

*Science, Service, Stewardship*



# Impacts of recovering humpback whale populations in Alaska

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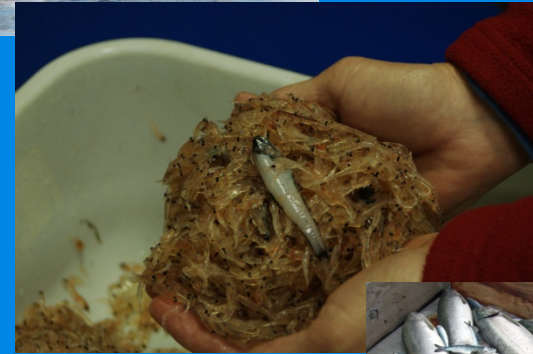
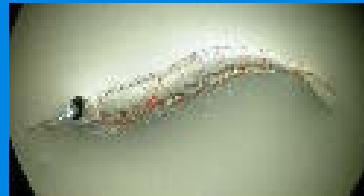
# Ecological Role of Humpbacks in Alaska:

Gulp 15,000 gallons of seawater and prey



Consume 0.4 tons of food/day  
(Witteveen 2003)

**Generalist** - prey on large zooplankton, forage fish, adult pink salmon.



Potential competitors with forage fish, ground fish, salmon, sea birds, seals, sea lions, other cetaceans.

**Play with their food** - concentrate prey using barriers (bubbles, body parts, bathymetry).



**Migratory** - most Alaskan humpbacks head to Hawaii for breeding. But are seen every month in Alaska.

They are individuals.  
In appearance and  
Behavior.

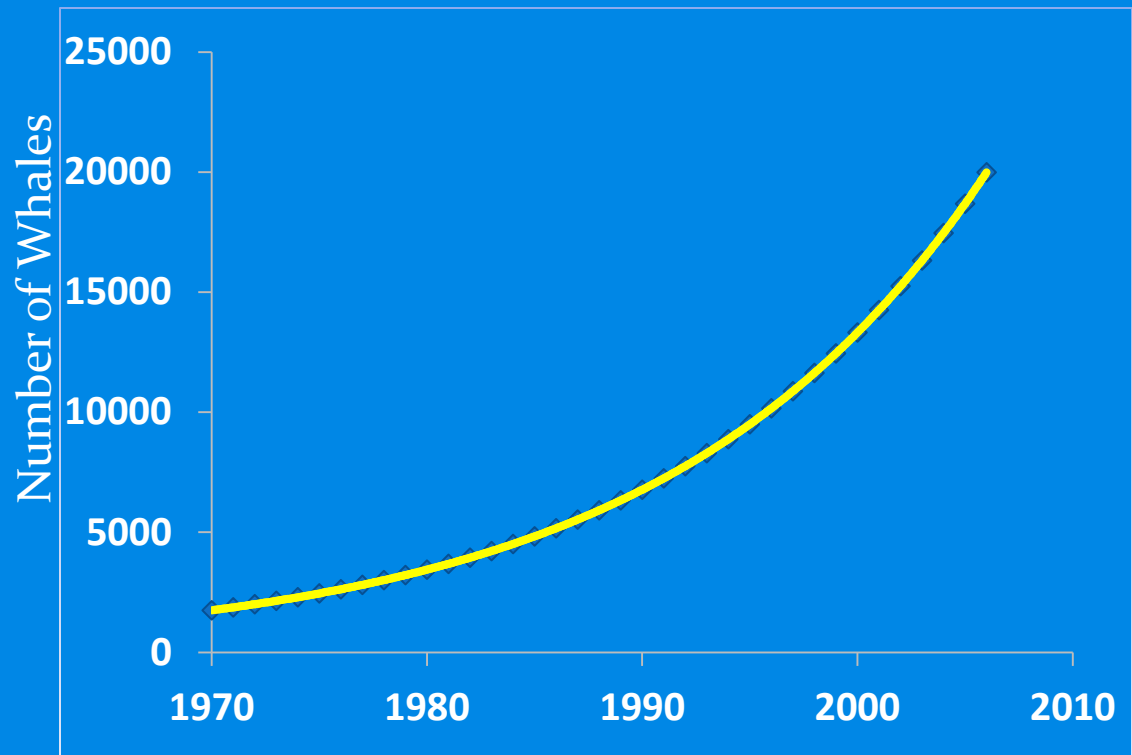


# ESA Success Story:

Humpback whales in the North Pacific are increasing at 5-7 % annually (Calambokidis et al 2008).

20,000 whales ~7.5 million people

Alaska's human pop.=723,000



(Darling, Nicklin, Barnes 2009)

# What are the implications of more whales?

Competition with fisheries, fish, sea birds, and marine mammals.

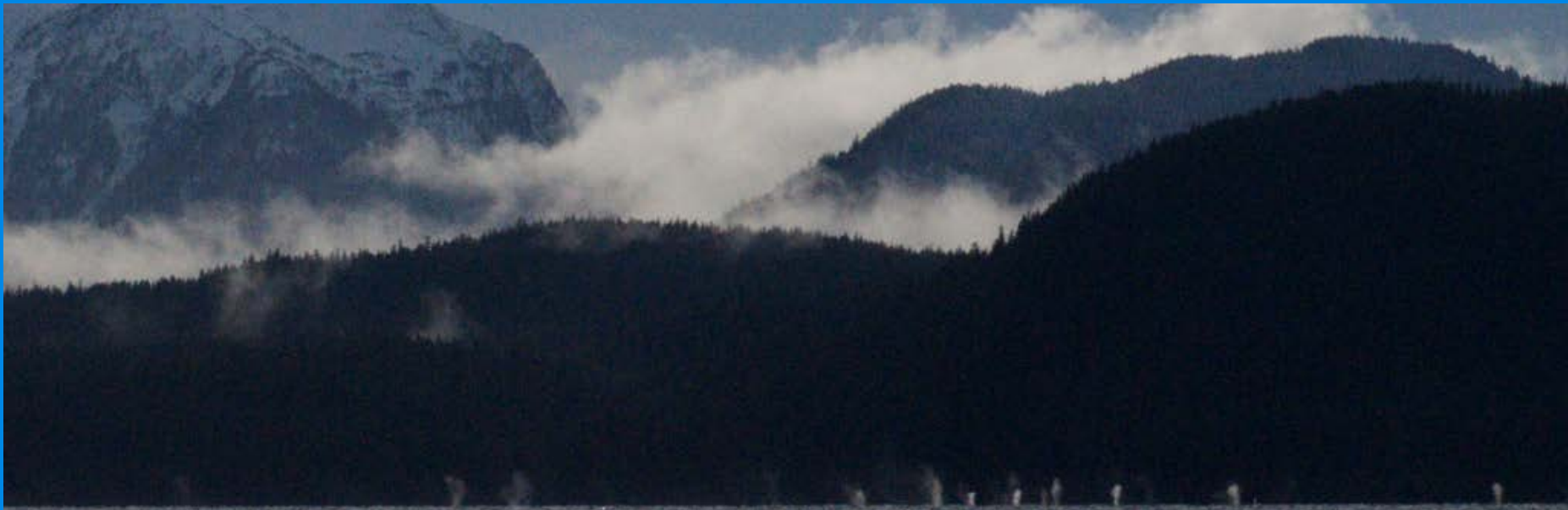
*“they are eating all the herring/salmon smolts”*

Entanglement in fishing gear

Collision with vessels

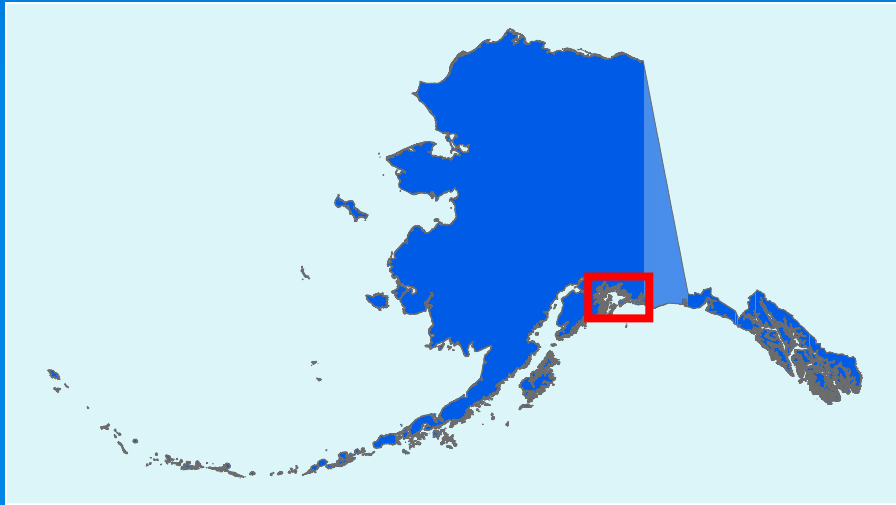
Complex ecosystem effect

\$\$\$ from whale watching



# Are they impacting commercial Fisheries

Maybe, at a local scale.



Prince William Sound,  
Alaska

Herring population crashed  
*Closed to fishing for 18 yrs*  
*No recovery*

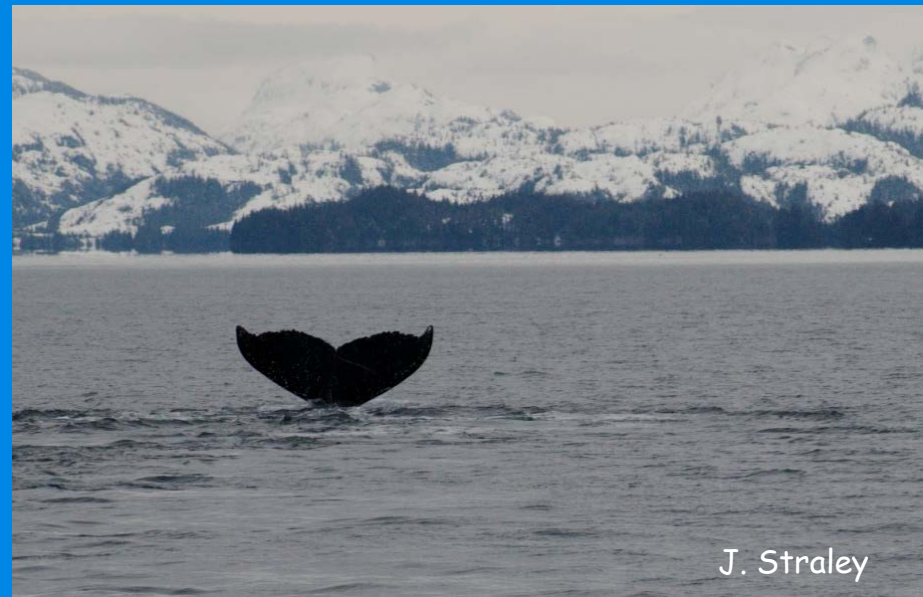
*Humpback populations are up.*

*Herring populations are down.*

*Humpback whales eat herring.*

*Humpbacks eat krill.*

*Herring eat krill.*



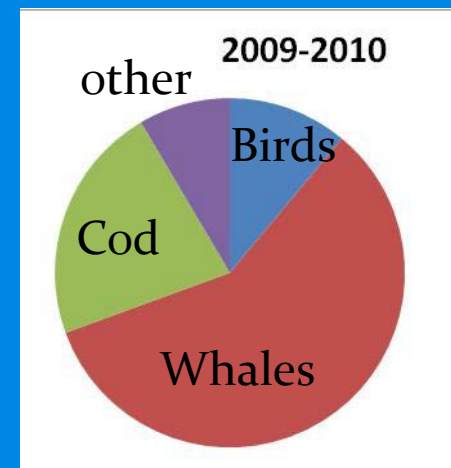
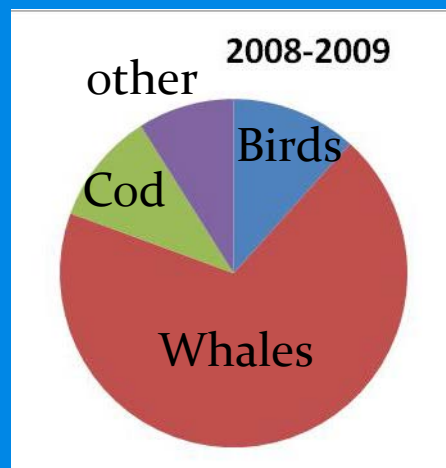
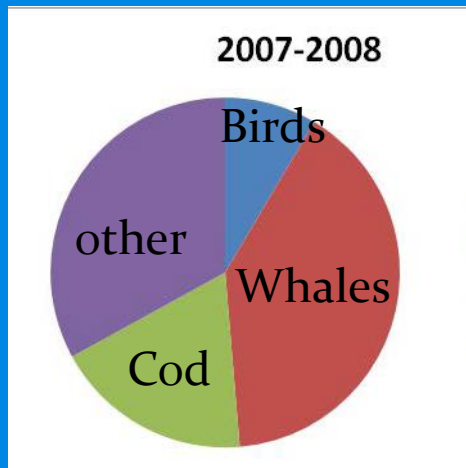
# What we found.

Whales were eating about 20% of the pre-spawning population  
About the same as the fishing quota.



## How important are whales?

Estimated sources of herring mortality in Prince William Sound



# What else are they doing?

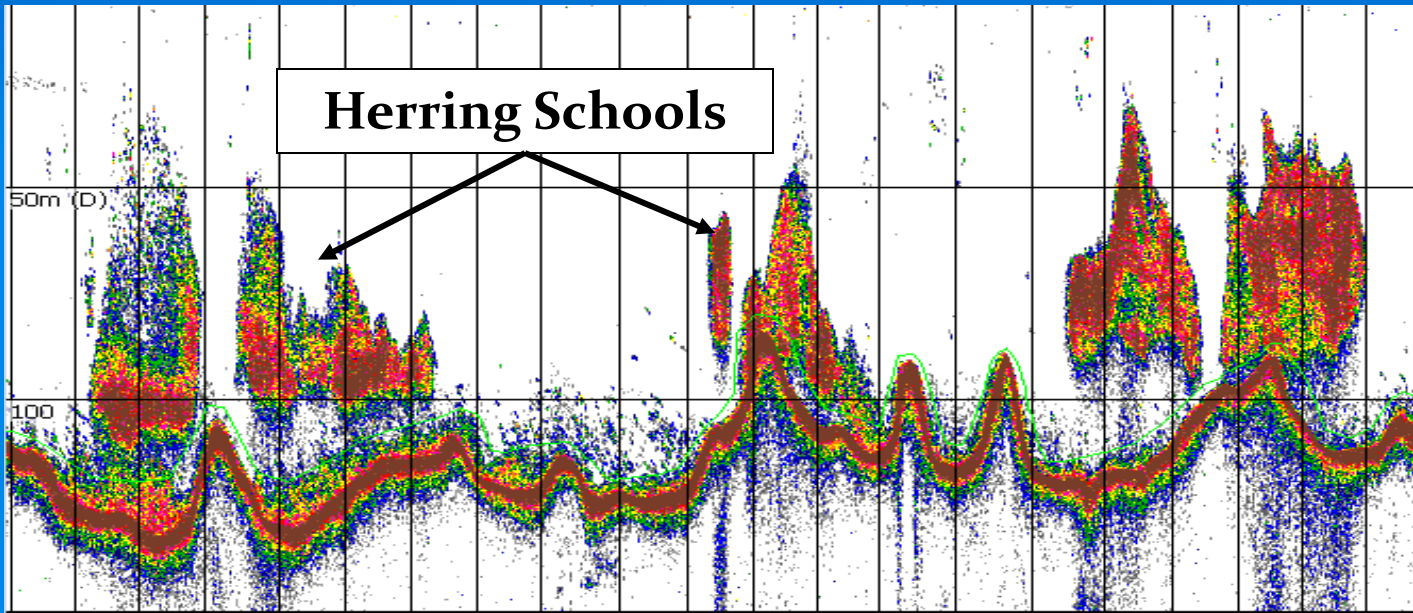
A few humpbacks have figured out that salmon enhancement facility are a good place to eat



Photo courtesy of NSRAA.

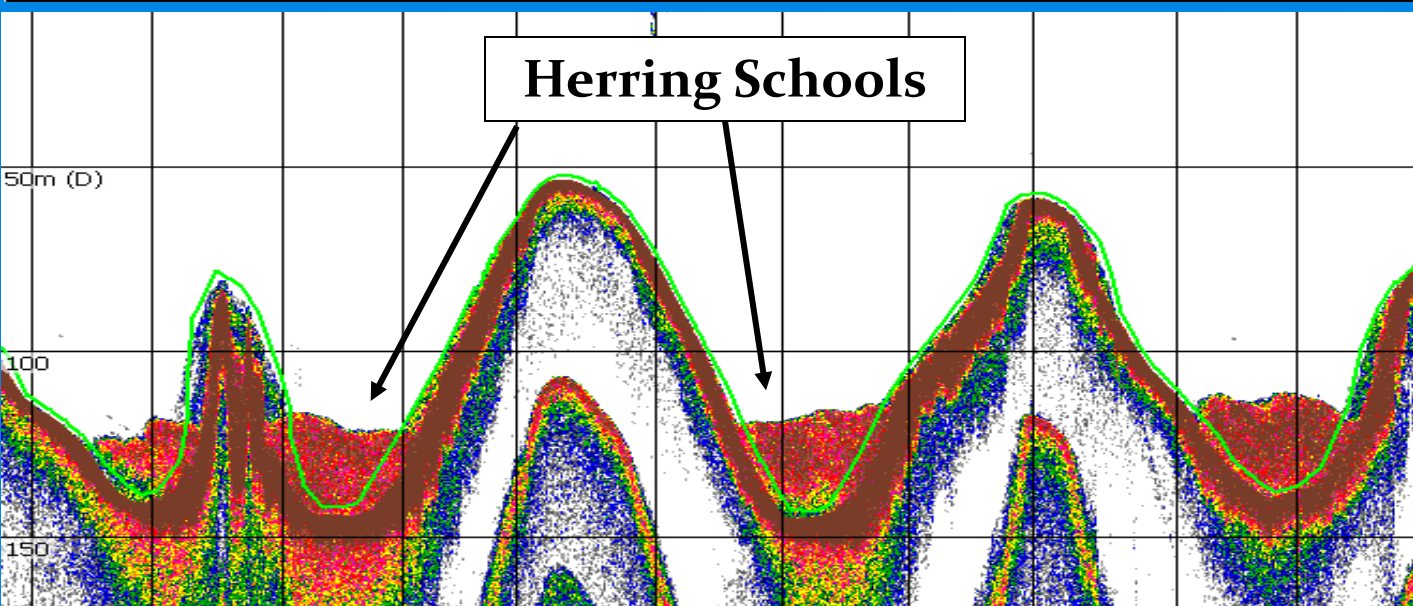


# How are humpbacks affecting other species?



**Whales  
present**

**Whales stir  
up the  
herring for  
other  
predators**



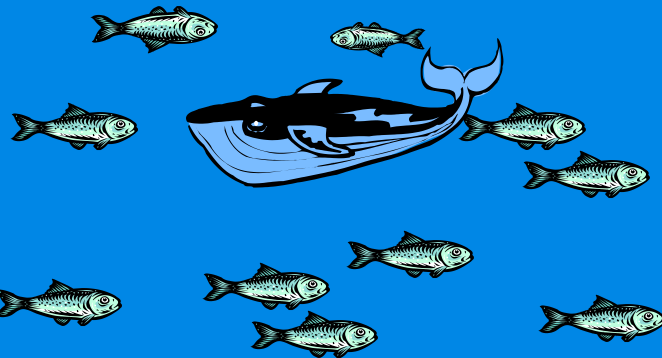
**Whales  
Absent**

# Dilemma for wintering Herring :

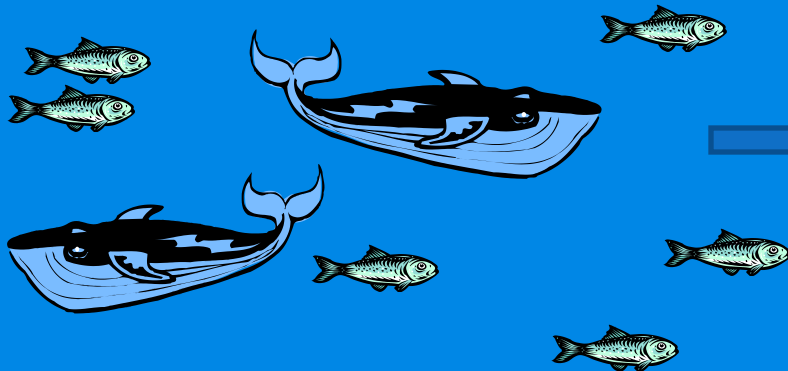
Strategy for avoiding whales differs from avoiding sea lions.

## Whales Present

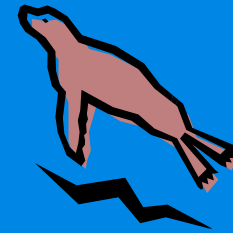
## Whales Absent



Herring schools are dispersed

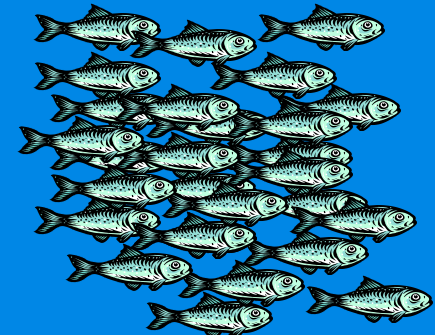


Easier meal  
For seals, sea lions,  
diving birds



Herring schools are deep and dense

Easier meal  
For whales



# Other Species

**Strong association between whales and other predators. Whales are making it easier for other species to catch herring.**



# Similar story with krill

Bringing food to the surface.

More than 200 whales late-  
season whales.

Long-tailed Ducks and  
Bonaparte's Gulls benefit.



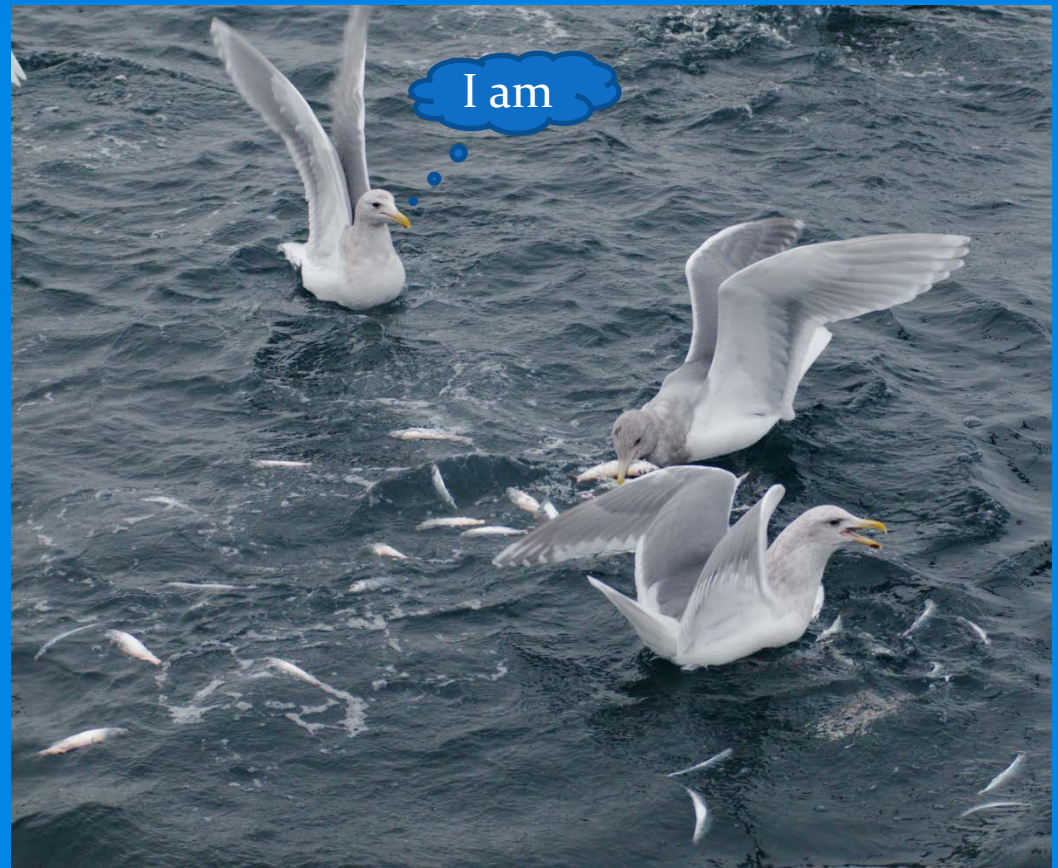
# Are marine mammals and Birds Benefiting from the presence of whales?

Yes, short term for individuals.

**Are humpbacks out competing other predators (seals, sea birds, fish)?**

We don't know. (seals, sea birds, fish)

Need more research.



Glaucous-winged gulls feed on herring stunned at depth by a humpback whale in December.

# Entanglements

More whales means more whales getting tangled up in stuff.



Researchers, whale watchers, and the fishing industry are working together for solutions (prevention and disentanglement).



# Ship Strikes

More whales means more whales getting hit by boats.



Photo courtesy of  
Alaska Sea Life Center

Big boats are bad for whales



Big whales are bad for small boats

# The bottom line

We will have to figure out how to live with a lot more humpbacks.

In terms of dollars (from whale watching), these whales may be worth more than Alaska's herring fishery.







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