

# SHORELINE MASTER PROGRAM INVENTORY ANALYSIS & CHARACTERIZATION

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# Inventory, Analysis & 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

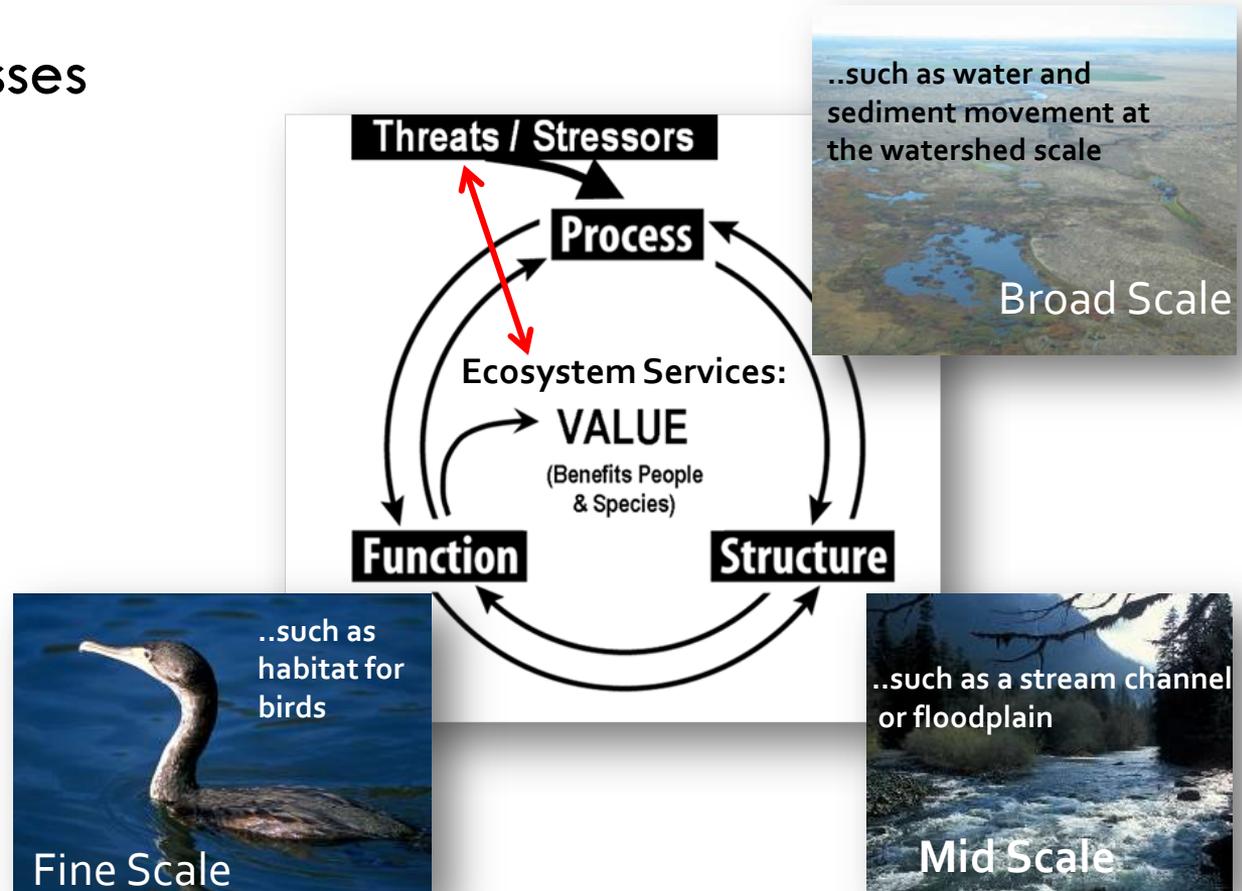
# Inventory, Analysis & Characterization

- 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
    - Hydrology, Water Quality, Habitat
  - ▣ 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

# Characterizing Ecosystem Processes - Purpose

## □ Ecosystem Processes Drive Reach & Site Scale:

- Shoreline Processes
- Structure
- Function

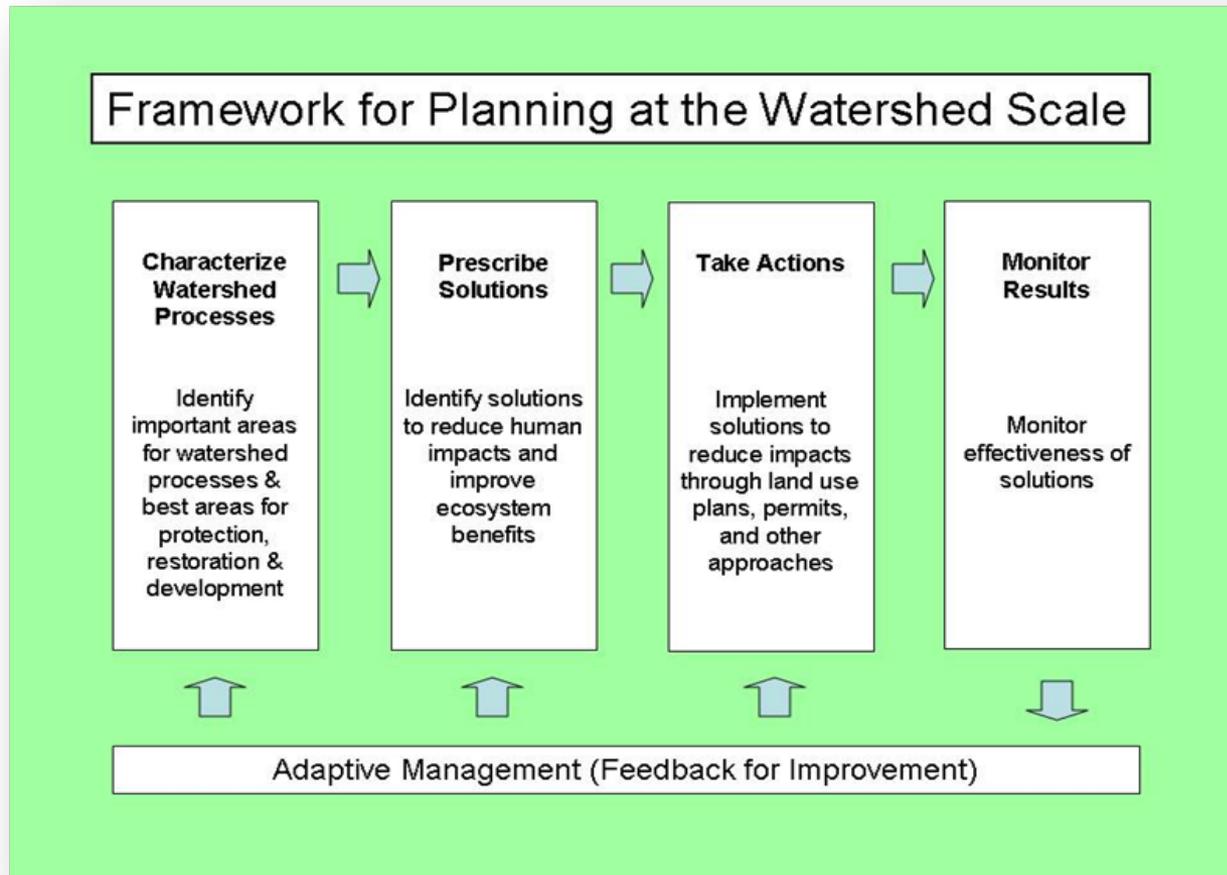


# Characterizing Ecosystem Processes

Ecosystem-wide Process	Ecological Function Group	Ecological Service
Hydrologic – movement of surface and subsurface water	Water Quantity Function	Storage of water in floodplains and associated wetlands
Movement of sediment, toxics, and nutrients	Water Quality Function	Removal of sediment, toxics, nutrients and pathogens (wetlands and floodplains)
Movement of water, sediment, and debris	Habitat Functions	Aquatic habitat for fish, amphibians, and invertebrates

# Inventory Analysis & Characterization

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



# 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
  - ▣ Look at local and WRIA plans, Shoreline Permits, 404 permits, NWI etc.
  - ▣ What do you already know?
  - ▣ What are your shoreline management issues?
    - Storm runoff, flooding
    - Loss of riparian vegetation
    - CMZ
    - Public access

# 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, if the jurisdiction has no ESA salmonids do not expend budget on historic distribution
  - ▣ Create list of data sources and data gaps for Ecology review

# 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

## Natural Environment

- Shorelines of **statewide significance (SSWS)**
- Significant **natural resources**: vegetation, topography, etc.
- **Degraded** areas
- Drainage or **hydrological systems**, flood protection, irrigation, etc
- **Critical Areas**, especially wetlands and F&W PHS mapping
- **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**



# 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?	Watershed Plan and WDFW beaver management plans



# Inventory – Example Issues and Questions

**Table 7.2**

## **Shoreline Issues & Data Related Questions**

Public access

Are there extensive stretches of the shoreline without public access? Are new public access sites planned in park plans or other documents?

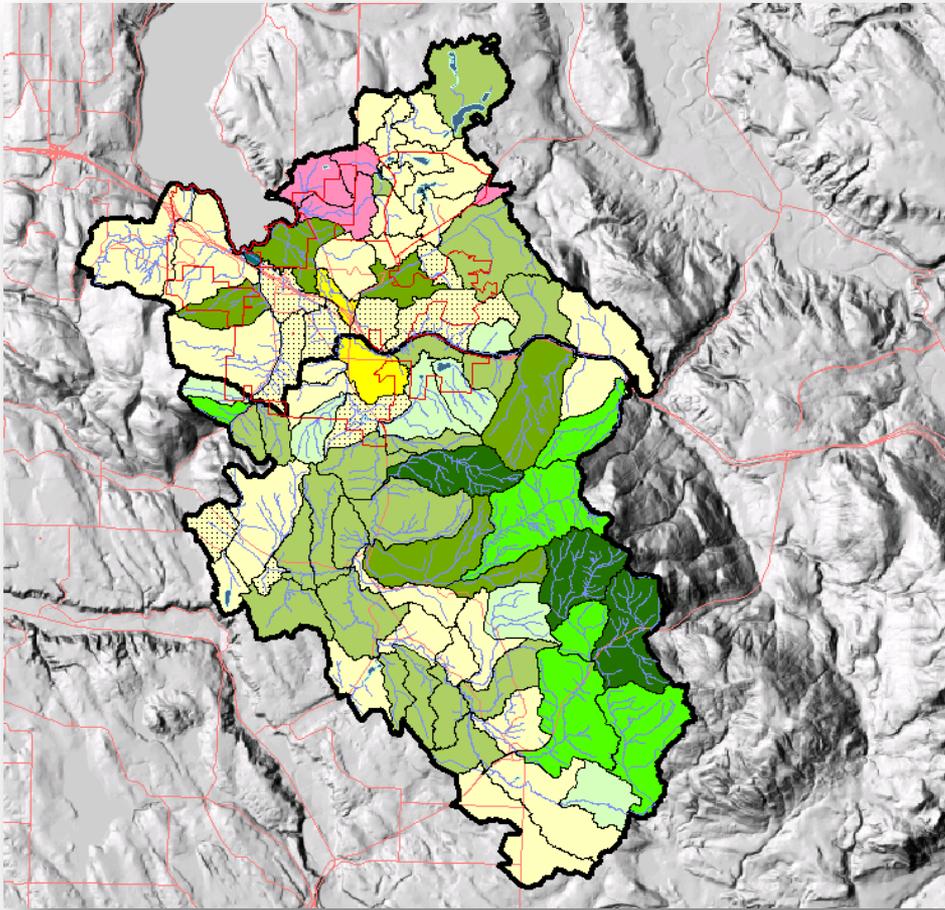
Current Shoreline Use

Are there small, platted and undeveloped shoreline lots? Are property owners proposing redevelopment of lots with small cabins? Do use conflicts exist, e.g. residential/aquaculture; public access and industry; recreational moorage and fishing fleets.

Loss of upland/riparian habitat

Is riparian vegetation that provides ecological functions, including habitat for aquatic and terrestrial species in place or missing?

# Characterization - watersheds

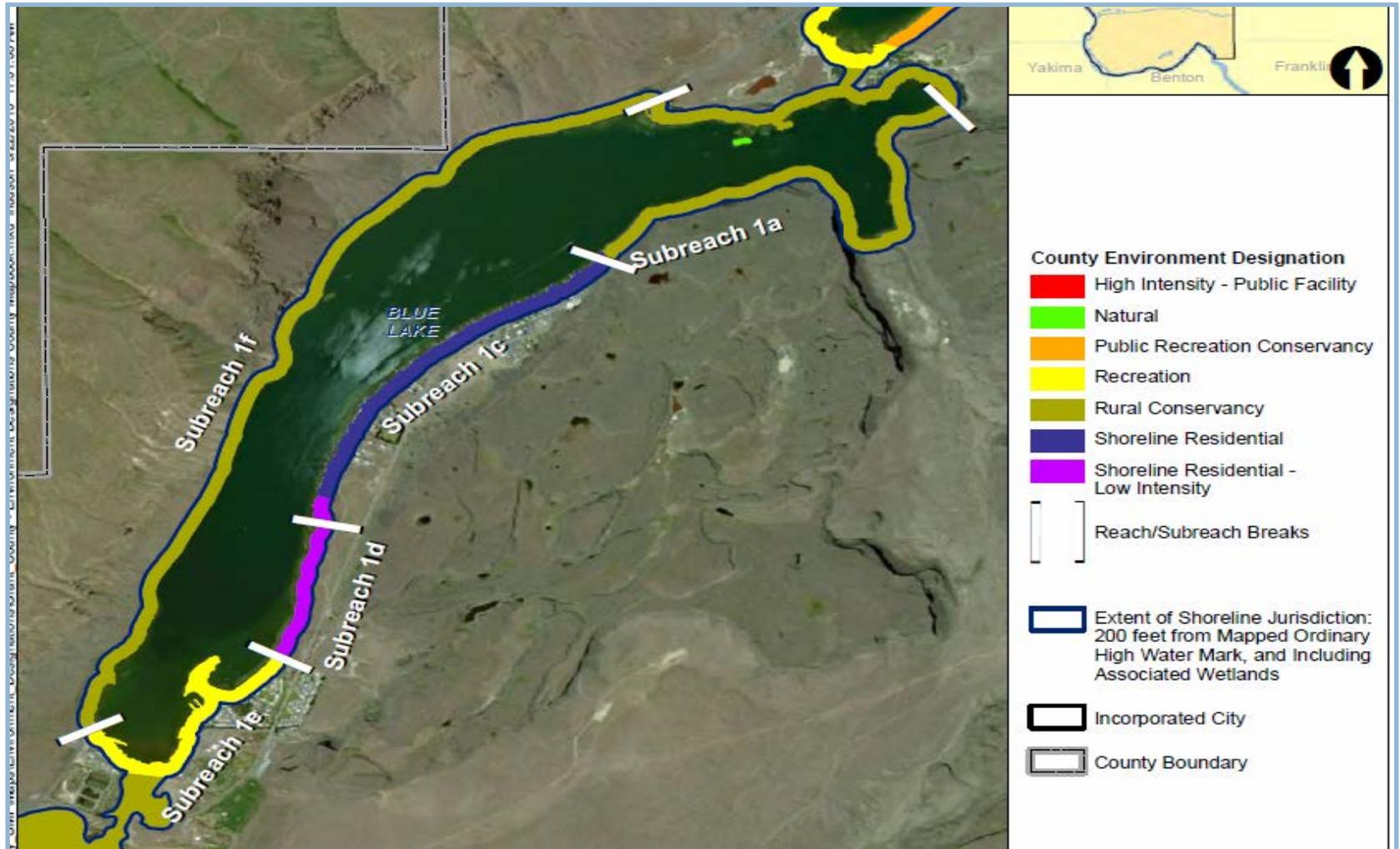


- Determine what watersheds directly influence the shoreline
  - ▣ Check local watershed or WRIA plans
  - ▣ Hydraulic Unit Codes (HUCs)

# Characterization - reaches

- Determine shoreline reaches
  - ▣ Use maps and aerial photos
  - ▣ Consider physical & biological changes – gradient, confinement, vegetation, land use
  - ▣ Serve as a basis for Environment Designations

# Characterization - reaches



# 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 Inventory & characterization

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

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

# Ecology “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: <u>Linear length</u> 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: <u>Linear measurement</u> of mature native riparian vegetation of a given width (buffer width) or <u>percent cover</u> 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.

# 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)

QUESTIONS?  
COMMENTS?  
CONCERNS?

