Apr 28th, 10:15 AM - 11:45 AM

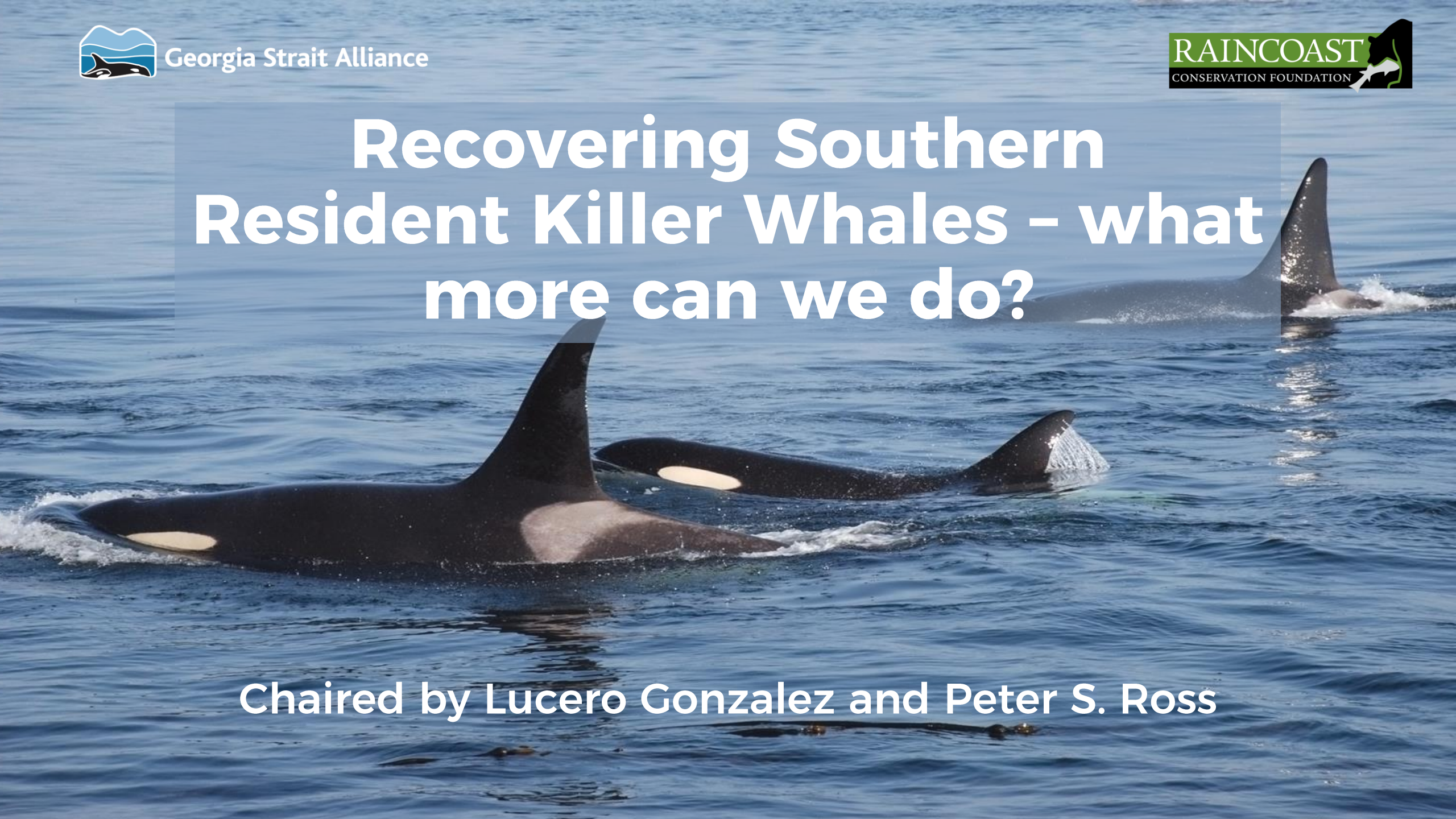
The plight of the enigmatic southern resident killer whales: Have we done all we can to recover these icons of the Salish Sea?

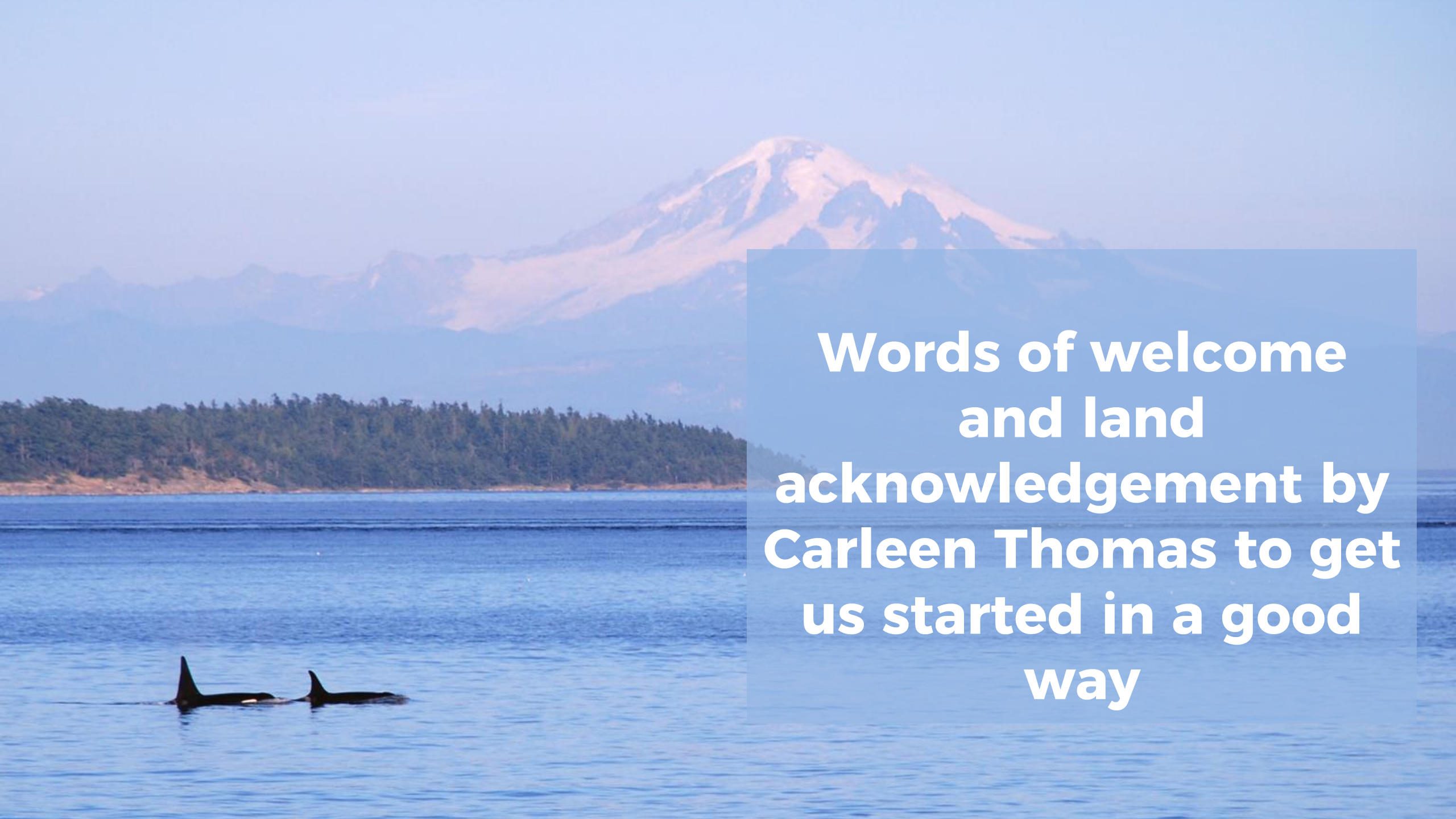
Orla Robinson

Regan Nelson

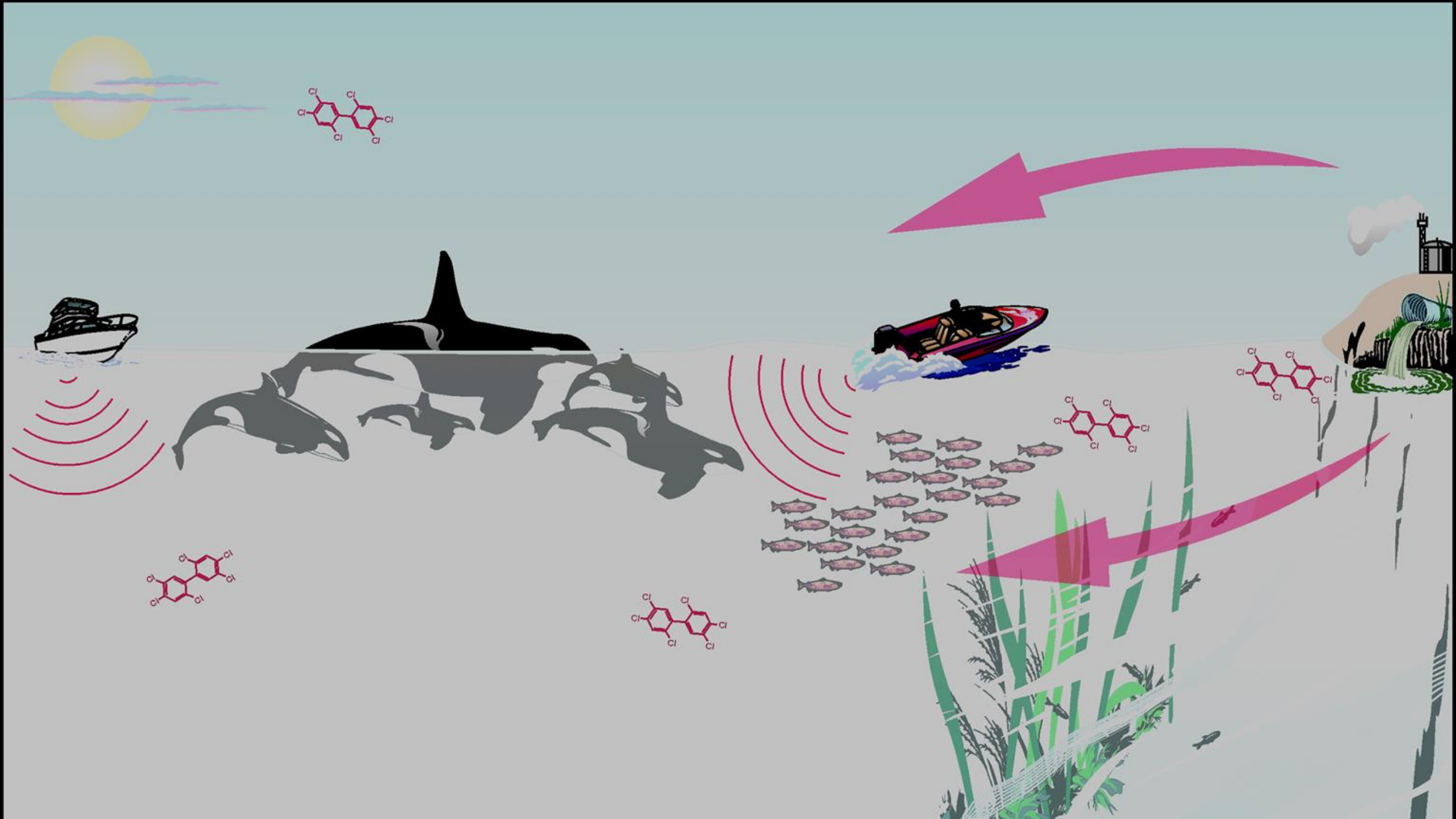
Dr. Lance Barrett-Lennard

Carleen Thomas


Georgia Strait Alliance
RAINCOAST
CONSERVATION FOUNDATION
Recovering Southern Resident Killer Whales – what more can we do?
Chaired by Lucero Gonzalez and Peter S. Ross



Words of welcome and land acknowledgement by Carleen Thomas to get us started in a good way



Overcoming the challenges that constrain the recovery of SR Killer Whales

- Mobile
- Long-lived
- High trophic level predators
- Large habitat needs
- Low reproductive rate
- Primary prey rely on both freshwater and marine
- Difficult to study (legal, logistics and ethics)
- Are heavily contaminated, have a dwindling food supply, and live in a busy, noisy Salish Sea

Progress has been made

Listed in both US (2005) and in Canada (2003)

Conservation / Action Plans in place

Researchers in both countries are generating data, knowledge and expertise

Indigenous Nations are actively engaged in knowledge generation and resource management

Communities (municipalities, wastewater authorities, regional governments) are increasingly engaged in watershed activities

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Getting to know our speakers for today

- **Carleen Thomas**

  Special Projects Manager

  Tsleil-Waututh Nation
- **Lance Barrett-Lennard**

  Senior Scientist, Cetacean Conservation Research Program

  Raincoast Conservation Foundation
- **Orla Robinson**

  Program Advisor

  The ECHO Program
- **Regan Nelson**

  Senior Advocate

  National Resource Defense Council

Agenda for today

- Panelists presentations ~ 40 min
- Q & A ~ 30 min
- Panel Closing ~ 5 min

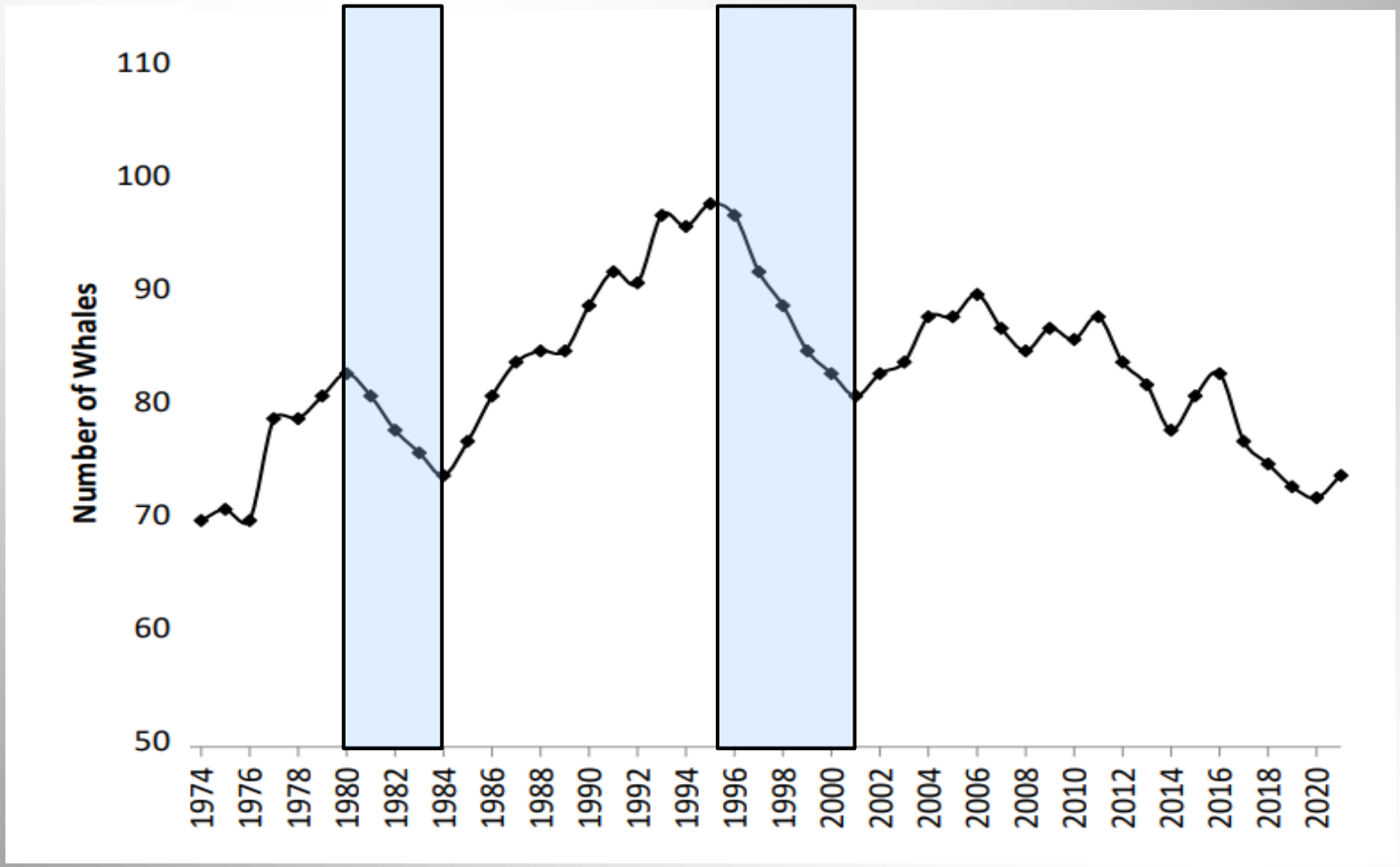
Ensuring Adequate Prey for Southern Resident Killer Whales

Lance Barrett-Lennard

RAINCOAST CONSERVATION FOUNDATION

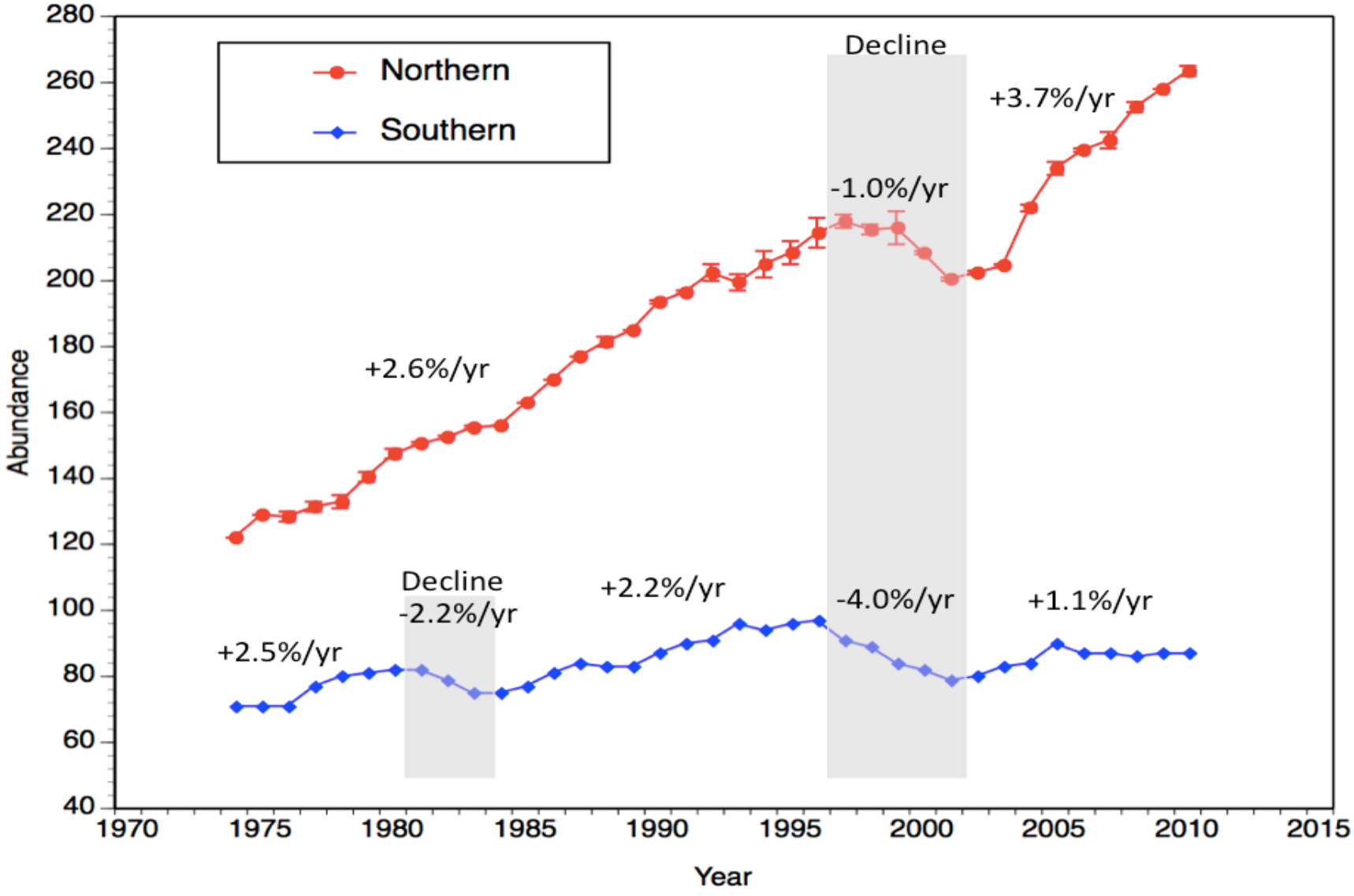
University of British Columbia

Southern Resident Killer Whale Population Size



Source: Centre for Whale Research

Abundance trends in Southern & Northern Residents



Sources: NRKW - Ellis, Towers & Ford 2011 DFO Tech Rep 2942
SRKW - Center for Whale Research, Friday Hbr, WA

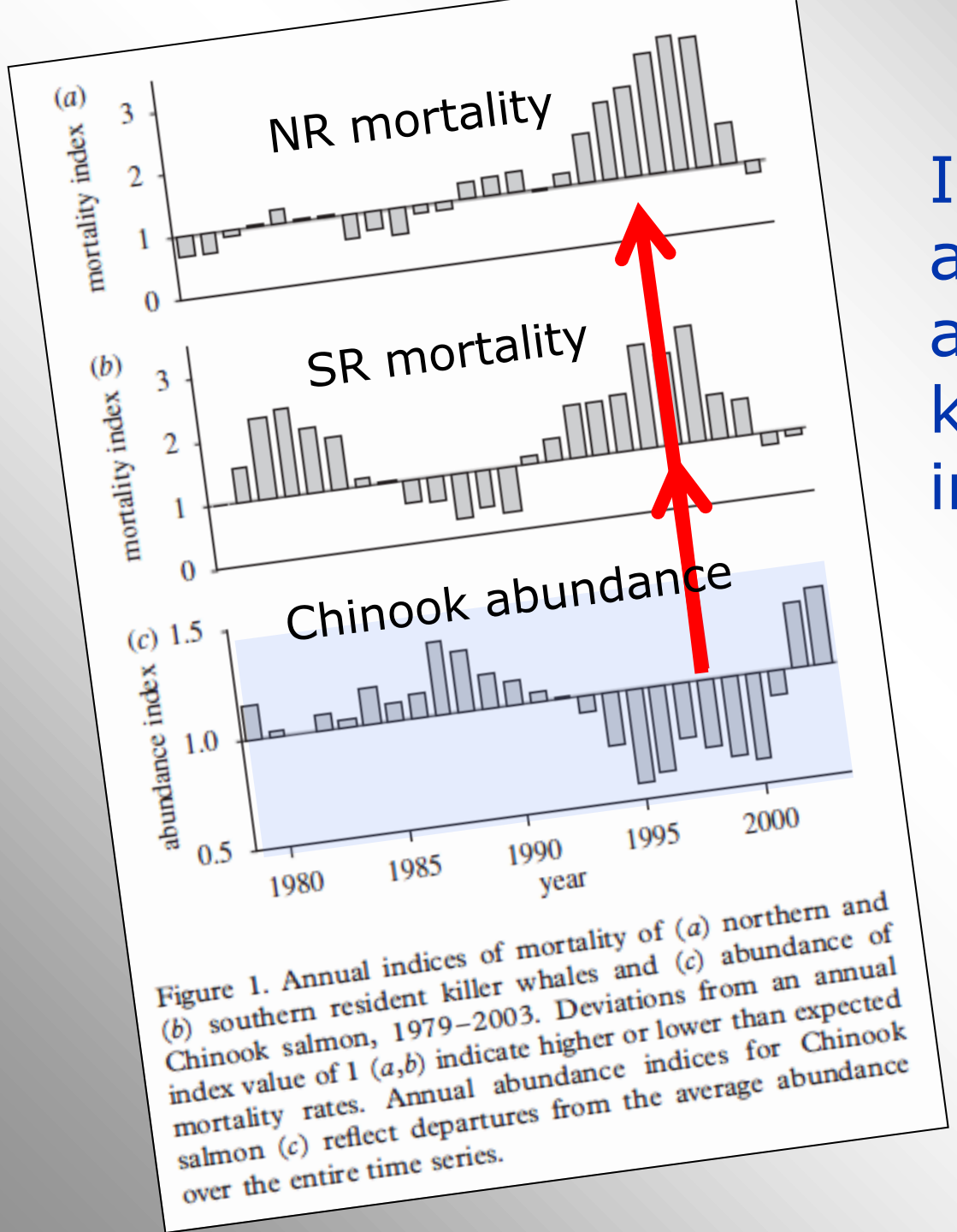


Figure 1. Annual indices of mortality of (*a*) northern and (*b*) southern resident killer whales and (*c*) abundance of Chinook salmon, 1979–2003. Deviations from an annual index value of 1 (*a*,*b*) indicate higher or lower than expected mortality rates. Annual abundance indices for Chinook salmon (*c*) reflect departures from the average abundance over the entire time series.

In years of lower-than average Chinook salmon abundance, resident killer whale mortality increases (1 yr time lag)

Ford, Ellis, Olesiuk & Balcomb 2009 Linking killer whale survival and prey abundance: food limitation in the ocean's apex predator:Biology Letters 6: 139-142.

NOAA FISHERIES SERVICE
NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION

Fisheries and Oceans Canada | Pêches et Océans Canada

July 28, 2011

A Bilateral Scientific Workshop Process to Evaluate Effects of Salmon Fisheries on Southern Resident Killer Whales

Background and context: Southern Resident killer whales (*Orcinus orca*) are listed as an endangered species under both the U.S. Endangered Species Act (ESA) and Canada's Species at Risk Act (SARA). The National Marine Fisheries Service (NOAA Fisheries) and Fisheries and Oceans Canada (DFO) have developed and adopted recovery plans as required by their respective statutes. These recovery plans present the biological status of the population, describe threats and factors believed to be limiting recovery, establish interim recovery objectives and identify critical uncertainties. They prescribe actions to address the threats and limiting factors and call for research to address critical uncertainties and data gaps.

The Panel agreed that low Chinook salmon abundance was associated with increased mortality and lowered reproduction in southern resident killer whales, but failed to find evidence that reductions in the harvest of any specific runs of Chinook would lead to the recovery of the whales.

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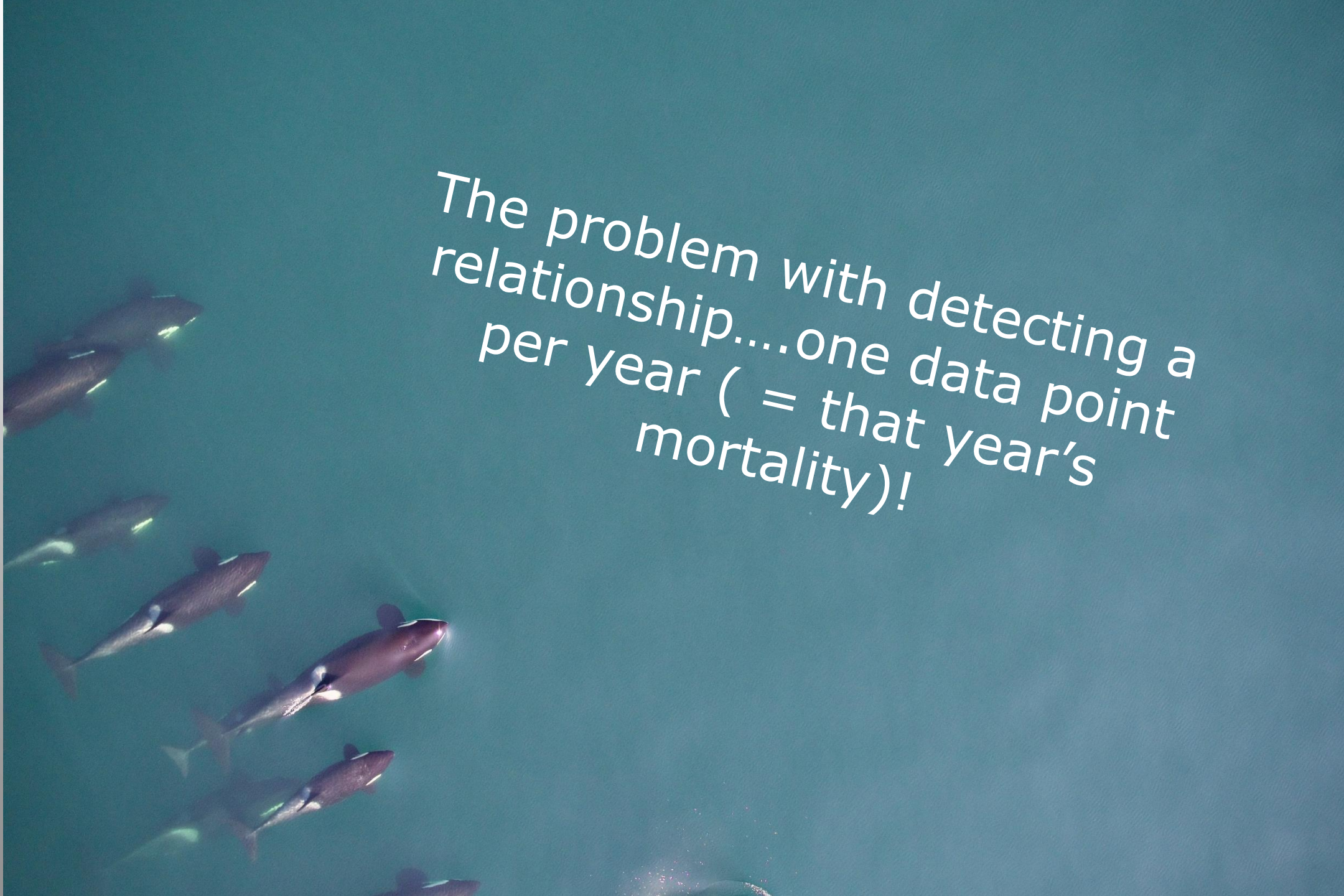

The problem with detecting a relationship….one data point per year (= that year's mortality)!

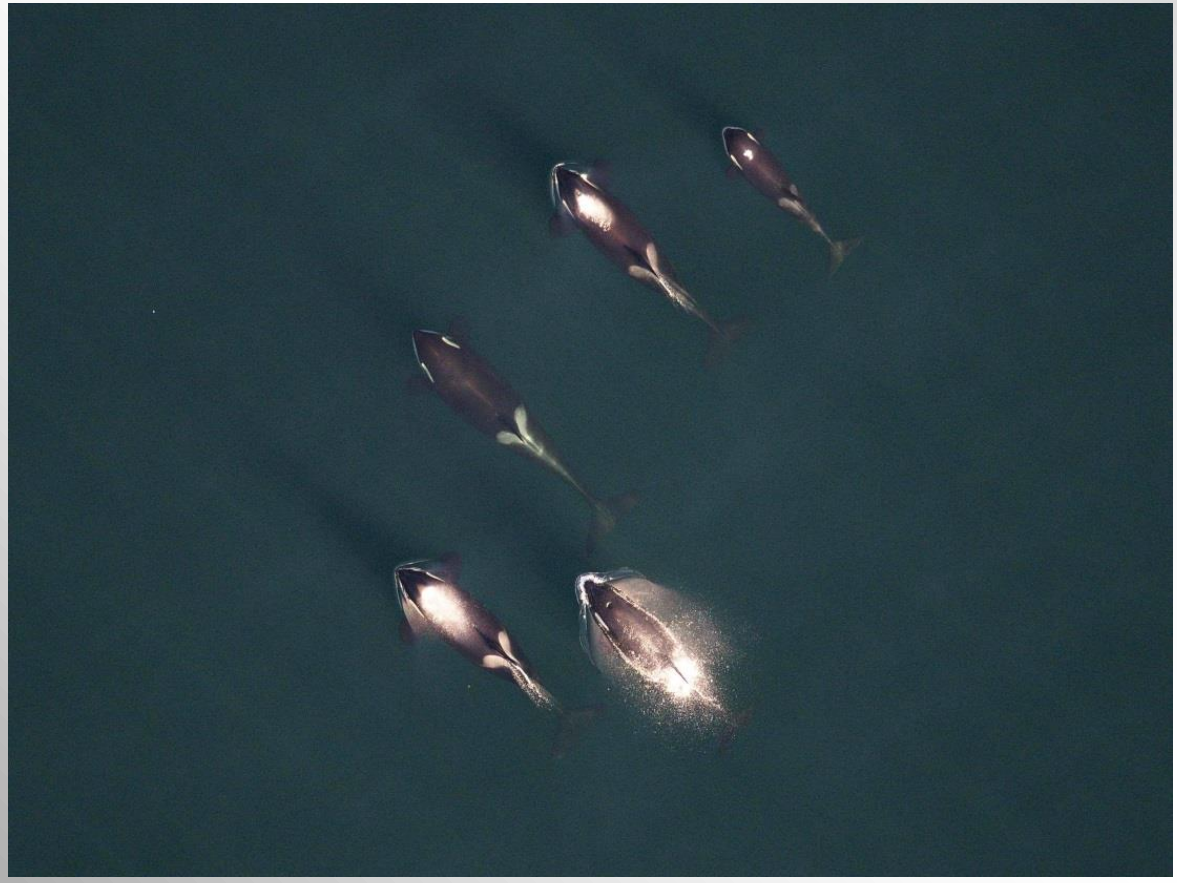
Salmon Now, or in the future?

The analyses considered at the bilateral workshops attempted to predict how reductions in fishing effort would increase salmon returns (in several years)—and benefit killer whales at that time.

They did not consider the immediate benefits of reduced competition.

In an emergency, short-term survival—aka immediate benefits---should trump everything.

"Overall, the Independent Science Panel believes that photogrammetry to monitor seasonal and interannual changes in growth and body condition of southern resident killer whales is likely to yield the greatest number of new insights…"



Idea!

Link near real time assessments of :

a) killer whale body condition (fatness)

…with

b) Chinook abundance in SRKW critical habitat

…to create a trigger

To trigger, when required, in-season, area-based fisheries closures

Aerial Photogrammetry

EyePatch Ratio: A Reliable Indicator of Body Condition

EP=W1/W2

Photogrammetry Papers

Durban, J.W., Fearnbach, H., Barrett-Lennard, L.G., Perryman, W.L., Leroi, D.J., 2015. **Photogrammetry of killer whales using a small hexacopter launched at sea** 1. Journal of Unmanned Vehicle Systems, 3: 131-135.

Groskreutz, M.J., Durban, J.W., Fearnbach, H., Barrett-Lennard, L.G., Towers, J. R., & Ford, J. K. 2019. **Decadal changes in adult size of salmon-eating killer whales in the eastern North Pacific. Endangered Species Research**, 40:183-188.

Fearnbach, H., Durban, J.W., Barrett-Lennard, L.G., Ellifrit, D.K., Balcomb III, K.C. 2020. **Evaluating the power of photogrammetry for monitoring killer whale body condition**. Marine Mammal Science, 36: 359-364.

Stewart, J. D., Durban, J. W., Fearnbach, H., Barrett-Lennard, L. G., *et al.* 2021. **Survival of the fattest: linking body condition to prey availability and survivorship of killer whales**. Ecosphere, 12, e03660.

Chinook fisheries management adjusted according to SRKW body condition is…

SMART

-**S**ignificant (focused on primary threat)

-**M**easurable (body condition and salmon abundance)

-**A**chievable (using presently-existing methods)

-**R**esponsive (analysis and imposition of measures can be done in near real time)

-Timely (given that SRKW are critically endangered)

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Transboundary limitations to the recovery of SRKW

The plight of the enigmatic southern resident killer whales: Have we done all we can to recover these icons of the Salish Sea?

Orla Robinson
ECHO Program Advisor

Presentation to Salish Sea Ecosystem Conference

April 28, 2022

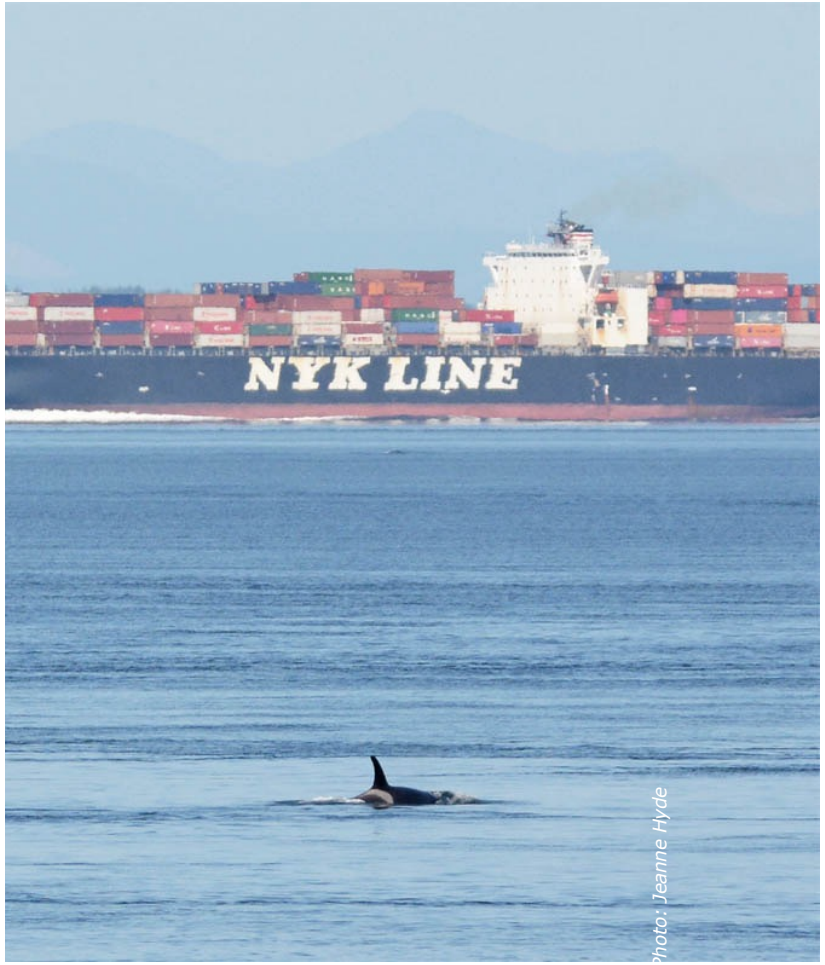
Canada

What is the ECHO Program?

A **collaborative** regional initiative launched in 2014 by the Vancouver Fraser Port Authority to better understand and reduce the cumulative effects of shipping on at-risk whales.

Key ECHO Program actions:

- Facilitate collaboration and engagement
- Trial and implement threat reduction measures
- Advance research projects with a focus on underwater noise
- Support national and international initiatives



ECHO Program success: strong voluntary collaborative model

- Clear program objectives, urgency around protecting an endangered species
- Adequate resources and time
- Diverse perspectives, high levels of engagement and commitment regionally
- Science based, informed decision making
- Shared responsibility in real world trials
- Adaptive management based on research learnings

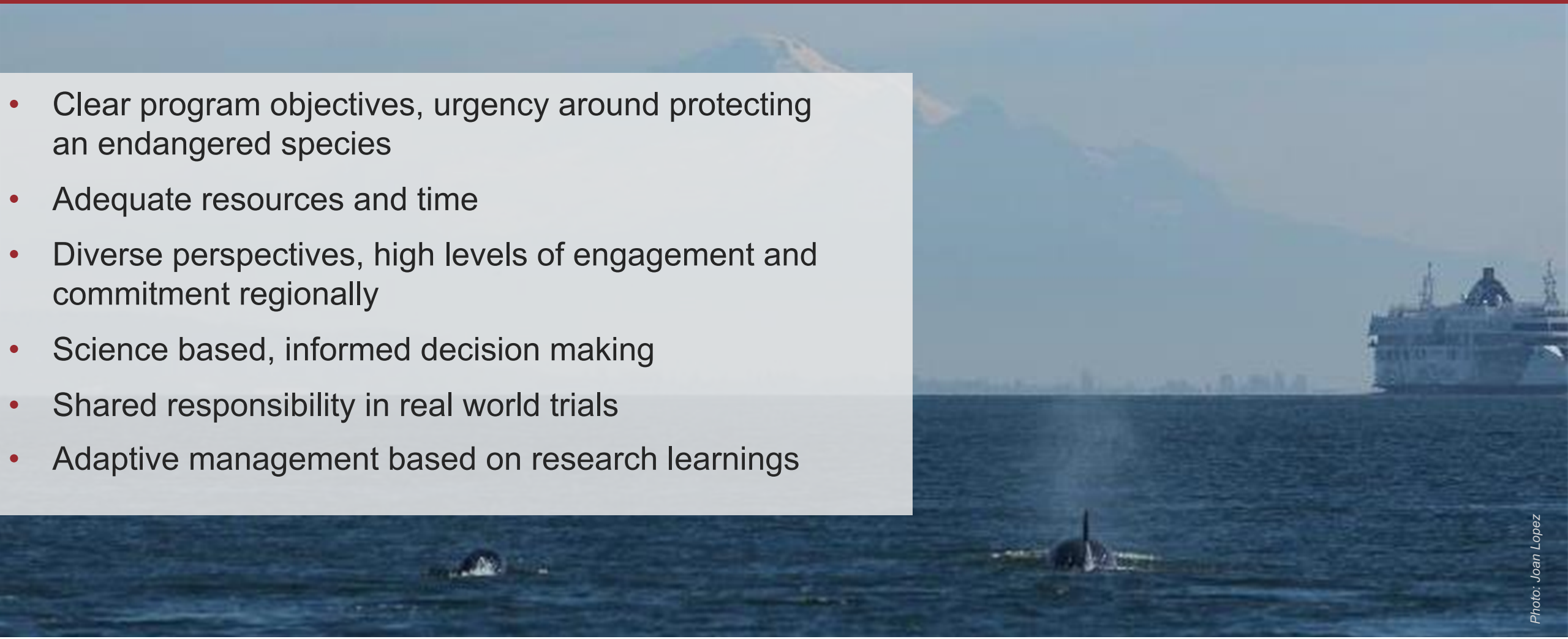


Photo: Joan Lopez

ECHO Program challenges: shifting the needle at the international level

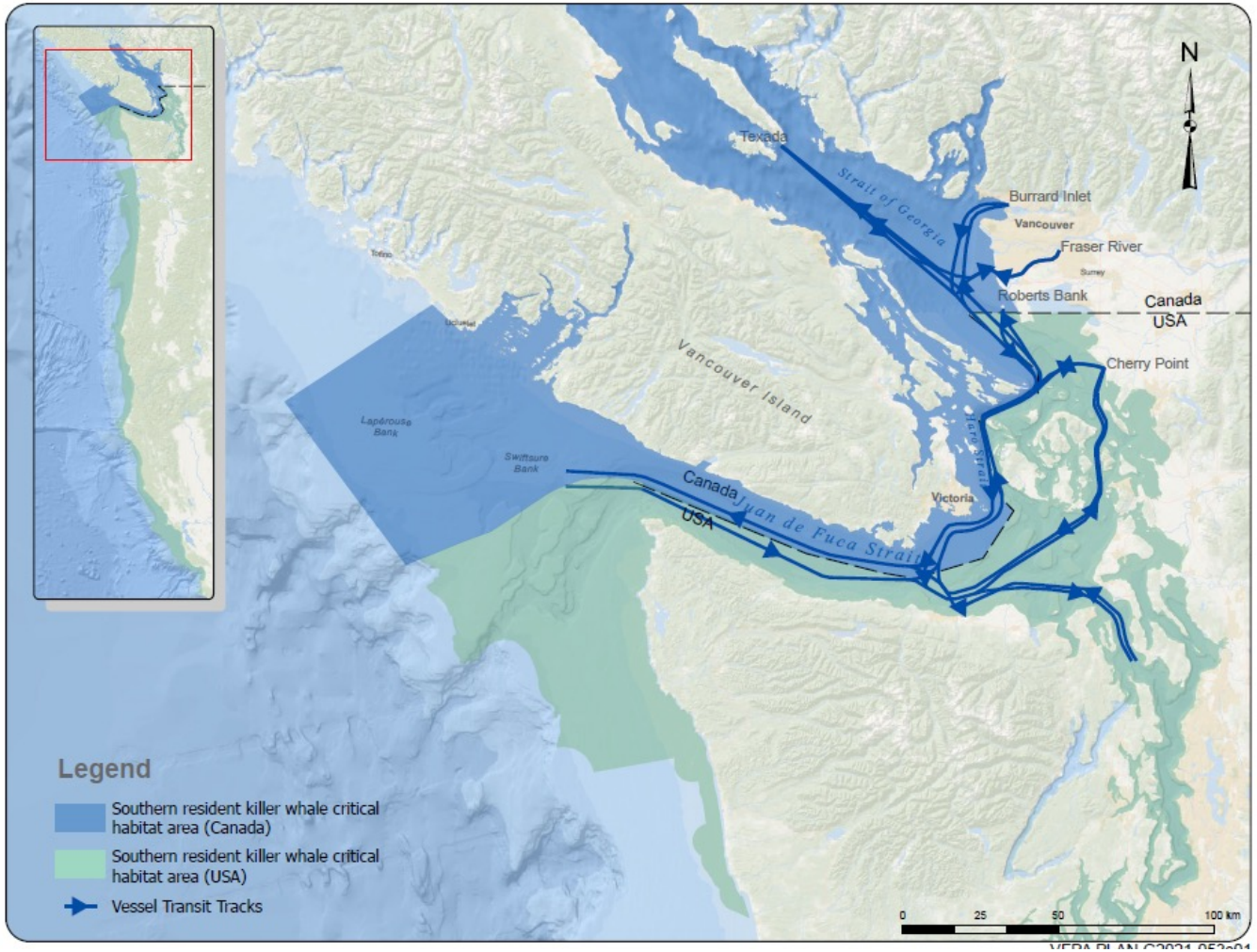
Photo: Jeanne Hyde

- No international regulation around underwater noise
- Necessity for ship owners to meet other regulatory requirements as a priority
- Complex ownership and decision making structures

Looking to the future: advancing on the recovery of SRKW

"Driving change towards a future of quieter vessels calling the west coast"

- Need for concerted engagement effort with ship owners, ship designers, ship builders, "shippers" and ports
- Opportunities to harness momentum around fleet renewal/ upgrades occurring to meet international 2030/2050 GHG emission targets
- You, the consumer, have a role to play!



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Thank you

Photo: Joan Lopez

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Questions or comments?
echo@portvancouver.com | portvancouver.com/echo

Regan Nelson

Marine Mammal Protection Project

Campaign to Reduce Vessel Noise in the Ocean

Overview of NRDC priorities relevant to SRKW

Removal of the Snake River dams

Mitigating non-vessel sources of noise (offshore wind development; naval sonar exercises; seismic surveys)

Engagement in Quiet Sound (U.S.) and ECHO (Canada)

Reducing vessel disturbance of SRKW (intentional whale watching/vessel buffer zones)

Vessel Noise 10-year vision: Quiet Ships

- Large international ships (cargo/tanker/cruise)
- Ferries
- Tug/Tow/Other Harborcraft
- Small recreational vessels

How do we get there?

- Large international ships (cargo/tanker/cruise)
  - Binding regulations on quiet ship design from the International Maritime Organization (IMO)
  - Green Corridors (NW/China; West Coast)
- Ferries
  - New ferry classes are intentionally designed (and funded) to be quiet
- Tug/Tow/Other Harborcraft
  - Funding support to assist with design/build
  - Incentive programs
- Small recreational vessels
  - “Off-the-shelf” commercial technology available for small vessels

How do we get there? Cont.

H.R. 6987 – Protecting our Marine Mammals Act (led by Representative Rick Larsen)

- Promotes research, development, and deployment of innovative ship quieting technologies
- Assesses available naval technologies for quieting U.S. government vessels
- Assists ports to establish programs that minimize vessel impacts on marine mammals
- Increases manager's ability to locate whales and mitigate harmful activities in real-time
- Invests in measuring and tracking underwater noise pollution

How do we get there? (cont'd)

Other Federal policy levers

- Infrastructure funding (Port Infrastructure Development Program)
- Compel uptake of quieting technologies using Vessel Incidental Discharge Act regulations

How much is enough?