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# Developing a Regional Protocol for Photo-ID of Harbor Porpoise, *Phocoena phocoena*, in the Salish Sea Through Transboundary Collaboration



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**ABSTRACT:** Harbor porpoises (*Phocoena phocoena*) are one of the most common cetaceans in the Salish Sea. However little is known about this species' regional and fine-scale habitat use patterns. Photo-identification (photo-ID) is a key tool that has long been used with other cetaceans in the Salish Sea (e.g. *Orcinus orca*) to understand ecological parameters including site fidelity, habitat use, ranging patterns, and group dynamics. This technique had not previously been applied to Salish Sea harbor porpoise research until 2014 when Pacific Mammal Research (PacMam) initiated a long-term photo-ID study off Fidalgo Island, WA. This demonstrated the viability of photo-ID for harbor porpoises within a geographically limited scale. However, to fully understand the larger-scale ranging patterns of the harbor porpoise in the larger Salish Sea region, collaborations are required. PacMam has partnered with the Porpoise Conservation Society (PCS) to integrate photo-ID into an existing PCS habitat use research program in British Columbia, Canada. The objectives of the collaborative research program are to: 1) expand PacMam's photo-ID protocol to a second study site in the Salish Sea; 2) test the protocol for applicability between sites; 3) develop a regional protocol for use throughout the global distribution of harbor porpoise; and 4) integrate sightings and photographic data into a regional platform for use throughout the Salish Sea. The results will provide greater insight into the daily lives of individuals and their regional movements thereby providing ecological insight for this complex and difficult to study species at varying spatiotemporal scales. This is vital for harbor porpoise conservation, particularly in the Salish Sea where anthropogenic effects are concentrated. Our partnership will provide valuable information on Salish Sea harbor porpoises, a regional protocol for use by others around the world, and a database open to contributions from around the Salish Sea.

## Introduction

- Little is known about harbor porpoise habitat use patterns.
- Photo-ID is a valuable tool to understand ecological parameters such as site fidelity, habitat use, ranging patterns and group dynamics.
- Pacific Mammal Research (PacMam) began a successful photo-ID study of harbor porpoises off Fidalgo Island in 2014.
- Transboundary collaborations are required to understand larger-scale ranging patterns in the Salish Sea.
- PacMam and Porpoise Conservation Society (PCS) in Canada are collaborating to expand and test the use of the photo-ID protocol and develop tools that can be used in other study sites here and around the world.

## Methods

- Photos are being catalogued and analyzed.
- PacMam: land-based study: Burrows Pass, Fidalgo Island, WA.
- PCS: land-based study: Whytecliff Park, West Vancouver, BC, Canada.
- Photographic, environmental, group and social data recorded for all sightings.
- Photo-ID analyses conducted by PacMam utilizing their identification matrix (Elliser *et al.* 2017).
  - Primary marks: pigmentation, scars/lesions
  - Secondary marks: fin trailing edge, peduncle
  - Confirmation marks: fin shape, fin size, fin base width, overall coloration
- Information is stored in a collaborative database with ancillary data for each photograph.
- PacMam and PCS will work together on developing a photo-ID protocol that can be used in regionally and worldwide for harbor porpoises.

## Results/Discussion

- Photo-ID is a viable tool for ecological studies of small cetaceans.
- Collaborations like these are critical for improved understanding of complex and difficult to study species, like harbor porpoises.
- From the results of this study a regional protocol will be developed and published/shared so is accessible to other researchers in the Salish Sea and around the world.
- Encouraging opportunities for collaboration, data sharing and a creating a regional database will provide greater insight into the daily lives of harbor porpoises and their regional movements, providing valuable ecological data at varying spatiotemporal scales.
- This study demonstrates how research collaboration across borders can effect conservation at the ecosystem scale.



PacMam: Examples of markings from Harbor Porpoises in Burrows Pass, Fidalgo Island, WA.



PacMam: Example of ID matches in Burrows Pass, Fidalgo Island, WA (Elliser *et al.* 2017)

- A) ORE – 4/20/16 and 1/13/17,
- B) JAW – 6/20/14 and 5/18/16,
- C) CQUO – 4/14/14 and 4/13/16.



PCS: Example of Harbor Porpoise photos received for ID from Whytecliff Park, West Vancouver, BC, Canada