of first draft (and subsequent syntheses) by broader scientific community

Notes about Slide Examples

- These results are draft—will be more refined in March
- Examples of what current Sound-wide data show
- Will be gaps in knowledge
- Need to figure out ways to roll up and show data across goals and within action areas
- Not all information on local conditions is represented (Our work here today)

Summarizing status

| Ecosystem component | Status Indicators |
|----------------------------|---|
| Species/food web | Shorebird & seabird colonies, salmon, herring, intertidal species richness |
| Habitat | Eelgrass, upland forests, riparian forests, mudflat/saltmarsh, lowland headwaters |
| Water quality | Water quality index and 6 sub-components |
| Water quantity | <i>NA for today</i> |
| Human health | Shellfish bed pollution |
| Human well being | Landscape value, catch of marine species |

Species / Food Web Status

Draft February 20, 2008



Shorebird Colonies

H = 0; M = 0.4; L = 0.67

These numbers represent the proportion of colonies with 'good' status within each action area. (source: TNC WPG ecoregional assessment)



Seabird Colonies

H = 0; M = 0.14, 0.2, 0.25; L = N/A

These numbers represent the proportion of colonies with 'good' status within each action area. (source: TNC WPG ecoregional assessment)



Chinook Salmon

H = n/a; M = n/a; L = n/a

These H, M, L values represent the status (based on abundance and productivity) of the primary chinook salmon populations spawning or rearing in rivers and marine waters in each Action Area. (source: PS TRT and NWFSC)



Herring Spawning

H = >30%; M = 6-30%; L = <6% of total area used by herring in Puget Sound. These H, M, L values represent the relative size of the area used by herring for spawning and holding within each Action Area. (Source: PS Update 2007)



Intertidal Species Richness

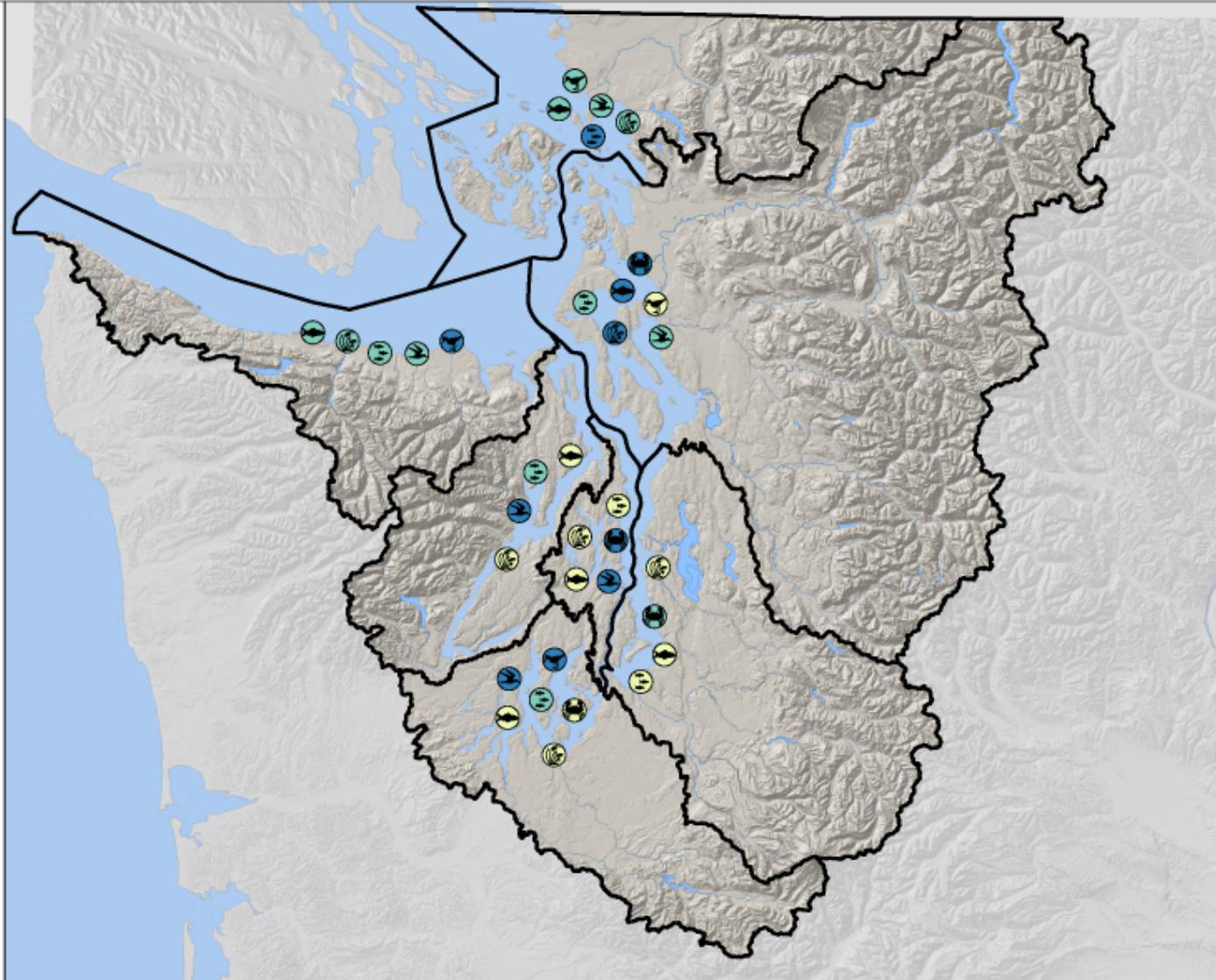
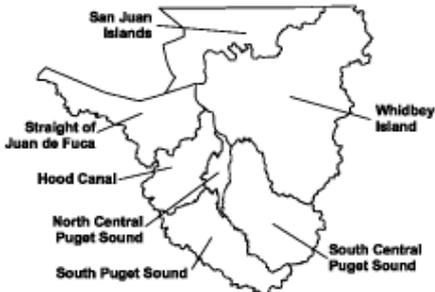
H = >50; M = 35-50; L = <35

These H, M, L values represent the average intertidal species richness (i.e., diversity) values across 3-18 sites within each Action Area. (source: PS Update 2007).

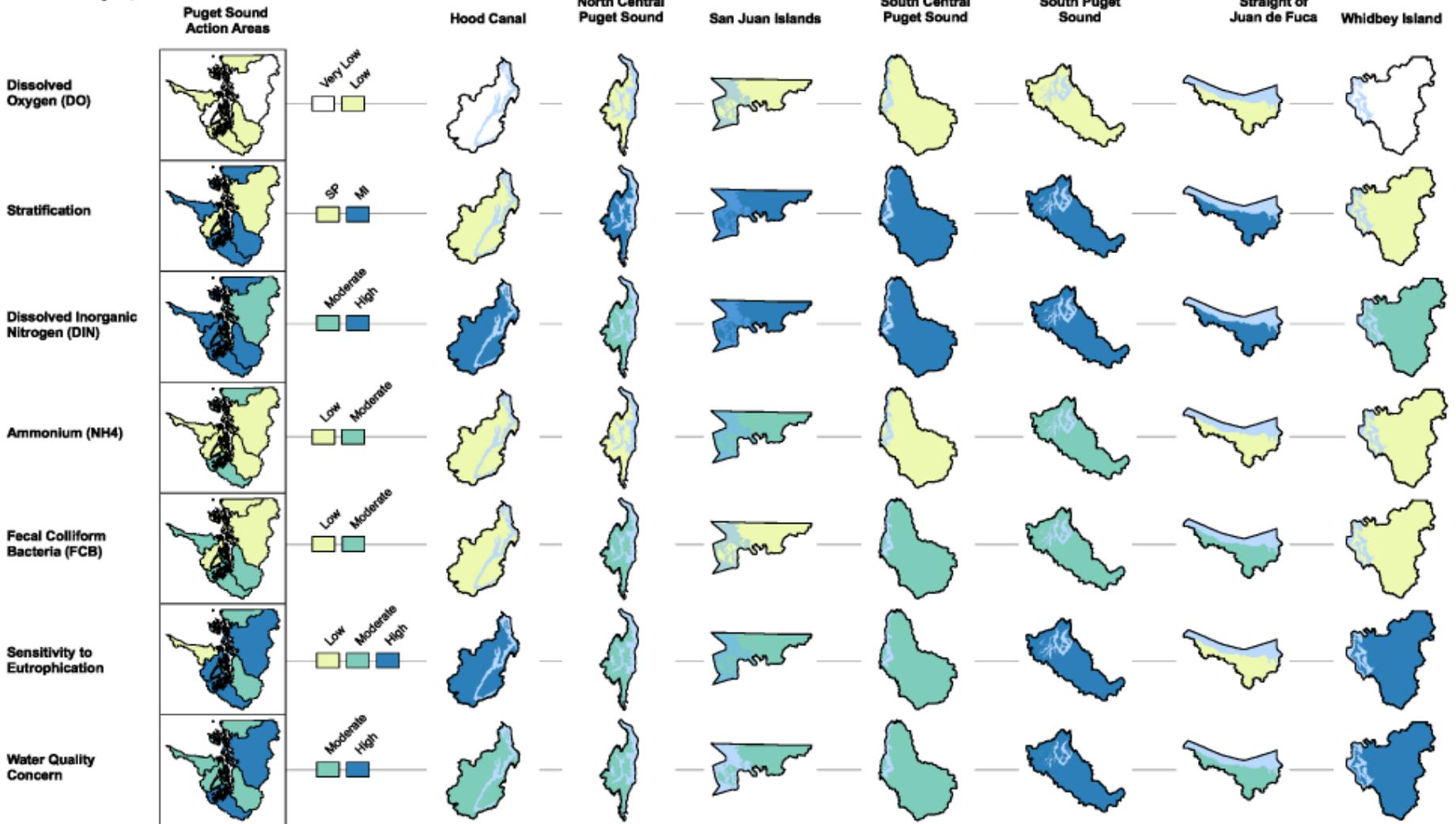


Eelgrass Area

H = >100,000 km²; M = 20,000 - 100,000 Km²; L = 2,000-20,000 km² eelgrass



Water Quality Status
Draft February 20, 2008



Puget Sound Risk Assessment

February 20, 2008

Summarizing threats

| Threat type | Threat Indicators |
|-----------------------------|--|
| Habitat alterations | Shoreline modification, forest cover, overwater structures, impervious surfaces, shoreline ownership |
| Surface/groundwater impacts | <i>NA for today</i> |
| Pollution | Hazardous waste generators |
| Captive breeding | Salmon hatchery releases |
| Harvest | Marine harvest |
| Species invasion | NA for today |
| Natural drivers | <i>NA for today</i> |

**Change in Forest Cover Threat
Subwatershed Scale (HUC 6)
Draft February 20, 2008**

Percentage of land with lost canopy.

Hood Canal

High ■ -10.87% - -4.09%
 Moderate ■ -4.08% - 0.88%
 Low ■ 0.89% - 6.74%

North Central Puget Sound

High ■ -3.04%
 Moderate ■ -3.03% - -1.02%
 Low ■ -1.01% - 0.39%

San Juan Islands

High ■ -10.66% - -3.56%
 Moderate ■ -3.55% - 0.4%
 Low ■ 0.41% - 3.99%

South Central Puget Sound

High ■ -16.22% - -7.3%
 Moderate ■ -7.29% - -0.68%
 Low ■ -0.67% - 5.61%

South Puget Sound

High ■ -11.51% - -3.83%
 Moderate ■ -3.82% - 2.18%
 Low ■ 2.19% - 12.52%

Straight of Juan de Fuca

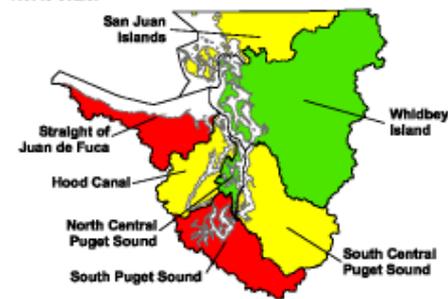
High ■ -24.83% - -13.98%
 Moderate ■ -13.97% - -2.92%
 Low ■ -2.91% - 11.86%

Whidbey Island

High ■ -19.62% - -6.26%
 Moderate ■ -5.2% - 1.68%
 Low ■ 1.97% - 7.73%

**Change in Forest Cover Threat
Action Areas**

Not to scale.



High ■ >3%
 Moderate ■ 1-3%
 Low ■ < or = 1%



Threat summaries by Action Area

| Threat/ Action Area | Strait | San Juan | Hood Canal | Whidbey | N. Central | S. Central | SPS |
|---------------------------|------------|-------------|---------------|---------|---------------|---------------|--------|
| Habitat alteration | Dark Green | Light Green | Yellow | Yellow | Yellow | Red | Orange |
| Surface/ gr-water | White | White | White | White | White | White | White |
| Pollution | Dark Green | Yellow | Dark Green | Yellow | Yellow | Red | Yellow |
| Captive breeding | Yellow | Dark Green | Red | Yellow | Dark Green | Red | Yellow |
| Harvest | Dark Green | Orange | Yellow | Orange | Orange | Dark Green | Orange |
| Invasive species | White | White | White | White | White | White | White |
| Natural drivers | White | White | White | White | White | White | White |

This matrix is based on preliminary data.

How do we link status with threats?

Conceptual models



KEY ECOSYSTEM COMPONENTS/SERVICES

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Estuaries support high primary production and provide important habitat for fish and other aquatic species (refs).
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Estuaries regulate flooding and improve water quality (refs).
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Shorelines provide important habitat for marine plants and animals, as well as aesthetic and recreational opportunities for humans (refs). Shorelines also represent an important transition zone between upland/terrestrial habitats and nearshore marine habitats; regulating transfer of organic and inorganic matter both upstream and downstream (refs).
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Marine ecosystems support high primary productivity and species abundance, as well as managed aquaculture, commercial and recreational harvests (refs). Marine systems also provide aesthetic and recreational opportunities (refs).

MAJOR THREATS/DRIVERS

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Invasive species; development; point and non-point sources of water pollution (e.g., from agriculture, stormwater, septic systems, etc.; sea level rise (refs).
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Floodplain conversion to industrial, commercial, urban, and agricultural land uses results in changed hydrology and degraded habitat and water quality conditions. (refs).
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Shoreline armoring and structures; shoreline development; stormwater and other discharges; unmanaged shoreline recreation, natural disturbance regimes (i.e., extreme weather events) (refs).
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Invasive species; spills and discharges; channel dredging and boat operation; natural disturbance regimes (i.e., extreme weather events) (refs).

MANAGEMENT PRIORITIES

Using the status and threats analysis to identify priority actions

- Combine Sound-wide analysis with:
 - information from local assessments
 - conceptual models of likely cause-effect
 - summaries of certainty of actions from topic forums
 - inventory of existing/missing actions
- Build logic to set criteria for identifying priority strategies
 - impaired vs. intact?
 - key threats?
 - existing/missing actions?
 - certainty of actions?
 - Others?

Why are we here today?

- What local assessments exist that can add to the weight of evidence (from Sound-wide risk analysis, information on certainty of actions, etc.) in building a case for priority strategies?
- How does your local experience compare to this Sound-wide assessment?
- Begin establishing criteria to determine Action Agenda priorities

Local assessments

Six Ecosystem Goals by 2020

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