

# Marine birds of the Salish Sea

## *Ecology and conservation*

Peter Hodum

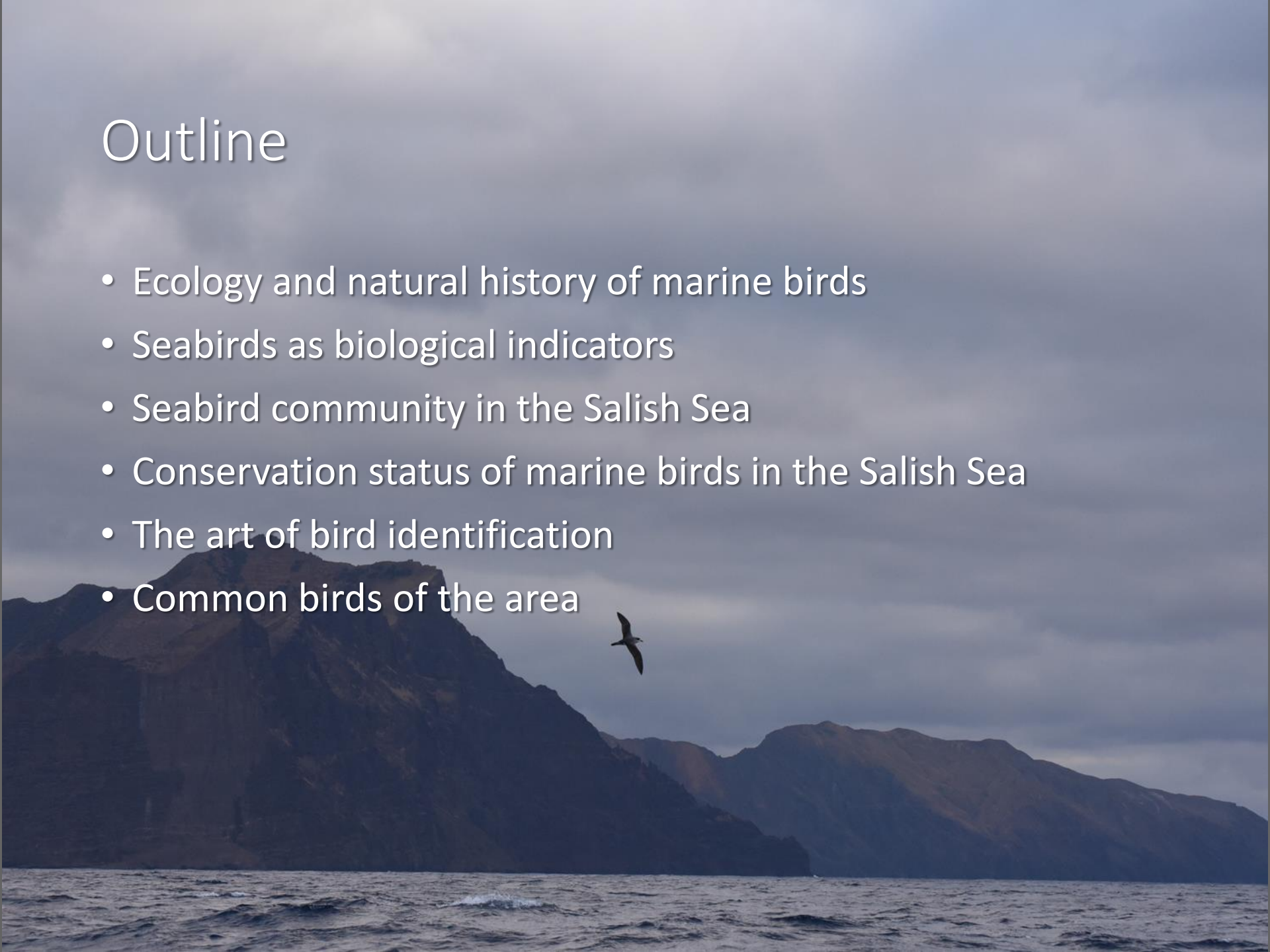
University of Puget Sound

Oikonos Ecosystem Knowledge



# Outline

- Ecology and natural history of marine birds
- Seabirds as biological indicators
- Seabird community in the Salish Sea
- Conservation status of marine birds in the Salish Sea
- The art of bird identification
- Common birds of the area



# Natural history of marine birds

- True seabirds vs. **seasonal marine birds**
  - Year-round vs. seasonal dependence on marine habitats
- Examples?



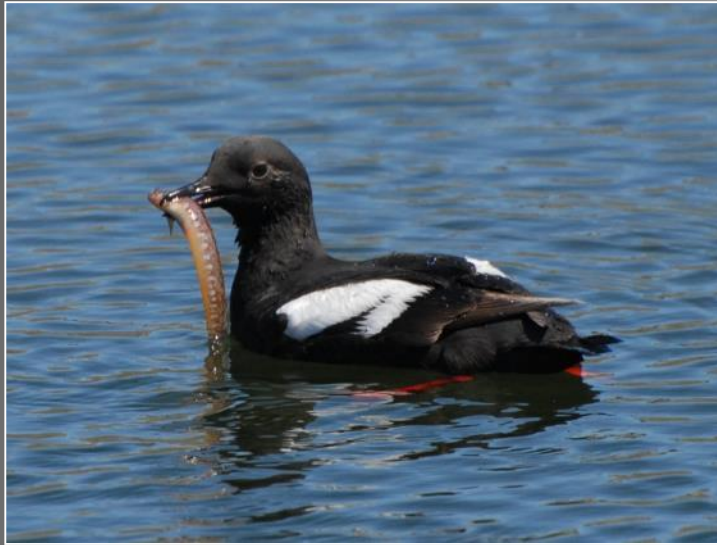
# Natural history of marine birds

- Range from inshore to highly pelagic
- Long-lived (high adult survival)
- Deferred sexual maturity (3-10 yrs.)
- Low reproductive rate (1-3 eggs/yr.)
- Primarily migratory
- Complex life histories





# Seabirds as biological indicators



# Seabird community in the Salish Sea

## *Summer*



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# Seabird community in the Salish Sea

## *Winter*



# Seasonal differences in diversity and abundance

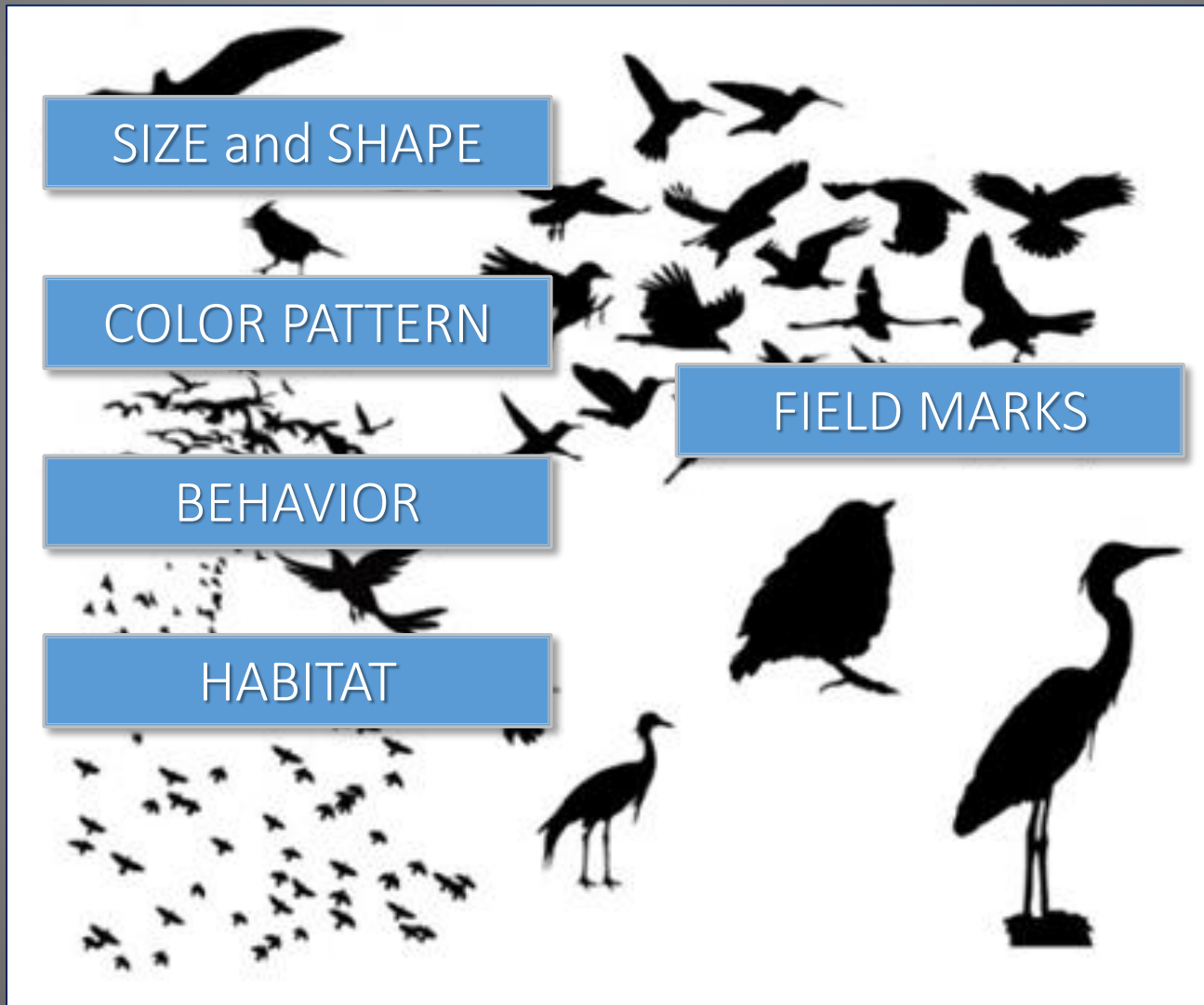
Why?



*Breakout group discussions*

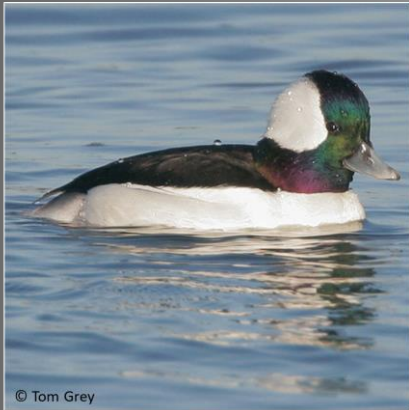


# The art of bird identification



# Diving ducks

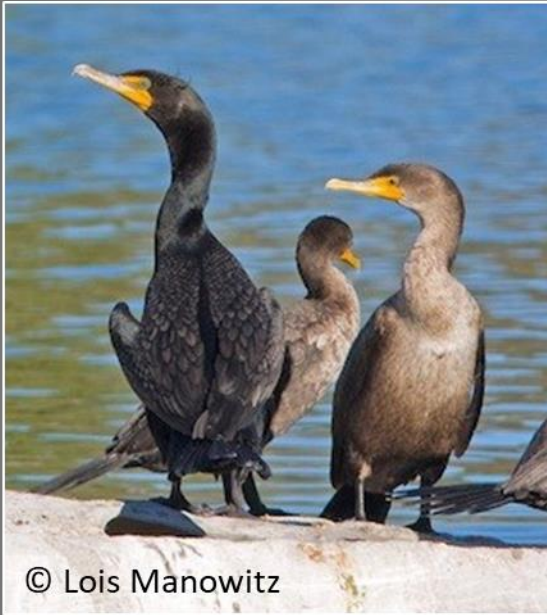
*Oct-Apr*





# Cormorants

*Aug-June*



# Grebes and loons

*Oct- Apr*





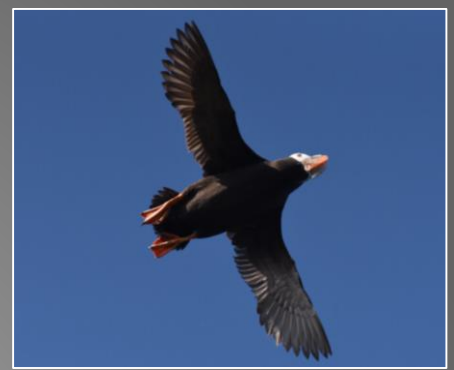
# Gulls and terns

*Seasonal to year-round*



# Alcids

*Year-round*





# Seabirds in WA

- Salish Sea
  - 73 species highly dependent seasonally or year-round.
- Outer Coast
  - 50+ species seasonally.
- 2 species state/federally listed
  - Marbled Murrelet
  - Tufted Puffin



# Status of seabirds in Salish Sea

- 8 species of concern (at WA and/or federal level)
- Status and population trends poorly known for many species

## Alcids and cormorants

Species	MAMU (2001-2013)	PSSS (2008-2013)	BCCWS (1999-2013)	PSAMP (1993-2013)
Pigeon Guillemont	↔		↑	—
Rhinoceros Auklet	↔	↑	↓	—
Marbled Murrelet	↓			—
Common Murre	↔	↑	↑	—
Double-crested Cormorant		↑	↓	—
Pelagic Cormorant	↔			—
Brandt's Cormorant		↑		—

## Loons and grebes

Species	PSSS (2008-2013)	BCCWS (1999-2013)	PSAMP (1993-2013)
Common Loon	↑	↓	↓
Pacific Loon		↓	↓
Red-throated Loon		↓	↓
Loons			↓
Red-necked Grebe	↓	↓	
Western Grebe	↓	↓	↓
Horned Grebe	↑	↓	



# Threats to seabirds in the Salish Sea

*Breakout group discussions*



# Threats to seabirds in the Salish Sea

- Declining prey availability
- Recovery of avian predators
- Contaminants and pollution
- Fisheries bycatch
- Shoreline armoring
- Introduced species
- Disturbance
  - Breeding colonies
  - At-sea
- Harmful algal blooms
- Climate change
- Ocean acidification





# Forage fish

## *Ecological connectedness*

The Marine Food Web

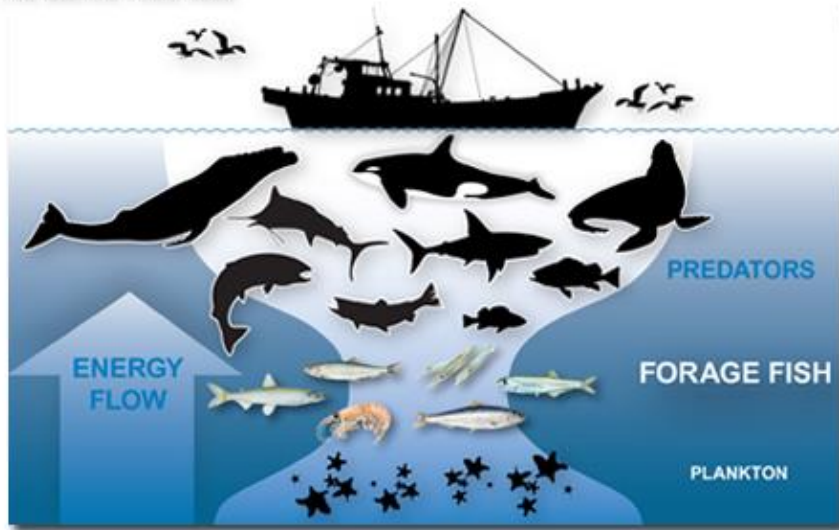
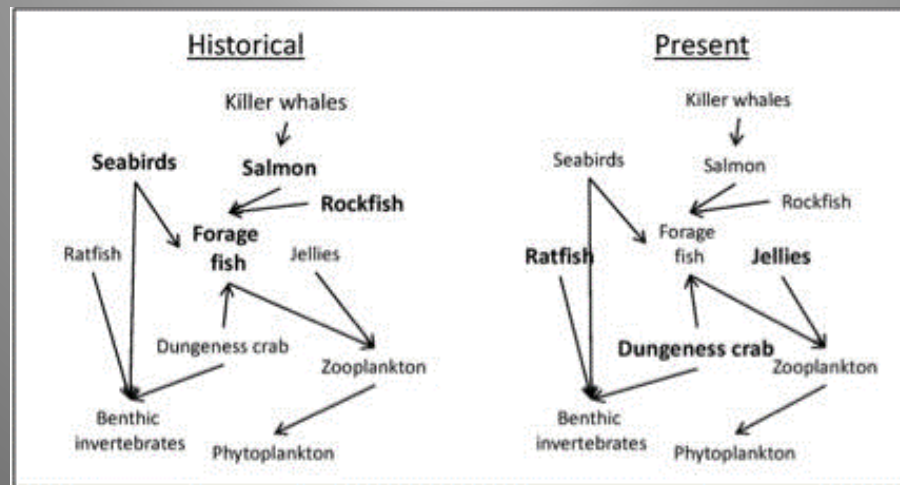


Chart: Pew Environment Group



# Thank you!



Peter Hodum

Associate Professor, Biology Dept., University of Puget Sound

Director of Chile Programs, Oikonos Ecosystem Knowledge

*[peter@oikonos.org](mailto:peter@oikonos.org)*

*[phodum@pugetsound.edu](mailto:phodum@pugetsound.edu)*