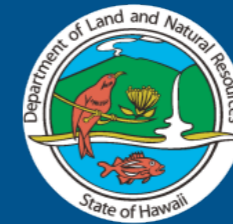


# Status and Movements of the North Pacific Humpback Whale Population



# Some Basics



- Feed in high latitude, cool waters (Summer)
- Breed and calve in low latitude, warm waters (Winter)
- Migration is over 2500 miles
- Fastest known migration is 36 days (NMFS)
- Females give birth every 2-3 years
- Age at maturity is 9-12 yrs (Best, 2011; Gabriele et al., 2007)

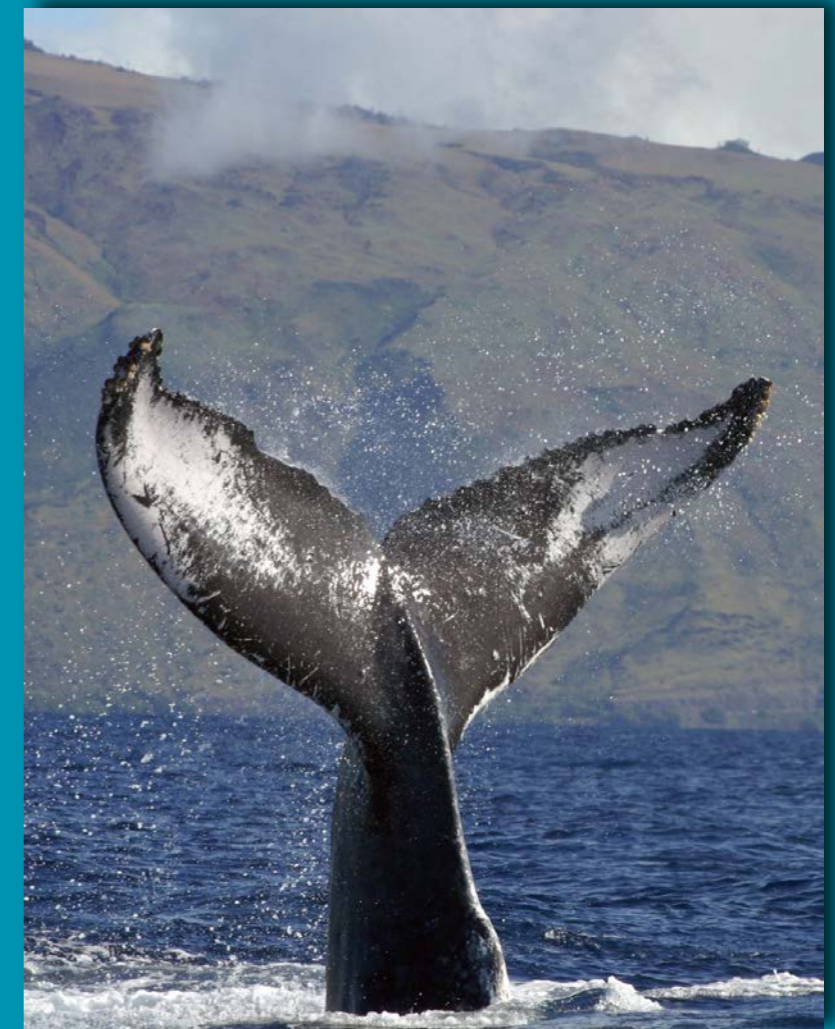


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# History



- Historic population estimated to be at least 15,000 (Allen, 1980; Rice, 1978)
- Over 30,000 killed before 1966 (Rice, 1978)
- In 1966, North Pacific Population estimated at <math><1,500</math> (Johnson & Wolman 1984; Gambell 1976)
- 1966: Moratorium on hunting of humpback whales in North Pacific
- 1972: Listed as “depleted” under the Marine Mammal Protection Act (MMPA)
- 1973: Listed as “endangered” under the Endangered Species Act (ESA)
- 1992: Sanctuary established in Hawaiian waters
- Protected under various State of Hawaii laws (e.g., seasonal thrill craft ban off West Maui)



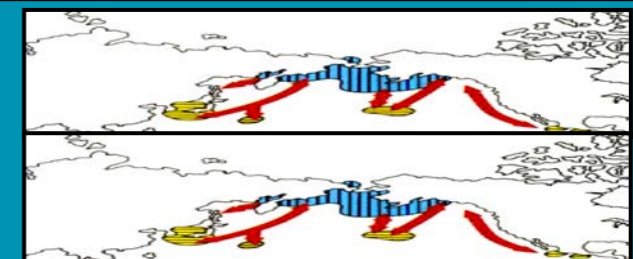
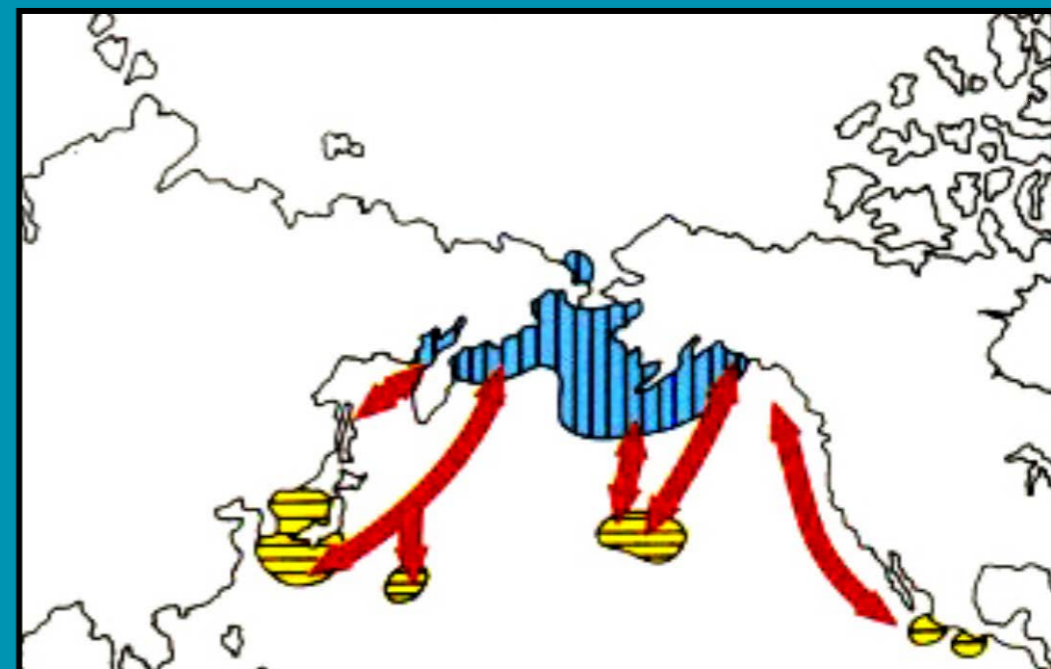
**How are the whales doing today?**

# SPLASH: Structure of Population, Levels of Abundance, and Status of Humpbacks



- Cooperative, international research project: 10 countries and 400+ researchers
- Entire North Pacific basin: All known winter breeding grounds and summer feeding grounds
- Field efforts: 2004 - 2006
- Standardized techniques, pooled resources
- Sanctuary key part of steering committee that developed and implemented SPLASH
- Supported by several agencies from the U.S. and Canada: Sanctuaries and NMFS

North Pacific humpback whale feeding and breeding grounds



# SPLASH: Structure of Population, Levels of Abundance, and Status of Humpbacks



## Methods

“**Mark and Recapture**”: Research strategy for determining population estimates

✓ Each individual can be identified (by unique pattern on fluke; genetics)

✓ Multiple surveys

• Each individual in the population has an equal probability of “capturability” at any given time

– Not all animals migrate

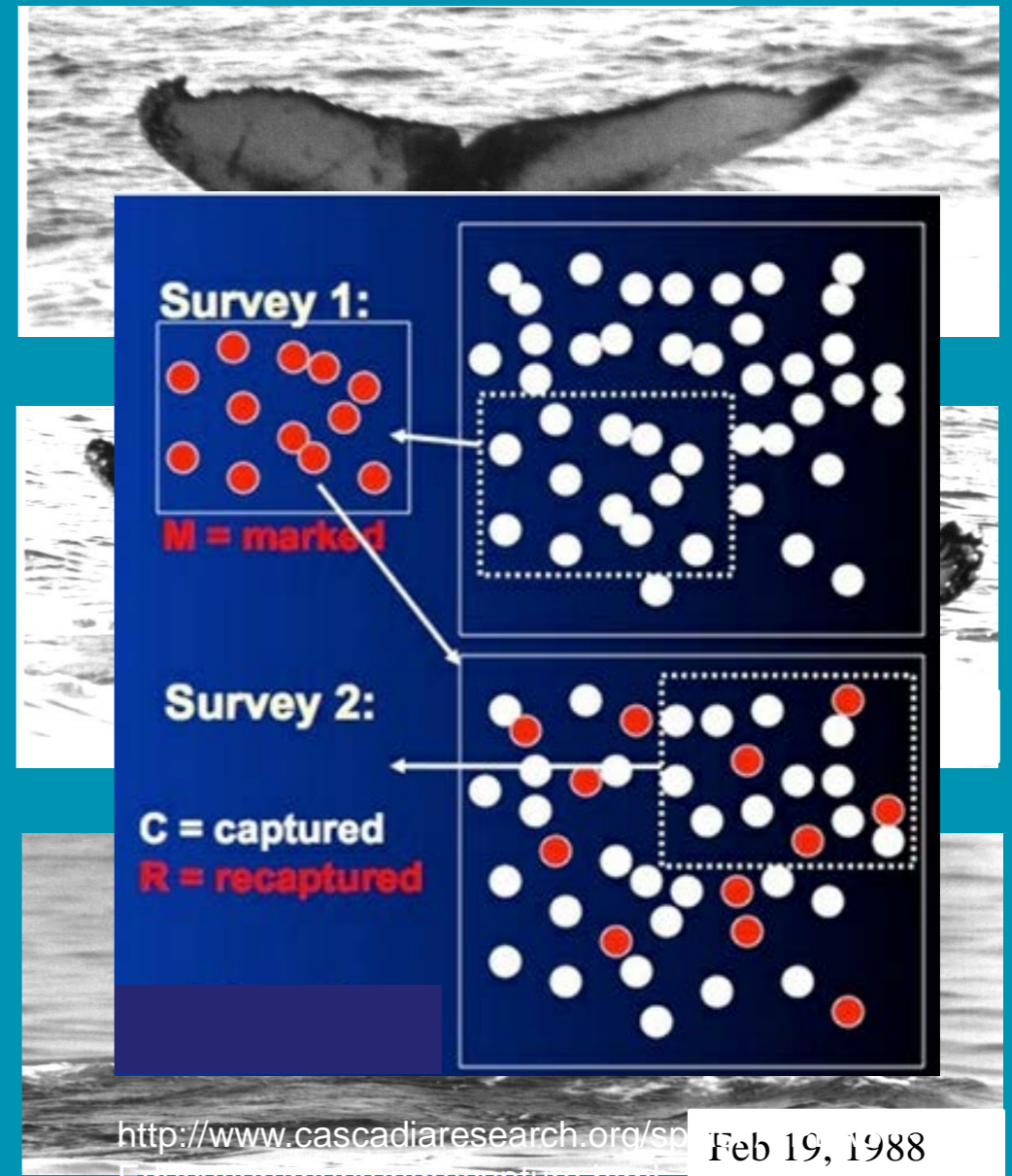
– Temporal fidelity & resident time

## Data Gathered

➤ 18,000 photographs

➤ 8,000 individual animals identified

➤ 6,000 biopsy samples



Photos courtesy of The Dolphin Institute

# Results - North Pacific population estimates



- Best estimate for 2006 North Pacific Population: **21,063**

(Barlow et al, 2011)

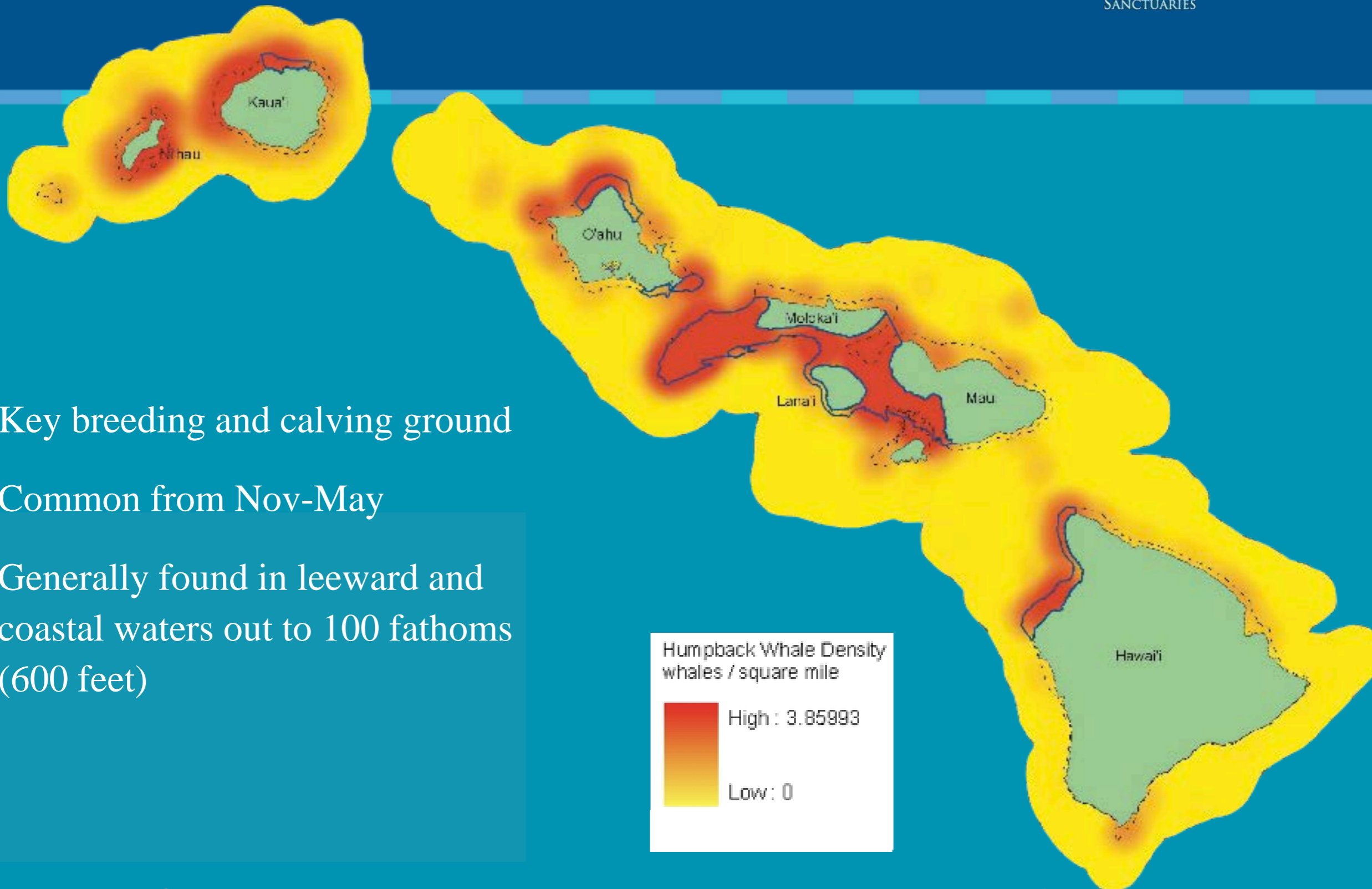
## Growth Rate:

6.8% for NP (1966 - 2006; 39 yrs)  
Calambokidis *et al* 2008

4.9% for NP (1993 - 2006; 13 yrs)  
Calambokidis *et al* 2008

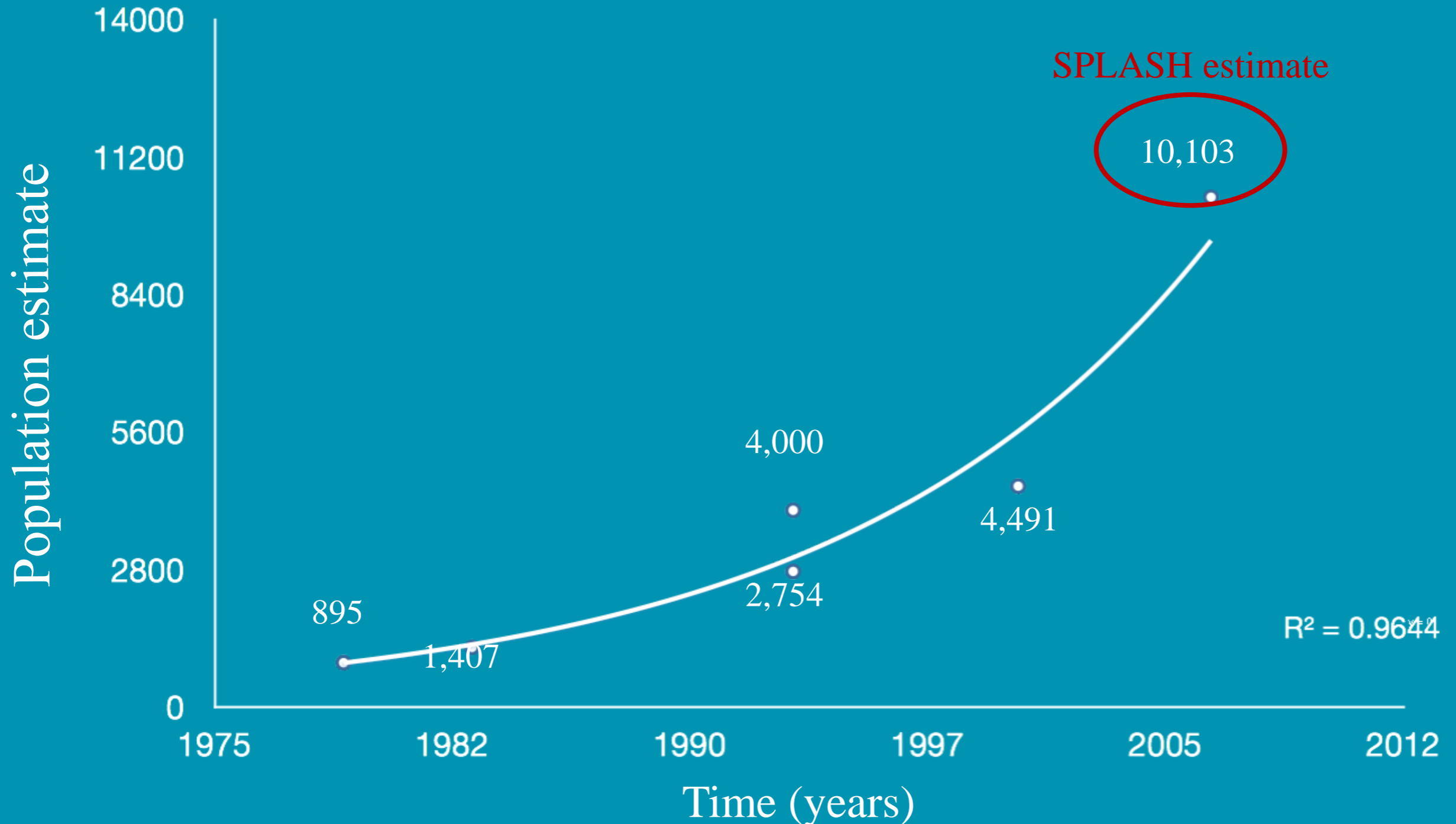


# Humpbacks in Hawaii



- Key breeding and calving ground
- Common from Nov-May
- Generally found in leeward and coastal waters out to 100 fathoms (600 feet)

# Population estimates for Hawaii: 1979- 2006





# Results - Hawaii Population estimates



- Over 50% of the North Pacific population winter in Hawaii
- Best estimate for 2006  
Hawaii Population: **10,103**

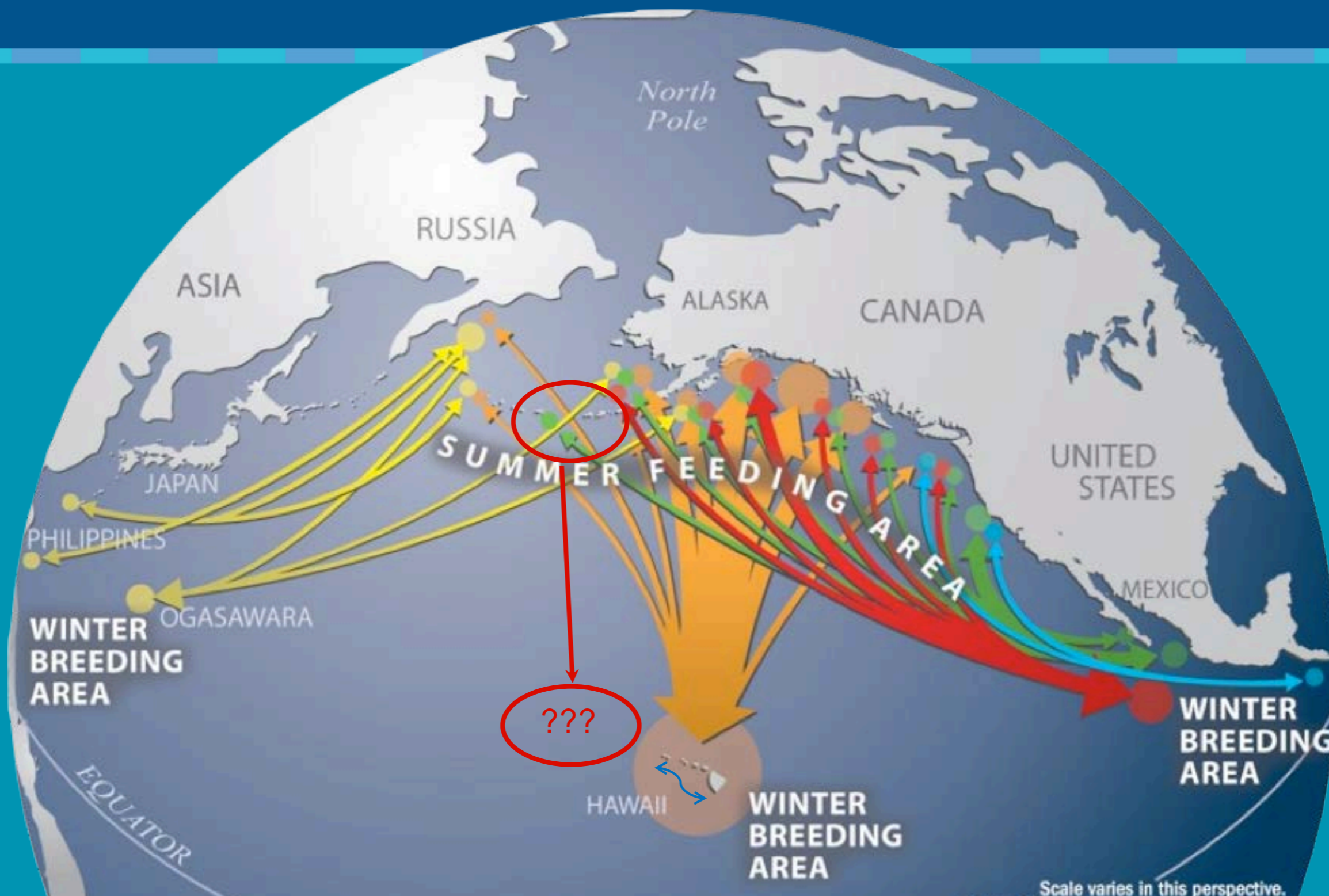
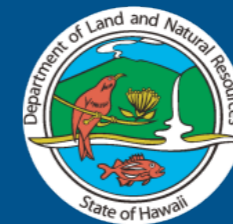
## Growth Rate

- 10% for HI (1979 - 1996; 17 yrs)  
Mizroch *et al*, 2004
- 7% for HI (1993 - 2000; 7 yrs)  
Mobley *et al* 2001
- 5.5 - 6.0% for HI (1993 - 2006; 13 yrs)  
Calambokidis *et al* 2008



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# Results - Movements of Humpback Whales in the North Pacific: Basin-wide and within the MHI

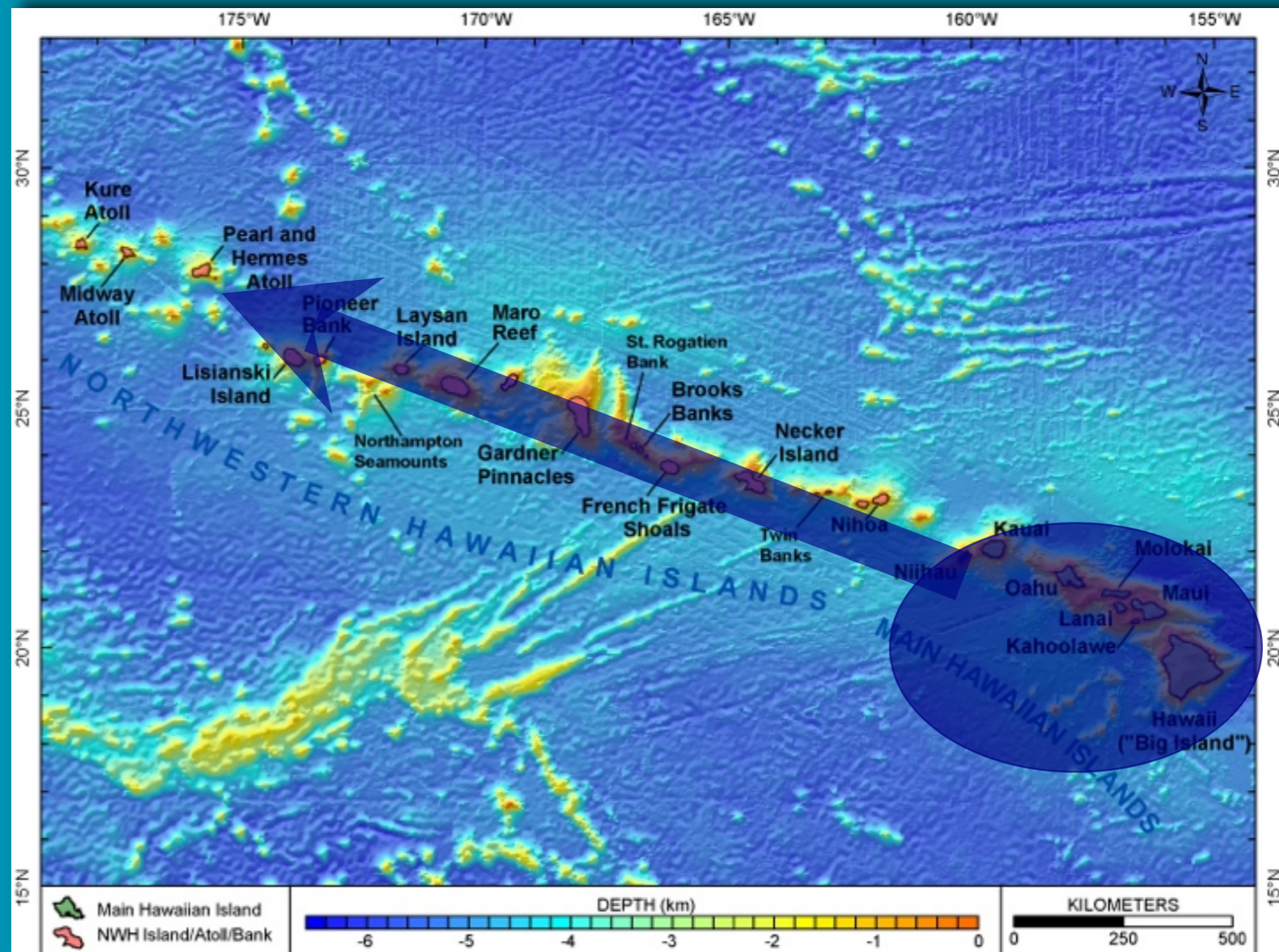


# Results - Movements of Humpback Whales in the North Pacific: Role of the NWHI?



- SPLASH data suggests undiscovered breeding ground
- Increased use in the NWHI (Lammers et al., 2011; Johnston et al, 2007)

Separate stock or ecological expansion?



# Summary



- Multiple population estimates demonstrate that humpback whale abundance in the North Pacific, including the Hawaii population, is increasing (“rebounding”)
  - Most recent population estimate for the entire North Pacific (2006): over 21,000
  - Most recent population estimate for Hawaii (2006): over 10,000



HIHWNMS, NOAA permit 782-1719

# Conclusions



↑ Whales + ↑ Ocean Users =  
↑ Increased interactions

↑ Need for management to reduce unwanted interactions between humans and whales





# Questions?



## Acknowledgements

- NOAA Fisheries Protected Resources
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- Department of Land and Natural Resources
- Researchers
- Commercial tour operators
- Fishers and other ocean users

