WRIA 9 Marine Shoreline Monitoring and Compliance Project *Phase 2*

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Project Area

92 miles

- 52 miles rural (48% armored)
- 40 miles urban (83% armored)
Why do this Project?

WRIA 9 Salmon Plan calls for:
- No new shoreline armoring
- Monitoring of shoreline condition
- “Improve enforcement of existing land use and other regulations”

PSP-Vital Sign Target-More armor removal than new by 2020

2012-2013 Pilot project found:
- Many repairs to existing armor
- Low compliance (no permits)
- New armor offset previous 10 years of restoration
What is Shoreline Armoring?

Human-made structures to reduce shoreline erosion

Bulkheads, Revetments, Sea walls
Why do we care?

Blocks *feeder bluffs* from feeding beaches.
From Phill Dionne
Forage fish spawn on upper beaches.
Armor displaces forage fish spawning habitat & juvenile salmon rearing habitats.
Why do Phase 2?

- Has the amount of shoreline armor gone ↑ or ↓
- Pilot project-High visibility on Vashon, little to none in cities
- Anecdotally, some people changing their behavior
New research vessel for King County

SoundGuardian research catamaran
- Cost: $1.98 million

- Marine crane
  - 2,200-pound capacity

- A-frame
  - 2,500-pound capacity

- Laboratory
  - Portable sediment table
  - Hydrowire metering
  - Vacuum pump and tank

Length: 48 ft.  Fuel capacity: 650 gallons
Beam: 18.8 ft.  Fresh water capacity: 100 gallons
Draft: 3 ft.  Passengers: 4 crew, 20 scientists

I-Pad mini with ARC Collector

GPS capable camera
2016 Survey

- Initially 139 changes-after QA/QC, 147

2018 Survey

- Initially 153 changes-after QA/QC, 138
% of WRIA 9 shoreline

- Burien
- Normandy Park
- Des Moines
- Federal Way
- Seattle
- King County

Bar chart showing the percentage of the WRIA 9 shoreline for each area.
Changes per Mile by Jurisdiction & Study Period

- Burien
- Normandy Park
- Des Moines
- Federal Way
- Seattle
- King County

# per mile
- 2004-2012
- 2012-2013
- 2013-2016
- 2016-2018

Values:
- Burien: 4.5
- Normandy Park: 1.5
- Des Moines: 1.5
- Federal Way: 3.5
- Seattle: 1.0
- King County: 2.0
Evaluated impacts to ecological processes:

- Sediment delivery to beach
- Sediment transport along the beach
- Light energy (day & night)
- Organic material accumulation (input)
- Wave energy
- Water Quality
- Forage fish spawning habitat displacement
- Hazards to public safety
% of Changes by Type with no Apparent Effect
Compliance

- Compliance = getting a permit prior to undertaking a project
- **Not** evaluating if those who got permits followed the permit conditions
All Local Governments Compliance by Type of Change by Year

- Armoring new
- Armoring major
- Armoring minor
- Clearing
- Houses
- Docks
- Stairs
- Other

Year: 2012, 2013, 2016, 2018
Compliance: WDFW vs local governments combined

- All local gov't
- WDFW subset
Is Removal Out-pacing New Armor?
PSP-Shoreline Armor Vital Sign

Target

- From 2011 to 2020, the total amount of armoring removed is greater than the total amount of new armoring in Puget Sound (total miles removed > total miles added)

Indicator

- Net change in permitted shoreline armor
FIGURE 1. NEW, REMOVED, ANNUAL NET, AND CUMULATIVE NET ARMOR CHANGE PERMITTED IN PUGET SOUND 2005 – 2017

Source: Data compiled from Hydraulic Project Approvals issued by Washington Department of Fish & Wildlife, Habitat Program.
King County
Cities
Not permitted: 75% by length
Summary

• Most changes were associated with **repairs**
• **60%** of changes had **negative** ecological impacts
• Net **increase** in shoreline armor, mostly **unpermitted**, and mostly in unincorporated King County
Summary continued

• Compliance **high** in some cities, **low** on Vashon/Maury,
• WDFW permit compliance even **lower** than local government rates
• Compliance rate **lower** than seen in the few similar studies of Puget Sound shorelines
Recommendations?

• Study why permit compliance rates are so low
• Add new requirement that state and local permits cross reference each other’s permit numbers
• Study larger portion of Puget Sound to see if WRIA 9’s low compliance rates are typical or an aberration
• Research if there other land use enforcement frameworks that are more successful than complaint based
To get entire report

- OR, email [Kollin.Higgins@kingcounty.gov](mailto:Kollin.Higgins@kingcounty.gov)

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- **Thanks** to everyone that helped make this project happen

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