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The ECHO Program
An overview

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Presentation to North Shore Community Advisory Panel

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Canada

The Vancouver Fraser Port Authority
Enabling trade with more than 170 world economies

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Enhancing Cetacean Habitat and Observation (ECHO) Program

- **What:** A collaboration with over 100 U.S. and Canadian partners and advisors from across the marine transportation industry, government, Indigenous communities, and environmental groups
- **Why:** To better understand and reduce the cumulative effects of commercial vessel traffic on at-risk whales throughout the southern coast of British Columbia
- **Key focus:**
  - Building collaborative relationships
  - Advancing globally-reaching research and education projects
  - Leading large-scale underwater noise reduction initiatives

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ECHO Program structure

Advisory Working Group

Provides guidance and advice to shape the program

- Marine transportation industry
- Canadian and US government
- Indigenous representatives
- Environmental organizations

Vessel Operators Committee

Supports the planning, implementation and communication of on-water noise reduction initiatives

- Marine transportation industry
- Canadian and US Coast Guards

Acoustic Technical Committee

Provides technical and scientific advice on research projects and measurement and evaluation of URN

- Acousticians and bio acousticians
- Naval architects and engineers

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At-risk whales in our region

Harbour Porpoise
(Special Concern)

Humpback
(Threatened)

Fin
(Threatened)

Sei
(Endangered)

Blue
(Endangered)

North Pacific Right whale
(Endangered)

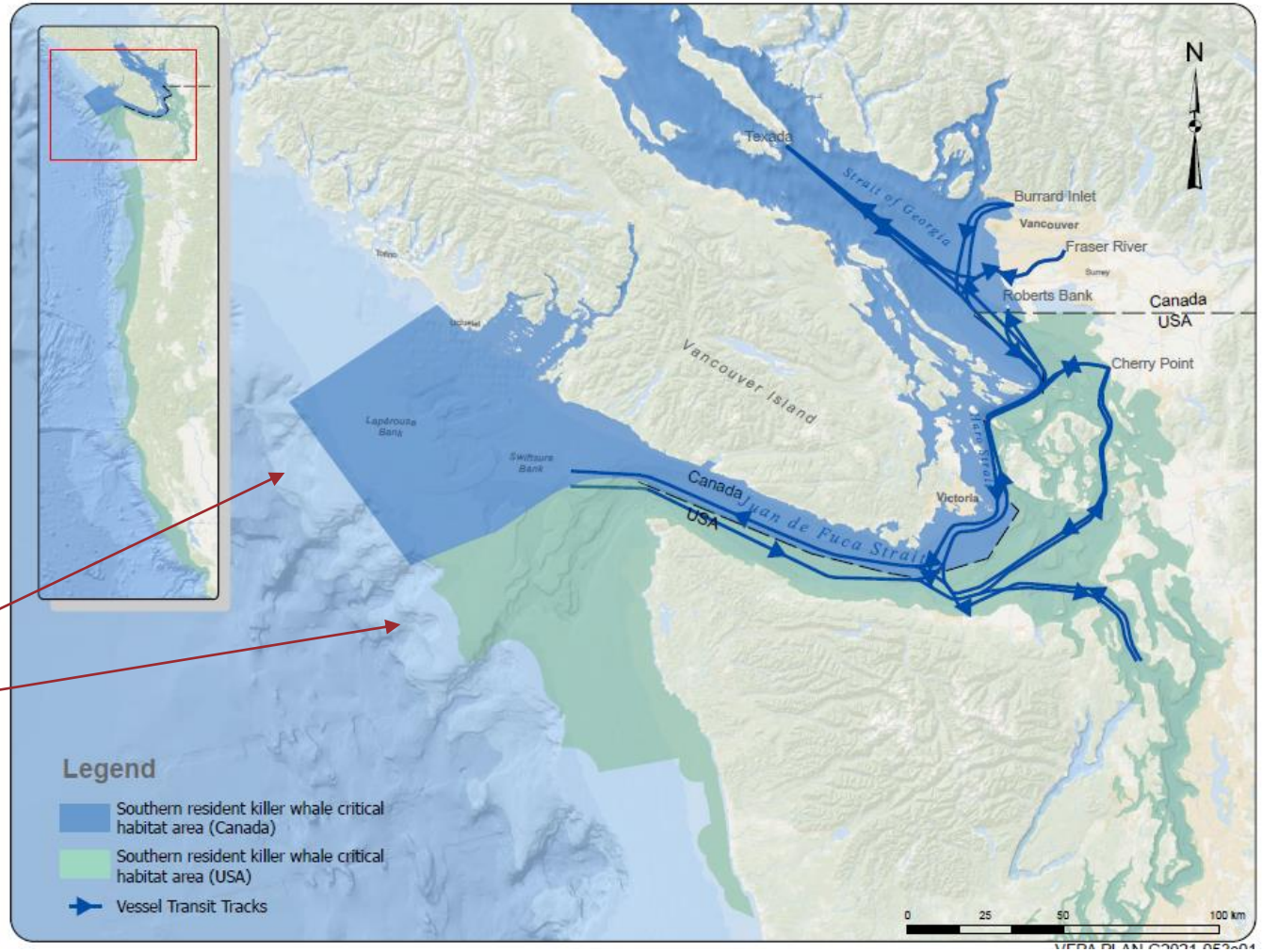
Biggs (transient) killer whale
(Threatened)

Southern resident killer whale
(Endangered)

Based on Canadian Species at Risk Act.

Shipping and Southern Resident killer whales

Critical habitat of southern resident killer whales in Canada (blue) and the U.S. (green)



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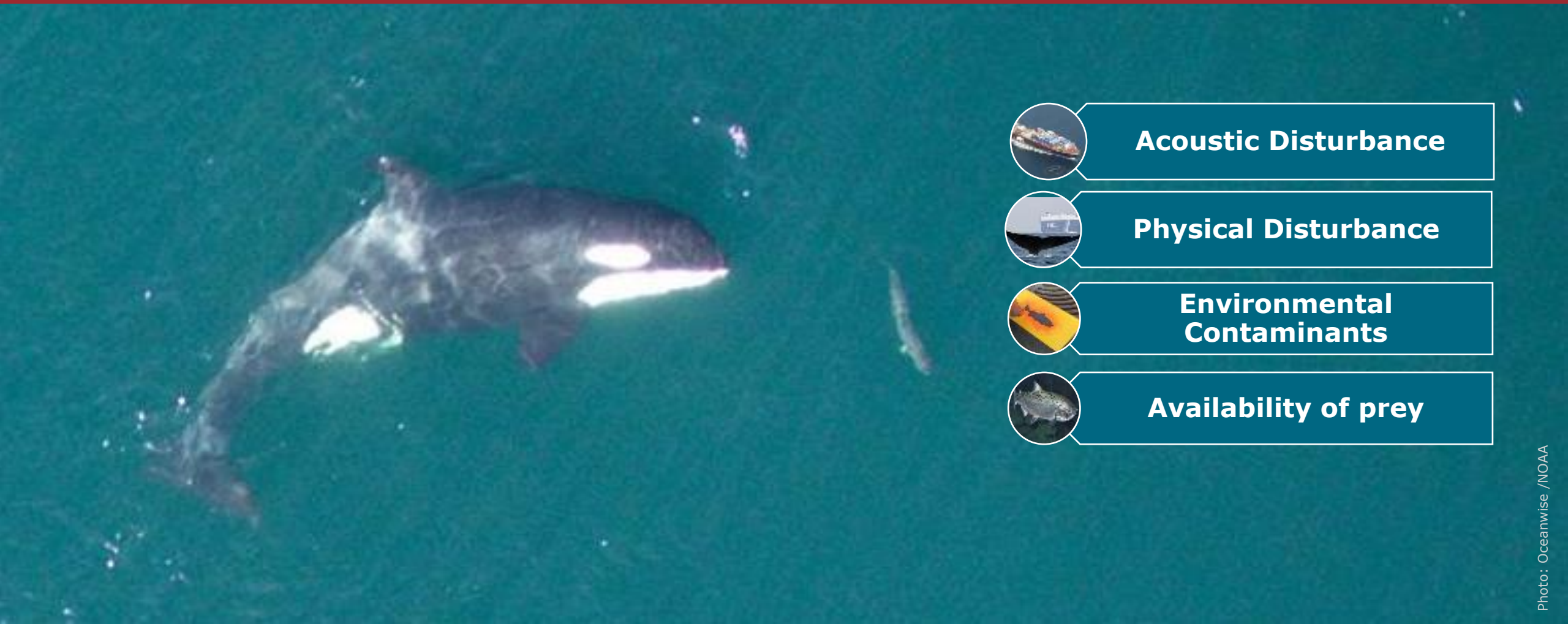
Known threats to marine mammals



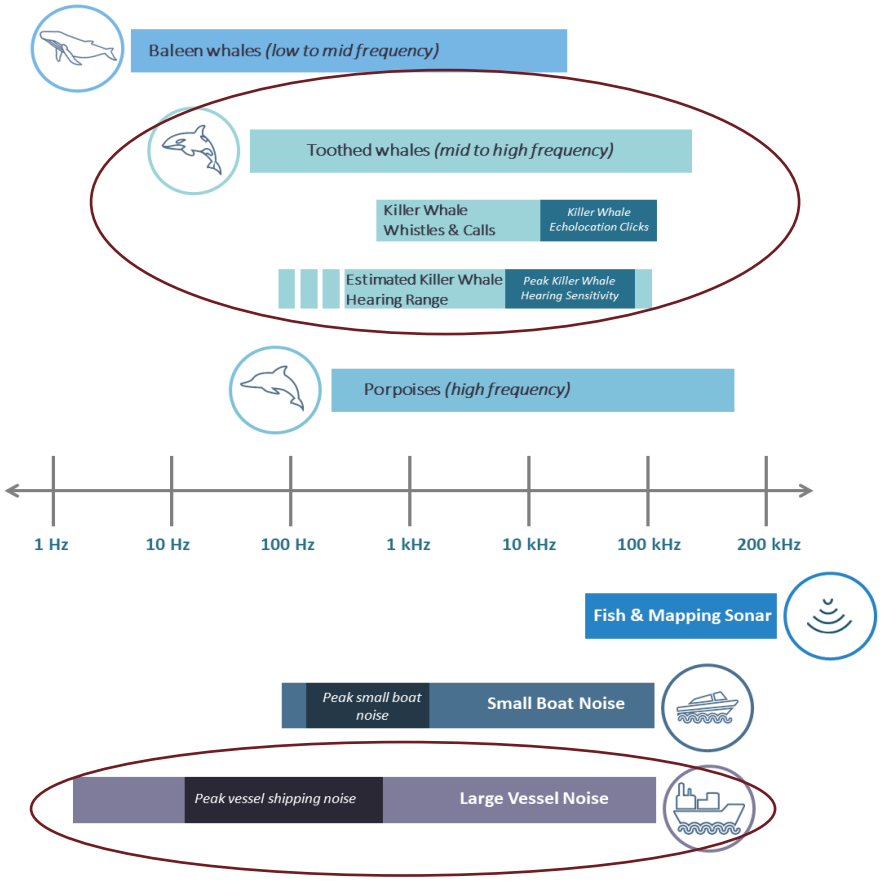
- Acoustic Disturbance
- Physical Disturbance
- Environmental Contaminants
- Availability of prey

Photo: Oceanwise /NOAA

Whales, shipping and the ECHO Program

Underwater vessel noise overlaps with marine species's use of sound

- Many marine mammals, including southern resident killer whales use sound to find food, communicate and navigate
- Ship noise can disrupt their ability to communicate, socialize, rest and mask their ability to hear returning echolocation clicks when feeding
- Research indicates that approx. 130 different marine species are impacted by ship noise



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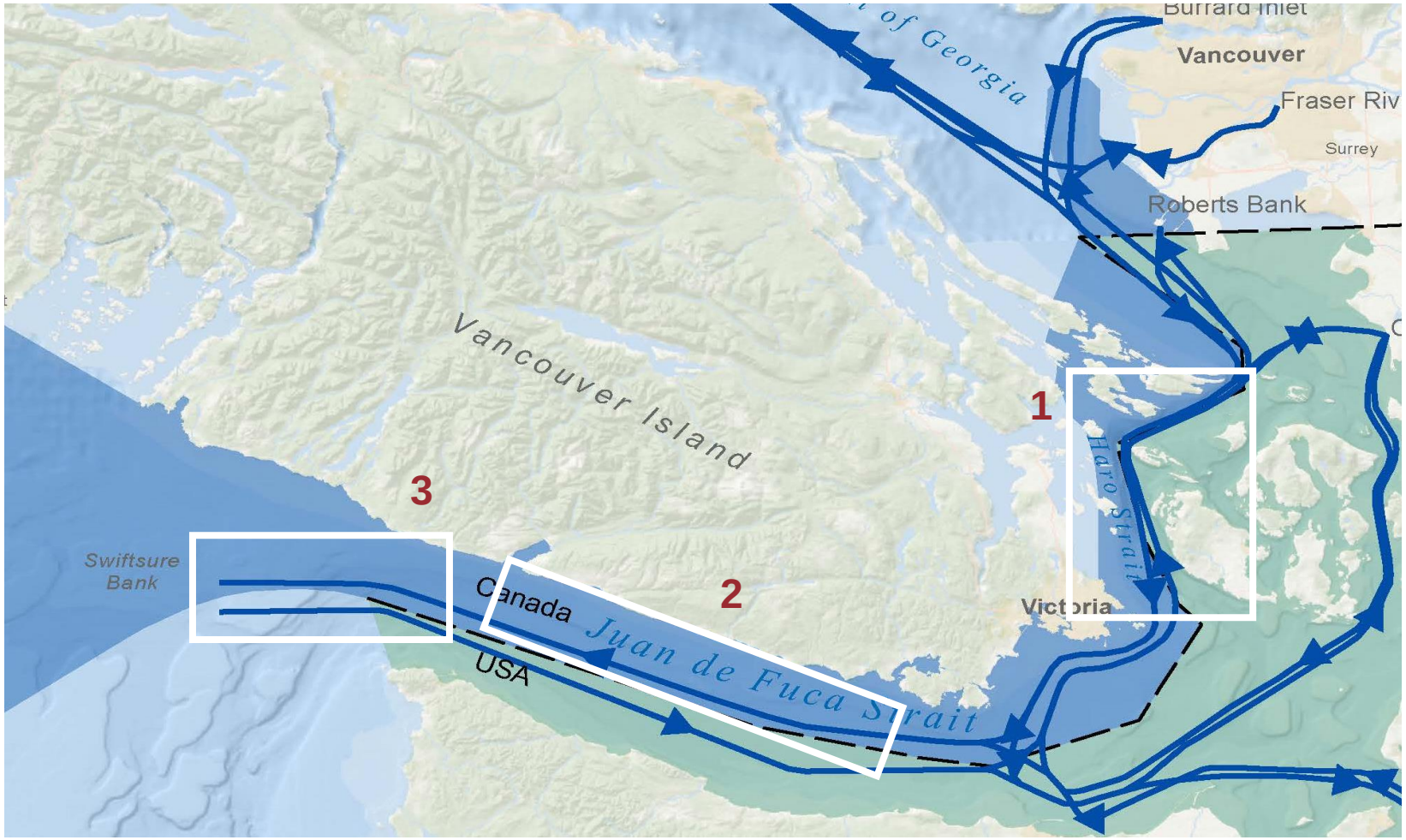
Underwater noise reduction initiatives



1. Haro Strait & Boundary Pass slowdown *(2017 - 2021)*
2. Strait of Juan de Fuca inshore lateral displacement *(2018 – 2021)*
3. Swiftsure Bank slowdown *(2019 – 2021)*

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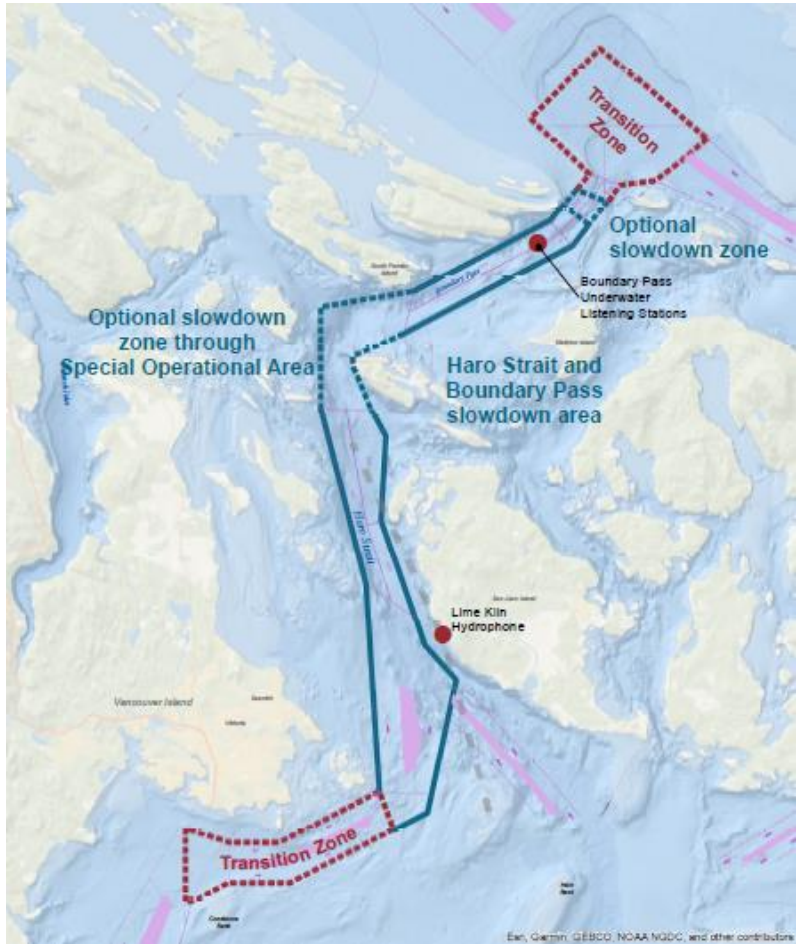
74nm
(nautical miles) of voluntary underwater noise reduction initiatives

~47%
of SRKW critical habitat along the international shipping lanes

1. 2021 Haro Strait and Boundary Pass slowdown: results



Haro Strait and Boundary Pass slowdown area

90%

of all vessel transits participated *

2,074

out of 2,295 vessel transits

>3dB

reduction in ambient noise in 2021

~55%

reduced sound intensity

**Pilot reported participation.*

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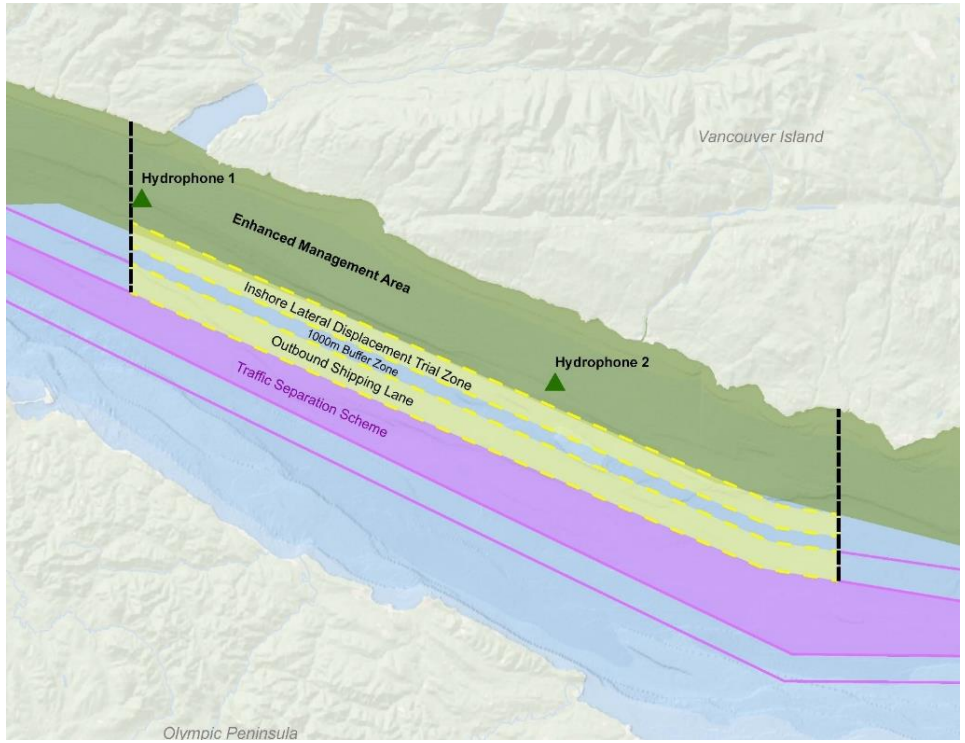
2. 2021 Strait of Juan de Fuca inshore lateral displacement: results



Strait of Juan de Fuca inshore lateral displacement area

88%

of all tug transits participated *

126

out of 143 tug transits

~4-7dB

reduction in ambient underwater noise per tug transit

~70%

reduction in underwater sound intensity per tug transit

**Spent more than half of transit in the inshore lateral displacement zone or the outbound shipping lane.*

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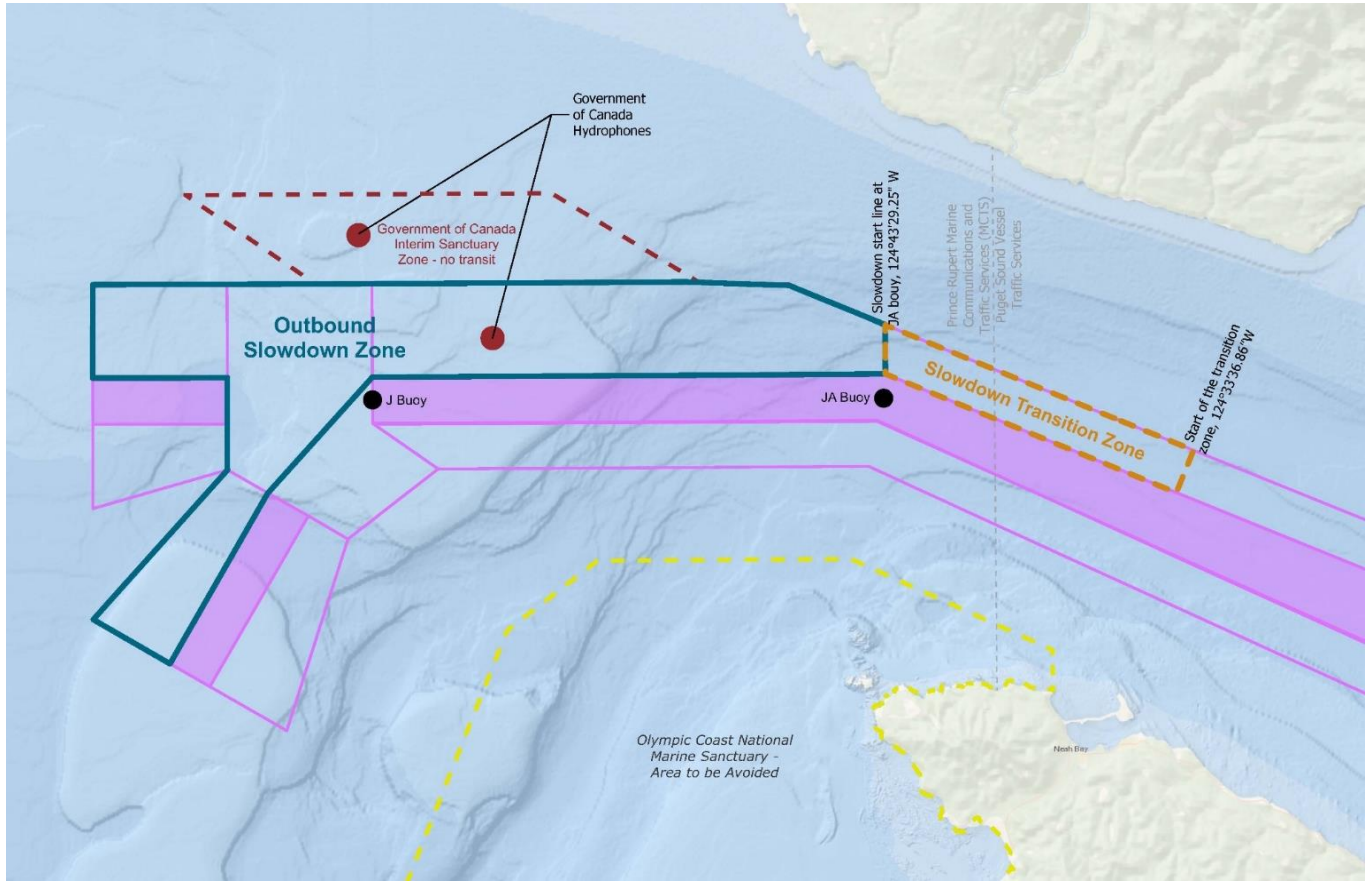
3. 2021 Swiftsure Bank slowdown: results



Swiftsure Bank slowdown trial area

81%

of all vessel transits participated *

1624

out of 2010 vessel transits

~2dB

reduction in ambient noise in 2020 – results for 2021 pending

~37%

reduction in underwater sound intensity in 2020 – results for 2021 pending

**Achieved an average speed through water <=1 knot of the target*

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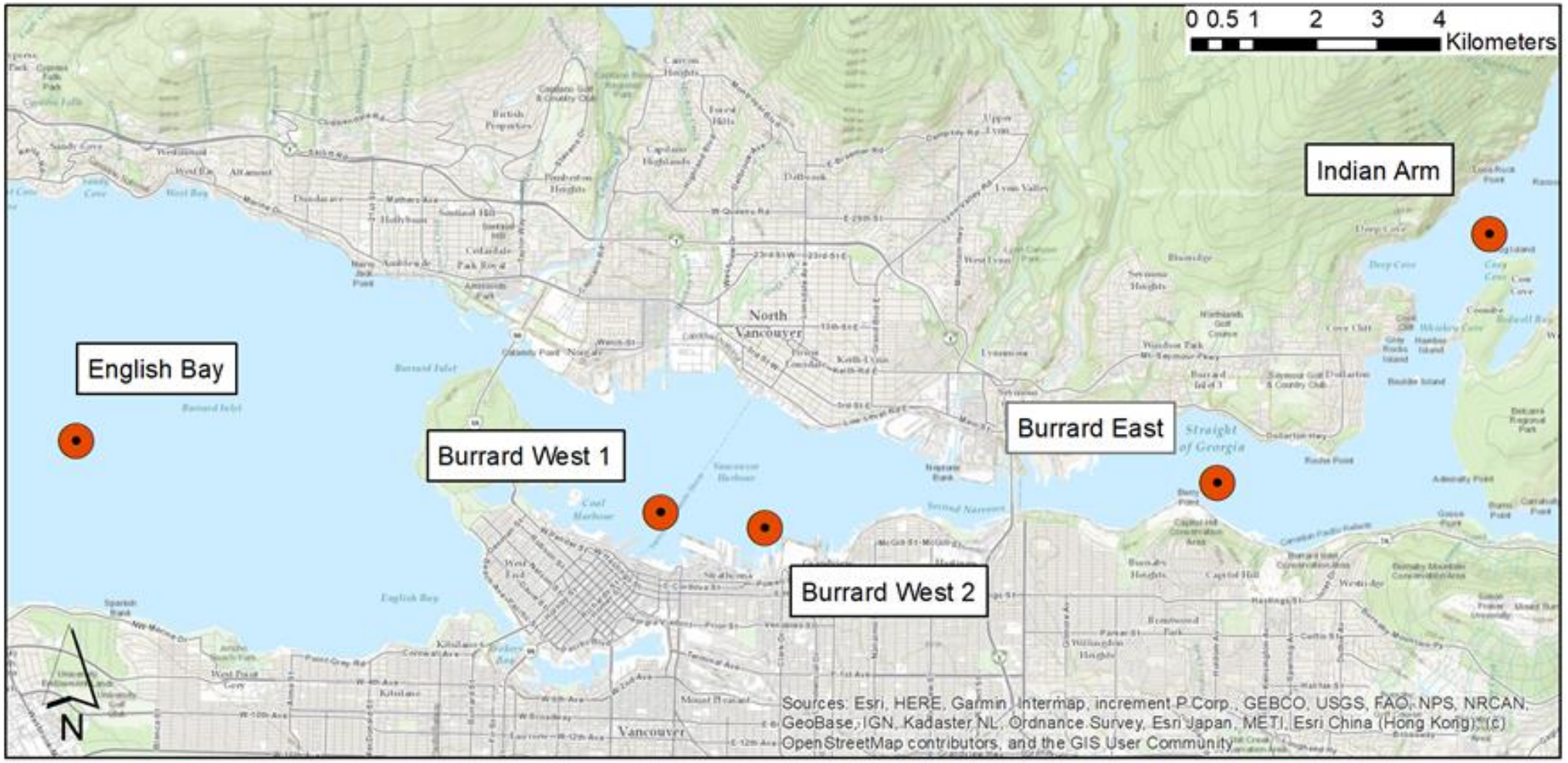
Underwater noise monitoring

- Measuring underwater noise since 2015
- Over 20,000 vessel transits recorded – one of the largest databases in the world
- Hydrophones are used to monitor and analyze underwater noise levels across key locations in the Salish Sea, including:
  - Strait of Georgia
  - Boundary Pass
  - Haro Strait
  - Burrard Inlet

Underwater noise monitoring – Burrard Inlet

Ambient noise monitoring locations



Burrard Inlet underwater noise monitoring
Ambient noise trends

Key findings of 2020 ambient noise monitoring in Burrard Inlet:

- Noise levels are higher in the summer due to recreational vessel traffic
- Noise levels are also higher during daytime in the inlet, due to Seabus traffic and other vessel activities
- Indian Arm is the quietest location overall
- English Bay has the most consistent noise levels over time

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Burrard Inlet underwater noise monitoring
Marine mammal trends

Harbour porpoise

- Harbor porpoises always present, but rarely seen
- Both NRKW and SRKW visually observed
- All killer whale detections in English Bay during winters months

	# of days visually observed	# of days acoustically observed
Killer whales	9 – Biggs	3 – Biggs 2 – SRKWs
Harbor porpoise	N/A	107 days

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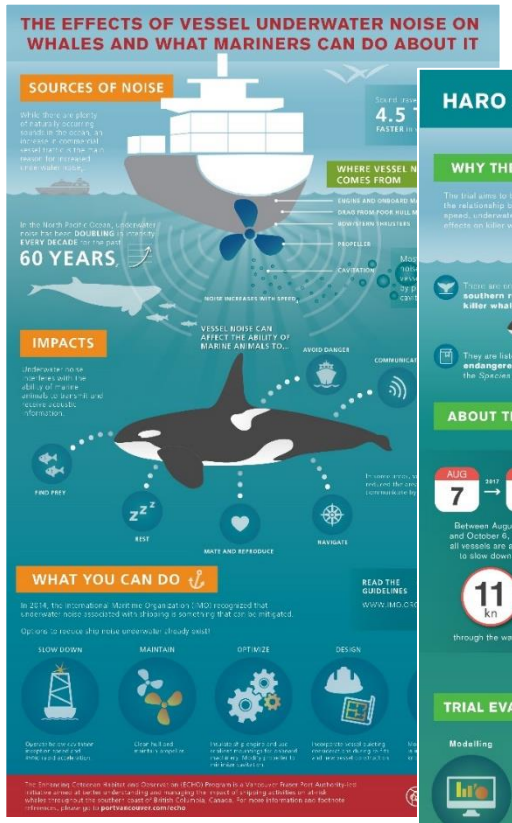
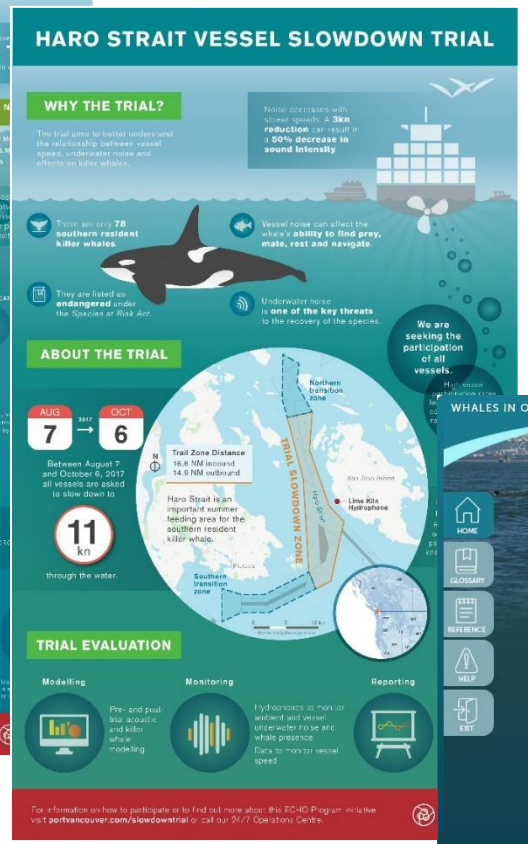
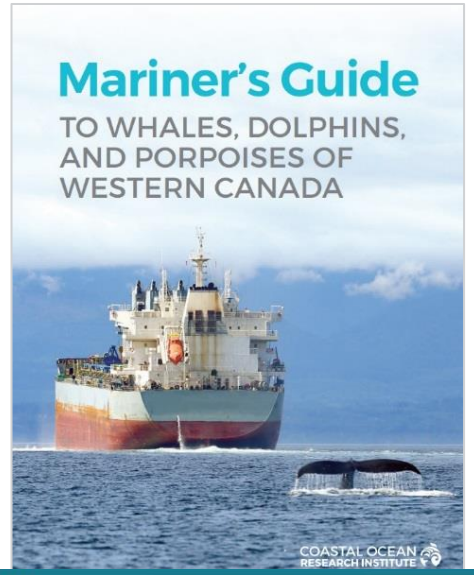
Educational resources







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Encouraging quieter ships at the Port of Vancouver

EcoAction Program

Underwater noise reduction incentive for commercial vessels, since 2017

EcoAction award levels

GOLD
Quiet ship notation from ship classification society

SILVER
Noise reduction performance indicator from Green Marine

BRONZE
Technologies that help reduce cavitation

International collaboration

- Spearheading internationally-reaching research and education on ship-generated underwater noise
- Current projects:
  - Helping to shape the International Maritime Organization on its underwater noise reduction guidelines
  - Working with international shipping classification societies to align ‘quiet ship’ notations
  - Providing input and research to various other international research efforts

The ECHO Program – Looking ahead

What's planned in 2022

What's next in 2022:

- New slowdown trial – inbound lane Swiftsure Bank
- Continued slowdown at Haro/Boundary and Swiftsure Bank outbound
- Lateral displacement in Strait of Juan de Fuca
- Co-benefits of voluntary slowdowns study

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Thank you

To learn more:

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www.portvancouver.com/echo

Photo: Joan Lopez

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