

SHORELINE MASTER PROGRAM INVENTORY & CHARACTERIZATION

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Inventory & characterization

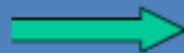
- Foundation for SMP!
 - ▣ Tells you what's on the shoreline
 - ▣ Identifies ecosystem processes & functions
 - ▣ Identifies potential sites for restoration, protection and public access
 - ▣ Guides development of strategy leading to policies, regulations & environment designations
 - ▣ Sets baseline for cumulative impacts analysis

Inventory & characterization

- Goal of the I and C is to create a snapshot of current ecological functions
 - ▣ Functions means the work performed by the physical, chemical, and biological processes at the shoreline
 - ▣ Creates and maintains the aquatic and terrestrial environment
 - ▣ Together constitutes the shoreline's ecosystem
- The condition against which No Net Loss is measured or modeled

Inventory and Characterization

Provide supporting information for environment designations



Environment designations

Establish baseline for "no net loss" of ecological conditions



Policies, Regulations, Mitigation standards

Identify opportunities for protection, improving public access, supporting water-dependent uses

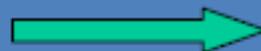


Identify piecemeal development causing harm to shorelines



Cumulative impacts analysis

Identify degraded areas & opportunities for restoration



Restoration plan



Developing the inventory

- 1) Scope out the issues
- 2) Identify appropriate data sources
- 3) Gather data & information
- 4) Prepare maps
- 5) Prepare report



Spokane River, Spokane County

Inventory - scoping

- Intent of scoping – focus on relevant issues & data
- Identify shoreline issues & opportunities
 - ▣ What do you already know?
 - ▣ Look at local and WRIA plans, Federal permits, NWI etc.
 - ▣ What are your shoreline management issues?
 - Storm runoff, flooding
 - Loss of riparian vegetation
 - Public access
 - Archaeological and Historical

Inventory – data sources

- Identify data & information sources
 - ▣ To understand the issues, develop questions
 - ▣ Link questions to data & information sources
 - ▣ Information should be relevant to issues
 - For example, lake shorelines – no need to list CMZ hazards
 - ▣ Create list of data sources and data gaps for Ecology review

Developing the inventory

- Link issues and questions to data source

Issue	Question	Data Source
Flooding of lake shoreline residences	What is the primary cause of flooding?	Basin Plan and WDFW beaver management plans



Inventory – Mapping

Built Environment

- Areas of **special interest** (e.g., toxic/hazardous waste sites, associated wetlands, eroding shorelines, redevelopment areas).
- Land and shoreline **ownership, hydropower** influenced areas.
- Pertinent **plans** and regulations: zoning, comprehensive planning, revitalization plans, historic districts, etc.
- **Public areas**: parks, open spaces, trails (existing and proposed), existing and potential public access sites.
- Shoreline **modifications** (bulkheads, docks, dikes, etc.).
- **Shoreline uses**: residential, commercial, industrial, ports, water-oriented, non-water-oriented uses.
- **Transportation** and **utility** systems.

Inventory – Mapping



Environmental

- Shorelines of statewide significance
- Significant **natural resources**: vegetation, topography, etc.
- **Degraded** areas
- Drainage or **hydrological systems**, flood protection, irrigation, etc
- **Critical areas**, especially wetlands
- **Channel migration zones** and **floodplains**

Inventory – Mapping

Other

- Archeological and historical sites and **cultural resources**.
- Past and current aerial photos of areas of **rapid change**

Spokane Valley
1946



Spokane Valley
1972

Inventory – Example of Issues and Questions

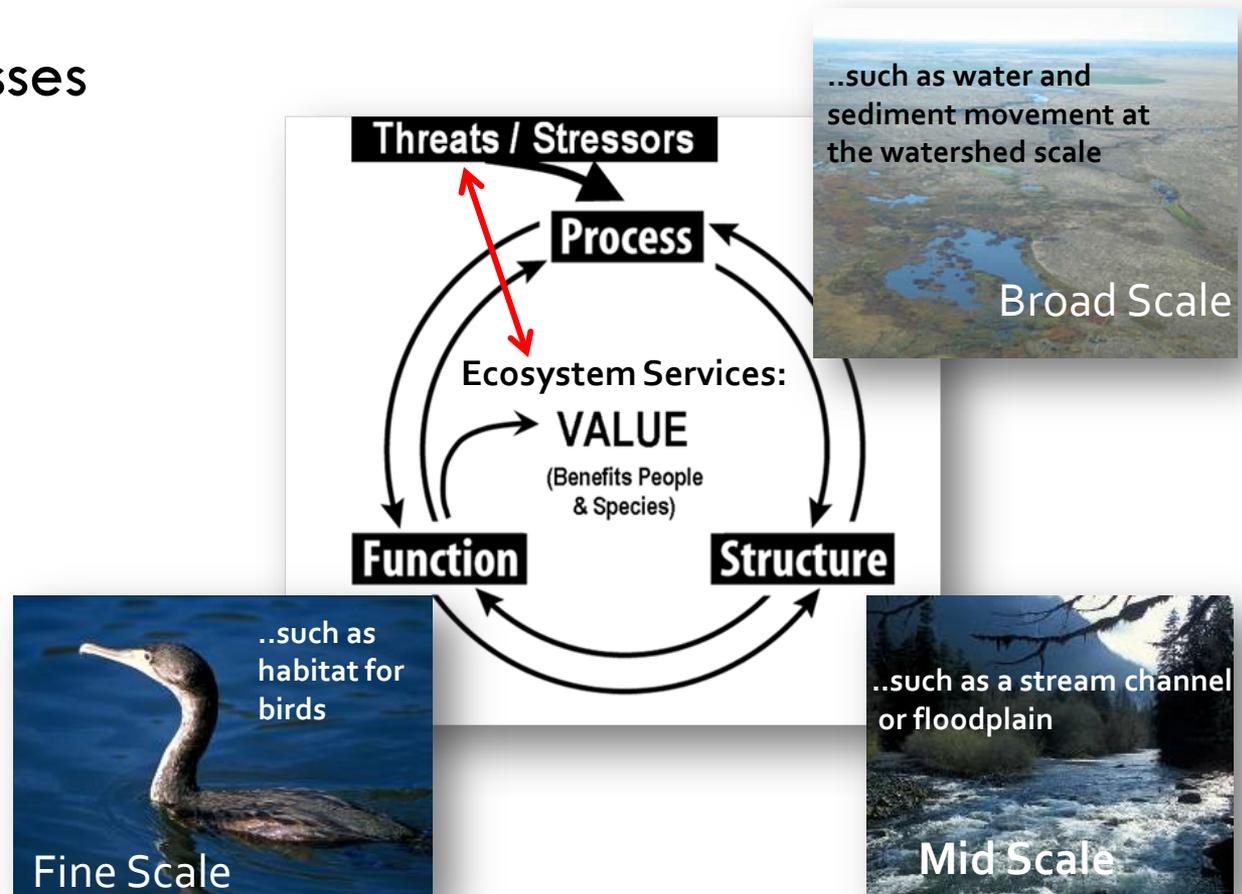
Table 7-2 Shoreline issues and data-related questions

Issue	Questions
Beach erosion	Has the source of the sediment supply to the beach been changed? Have bulkheads reduced the movement of sediment to the beach?
Flooding	What are the storm runoff processes? What are potential land management impacts to storm runoff processes in the watershed? Are floods increasing in magnitude and frequency? Have depressional wetlands been filled or altered?
Channel movement	Are there potential hazards such as avulsion, erosion or flooding due to channel migration?

Characterizing Ecosystem Processes - Purpose

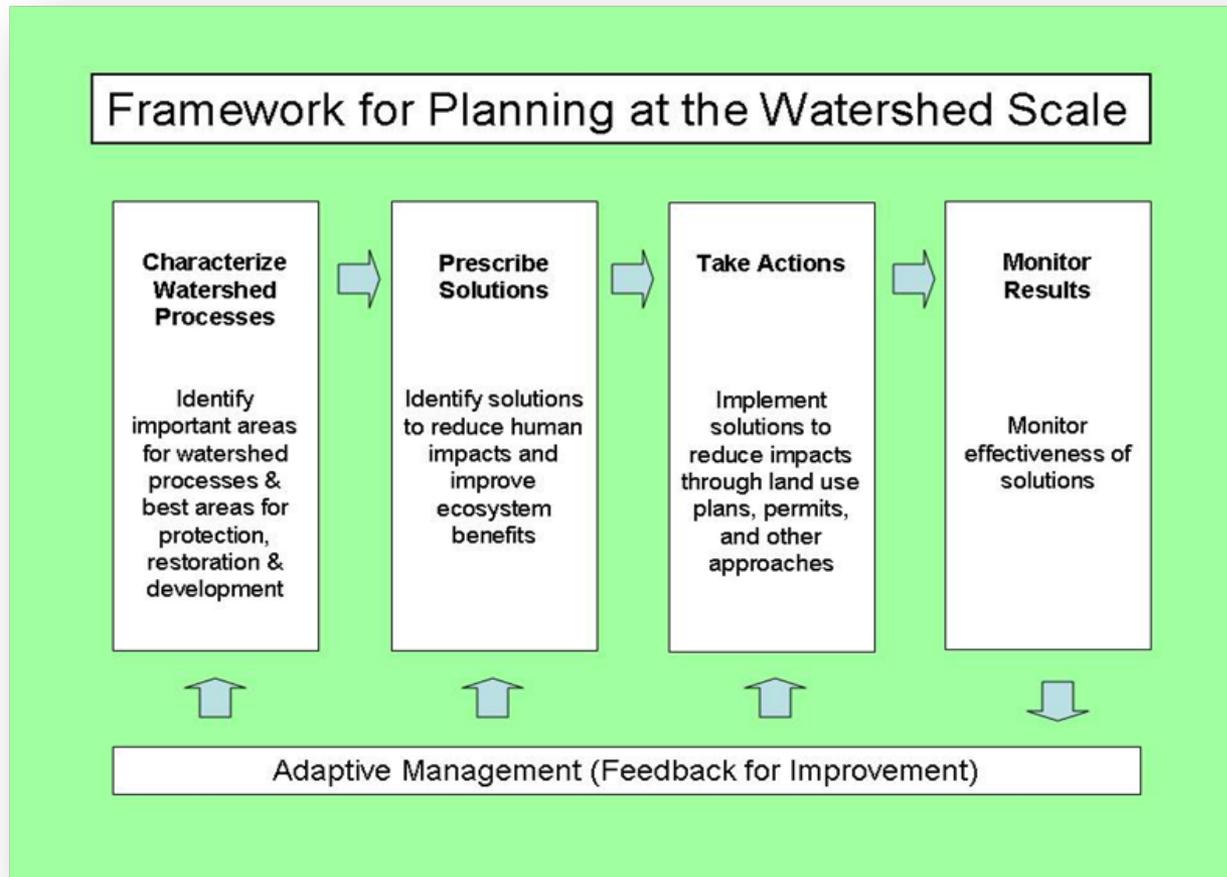
□ Ecosystem Processes Drive Reach & Site Scale:

- Shoreline Processes
- Structure
- Function



Inventory & Characterization

- Information on ecosystem processes and finer scale information helps inform SMP plan development



Characterization - analysis

- Use inventory information to help answer questions related to specific issues
 - ▣ Establish the relationship between processes and functions
 - ▣ Identify impairments to processes and functions
 - Briefly discuss historical impacts, if relevant
 - If needed, relate geology to shoreline issues
 - Identify changes to functions for fish, wildlife, water quality, and public access

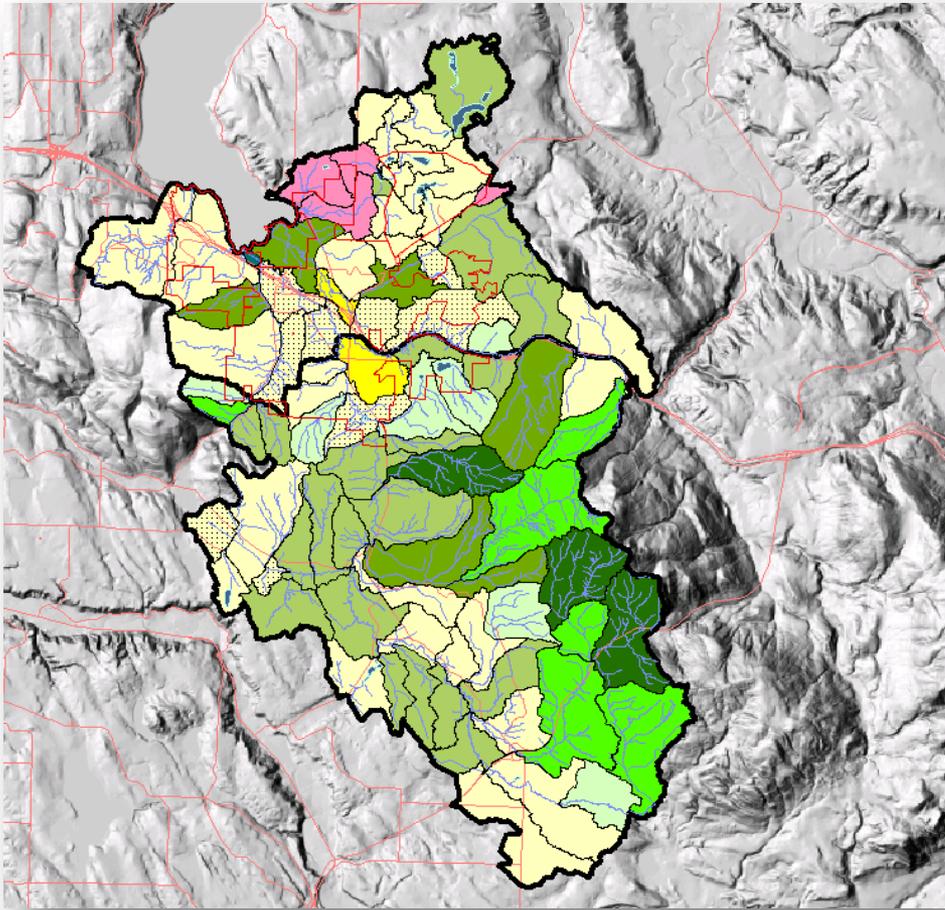
Characterization - solutions

- Develop preliminary recommendations for shoreline management
 - ▣ What are appropriate types and intensity of development?
 - ▣ What are the best areas for restoration and protection?
 - ▣ What types of mitigation are needed in certain shoreline areas?

Conducting the characterization

- 1) Determine shoreline reaches and contributing watersheds
- 2) Conduct analysis to characterize processes and functions
- 3) Prepare inventory and characterization report
 - Have mercy! Most of the inventory and analysis can be placed in tables.

Characterization - watersheds



- Determine what watersheds directly influence the shoreline
 - ▣ Check local watershed or WRIA plans
 - ▣ Hydraulic Unit Codes (HUCs)

Characterization - reaches

- Determine shoreline reaches
 - ▣ Use maps and aerial photos
 - ▣ Consider physical & biological changes – gradient, confinement, vegetation, land use
 - ▣ Classify shoreline types – flood scour lakes, unstable bluffs, industrial use, fluctuating reservoir, etc.
- http://www.ecy.wa.gov/programs/sea/sma/st_guide/SMP/inven_analysis/analysis/eco_functions/shore_types.html

Characterization - reaches



Conducting the Inventory & characterization

- Use analysis template to address reach issues – Chapter 7, Table 7-4

Shoreline Issue Reach X	How have ecosystem processes been changed relative to issue?	Solution	Solutions and Actions: Recommended protection & restoration measures and environment designations
<p>High sediment delivery to shoreline. Building of delta – affecting public access to dock and habitat functions.</p>	<p>Sediment Processes have been impaired within the shoreline</p>	<p>Requires additional analysis. Use characterization results and other reports to determine source of sediment and transport mechanism</p>	<p>Not determined</p>

DOE “No Net Loss” Indicators can help with your analysis at the reach scale

POTENTIAL NO NET LOSS INDICATORS for SHORELINE MASTER PROGRAMS

Indicator (all in shoreline jurisdiction)	Functions affected - key categories - water quality, water quantity and habitat	Type of Impairment**	Limitations of indicator	Where	Is data available or reasonable to obtain
Forest cover: Acres converted from forest land to other land uses.	Water quality-sediment, nutrients & toxic filtration, conversion, and/or retention; temperature regulation. Water quantity-flow regulation. Habitat-structure for habitat life needs; input of organics & LWM*.	Reduces forest buffers and decreases filtering, conversion, and/or retention of pollutants from surface & subsurface flow; increases quantity of pollutants to aquatic habitats. Alters the delivery and timing of water to aquatic areas, increasing quantity of water delivered to aquatic habitats during high and low flows, which affects habitat structures. Increases water temperature. Loss of nesting sites, rearing, refuge & foraging areas.	Doesn't identify future land use. May be difficult to determine acres in shoreline jurisdiction without finer scale analysis.	Rural.***	Details of application available from DNR and local government. Class IV forest practice applications. CCAP data.
Shoreline stabilization: Linear length or area of bulkheads, revetments, bioengineering, seawalls, groins, retaining walls, gabions. (Includes decrease in length, change to soft structure.)	Habitat-Riparian and aquatic habitat, sediment supply. Input of organics, prey base, & LWM. Structure for habitat life needs.	Interrupts habitat-forming processes, such as beaches & channel migration, by impacting sediment supply and transport. Loss of nesting sites, rearing, refuge & foraging areas. Loss of prey base with associated loss of riparian vegetation.	Combines different types of stabilization measures into one general category; impacts may vary.	Rural, urban.	Is data available from local government, including permits & SDP exempt projects? Can locals track over time? HPA information can supplement other data, but is not sufficient on its own. Detailed aerial photos may also show stabilization changes.
Marine & freshwater riparian vegetation: Linear measurement of mature native riparian vegetation of a given width (buffer width) or percent cover of different vegetation classes.	Water quality-sediment, phosphorus & toxic filtration, conversion, and/or retention; temperature regulation. Water quantity-flow regulation. Habitat-input of organics, prey base, & LWM. Structure for habitat life needs.	Removes capacity of riparian vegetation to filter surface flows, sediment, phosphorous and toxics; subsurface removal/conversion of nitrogen, pathogens. Increases overland and subsurface flows. Increases water temperature. Reduces prey base. Loss of LWM that provides instream	No permit, so no record of change. Focused project needed to track. Useful only if a baseline exists. Methodology needs to be able to measure change. May be difficult to measure over short time frame.	Rural, urban.	Can locals measure and track? Use sample areas, aerial photos. Puget Sound LIDAR consortium has some data.

Conducting the Inventory & Characterization

Shoreline Issue Reach X	How have ecosystem processes been changed relative to issue?	Solution	Solutions and Actions: Recommended protection & restoration measures and environment designations
<p>High sediment delivery to shoreline. Building of delta – affecting public access to dock and habitat functions. Loss of salmon spawning habitat.</p>	<p>Erosion and Bedload Transport. Sources of sediment in upper watershed</p>	<p>Stormwater Retrofit – Route runoff from impervious surfaces to rain gardens, infiltration galleries and detention ponds. Detention ponds necessary on golf course. Limit development on outwash deposits adjacent to steep slopes.</p>	<p>Provisions in SMP for stormwater mitigation fee. Develop new standards for stormwater retrofit. New BMPs and larger buffers elsewhere.</p> <p>High Priority for restoration – Year round flows.</p>

Preparing the report

- Inventory and characterization report includes:
 - ▣ Inventory information (maps depicting jurisdiction, reaches, CMZ, critical areas, restoration opportunity)
 - ▣ Ecosystem characterization (type and extent of alteration)
 - ▣ Shoreline functions
 - ▣ Shoreline use analysis
 - ▣ Public access opportunities
- Should be useful for making decisions
- Tables encouraged (template Table 7-4 in handbook)

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