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Understanding and managing underwater noise from vessel activities

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Understanding and Managing Underwater Vessel Noise

Supporting Recovery of the Southern Resident Killer Whale and Other Endangered Whales

Jeff Pelton
Transport Canada
April 2018
**SRKW Challenge: Growth & Shared Waters**

- Canadian and US shipping lanes go through SRKW critical habitat
- Expansion projects will result in additional vessel traffic
- Also expected increases in a wide variety of vessel traffic in Salish Sea, including ferries, commercial shipping, whale-watching, and pleasure craft
Why is this important?

- Whales are vital components of healthy marine ecosystems & SRKW are culturally significant
- Canadians rely on marine transportation and trade
- This will require TC to work collaboratively with other Federal Government departments to address the threats.
What is the Oceans Protection Plan?

5 year national Oceans Protection Plan (OPP) will:

• Improve marine safety and responsible shipping
• Protect Canada’s marine environment
• Strengthen partnerships with Indigenous communities
• Invest in science for evidence-based decision-making

Between 2017-2022, over 50 initiatives will be delivered to meet these goals.
**Recent Action: Advancing Understanding**

<table>
<thead>
<tr>
<th>Underwater listening capacity</th>
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<tr>
<td>• Support for underwater listening station in Strait of Georgia</td>
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<tr>
<td>• Feasibility study on future options for hydrophone placement in the Salish Sea</td>
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<td>• Support for analysis of noise baseline data in the Salish Sea</td>
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<th>Studies on sources and strategies</th>
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<tr>
<td>• Study on anthropogenic sources of noise (Final report available now)</td>
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<tr>
<td>• Modelling of potential noise mitigation measures to quantify effectiveness</td>
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<tr>
<td>• Simulation and desktop analysis of mitigation measures to assess feasibility</td>
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<tr>
<td>• Risk assessment to identify navigation safety risks of potential mitigation measures</td>
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<tr>
<td>• Voluntary slowdown trial in Haro Strait to 11 knots (Aug – Oct 2017)</td>
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<th>Building knowledge base through engagement</th>
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<tr>
<td>• Noise metrics workshop with Coastal Ocean Research Institute to establish appropriate metrics</td>
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<td>• Canadian Scientific Advisory Secretariat (CSAS) process to evaluate noise mitigation effectiveness</td>
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<tr>
<td>• SRKW Symposium involving broad range of Indigenous groups and stakeholders focused on challenges, opportunities, and solutions</td>
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Recent Action: International Collaboration

Developing US partnerships

• Establishment and monitoring of Salish Sea Ecosystem Indicators with US EPA
• Annual meetings on health of whales; on-going collaboration and information sharing on science and research on prey availability, underwater noise
• Agreement to work together to identify collaborative actions to mitigate noise and ensure consistency on approach across borders

Engaging the International Maritime Organization

• Leadership at the Maritime Environmental Protection Committee (MEPC)
• July 2017 MEPC 71 returned underwater noise to discussions
• April 2018 MEPC 72 Canada will highlight recent studies and seek a commitment to additional international collaboration and action
• Informal contact group established to continue discussion on measures to address underwater noise
Key lessons learned

- Collaboration is key. Finding solutions to the challenge of underwater noise is not something that one group, port, country or level of government can tackle on its own.
- Industry, governments, ports, NGOs and Indigenous communities have already been playing an important role in identifying, analyzing and testing potential solutions.
- Different solutions are required for different vessel types given the complexity of the issue.
- Feasibility of measures must be assessed from a variety of angles, including economic, cultural, risk to navigation, environmental, etc. and we have to figure out how best to weave those considerations together in decision making and implementation.
- Testing of new measures allows for real-time learning and the implementation of an adaptive approach.
- There are co-benefits between reducing noise and improving fuel efficiency.
Key lessons learned

• Jasco Phase 1 findings
  • Results quantify the noise reductions possible with proposed CSAS operational changes
  • Some options (speed reduction, lateral displacement) were effective, while other options (convoying, periods of quiescence, reduction by vessel type) were less effective or require more research

• Jasco Phase 2 findings
  • Analysis of more geographic areas and different bathymetry
  • Learning more about noise characterization – SRKW audiogram weighting changes vessel ranking significantly

• Collaboration and Innovation go hand in hand
  • International interest in underwater noise
  • BC Ferries – Speed/noise relationship varies with vessel design
  • Haro Strait Slow down – Extensive results and learning
  • Maersk – Overlap between noise reduction and fuel savings
Key Results

- **PRMM Risk Assessment**
  - Evaluated 18 scenarios under 4 broad categories
  - Assessed incremental risk (probability x consequence)
  - Identified many potential mitigations under 8 broad categories
  - With mitigation applied
    - 8 scenarios were flagged for further consideration
    - 7 scenarios were deemed unsafe for future implementation
    - 3 scenarios were flagged as unsafe but with a margin of uncertainty that could be explored through new risk mitigation, including advancements in technology.

- **Simulation and analysis**
  - Early stages, but will help us determine limits/cutoffs of what can safely be expected with operational changes.
Port Incentives – Opportunity for future collaboration
Where do we go from here?

- Government of Canada is committed to playing a meaningful role in solutions; recently announced an additional $167.4M in Budget 2018 to support whale recovery

- TC is looking at results of modelling work, studies and trials, and will continue discussions with stakeholders and Indigenous partners, in order to implement mitigation options

- TC would like to see more trials to provide real time benefits and important data on effectiveness and other challenges
Thank you

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