Responding to New ESA-species Mitigation Policy:

Programmatic Permits, Enduring Effects, and the "World Without Us" Framework

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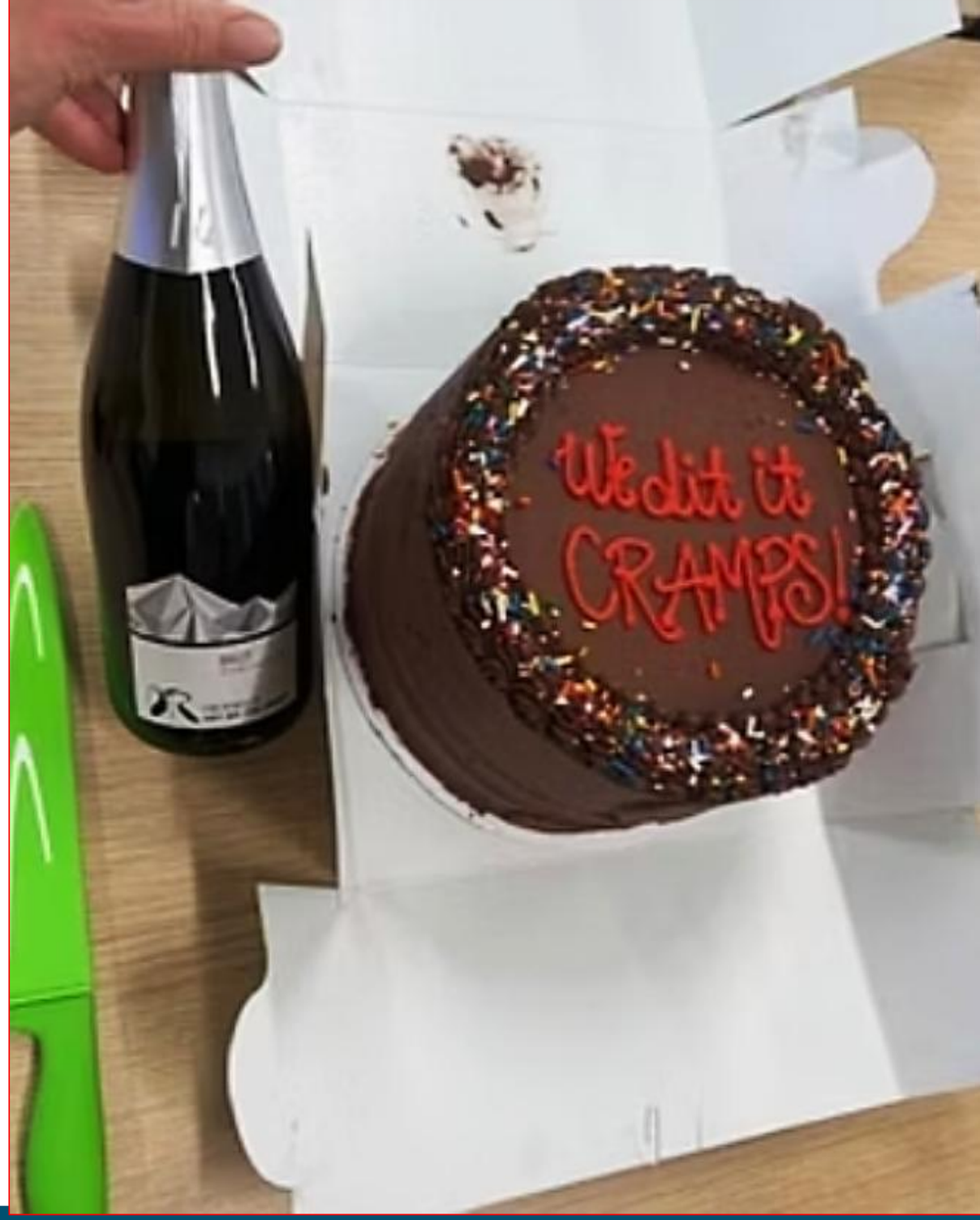
Maritime Environment & Sustainability
Port of Seattle

NAEP Annual Conference 2026

From Conflict to Cake & Champagne

The story of how we transformed transformed an adversarial relationship into a solutions-solutions-driven partnership with with agency colleagues.



We Were Stuck

NMFS Issues Enduring Effects Policy (2018)

NMFS Publishes Puget Sound Nearshore Calculator (2021)

Uncertainty and Risk for Ports:

- NMFS ESA Consultation Moratorium
- No clear path forward
- Costs were unaffordable
- Conflict was rising

Chinook Salmon

Oncorhynchus tshawytscha

ESA LISTED **THREATENED** - NMFS

Southern Resident Killer Whale

Orcinus orca

ESA LISTED **ENDANGERED** - NMFS

Puget Sound Steelhead Trout

Oncorhynchus mykiss

ESA LISTED **THREATENED** - NMFS

Bull Trout

Salvelinus confluentus

ESA LISTED **THREATENED** - USFWS

Marbled Murrelet

Brachyramphus marmoratus

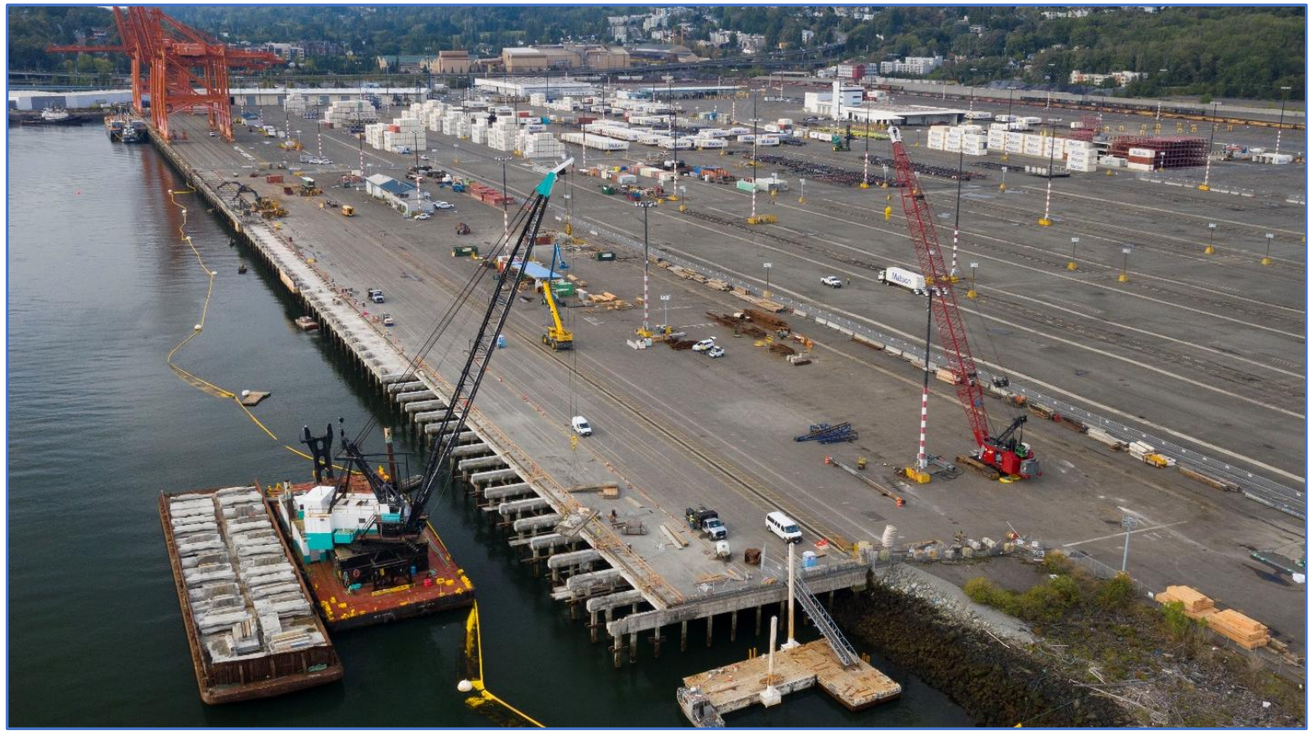
ESA LISTED **THREATENED -** USFWS

Duwamish River Estuary

Uniquely challenging context: Balancing Port operations with the habit needs of multiple listed species in a highly modified industrial waterway.

Nisqually River Estuary

Do repair and maintenance actions extend the life of structures and preclude ESA-species recover? Would the Duwamish look like this?



Close up:
Duwamish West Waterway Maritime-Industrial Development

Close up:
Residential Environment used for Development of NMFS Calculator

What Changed with the Enduring Effects Policy?

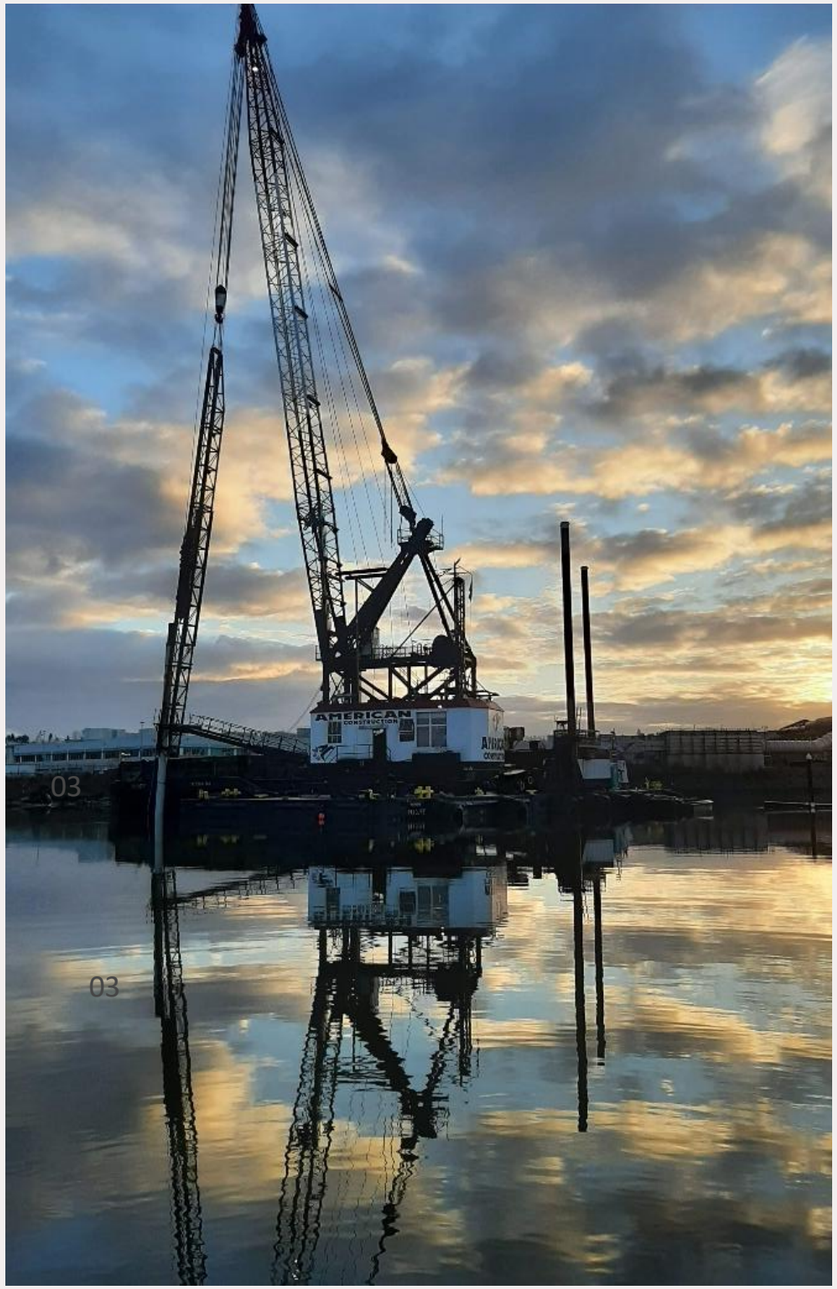
Implementation not rational with respect to port infrastructure and NMFS calculator that generated unaffordable mitigation requirements.

Three differences drove the need for recalibration:

Port Structures

Port Habitat Zones

Recovery Potential of Port Port Infrastructure



The Port's Solution: Lose Smart

01

Join forces with Port of Tacoma

02

Propose a Programmatic Approach (CRAMP) to Cover all Repair and Maintenance Activities

03

Agreement on Definitions: Baseline, Site Potential, Structures, Service Life

04

Undertake "World Without Us“ Exercise to Determine Habitat Recovery Precluded by R&M

05

Biological Opinion that includes Activities, Calculator, Rationale Document, and Credit Savings Instrument

Programmatic Permit (CRAMP)

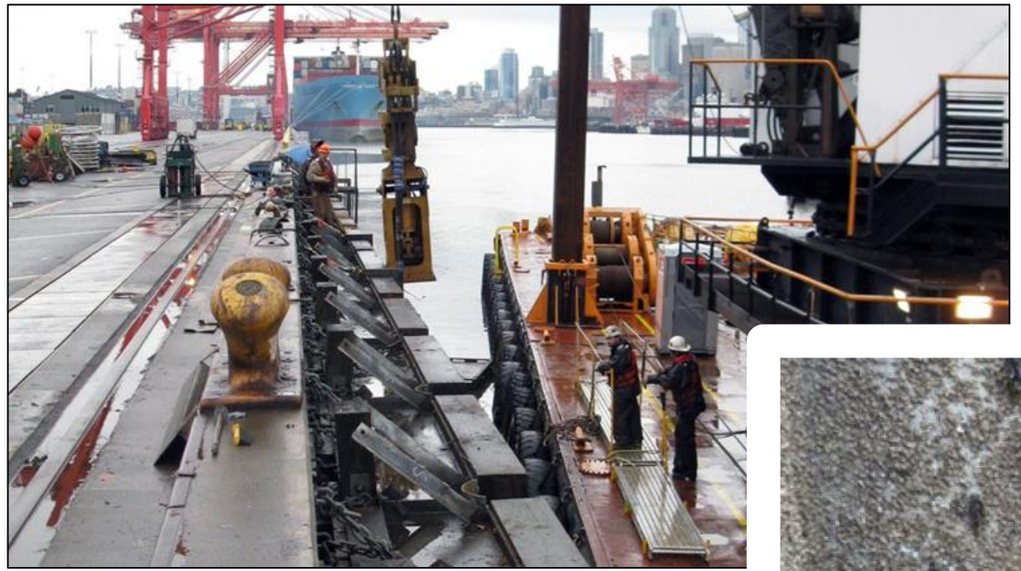
10-Year Coverage

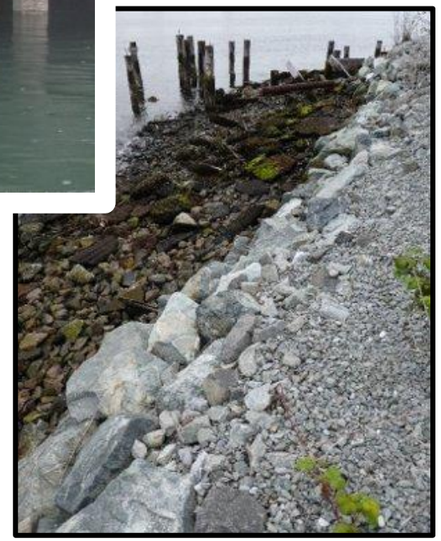
Mitigation Calculator

Streamlined Approvals

Annual Reconciliation

What's Covered?





EVERYTHING!

Credit-Generating Beneficial Activities

These activities support habitat gains by reducing contamination, restoring shoreline function, and strengthening the science behind future **restoration.**

Creosote-Treated Pile & Derelict Structure Removal

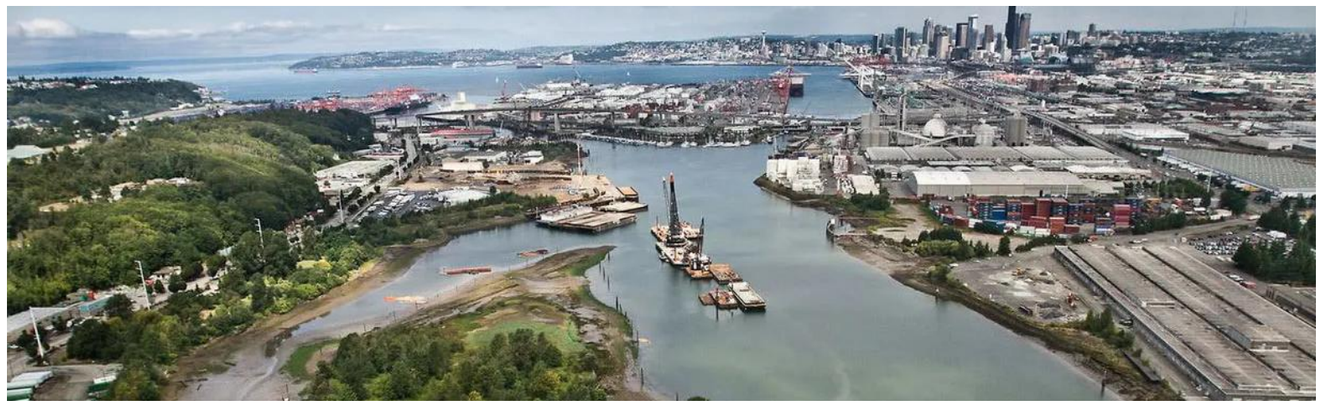
Alternative Shoreline Stabilization

Overwater Cover & Debris Removal

Scientific Studies and Experimental Restoration

Environmental Baseline

PRISTINE FULLY FUNCTIONING CONDITION



HIGHLY MODIFIED CONDITION

ZERO HABITAT FUNCTION

0 150 300

Time (years)

Environmental Baseline

PRISTINE

Fully Functional Habitat

Habitat Condition

NO FUNCTION

0

150

300

No Habitat Value

Time (years)

Environmental Baseline

PRISTINE

HIGHLY MODIFIED
(Current Conditions)

Fully Functional

Pre-Project Baseline

0

150

300

Time (years)

New Construction Project

PRISTINE

HIGHLY MODIFIED

MORE
HIGHLY MODIFIED

Fully Functional Baseline

Pre-Project Baseline

COMPENSATORY MITIGATION IS REQUIRED ($$)

Post-Project Baseline: Decreased Function

0

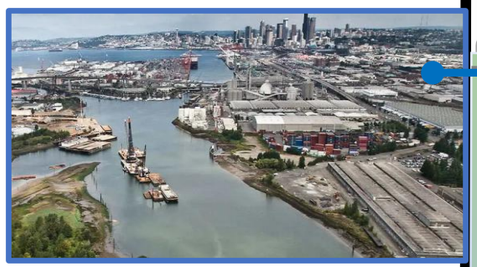
150

300

Time (years)

Repair & Maintenance of Existing Structure

PRISTINE



HIGHLY MODIFIED

MORE
HIGHLY MODIFIED

Hypothetical Fully Functional

Pre-Project Env. Baseline

Post-Project Env. Baseline

End of
Service
Life of
Structure

0

150

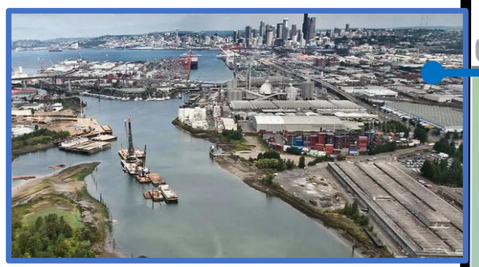
300

Time (years)

<u>SCENARIO 1</u>:
STRUCTURE IS REMOVED AT END OF SERVICE LIFE AND SITE IS ACTIVELY RESTORED

Repair & Maintenance of Existing Structure

PRISTINE



HIGHLY MODIFIED

MORE
HIGHLY MODIFIED

Hypothetical Fully Functional

Pre-Project Env. Baseline

Post-Project Env. Baseline

MITIGATION REQUIRED

End of Service Life of Structure

0

150

300

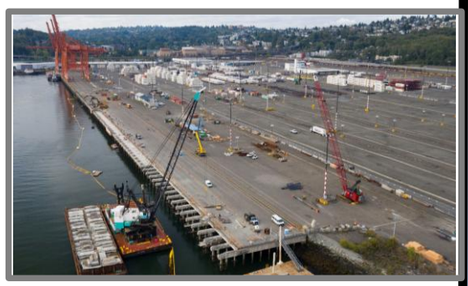
Time (years)

<u>SCENARIO 1</u>: STRUCTURE IS REMOVED AT END OF SERVICE LIFE AND SITE IS ACTIVELY RESTORED

Repair & Maintenance of Existing Structure

PRISTINE

HIGHLY MODIFIED



MORE
HIGHLY MODIFIED

Hypothetical Fully Functional

Pre-Project Env. Baseline

Post-Project Env. Baseline

End of
Service
Life of
Structure

SCENARIO 2:
STRUCTURE IS REMOVED BUT SITE IS NOT ACTIVELY RESTORED

0

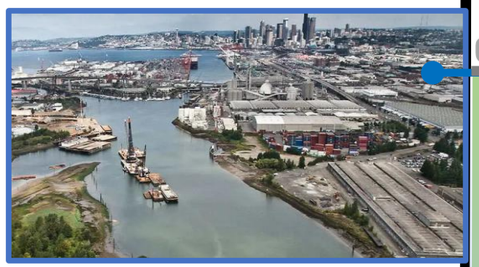
150

300

Time (years)

Repair & Maintenance of Existing Structure

PRISTINE



HIGHLY MODIFIED

MORE
HIGHLY MODIFIED

Hypothetical Fully Functional

Pre-Project Env. Baseline

MITIGATION
REQUIRED

Post-Project Env. Baseline

End of
Service
Life of
Structure

0

150

300

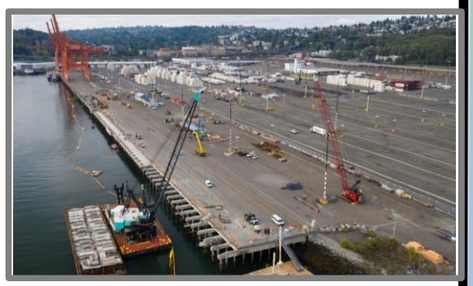
Time (years)

<u>SCENARIO 2</u>:
STRUCTURE IS REMOVED BUT SITE IS NOT ACTIVELY RESTORED

Repair & Maintenance of Existing Structure

PRISTINE

HIGHLY MODIFIED



MORE
HIGHLY MODIFIED

Hypothetical Fully Functional

Pre-Project Env. Baseline

Post-Project Env. Baseline

End of
Service
Life of
Structure

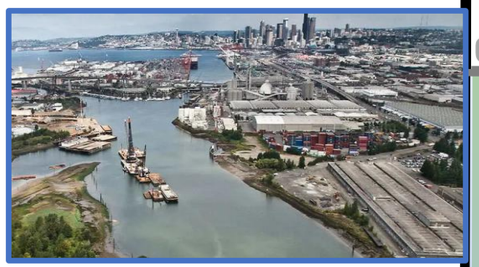
SCENARIO 3:
STRUCTURE IS ABANDONED AND LEFT IN PLACE, NO ACTIVE RESTORATION

0 150 300

Time (years)

Repair & Maintenance of Existing Structure

PRISTINE



HIGHLY MODIFIED

MORE
HIGHLY MODIFIED

Hypothetical Fully Functional

Pre-Project Env. Baseline

Post-Project Env. Baseline

End of
Service
Life of
Structure

SCENARIO 3:
STRUCTURE IS ABANDONED AND LEFT IN PLACE - NO ACTIVE RESTORATION

MITIGATION ONLY FOR THIS!

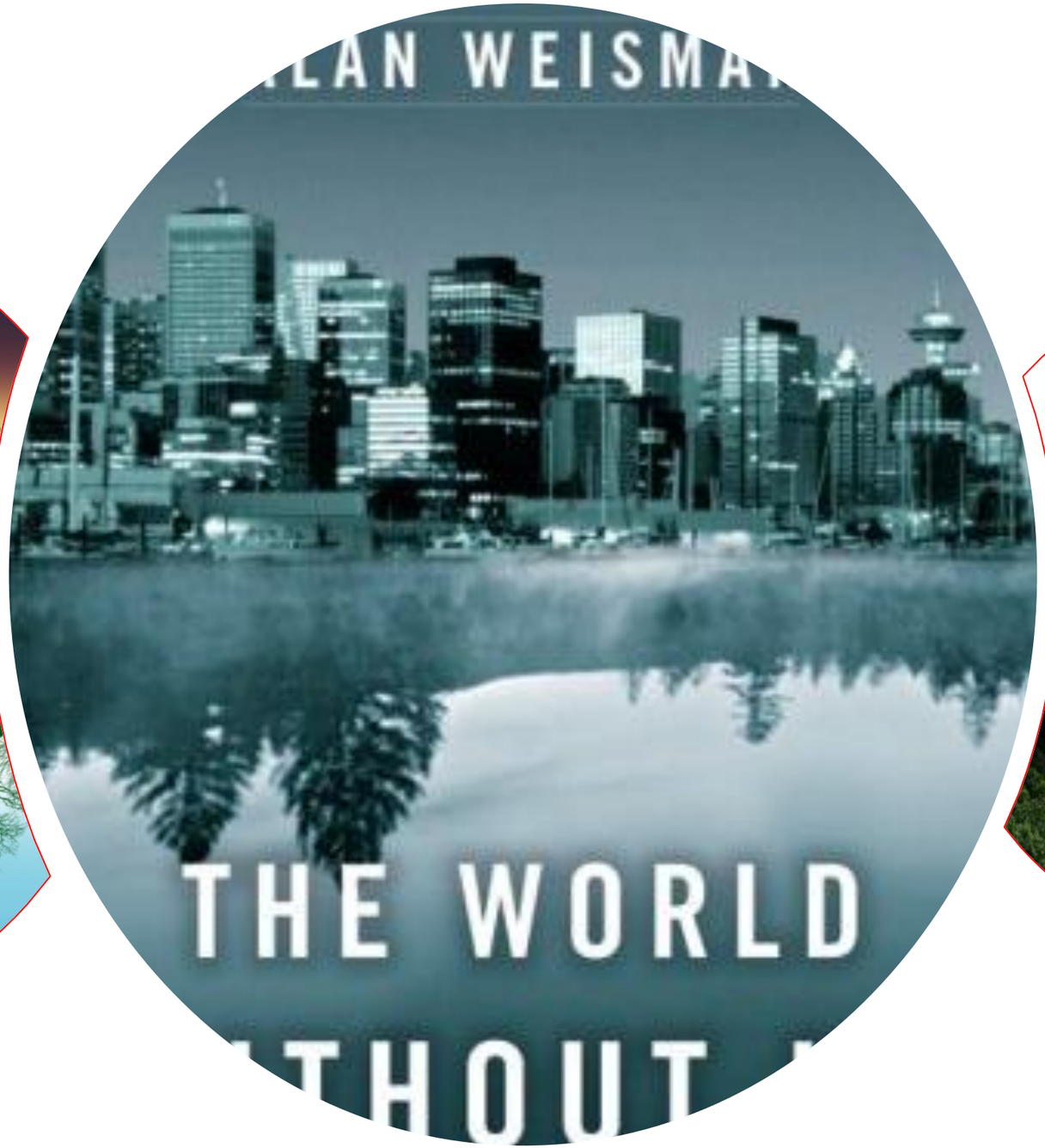
0

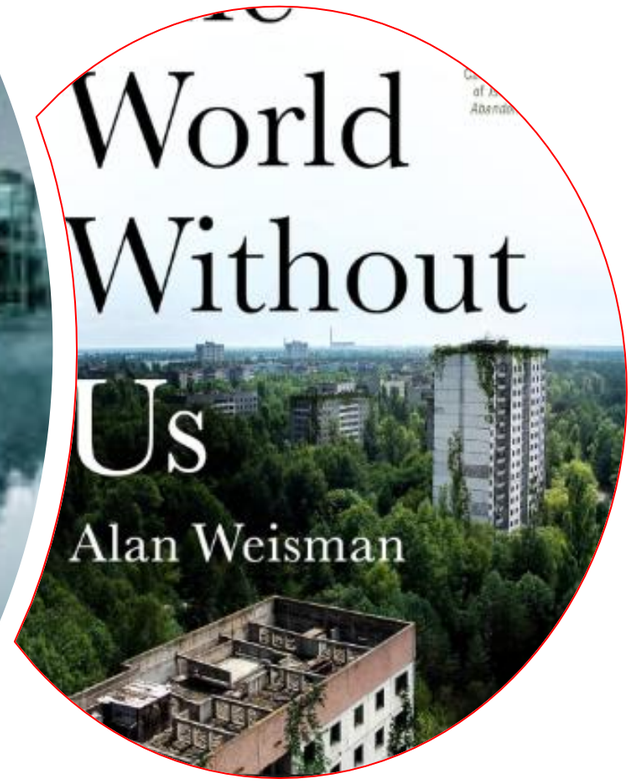
150

300

Time (years)

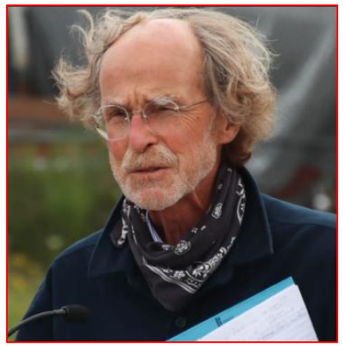
ATTRIBUTION:
World Without Us
Alan Weisman
2008





“World Without Us” Experts

Michelle Havey
Fisheries Biologist
Anchor QEA



George Blomberg
Urban Ecologist
Port of Seattle

John LaPlante
Geotechnical Engineer
Anchor QEA

Jenn Stebbings
Wildlife Biologist
Port of Seattle

Perry Welch, PE
Structural Engineer
Port of Seattle

Jon Sloan
Env. Policy
Port of Seattle

Example:
New In-Water Structure

- Built in formerly pristine estuary in 1886
- Impacts not mitigated at time of construction (predates laws)
- Conversion of riparian, intertidal, shallow subtidal, and deep subtidal zones
- Service life = 150 years
- For World Without Us, assume no maintenance at end of service life

Year: 1886

Riparian Zone → Upper Intertidal Zone → Lower Intertidal Zone → Subtidal Zone

Year: 3978

Example: Habitat Recovery in World Without Us

FULLY FUNCTIONAL

HIGHLY MODIFIED
(New York Harbor)

MORE
HIGHLY MODIFIED

Hypothetical Fully Functional

Pre-Project Env. Baseline

Post-Project Env. Baseline

Structure
Abandoned at
End of
Service Life

HABITAT RECOVERY
DUE TO CESSATION
OF MAINTENANCE

0

150

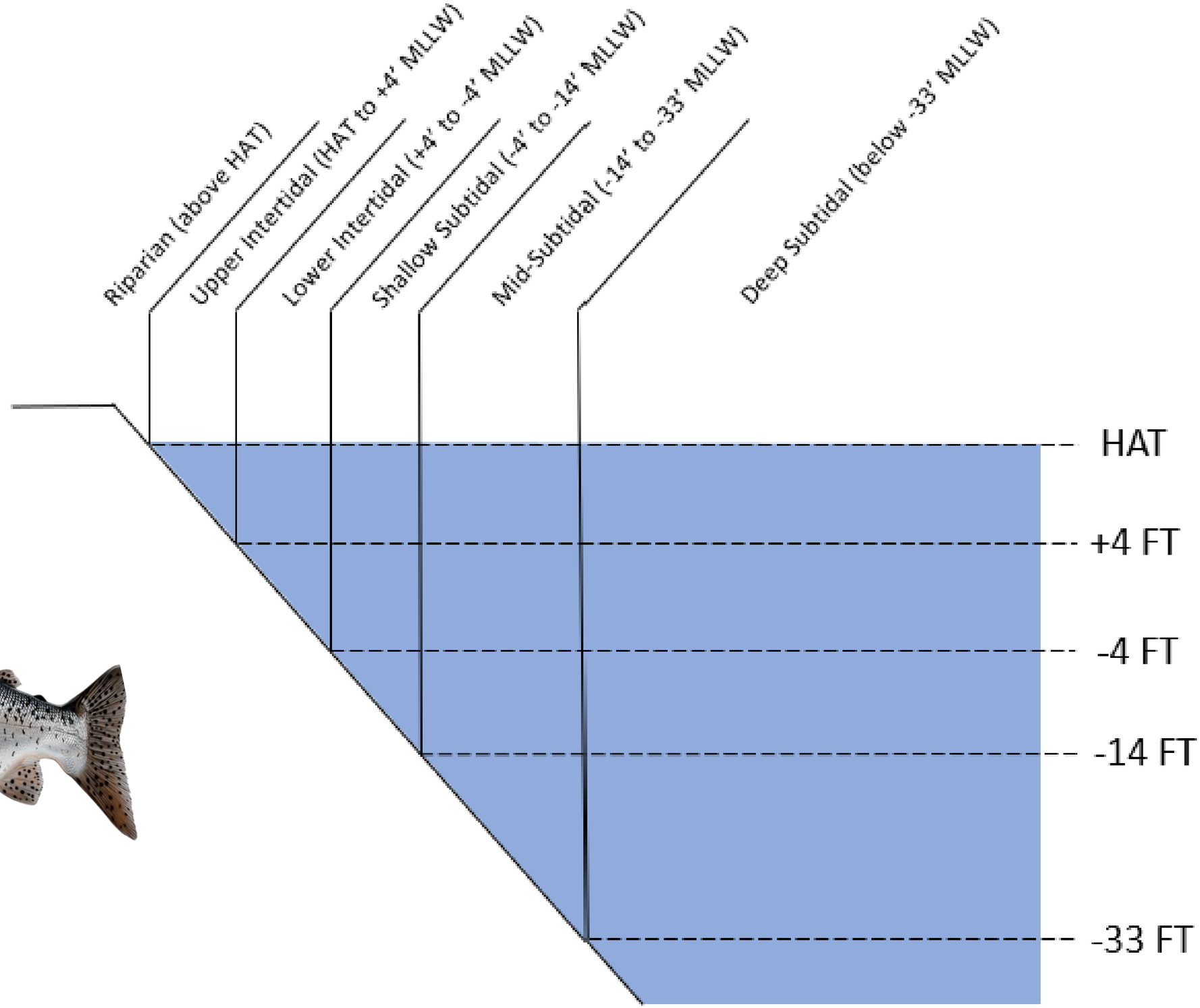
2000

Not to scale

Step 2: Structure Type and Durability

Structure	Elevation Habitat Zone	Structure Type (Light, Medium, Heavy)	Primary Material (Timber, Steel, Concrete, Rock, Asphalt, Concrete)	Maintenance Cycle (i.e., Years Functional Without Maintenance)	% of Structural Functional Loss (at 300 Years as Surrogate for In Perpetuity)
Vertical Bulkhead	Riparian	Heavy	Concrete, steel or timber	50	100%
	Upper IT			75	
	Lower IT				
	Shallow ST				
	Mid-ST			100	
	Deep ST				
Dredged Berth: Shallow depth<-14 feet MLLW (recreational marina)	Riparian	Light	Fine-grain substrate	30	100%
	Upper IT				
	Lower IT				
	Shallow ST				
	Mid-ST				
	Deep ST				
Dredged Berth: Medium depth -15 feet MLLW to -33 feet MLLW (barge moorage, fish processor, cruise ship)	Riparian	Medium	Fine-grain substrate	15	100%
	Upper IT				
	Lower IT				
	Shallow ST				
	Mid-ST				
	Deep ST				

Step 3: Defining Habitat Zones

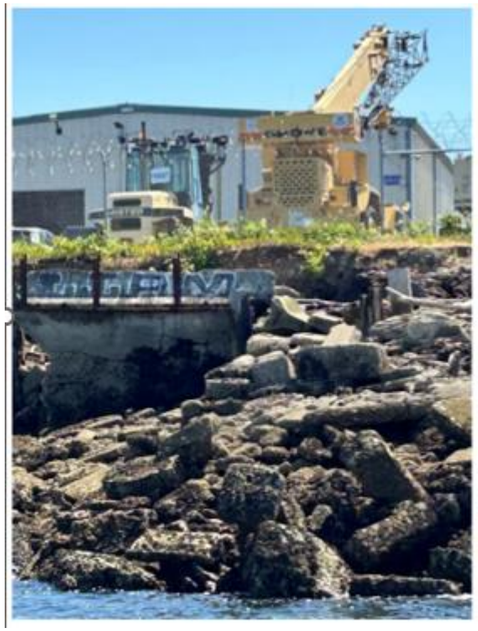


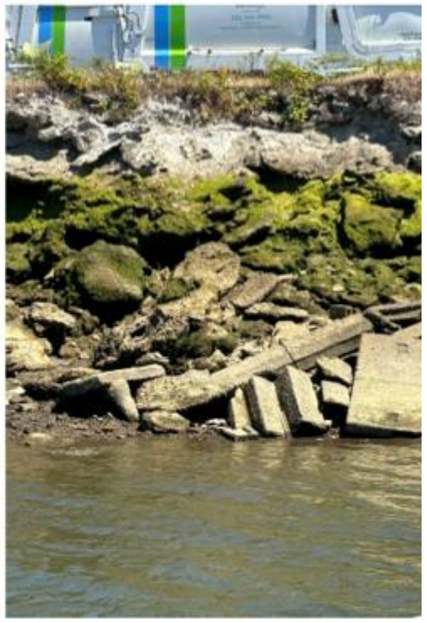
Step 4: Relative Values for Habitat Zones

Habitat Zone	Access	Chinook Salmon PBF Point Values				Sum	**Relative Habitat Value**
		Migration& Rearing	Forage & Prey	Cover	Water Quality		
Riparian	0	0	3 (2)*	2	3	1.33	**0.47**
Upper Intertidal	0.4	3	3	3	2	2.23	**0.79**
Lower Intertidal	0.94	3	3	3	2	2.77	**0.98**
Shallow Subtidal	1	3	3	3	2	2.83	**1.00**
Mid-Subtidal	1	3 (2)	1	1	0	1.83	**0.65**
Deep Subtidal	1	3 (2)	1	0	0	1.67	**0.59**

Step 5: Structural Decay vs Rate of Recovery

CHINOOK SALMON	Habitat Zone	**Structural Decay @ 300 Years**	**Habitat Recovery @ 300 Years**	Fully Functional Relative Habitat Value
Conventional Armored Slope – Heavy	Riparian	**100%**	**13%**	0.47
	Upper Intertidal	**40%**	**50%**	0.79
	Lower Intertidal	**30%**	**50%**	0.98
	Shallow Subtidal	**20%**	**50%**	1.00
	Deep Subtidal	**10%**	**50%**	0.59






Step 6: Ground-Truthing World Without Us Assumptions

Last Step: Finalize the Calculator

New Habitat Equivalency Analysis (HEA) Framework

Includes:

- Project area
- Species-specific habitat zones
- Relative value of habitat
- Existing condition of habitat
- Change between baseline and post-project conditions

+

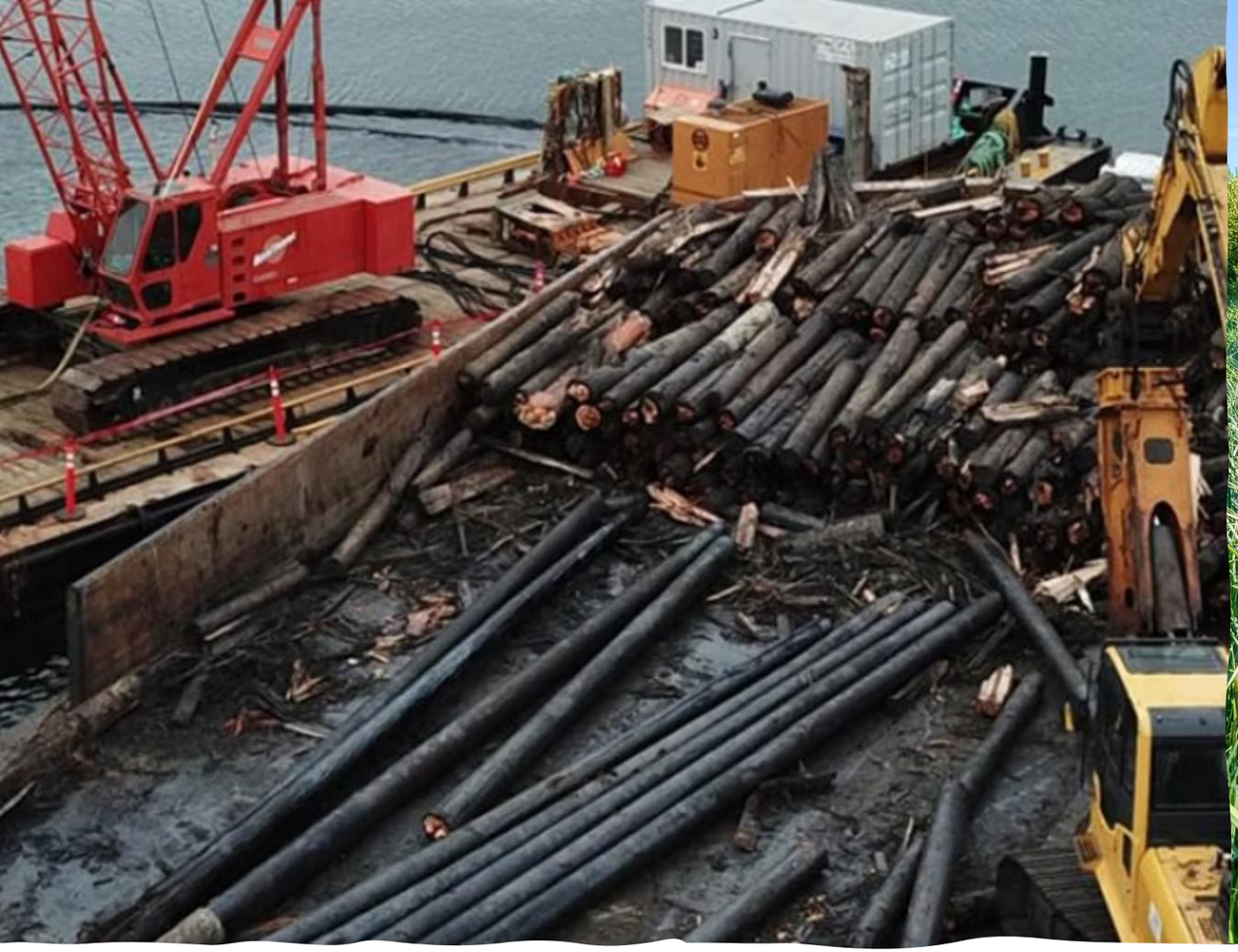
Enduring Effects

World Without Us Additions:

- Structure type
- Structure durability
- Habitat recovery rate (%)
- Structural decay (%)
- Adjustment factors, e.g., creosote removal

The Credit-Debit Ledger

- Calculator output is either credits or debits
- Debits result from adverse species impact
- Credits generated through restoration
- Debits are offset with credits w/in 3 years
- “Credit Savings Instrument” allows credits to be banked
- Exploring potential for export of credits to Umbrella Mitigation Bank (PORTfolio)



WHY SHOULD YOU PAY ATTENTION TO THE ENDURING EFFECTS POLICY?

Example:
Terminal 18
Maintenance Dredging
$3m Project

Description:

Repair rip-rap slope, remove accumulated sediment from berth

NMFS Calculator:

- 1500 debits = $1.8m
- 60% of budget

Port Calculator:

- 372 debits = $334,800
- 11% of budget

Example:
Harbor Island Marina Dock E Replacement $3m Project

Description:

Replace commercial moorage pier, including floats, piles and hardware.

NMFS Calculator:

- 79 debits = $84,000
- 3.2% of budget

Port Calculator:

- 20 debits = $24,000
- 0.8% of budget

Example: Terminal 5 Modernization $340m Project

Description:

Rebuild pier apron, strengthen crane rail, dredging along cargo pier.

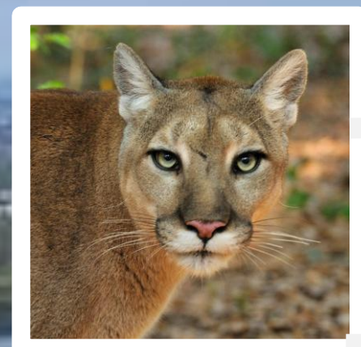
NMFS Calculator:

- 22,500 debits = $27M
- 8% of budget

Port Calculator:

- 1,000 debits = $1M
- <1% of budget

Florida Manatee



Florida Panther

Florida Scrub Jay

Green Sea Turtle

Indigo Snake

Timeline: The Road to Resolution

2018 — 1

NMFS publishes ESA "Enduring Effects" Policy

2 — **2019**

Early dialogue begins

2020–2023 — 3

Limited progress:
Ports consider “other” solutions, while pondering a “World Without US”

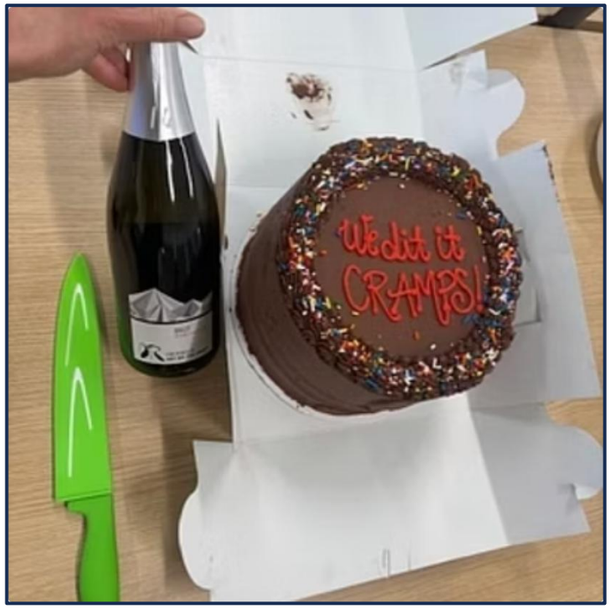
4 — **2023**

Ports decide to **Lose Smart**: form collaborative technical work group and pursue CRAMP

2025 — 5

Biological Opinions for CRAMP issued =
Cake and champagne with agency colleagues!

We Really Did Eat Cake and Drink Champagne!



> "Thank you, for highlighting the USFWS and NMFS teams, Ports and Corps partners, and our fruitful collaboration efforts to get us all to this point ... As someone who stepped into the middle of this ongoing, massive undertaking, I have been impressed with the technical expertise contributed, information shared, and collective dedication to conservation modeled by everyone."
>
> — Agency Branch Chief

Now What?

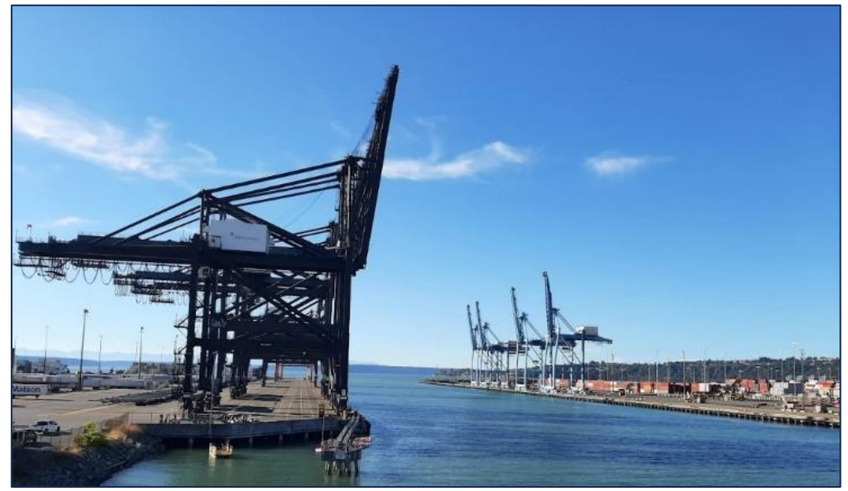
Project Design & Notifications

Project Construction

Annual Compliance Meeting

Looking Ahead

- Umbrella Conservation Banking Agreement
- Update calculator and modify permit as needed
- Permit renewal w/ expanded scope (2035–2045)



Thank You

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HAMBU
SÜD
COCL