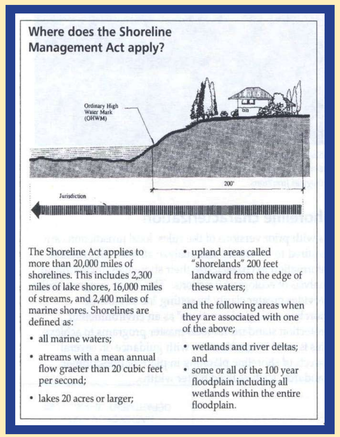
Shoreline Master Program Update

Key Concepts of the State's Shoreline Management Act

- Encourage water-dependent uses (e.g. marina)
- Protect shoreline natural resources
- Promote public access

Where Does the Shoreline Master Program Apply?

The Shoreline Master Program (SMP) applies to Lake Washington, land within 200 feet of Lake Washington's ordinary high water mark, and within wetlands connected to Juanita Bay and Yarrow Bay.



Where does the Shoreline Management Act apply?

Ordinary High Water Mark (OHWM)

200'

Jurisdiction

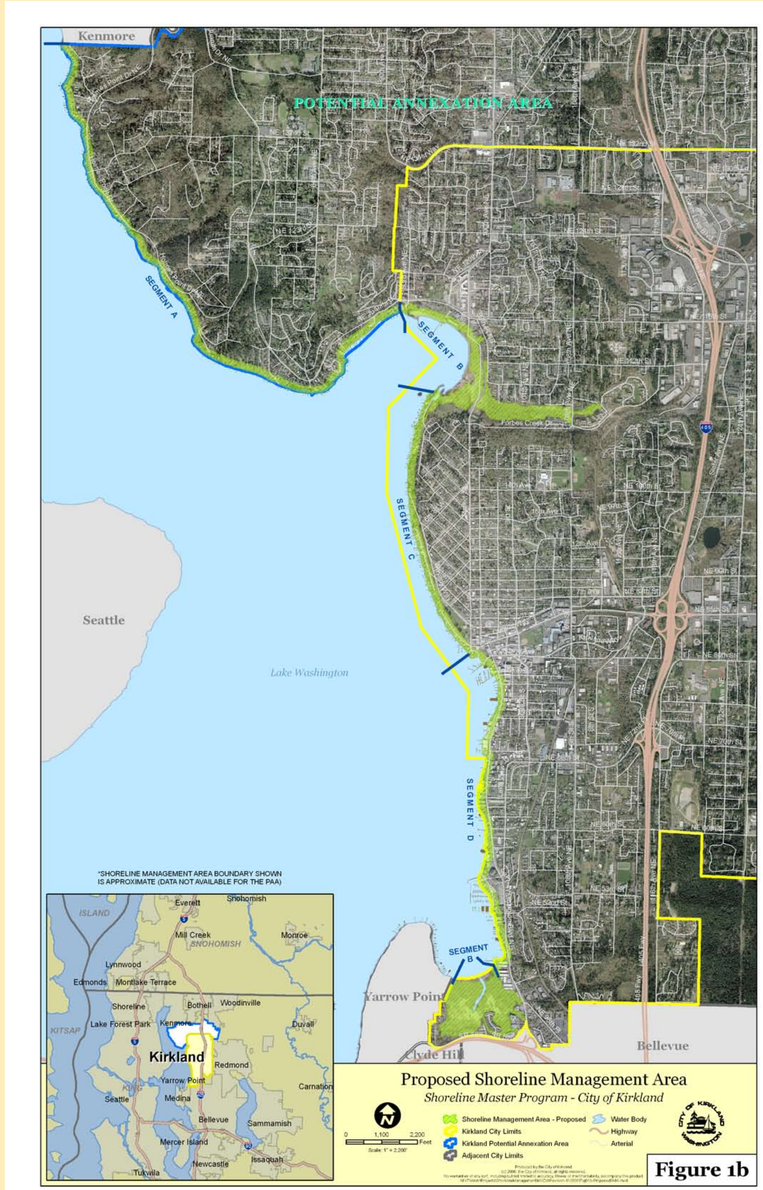
The Shoreline Act applies to more than 20,000 miles of shorelines. This includes 2,300 miles of lake shores, 16,000 miles of streams, and 2,400 miles of marine shores. Shorelines are defined as:

- all marine waters;
- atreams with a mean annual flow graeter than 20 cubic feet per second;
- lakes 20 acres or larger;
- upland areas called "shorelands" 200 feet landward from the edge of these waters;

and the following areas when they are associated with one of the above;

- wetlands and river deltas; and
- some or all of the 100 year floodplain including all wetlands within the entire floodplain.

Source: Department of Ecology



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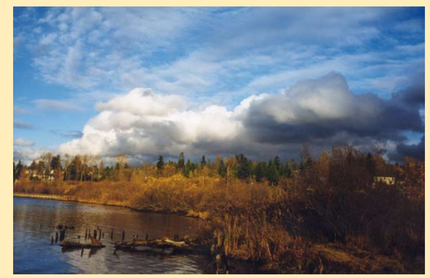
SHORELINE ECOLOGICAL FUNCTION

Limiting habitat factors and impacts on Lake Washington

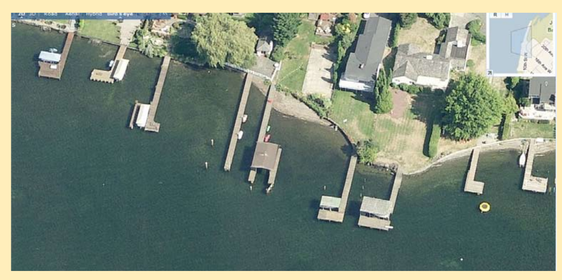
- The riparian shoreline of Lake Washington is highly altered from its historic state. Current and future land use practices all but eliminate the possibility of the shoreline to function as a natural shoreline to benefit salmonids;
- Introduced plant and animal species have altered trophic interactions between native animal species;
- The known historic practices and discharges into Lake Washington have contributed to the contamination of bottom sediments at specific locations;
- The presence of extensive numbers of docks, piers and bulkheads have highly altered the shoreline; and
- Riparian habitats are generally non-functional.

Source: Kervin, J. 2001. Salmon and steelhead habitat limiting factors report for the Cedar-Sammamish Basin (Water Resource Inventory Area 8.) Washington Conservation Commission. Olympia, WA

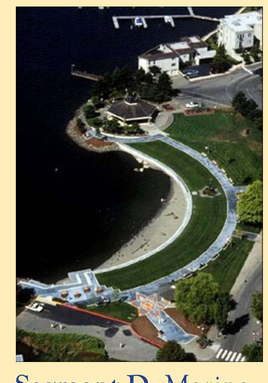
Kirkland Shoreline Ecological Function Scorecard		
Segment	Grade	Key Areas Needing Improvement
B Juanita Bay and Yarrow Bay Wetlands	High/Good	Improvements to fish passage and to mouth of Juanita Creek Improvements to overwater boardwalk at Juanita Beach Park Removal of invasive species
C Residential	Low/Poor	Improvements to nearshore vegetative cover Reduction or modification of shoreline armoring Reduction of overwater cover and in-water structures Reduction in impervious surface coverage
D Urban	Low/Poor	Improvements to nearshore vegetative cover Reduction or modification of shoreline armoring Reduction of overwater cover and in-water structures Reduction in impervious surface coverage



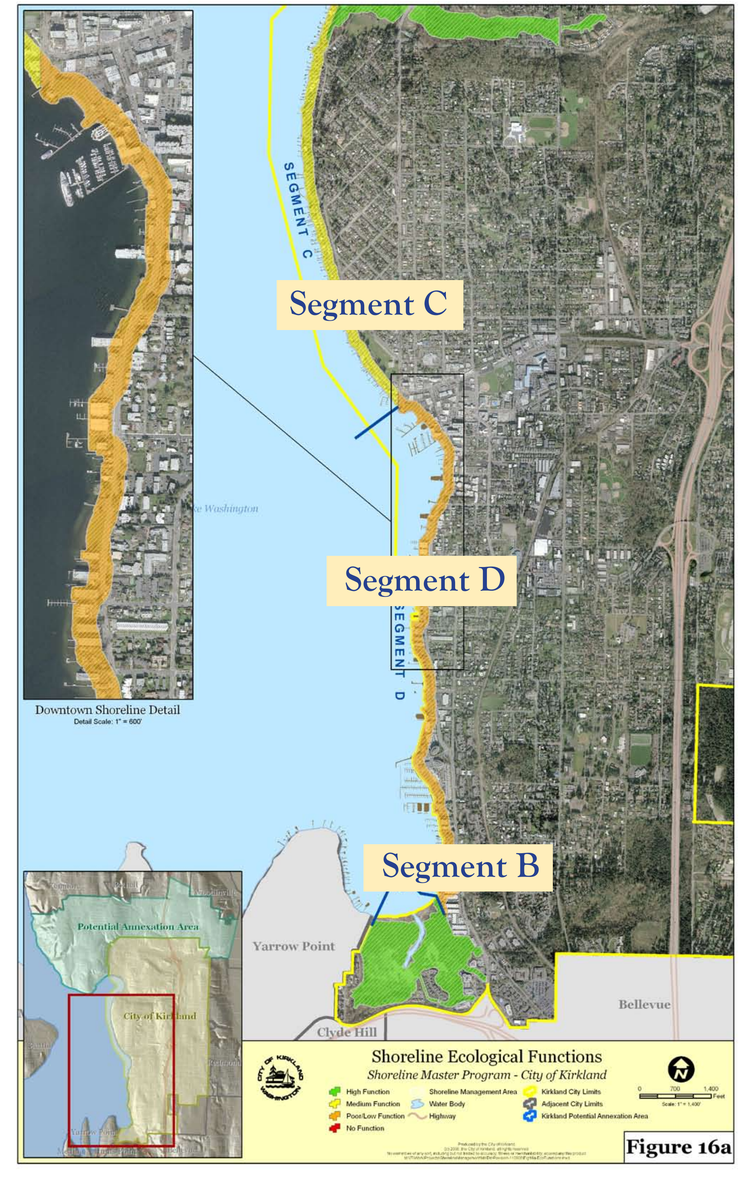
Segment B: Juanita Bay Wetlands



Segment C: Residential



Segment D: Marina Park



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SHORELINE ARMORING

What is shoreline armoring:

- Shore erosion control practices using hardened structures that armor and stabilize the shore
  Examples: bulkheads, concrete walls, rip-rap

Segment	Lake Edge Condition (feet / % of segment)			Relative Ranking of Segment
	Vertical	Boulder	Natural / Semi-Natural	
B Juanita Bay and Yarrow Bay Park/ Wetlands	317 3%	461 4%	9,855 93%	High/Good
C Residential	4,919 53%	2,793 30%	1,652 18%	Low/Poor
D Urban	5,145 42%	5,831 48%	1,266 10%	Low/Poor
TOTAL (percent of total length)	10,381 32%	9,085 28%	12,773 40%	

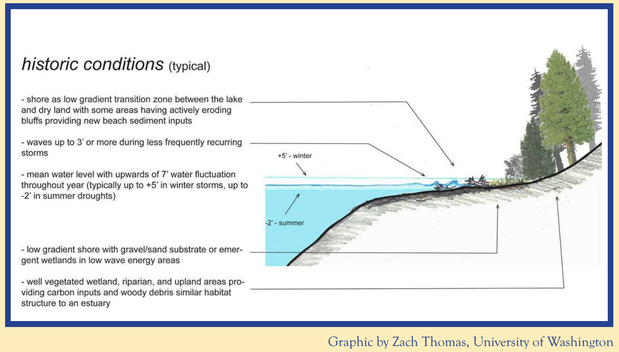
Juvenile Chinook Salmon Habitat needs:

- Shoreline areas with shallow depths (<1m)
- Gentle slope
- Fine substrates such as sand and gravel
- Overhanging vegetation/small woody debris
- Small creeks: mouths and shallow, low-gradient upstream portions

Impacts of shoreline armoring:

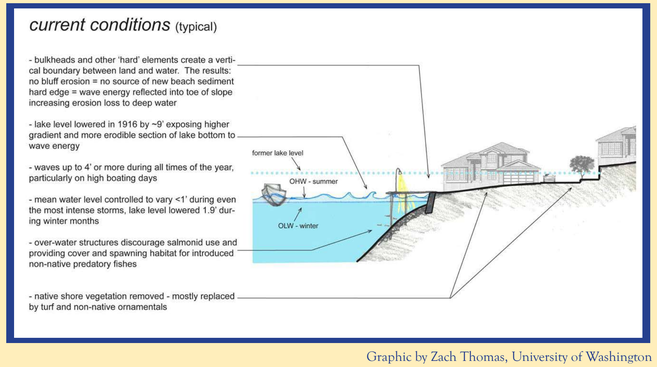
- Reduces natural gravel recruitment from erosion
- Causes excessive erosion on neighboring unarmored properties
- Can increase water depth by transporting nearshore sediment to deeper water and produces "wave bashing"effect – very turbulent nearshore
- Decreases habitat complexity
- Increases predator habitat (bass, sculpin)

Historical Shoreline



Graphic by Zach Thomas, University of Washington

Current Shoreline



Graphic by Zach Thomas, University of Washington

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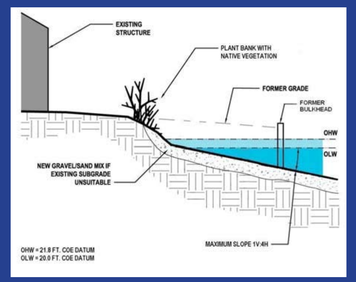
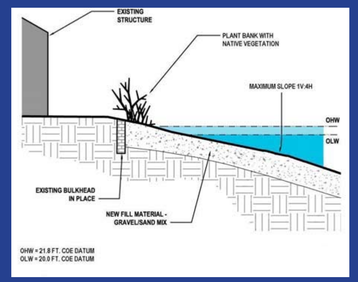
ALTERNATIVES TO SHORELINE ARMORING

These are recommendations developed by the Army Corps of Engineers and the National Marine Fisheries Service (NMFS) to provide for shoreline stabilization that will meet Endangered Species Act requirements under an Army Corps of Engineers Nationwide Permit. Other options require individual review and a project-specific assessment prepared by the applicant.

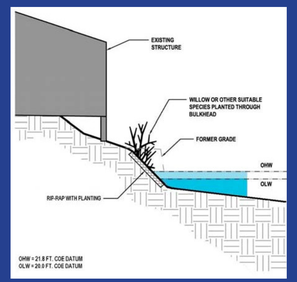
Alternative 1: Cut Beach, Place Gravel Fill and Re-vegetate



Alternative 2: Gravel Fill Beach and Re-vegetate



Alternative 3: Re-vegetate Armored Banks (only for bulkheads within 25 feet of residence)

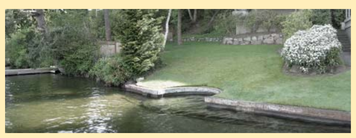


Example of Shoreline Alternative Design in Bellevue, WA

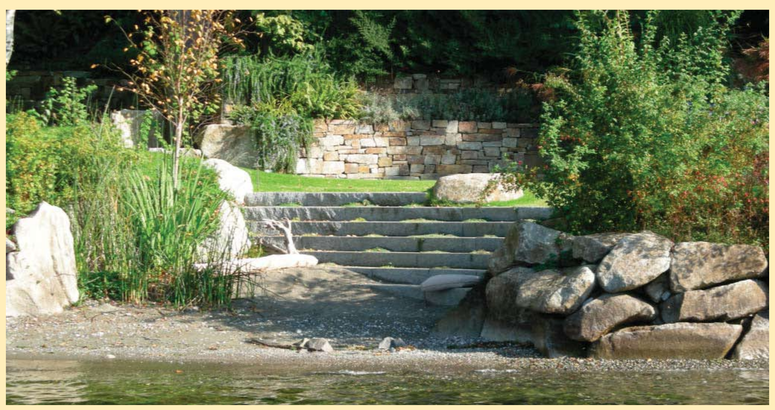
Restoration Plan for Bellevue residence

Designed by The Watershed Company

Before



After



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OVERWATER COVER

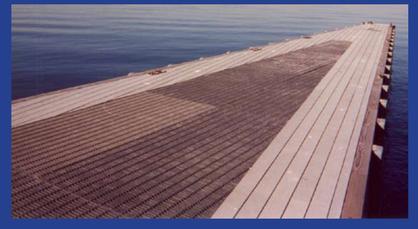
Segment	Overwater Coverage		Relative Ranking of Segment
	Overwater Cover/ Lineal Foot of Shoreline	# of Overwater Structures/Mile	
B Juanita Bay and Yarrow Bay Park/Wetlands	1.55 ft2	2.5	High/Good
C Residential	8.93 ft2	51.9	Low/Poor
D Urban	24.13 ft2	27.2	Low/Poor
TOTAL	12.3 ft2	26.2	

How do overwater structures such as piers affect the shoreline habitat?

- Impact the nearshore aquatic habitat, blocking sunlight and creating large areas of overhead cover.
- Shade the lake bottom and inhibit the growth of aquatic vegetation.
- Benefit non-native predators (like largemouth and smallmouth bass).
- Reduce the amount of complex aquatic habitat formerly available to salmonids rearing and migrating through Lake Washington. This can impact juvenile salmonids, in particular, due to their affinity to nearshore, shallow-water habitats.

Techniques to minimize impacts of overwater structures:

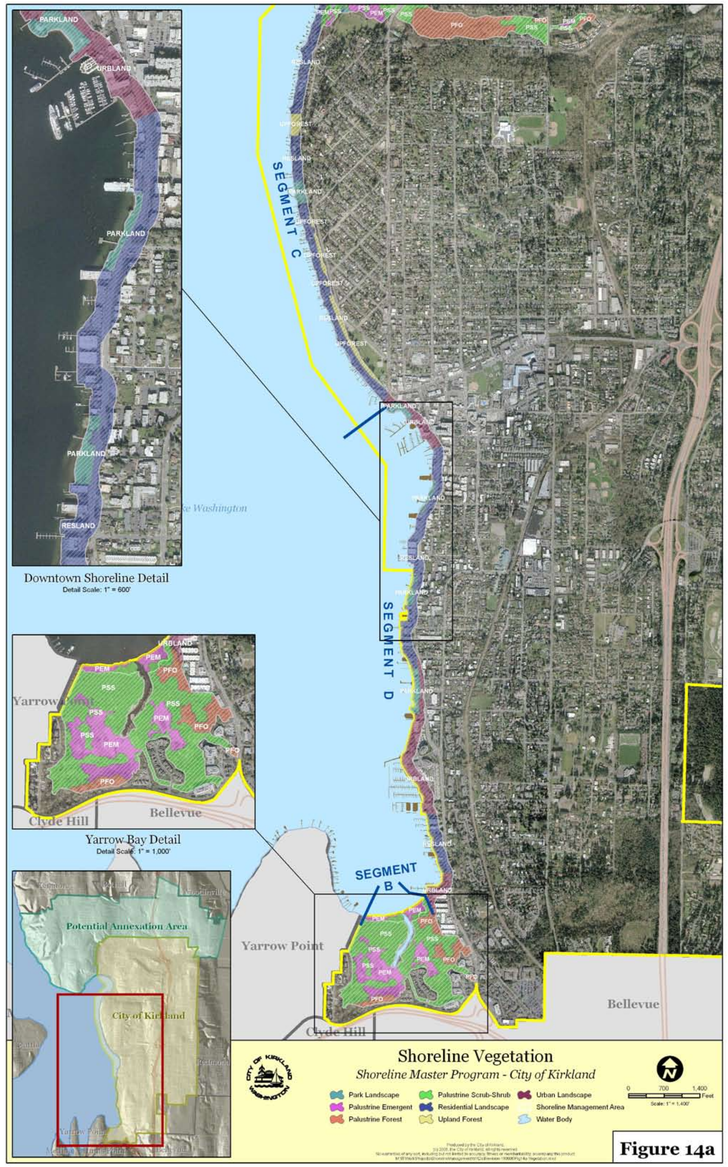
- Shared use of piers.
- Reducing or eliminating the number of boathouses and solid moorage covers (e.g. use of clear, translucent materials proven to allow light transmission for new canopies).
- Minimizing the size and widths of piers and floats.
- Increasing light transmission through any over-water structures (e.g. use of grated decking).
- Maximizing the height of piers above the water surface.
- Reducing the overall number and size of pier piles.
- Improving the quality of stormwater runoff.



SHORELINE VEGETATION

Benefits of Shoreline Vegetation

- Providing organic inputs critical for aquatic life
- Providing food in the form of various insects and other detritus that feeds benthic macroinvertebrates
- Stabilizing banks, minimizing erosion, and reducing the occurrence of landslides
- Filtering and vegetative uptake of nutrients and pollutants from ground water and surface runoff
- Providing a source of large woody debris into the aquatic system
- Providing shade necessary to maintain the cool temperatures required by salmonids and other aquatic biota



Examples of Shoreline Vegetation

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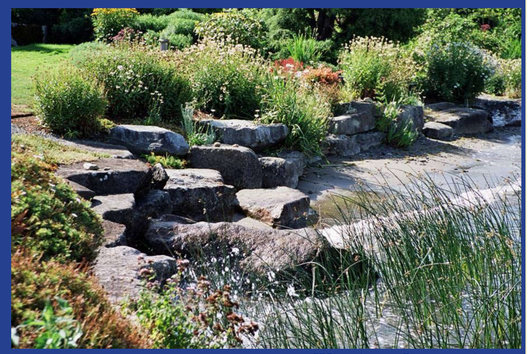
Berger Partnership



Waterfront Construction

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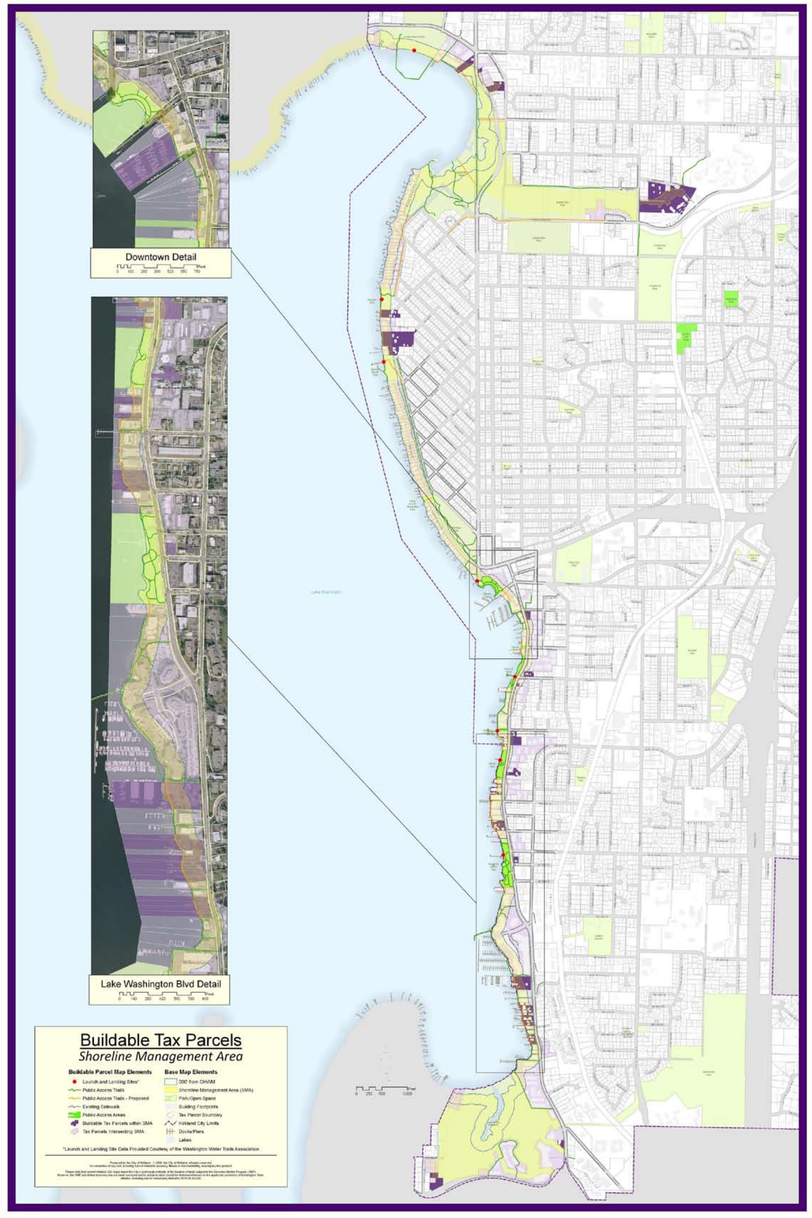
PUBLIC ACCESS AREAS

In shoreline jurisdiction, city currently has:

- 6.8 miles of trails
- 132.7 acres of parks and open space
- 2.5 miles of public waterfront access (trails and parks combined)



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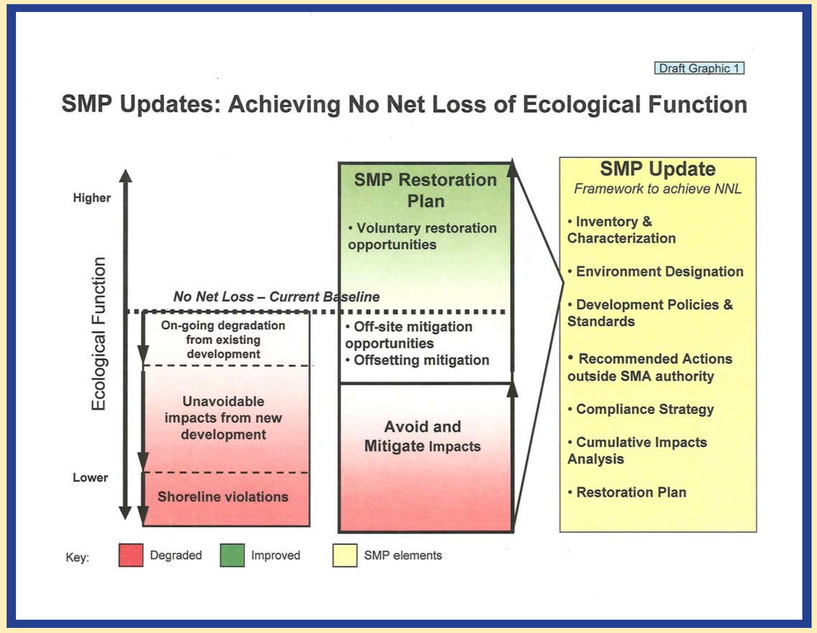
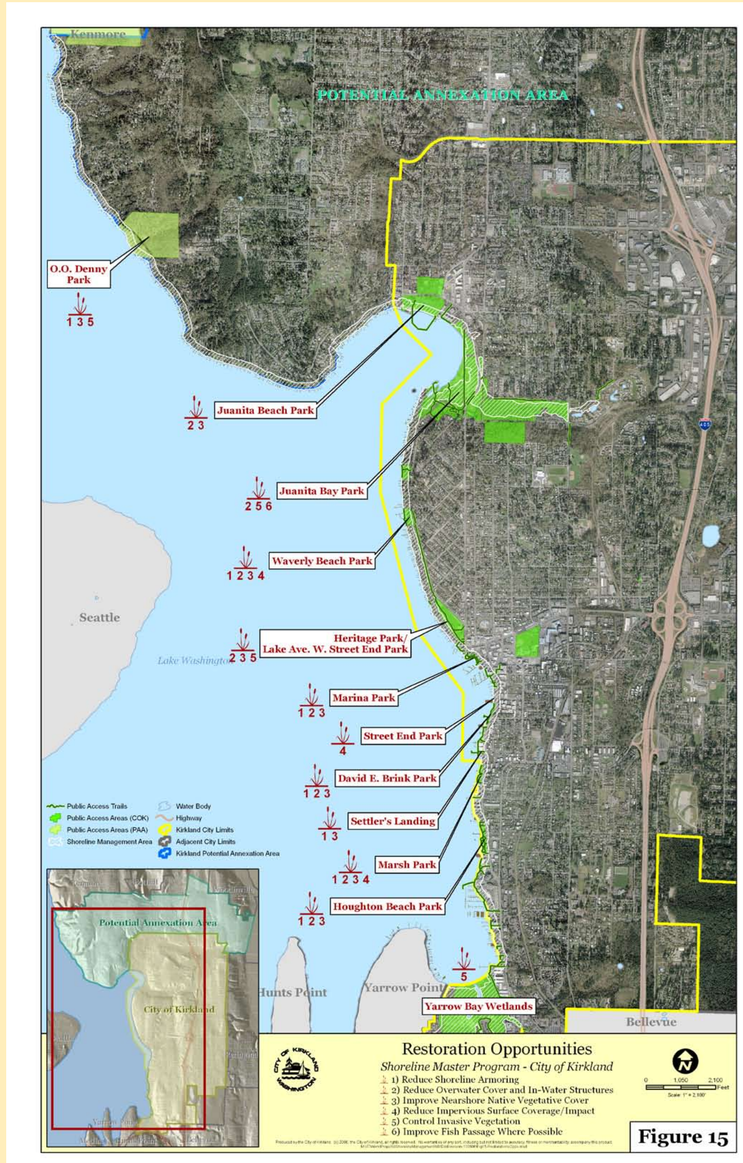
NO NET LOSS AND RESTORATION OPPORTUNITIES



Source: Department of Ecology



No Net Loss: The Shoreline Master Program should preserve the public's opportunity to enjoy the physical and aesthetic qualities of shorelines of the state and protect the functions of shorelines so that, at a minimum, the City achieves a 'no net loss' of ecological functions, as evaluated under the *Final Shoreline Analysis Report* issued in December 2006.

Restoration: The Program should also promote restoration of ecological functions where such functions are found to have been impaired, enabling functions to improve over time.

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