

# Eastern North Pacific Gray Whales



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# History of Whaling



- Centuries of hunting by aboriginal whalers
- 1846 American whalers found lagoons of Baja
- Coastal whaling stations appear in the 1850s
- “Economically extinct” by late 19<sup>th</sup> century
- Official protection by IWC in 1946

# Present Day Whaling

- Limited aboriginal subsistence whaling by Russia and the US is permitted by the IWC for the eastern gray whale.
- Catch limits have been set since the 1970s on the basis of scientific advice and a needs request from the relevant governments.
- The current (2003-2007) catch limit is 620 for five years, subject to a maximum of 140 in any single year.
- This meets the needs request and is considerably below the estimated level (over 400) that is sustainable (i.e. not harm the population).

# Gray Whale Migration

- Migrate annually 15,000 - 20,000 km round trip
- Arctic feeding grounds to Mexico breeding grounds
- Southward migration begins mid-November and is segregated by age, sex and reproductive condition:
  - (a) near-term pregnant females
  - (b) estrous females and mature males
  - (c) immature whales of both sexes
- Northward migration begins about mid-February and occurs in two phases:
  - Phase I = (a) adult males and anestrous females, (b) immature whales
  - Phase II = mothers with calves

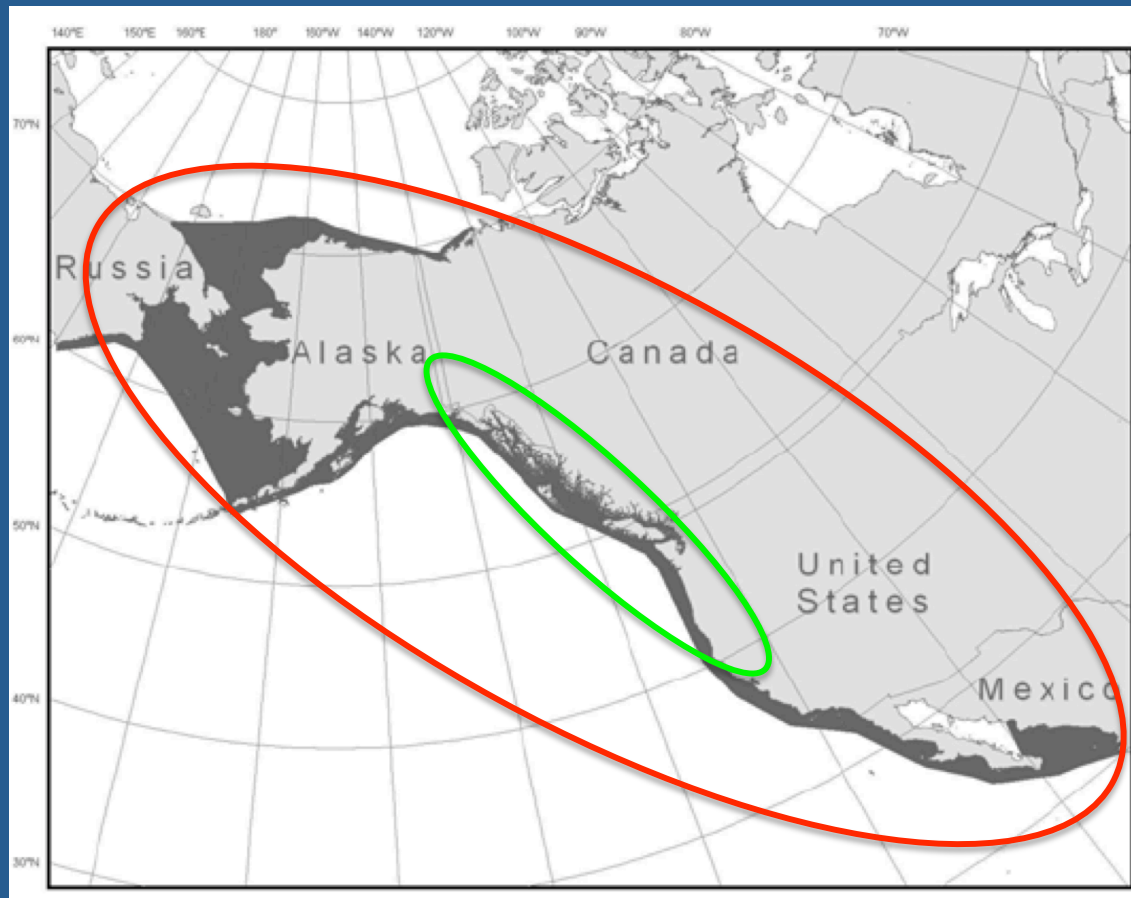
# Gray Whale Biology

- **Adult body size ranges from 11 to 15 m (females larger)**
- **Calves are 4.6 to 4.9 m at birth**
- **Sexual maturity is between 6 to 12 years of age**
- **Mean calving date mid-January (births occur on migration and near Baja lagoons)**
- **Gestation period is 12-13 months**
- **Healthy females reproduce at intervals of two years**
- **Calves are weaned at 7-9 months (about mid-August in the Arctic feeding area)**

## Population Status

- In 1994 the eastern North Pacific gray whale population was removed from the *List of Endangered and Threatened Wildlife* as it was no longer considered endangered or threatened under the ESA.
- In 2008, the Eastern North Pacific population was listed by the IUCN as being of “*Least Concern*”
  - Atlantic population extinct by early 1700s
  - Western population “*Critically Endangered*”

# Stock Definition and Geographic Range



Angliss, R.P. and Allen, B.M. 2007

# Abundance Estimation (southward migration)

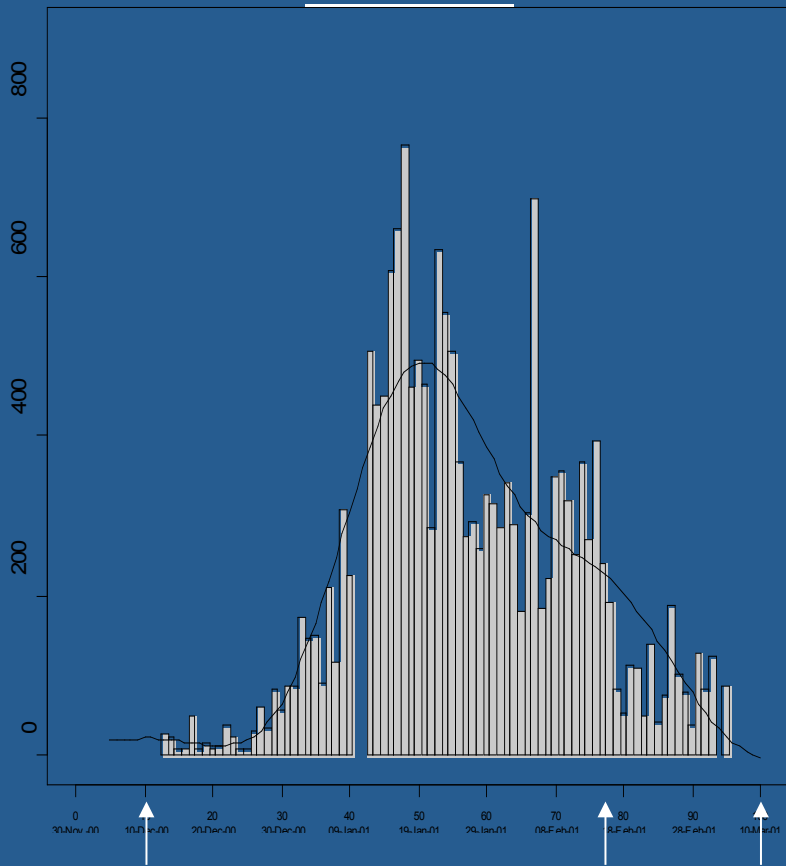


- Migration is about 2-3 km offshore along the central California coastline
- Count whales from shore at Granite Canyon late December to mid-February
- Test assumptions (offshore distribution, night migration rates, detection probability)



# Estimated Number of Whales Per Day

2000/01

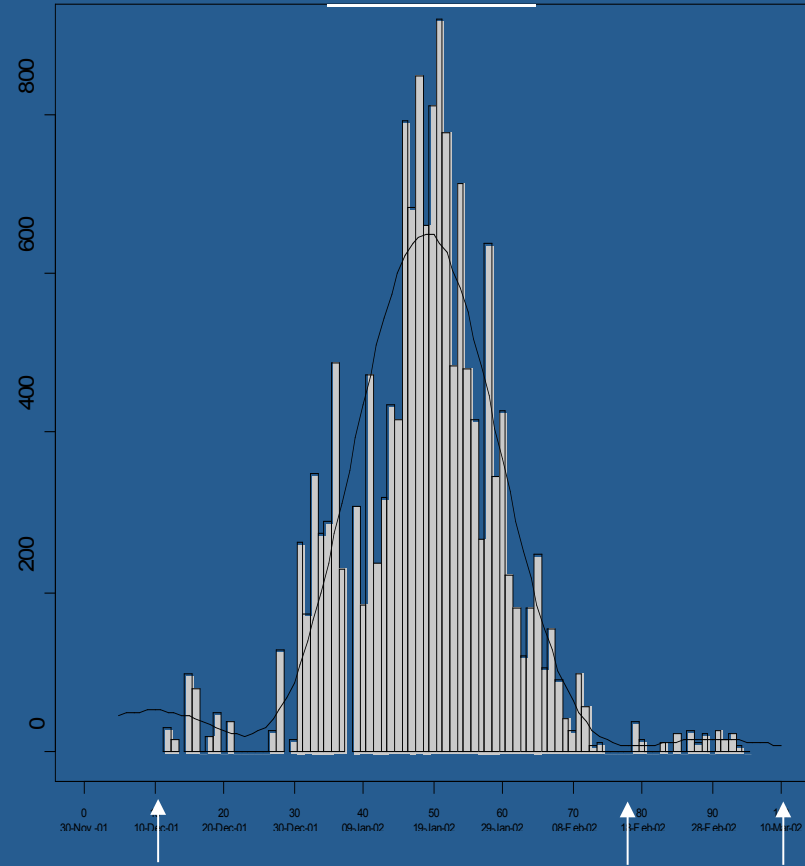


Dec 10

Feb 18

Mar 10

2001/02



Dec 10

Feb 18

Mar 10

# Population Size

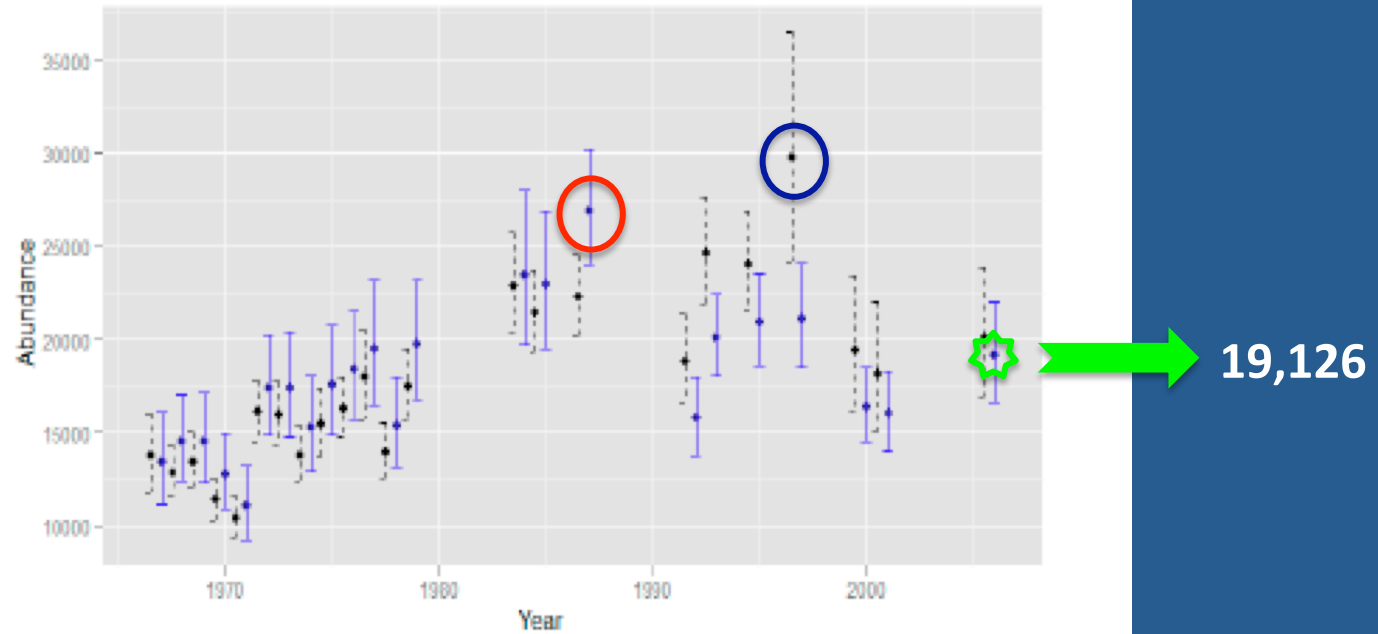
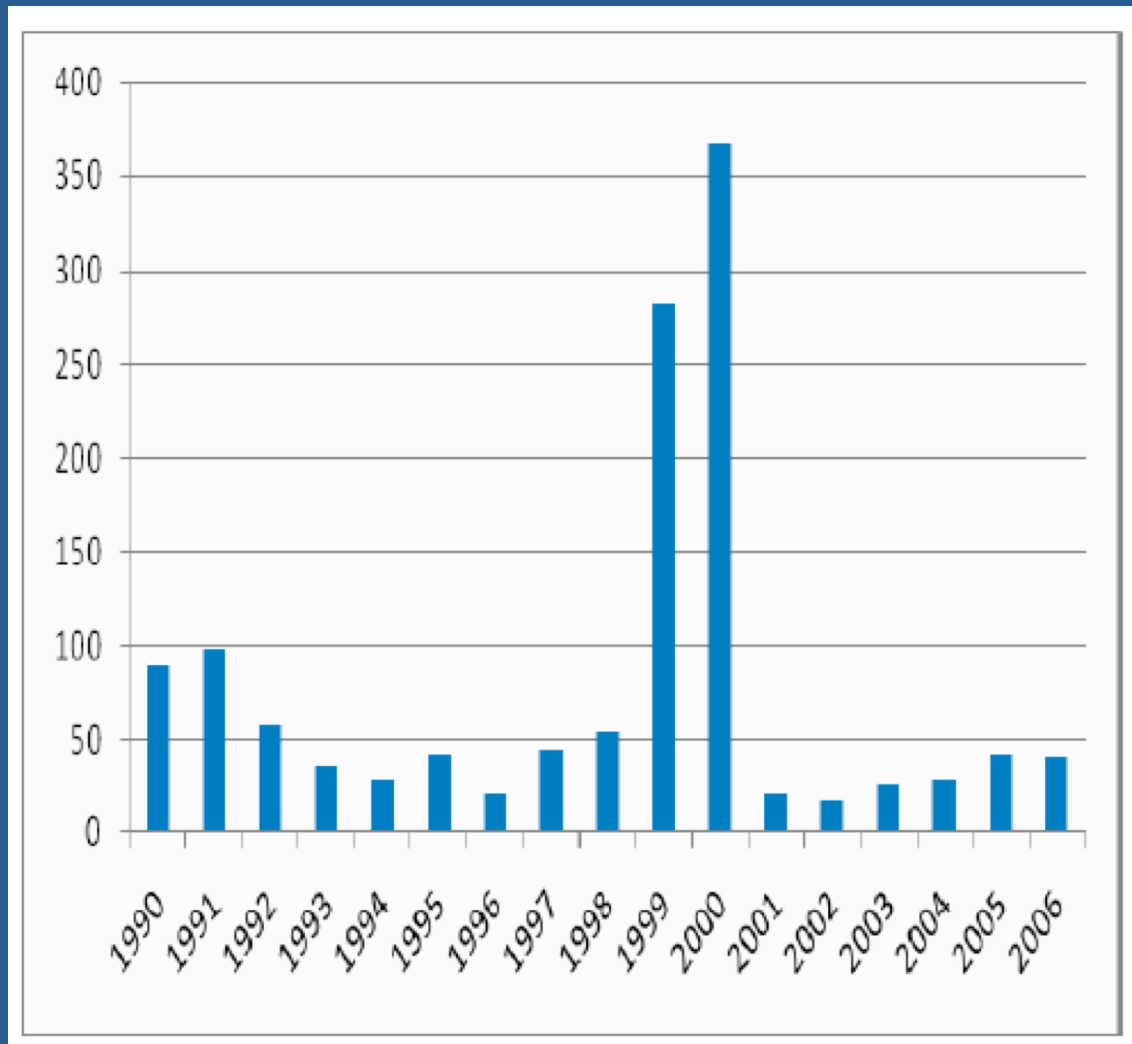


Figure 4. Abundance estimates with 95% log-normal confidence intervals for previous estimates (dashed line) taken from Rugh et al. (2008c) and current estimates (solid line).

Laake et al. 2009

# Mortality Event 1999-2000



Angliss, R.P. and Allen, B.M. 2007

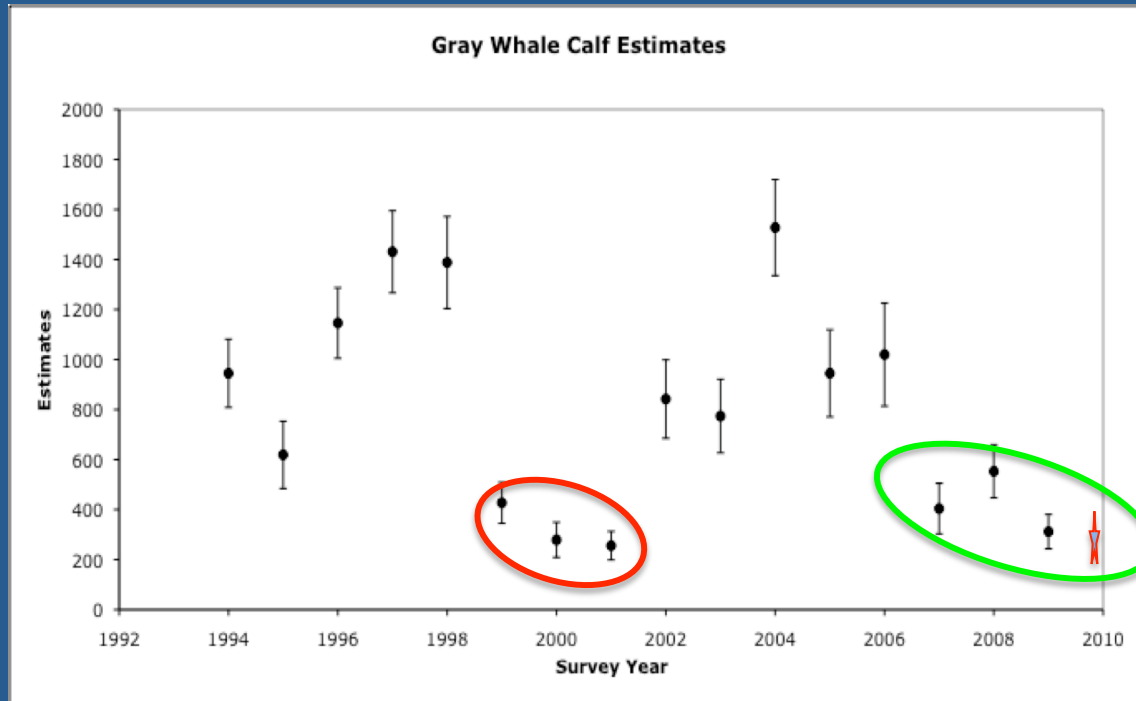
## Calf Counts (northward migration)



**Mother-calf migration is < 1 km offshore along the central California coastline**

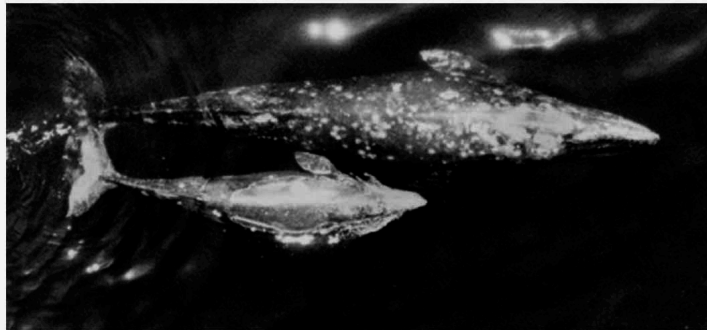
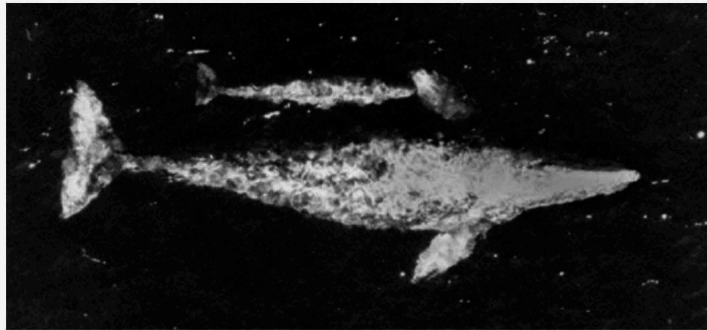
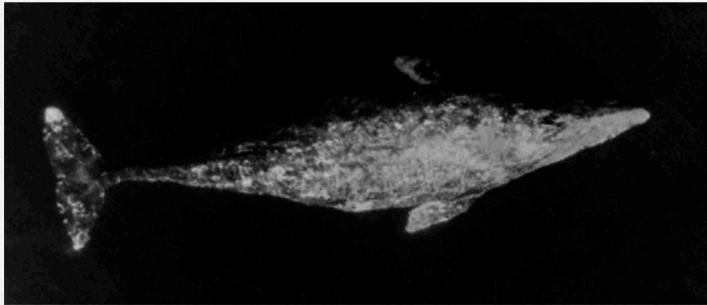
**Count whales from shore at Piedras Blancas Lighthouse from late March to late May**

# Calf Production



Perryman *et al.*, 2010

# Assessment of Body Condition



- The relationship between environmental conditions in the Arctic related to climate change, especially the spatial and temporal distribution of sea ice, and gray whale physical condition is poorly understood.
- Photographs of southbound gray whales taken from aerial platforms can allow for an assessment of body condition post-feeding.
- Skin and blubber biopsy samples collected from small boats simultaneous to aerial photography can provide tissues for measurement of thyroid to determine nutritive state.

***Distinctness of Pacific Coast Feeding Aggregation*** - Skin and blubber biopsy samples are being collected this summer (2010) from whales found within the range of the Pacific Coast Feeding Group as well as from whales feeding north of the Aleutian Islands. Data generated from these samples will indicate the magnitude of genetic differentiation between the Pacific Coast Feeding Group and whales feeding in more northern waters. These biopsy samples can also be used to evaluate the feasibility of using contaminant signatures to differentiate these two groups of animals.



Gray whales are subject to anthropogenic threats, including:

entanglements in fishing gear

environmental degradation including exposure to contaminants

disturbance by shipping

noise (e.g. seismic surveys) related to offshore oil and gas

Finally, the consequences of **climate change** on gray whales and their habitat, especially the notable reduction of sea ice and increasing water temperatures in the Arctic, are yet to be determined.



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