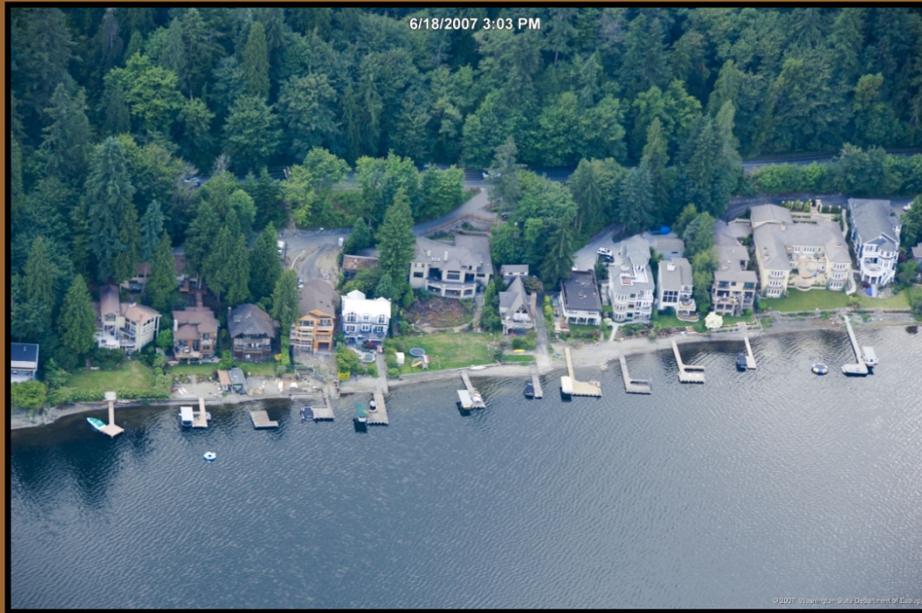
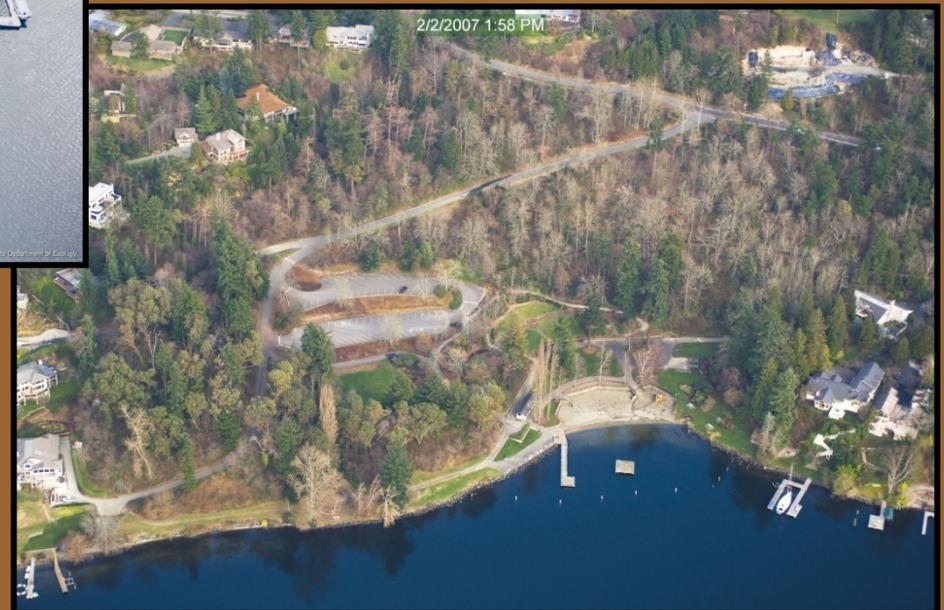


Existing Shoreline Conditions and Current Science



City of Bellevue
Open House
May 21, 2009



Bellevue's Inventory & Analysis Report

- Updated SMP must result in no net loss of ecological functions when implemented
- Inventory/Analysis Report establishes baseline from which future development actions in the shoreline will be measured

Historic Conditions



Past Practices



Past Practices



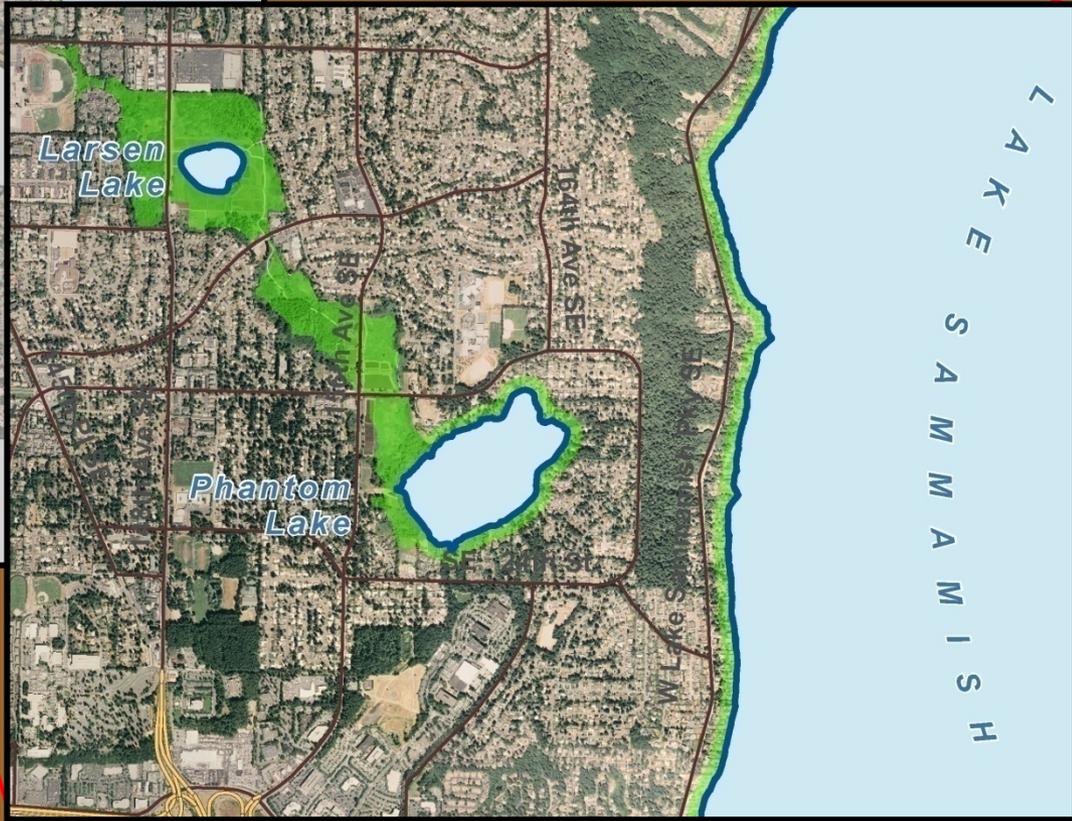
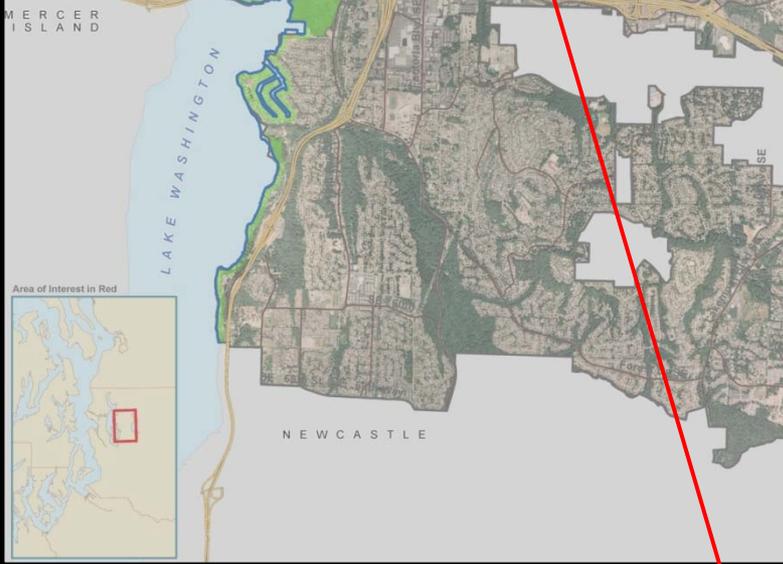
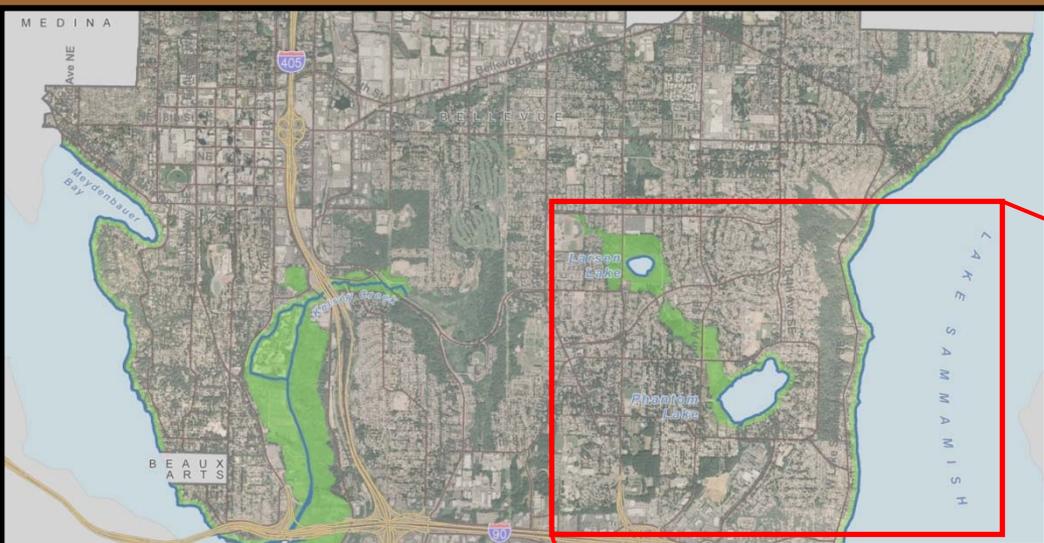
Shoreline Jurisdiction

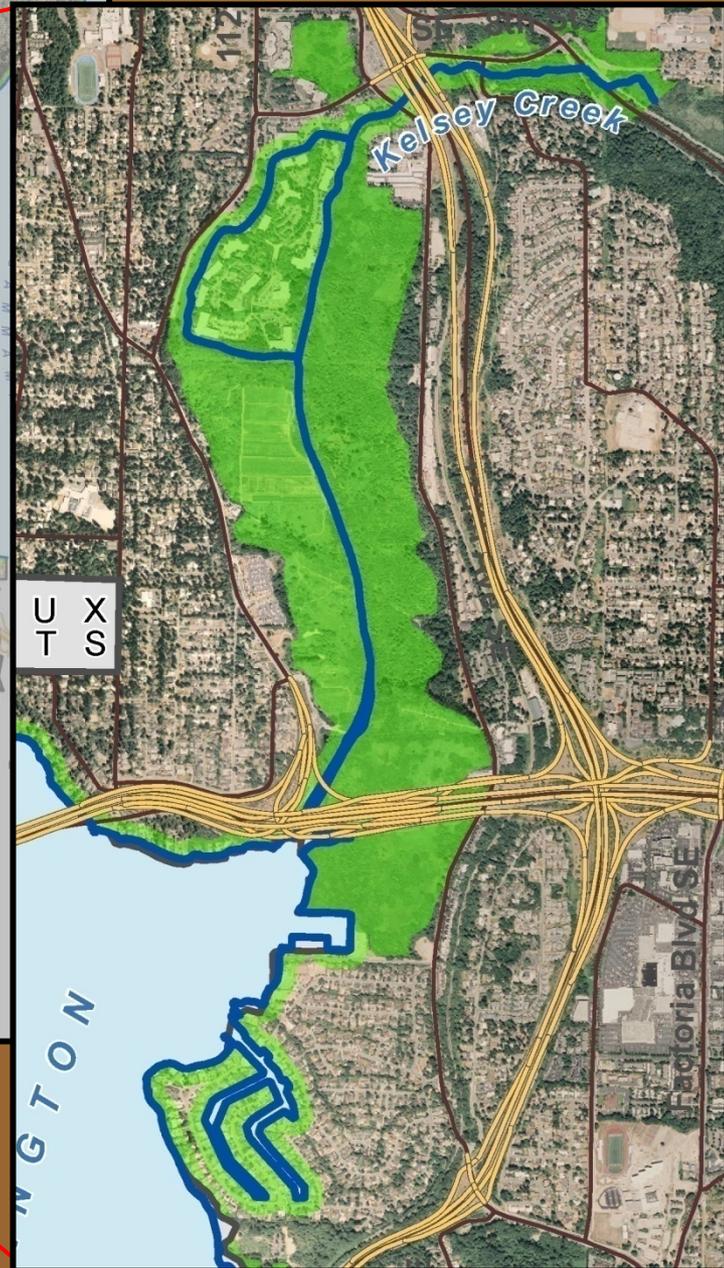
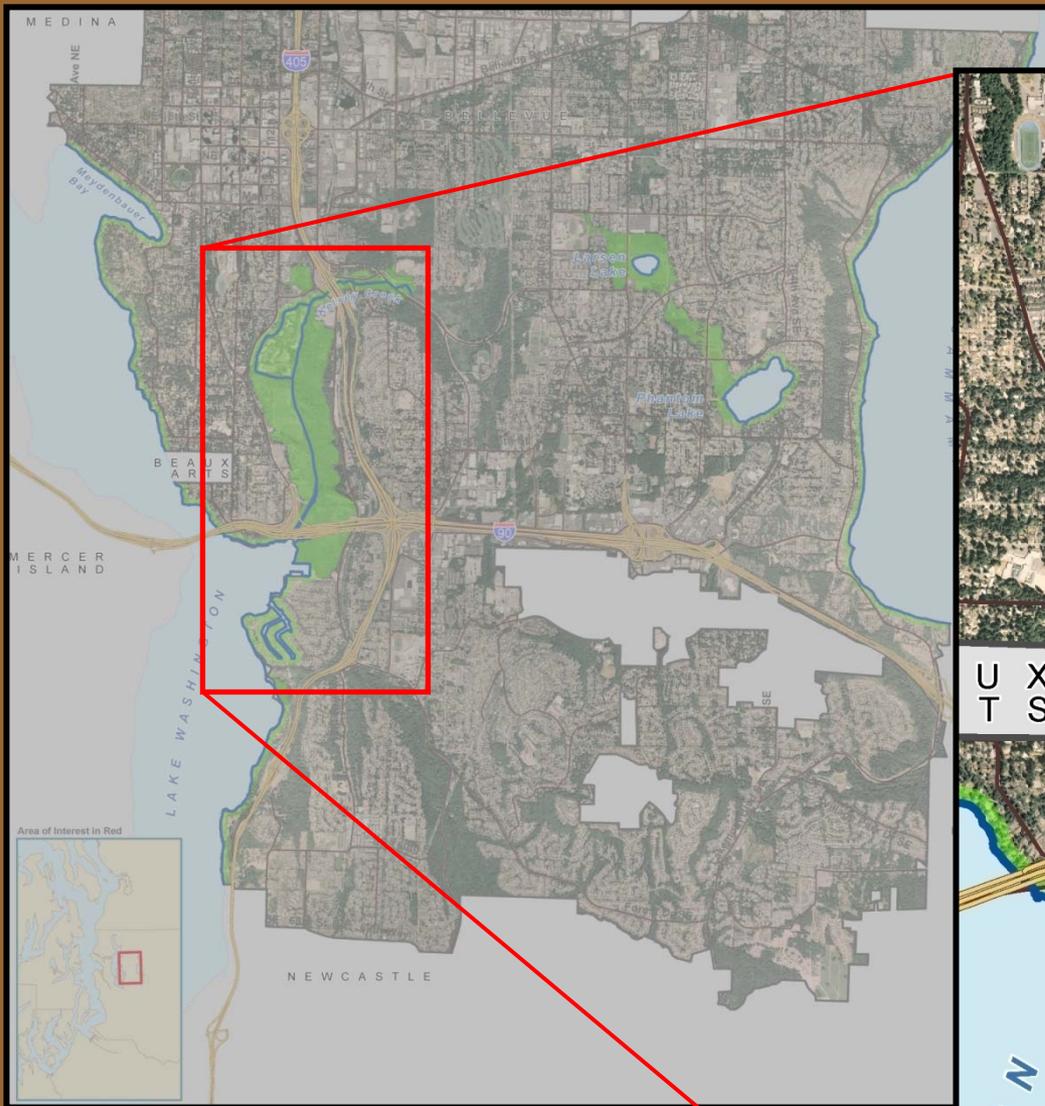
- All lakes greater than 20 acres in size (Lake Washington, Lake Sammamish, Phantom Lake)
- All streams/rivers with mean annual flows greater than 20 cfs (Lower Kelsey Creek and Mercer Slough)
- 200 feet from the ordinary high water mark
- Shoreline Associated wetlands

Shorelines Inventoried

- Lake Washington
- Lake Sammamish
- Phantom Lake
 - Including associated wetlands around Larson Lake
- Lower Kelsey Creek and Mercer Slough
 - Including associated wetlands in Mercer Slough Nature Park and Lower Kelsey Ck

Phantom Lake and associated wetlands

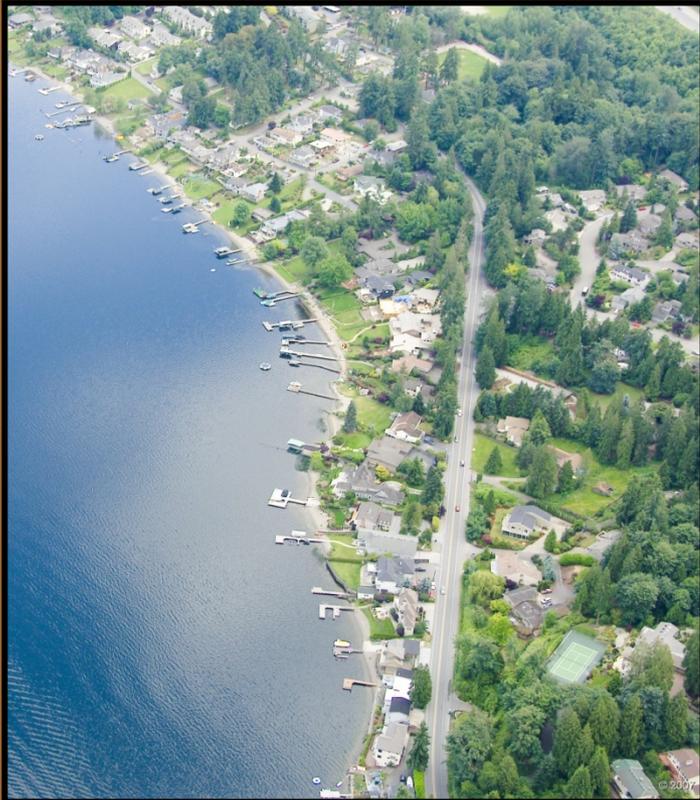




Lower Kelsey Creek and Mercer Slough

Inventory Methods

Collect “relevant and reasonably available” information



Areas of Interest

- Land use
- Utilities
- Impervious surface
- Priority habitats
- Critical areas
- Public access
- Transportation
- Shoreline Modifications
- Floodplains
- Historical sites
- Opportunities

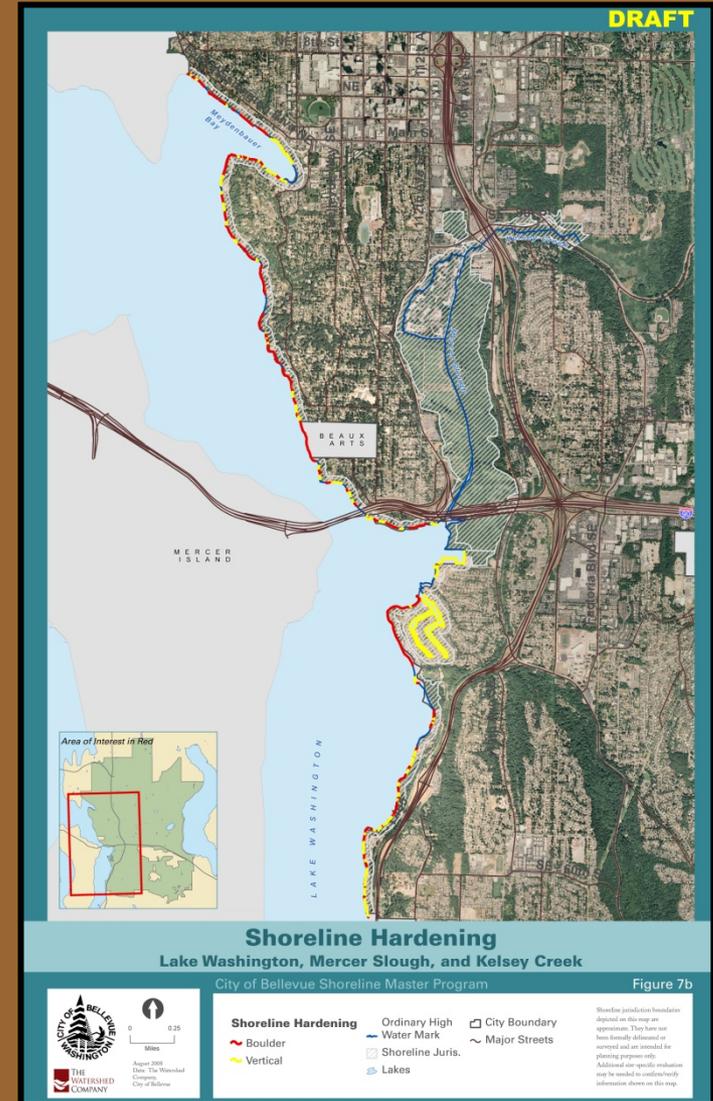
Inventory Results

Shoreline Specific Conditions = Baseline

Shoreline Modifications

Overwater Cover	# of piers/mile
Lake Washington	41
Kelsey Creek/Mercer Slough	--
Lake Sammamish	66
Phantom Lake	12

Shoreline Armoring	Percent Armoring
Lake Washington	81
Kelsey Creek/Mercer Slough	--
Lake Sammamish	71
Phantom Lake	2

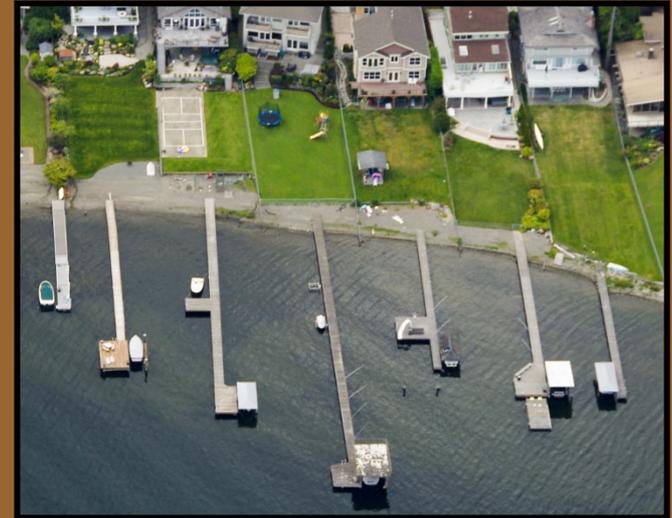


Inventory Results

Comparison with other jurisdictions

Shoreline Modifications

<u>Overwater Cover</u>	<u># of piers/mile</u>
Bellevue (residential)	43
Kirkland (residential)	52
Mercer Island	47
Lake Forest Park	59
Lake WA	39



Shoreline Armoring

<u>Shoreline Armoring</u>	<u>Percent Armoring</u>
Bellevue (residential)	87
Kirkland (residential)	83
Mercer Island	82
Lake Forest Park	80
Lake WA	71



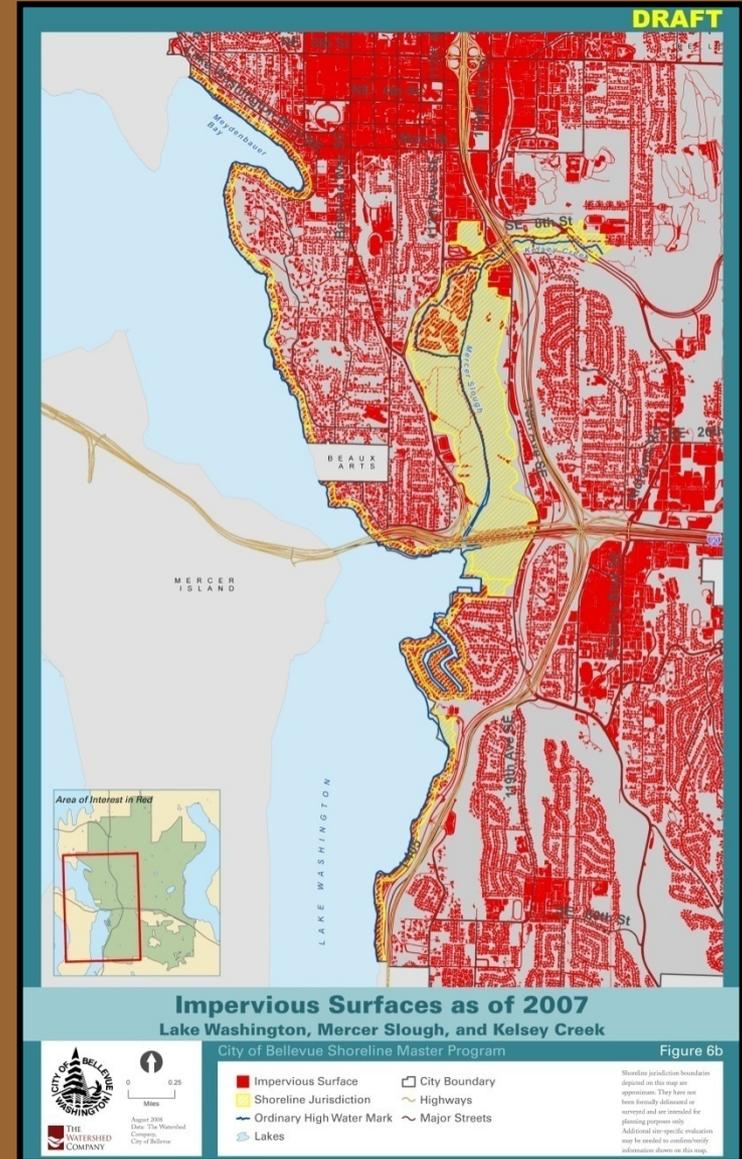
Inventory Results

Impervious Surfaces

	Percent
Lake Washington	43
Kelsey Creek/Mercer Slough	17
Lake Sammamish	39
Phantom Lake	7
TOTAL	24

Other jurisdictions

- Kirkland = ~44%
- Lake Forest Park = ~29%
- Mercer Island = ~26%



Analysis Methods

- Assessed ecological functions and processes
- Assessed current and potential land use
- Assessed current and potential public access

 Recommendations = foundation for SMP policies and regulations

Lake Washington Constraints

- 81% armored
- Numerous piers
- Shoreline vegetation dominated by lawn
- Marinas
- ESA listed species

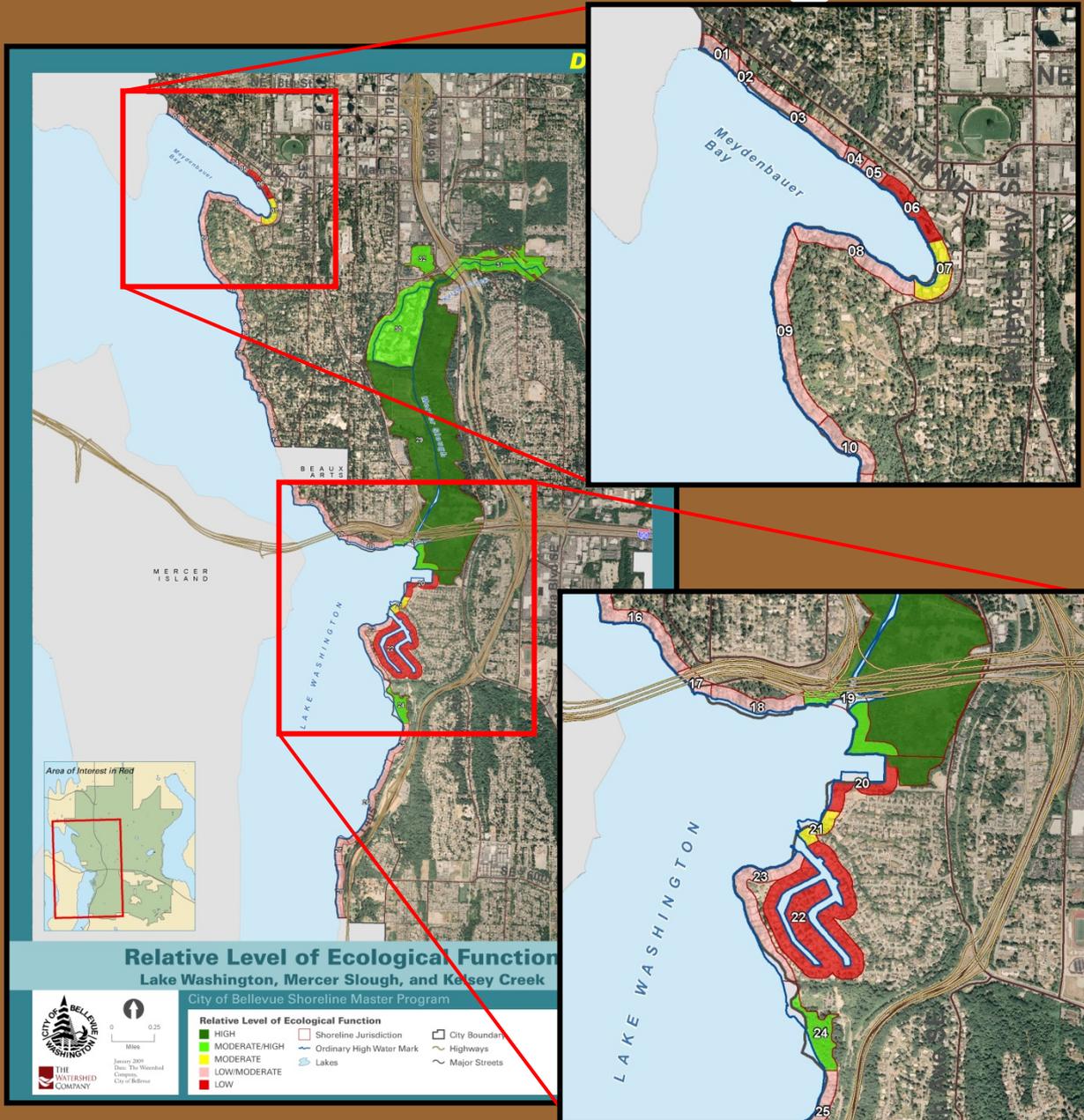


Lake Washington Opportunities

- Park improvements for shoreline restoration
- Modifications to residential shorelines have potential for win-win scenarios
- Numerous parks provide public access



Lake Washington Baseline



Highest function

Mouth of Mercer Slough
Newcastle Beach Park

Lowest function

Marina areas
Newport Keys

Most other areas rated as
“low/moderate”

Kelsey Creek/Mercer Slough Constraints

- Bellefield office complex
- Ongoing agriculture
- Passive recreation trails and public access
- Large associated wetlands
- Invasive species problem in some areas



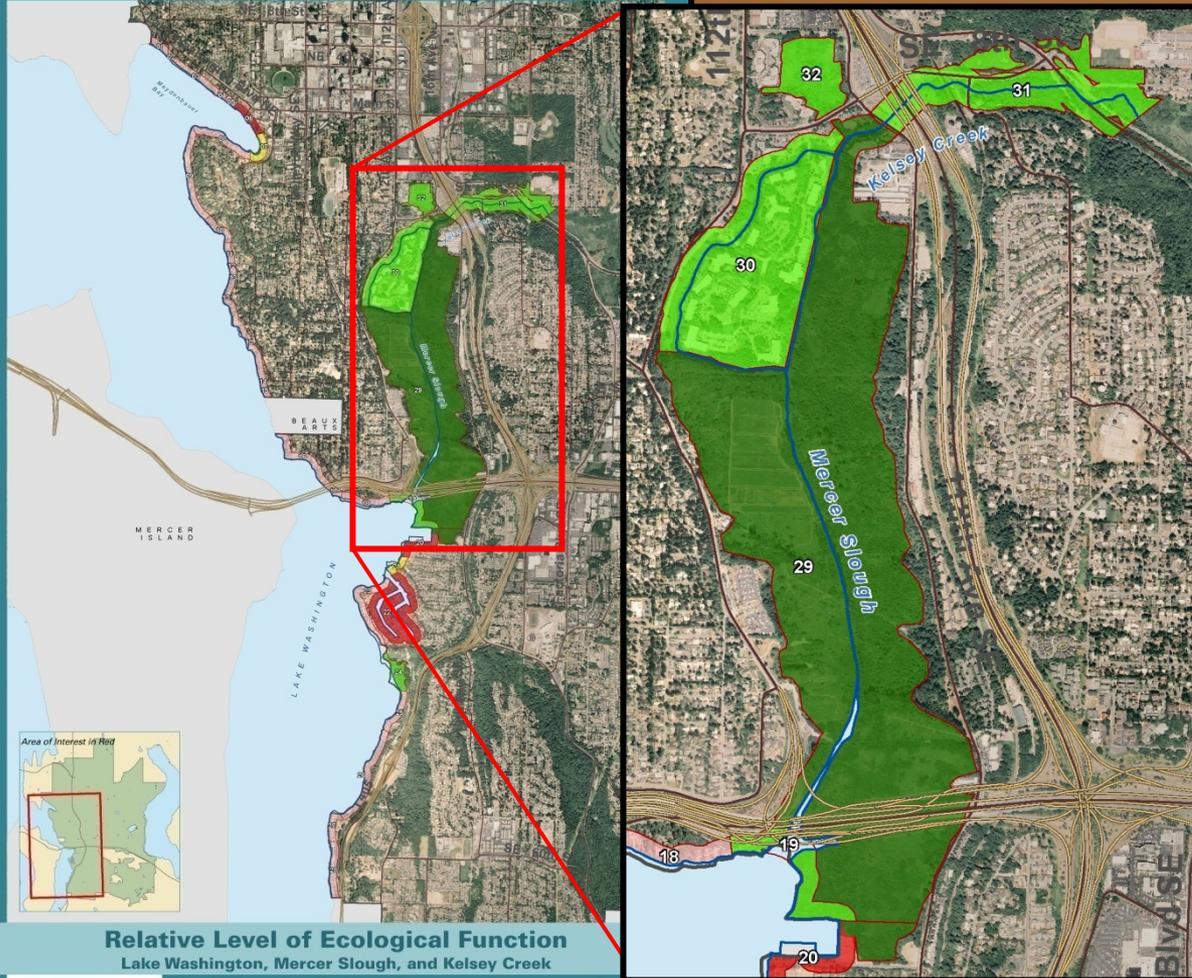
Kelsey Creek/Mercer Slough Opportunities

- Wetland enhancement
- Fish passage
- Public access



Kelsey Creek/Mercer Slough Baseline

DRAFT



Relative Level of Ecological Function
Lake Washington, Mercer Slough, and Kelsey Creek

City of Bellevue Shoreline Master Program

Figure 100

Relative Level of Ecological Function

- HIGH
 - MODERATE-HIGH
 - MODERATE
 - LOW/MODERATE
 - LOW
- Shoreline Jurisdiction
 - Ordinary High Water Mark
 - City Boundary
 - Highways
 - Major Streets
 - Lakes

Shoreline jurisdiction boundaries depicted on this map are approximate. They have not been formally delineated or surveyed and are intended for planning purposes only. Additional site-specific evaluations may be needed to confirm survey information shown on this map.

Highest function
Mercer Slough Nature
Park

Most other areas still rated
well – even the office
park

Lake Sammamish Constraints

- 71% armored
- High pier density
- Riparian vegetation dominated by lawn
- Limited public access
- Aquatic invasive species problem in some areas



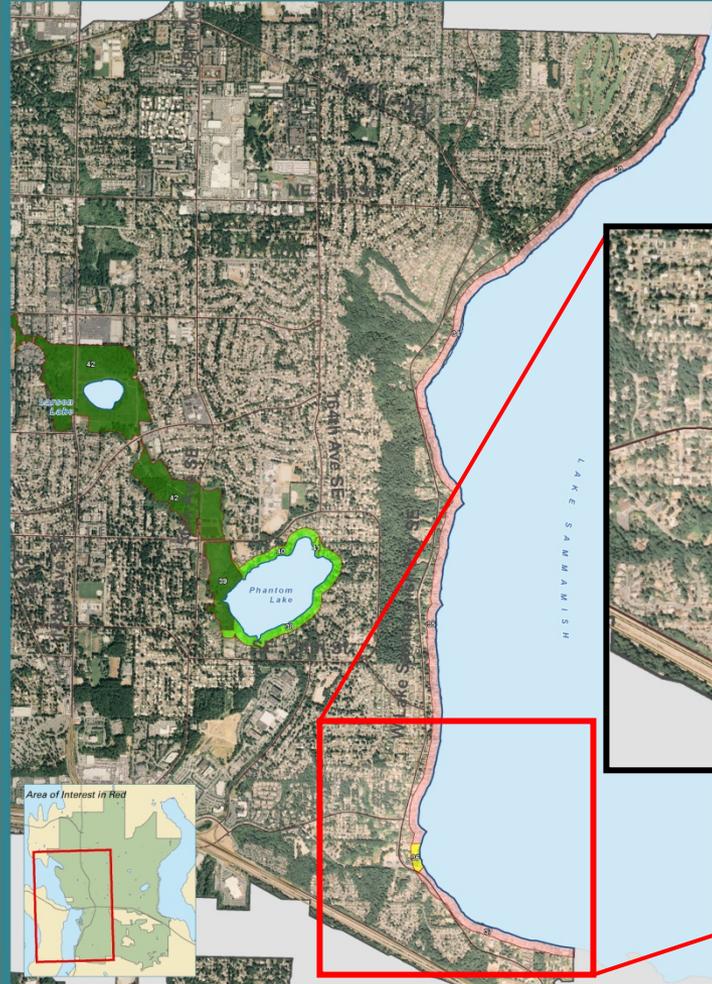
Lake Sammamish Opportunities

- Expand public access
- Modifications to residential shorelines have potential for win-win scenarios



Lake Sammamish Baseline

DRAFT



Highest function
Vasa Park

All other areas rated as
“low/moderate”

Relative Level of Ecological Function
Lake Sammamish/Phantom Lake

Figure 16c



Phantom Lake Constraints

- Aquatic invasive species problem
- Riparian vegetation dominated by lawn
- Water quality concerns



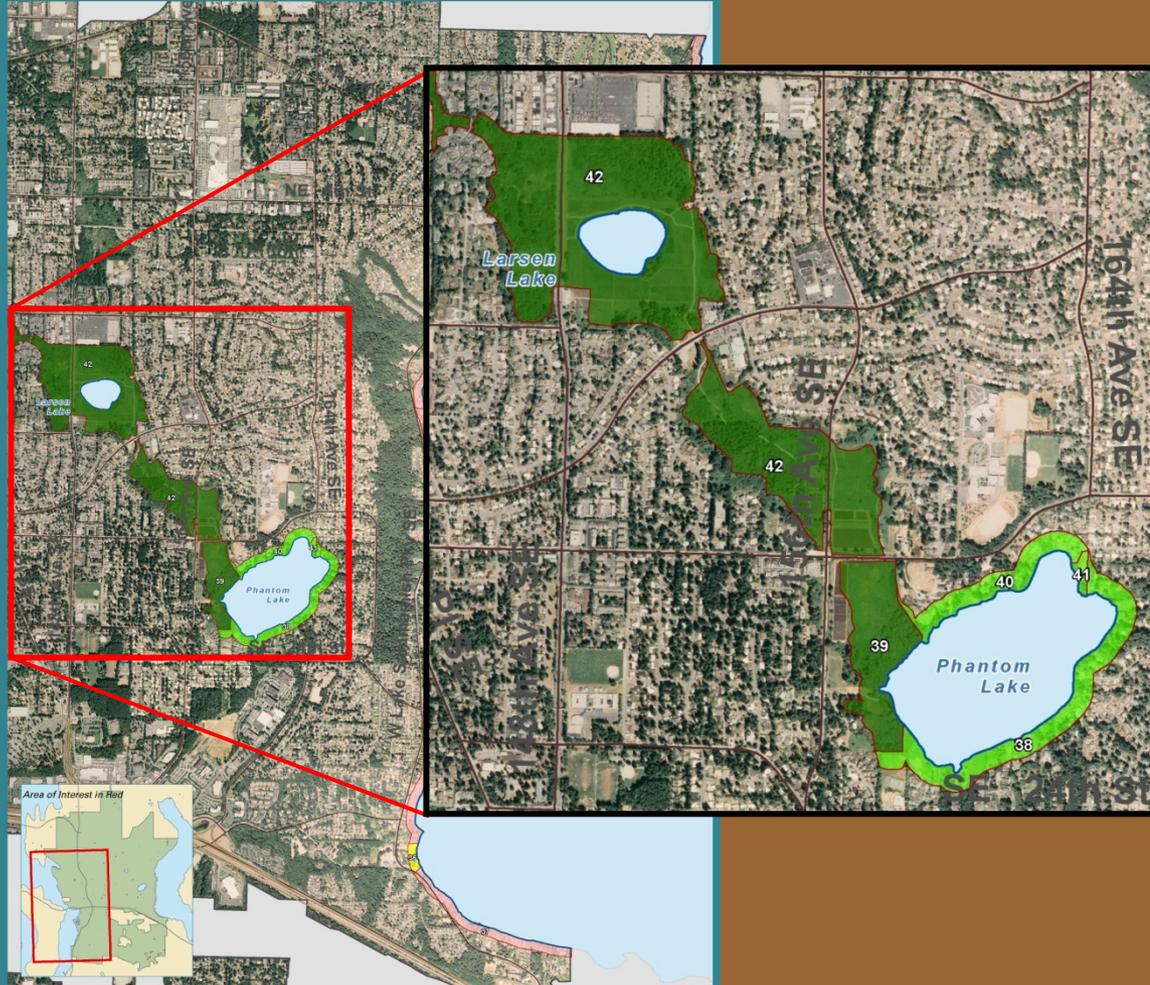
Phantom Lake Opportunities

- Improvements to lake water quality
- Passive public access to waterbodies and throughout greenbelt
- Vegetation enhancement
- Protection of lake fringe wetlands



Phantom Lake Baseline

DRAFT



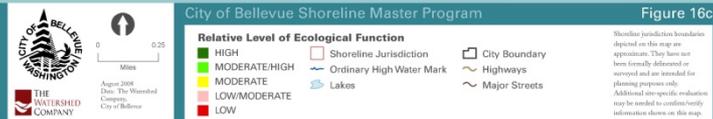
Highest function
Lake Hills Greenbelt

All other areas rated as
“moderate/high”

Relative Level of Ecological Function
Lake Sammamish/Phantom Lake

City of Bellevue Shoreline Master Program

Figure 16c



Why Do We Build Bulkheads?

Shoreline protection

Decrease erosion

Reduce wave impacts

Increase or maintain size of lawn areas

Neighboring properties also have bulkheads

Potential Bulkhead Impacts

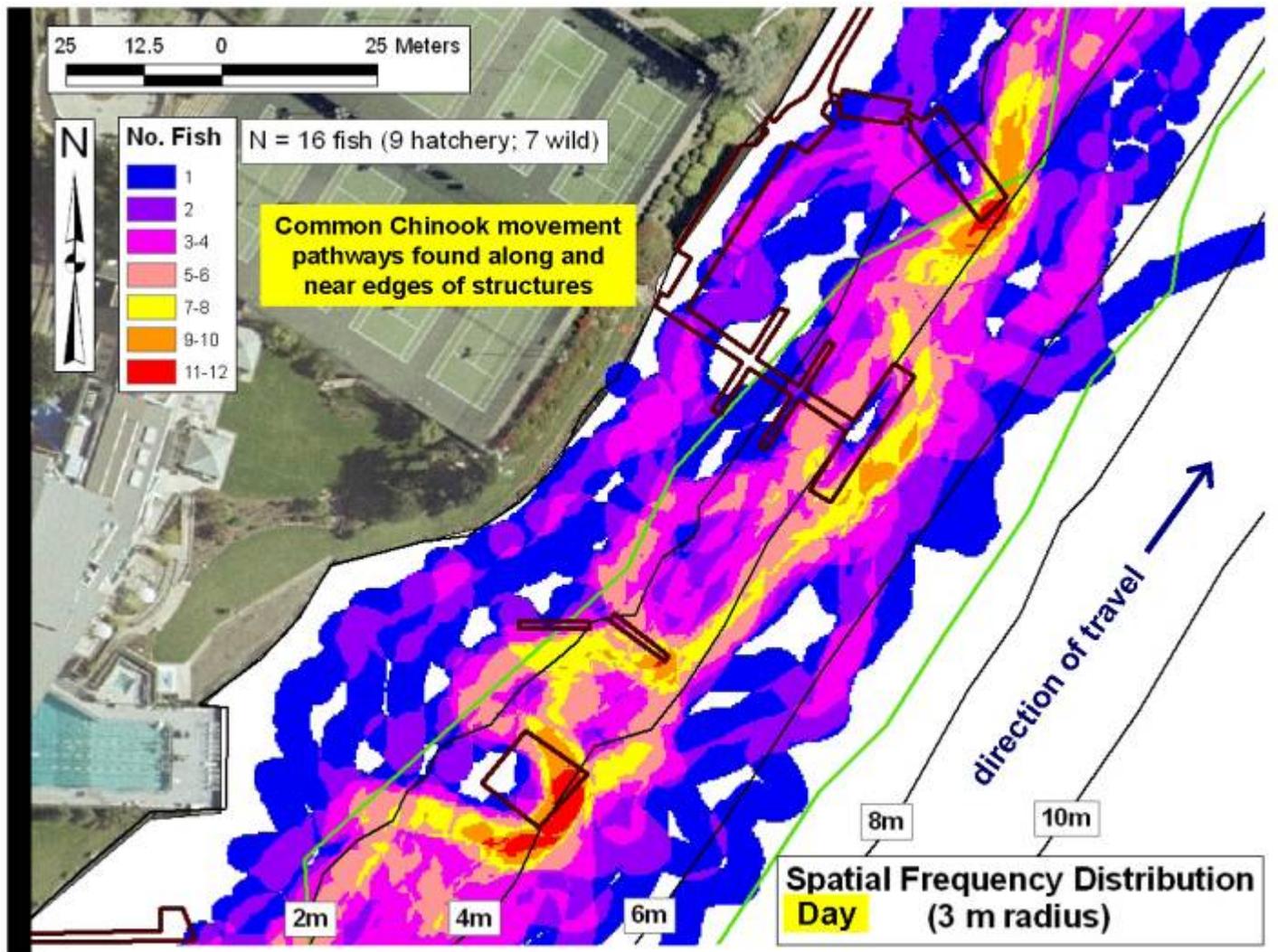
- Decrease natural gravel recruitment
- Lacks natural wave attenuation
- Decreases complex habitat
- Increased predator habitat

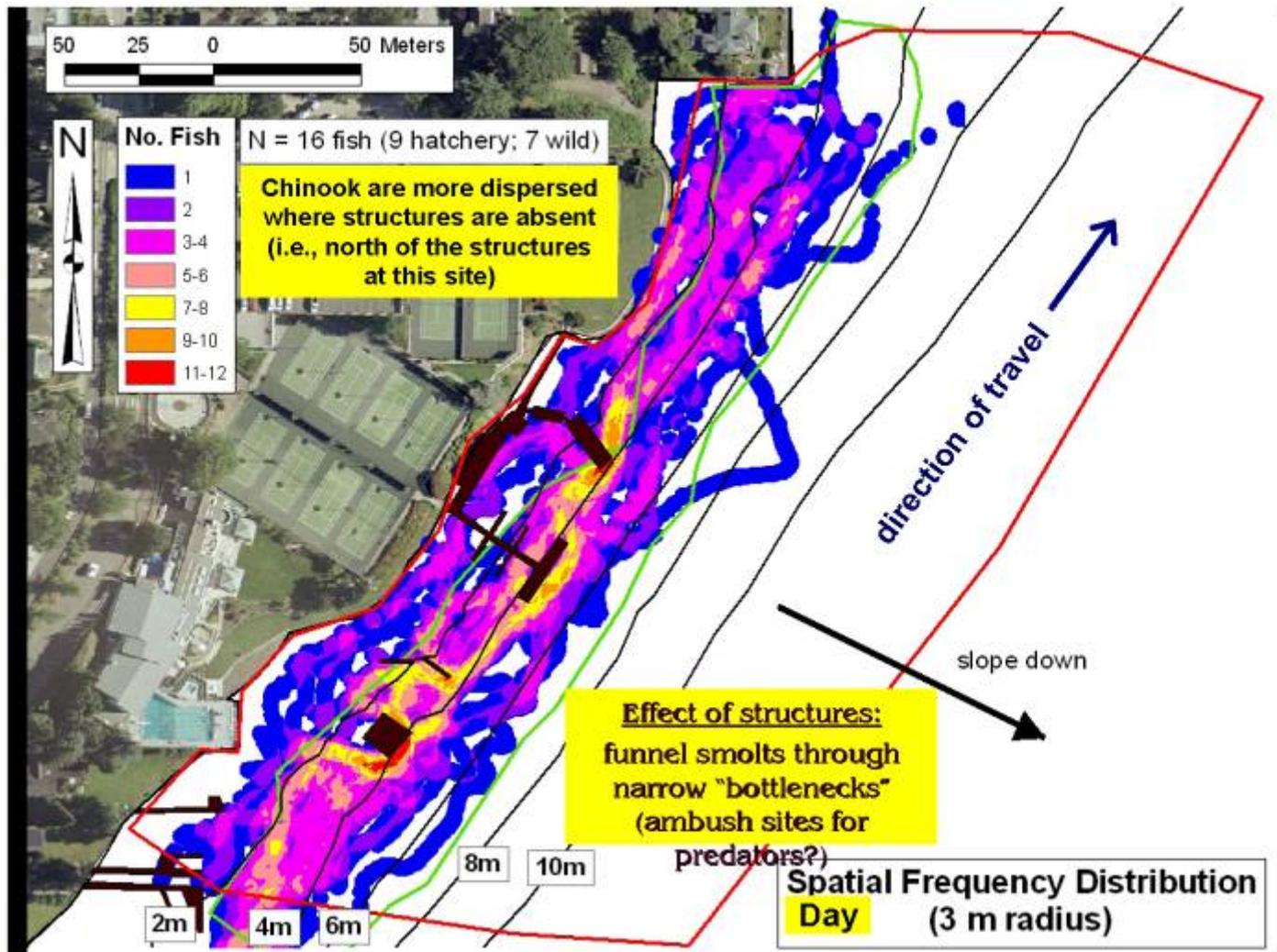
Alternative Design Objectives

- **Improve water access**
- **Improve aesthetics**
- **Reduce wave impacts and erosion**
- **Retain and plant native vegetation**
- **Improve fish and wildlife habitat**

What about piers?

- Inhibit juvenile migration
- Sharp shade lines
- Shading inhibits aquatic vegetation
- Predator habitat (piles and cover)
- Nearshore habitat is compromised





Sharp shade line from pier



Overhanging vegetation



Traditional pier



Pier Design Alternatives

- Width reduction
- Grated decking
- Increase height off water
- Extend eills to deeper water
- Elevated nearshore walkways
- Longer pile spans
- Reduce pile size and number

Grated Decking



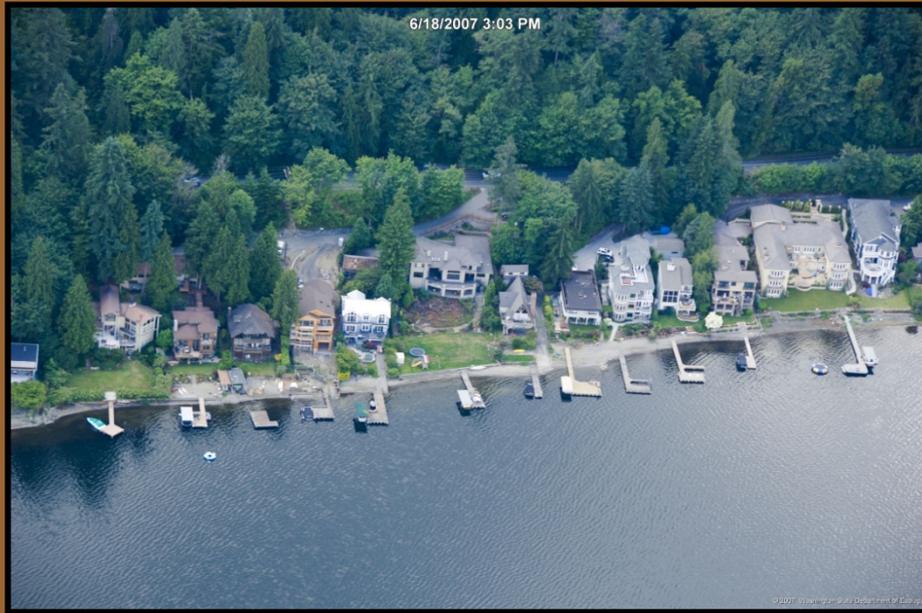
Elevated pier height



Bridge spanning nearshore



Existing Shoreline Conditions and Current Science



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