

Brown Bear Population Estimates in Unit 4



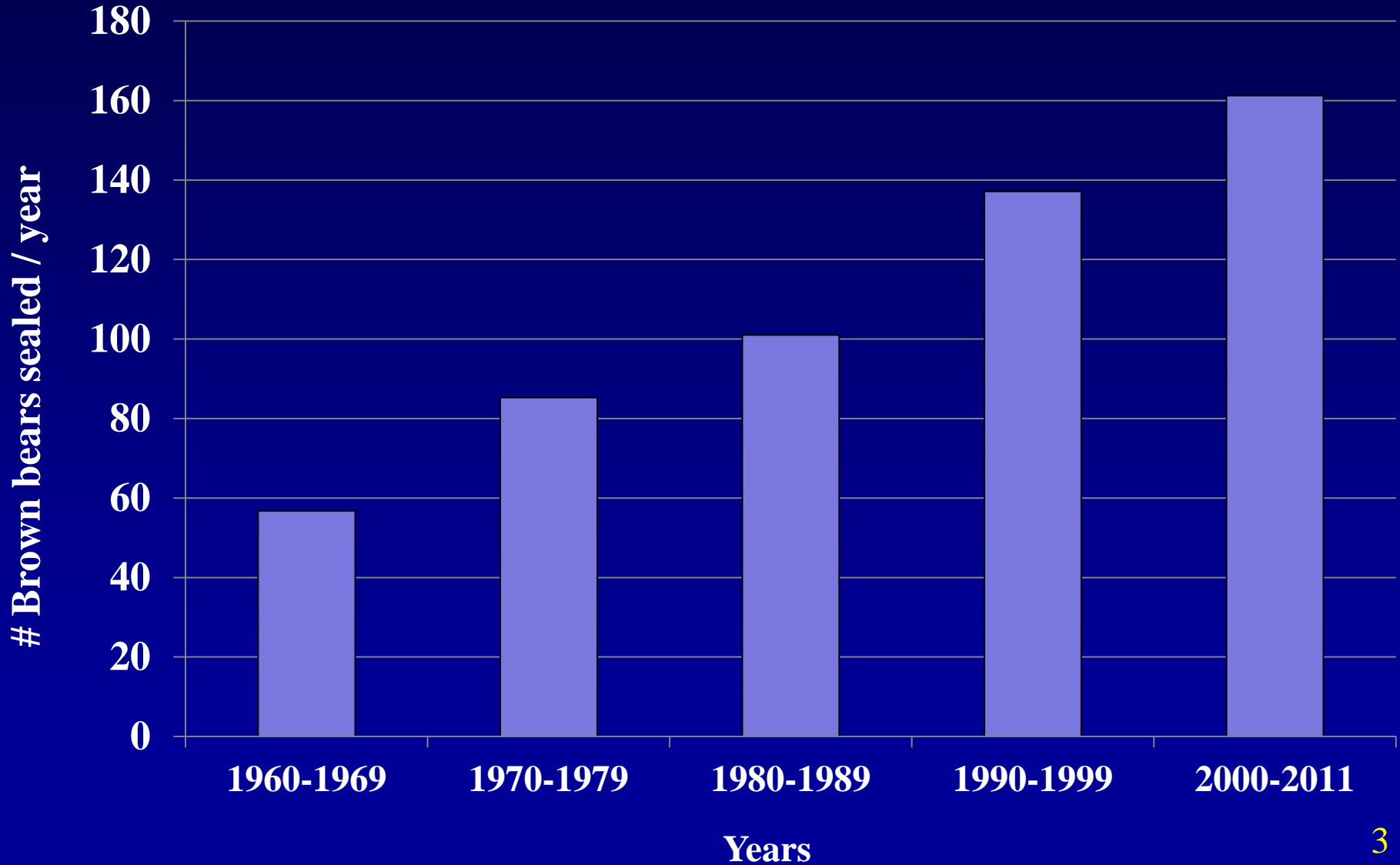
Presentation Outline

- Background
- Objectives
- Methods
- Results
 - Population Estimates
 - Population Density
- Summary



Background

Unit 4 Brown Bear Human-caused Mortality



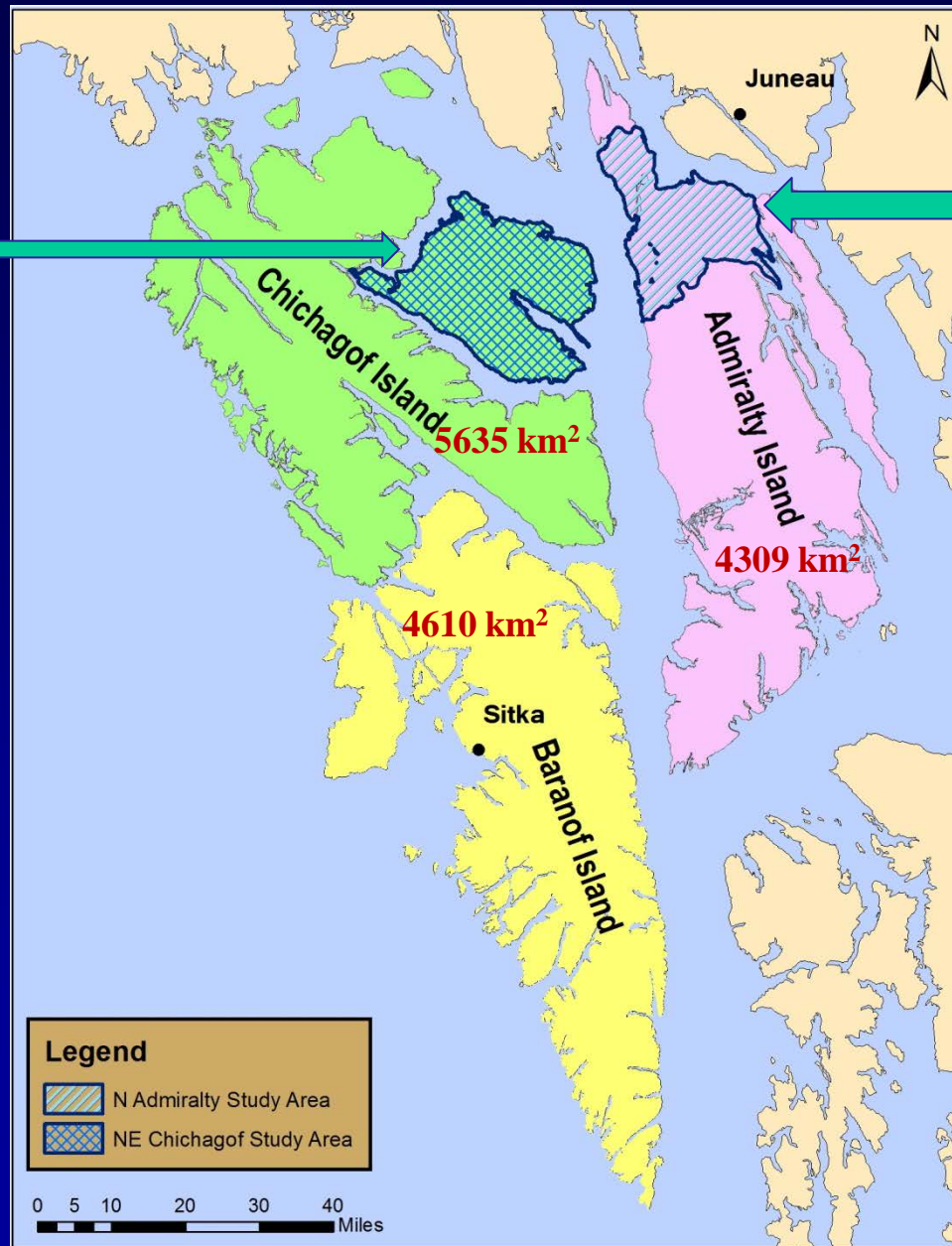
Objectives

- Estimate brown bear population size on northern Admiralty and Northeast Chichagof islands
- Derive brown bear population densities for Admiralty and Chichagof islands
- Obtain information on brown bear population demographics

Unit 4 Islands and Study Areas

Northeast
Chichagof
study area

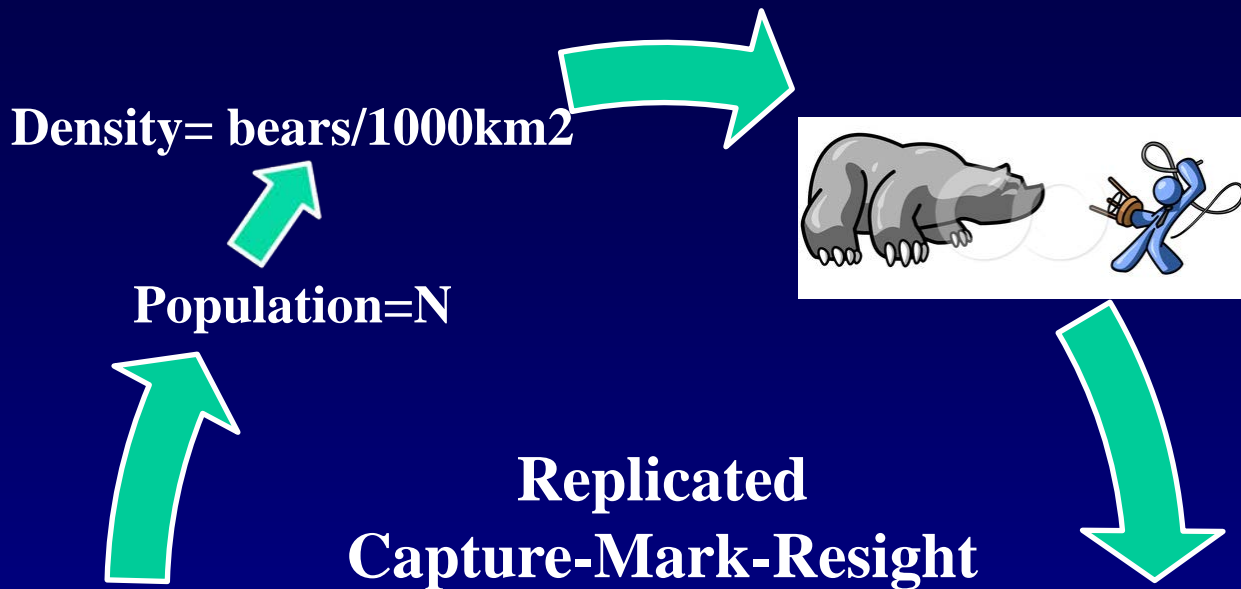
Admiralty
Island
study area



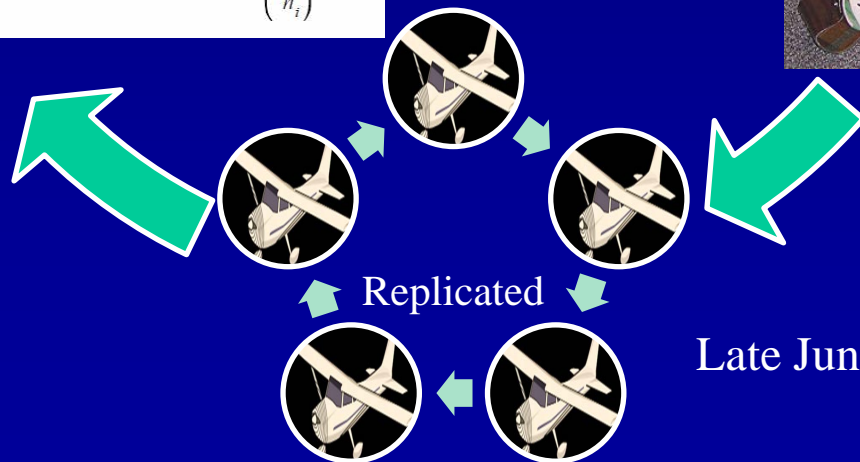
Methods

- Replicated Capture-Mark-Resight (CMR)
 - Primarily searched habitats above timberline
- Admiralty Island study area- 344 km²
1986-87 and 1993
- NE Chichagof Island study area- 1112 km²
1992 and 2002

Methods



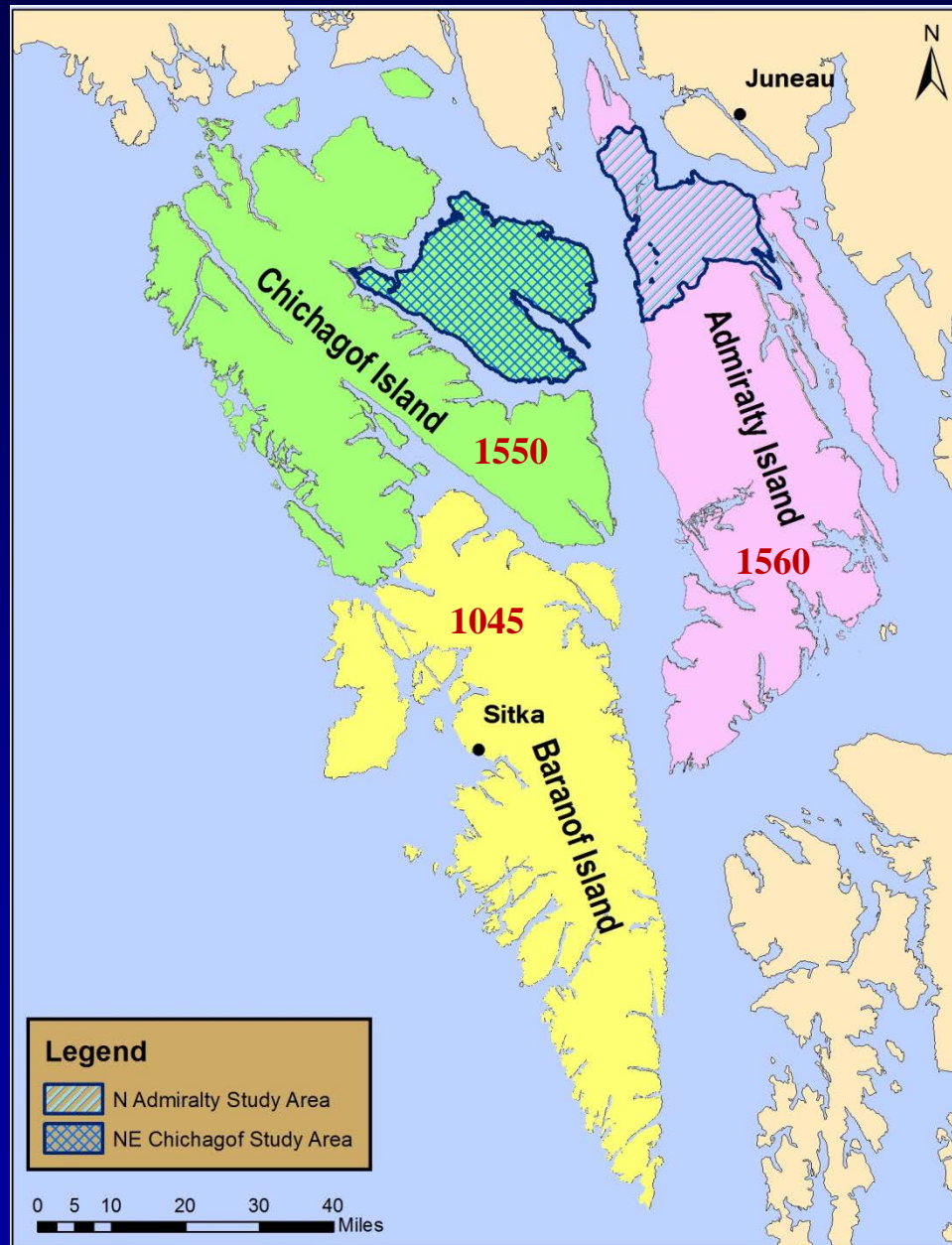
$$\mathcal{L}(N^*, N_i | T_i, M_i, m_i, n_i) = \prod_{i=1}^k \binom{T_i}{M_i} \left(\frac{N_i}{N^*} \right)^{M_i} \left(1 - \frac{N_i}{N^*} \right)^{T_i - M_i} \frac{\binom{M_i}{m_i} \binom{N_i - M_i}{n_i - m_i}}{\binom{N_i}{n_i}}$$



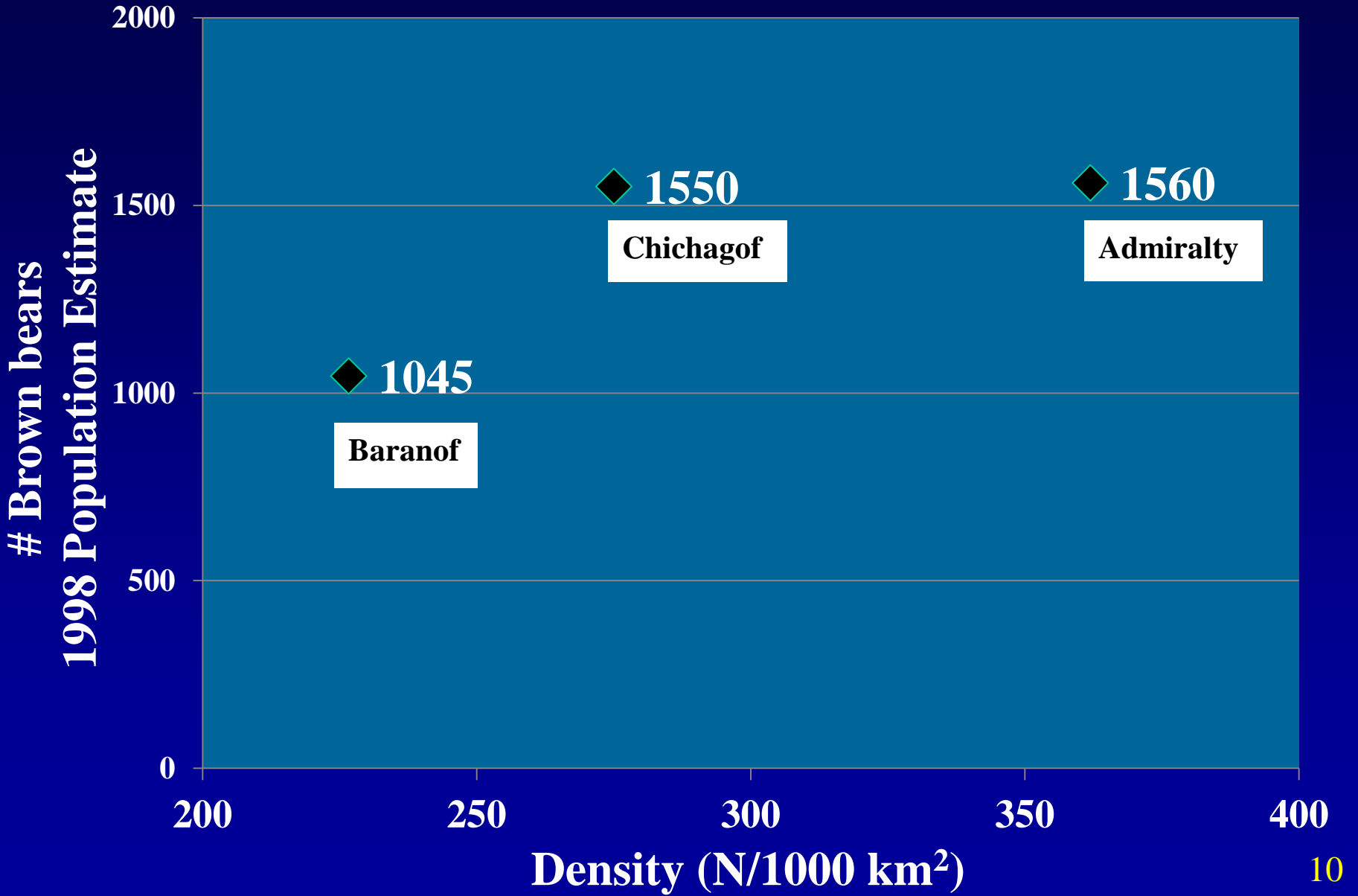
Population Estimate

- The current estimates are based on ADF&G mark/recapture research conducted on northern Admiralty and Northeast Chichagof islands and extrapolated to the rest of Unit 4 based on a combination of factors including:
 - biologists' personal knowledge of habitat characteristics,
 - the predictions of a brown bear habitat capability model,
 - anecdotal reports of field sightings by hunters, and other outdoors persons, and harvest data.

Unit 4 Population Estimates



Brown Bear Population and Density



Northeast Chichagof Population Estimate

1992 Study

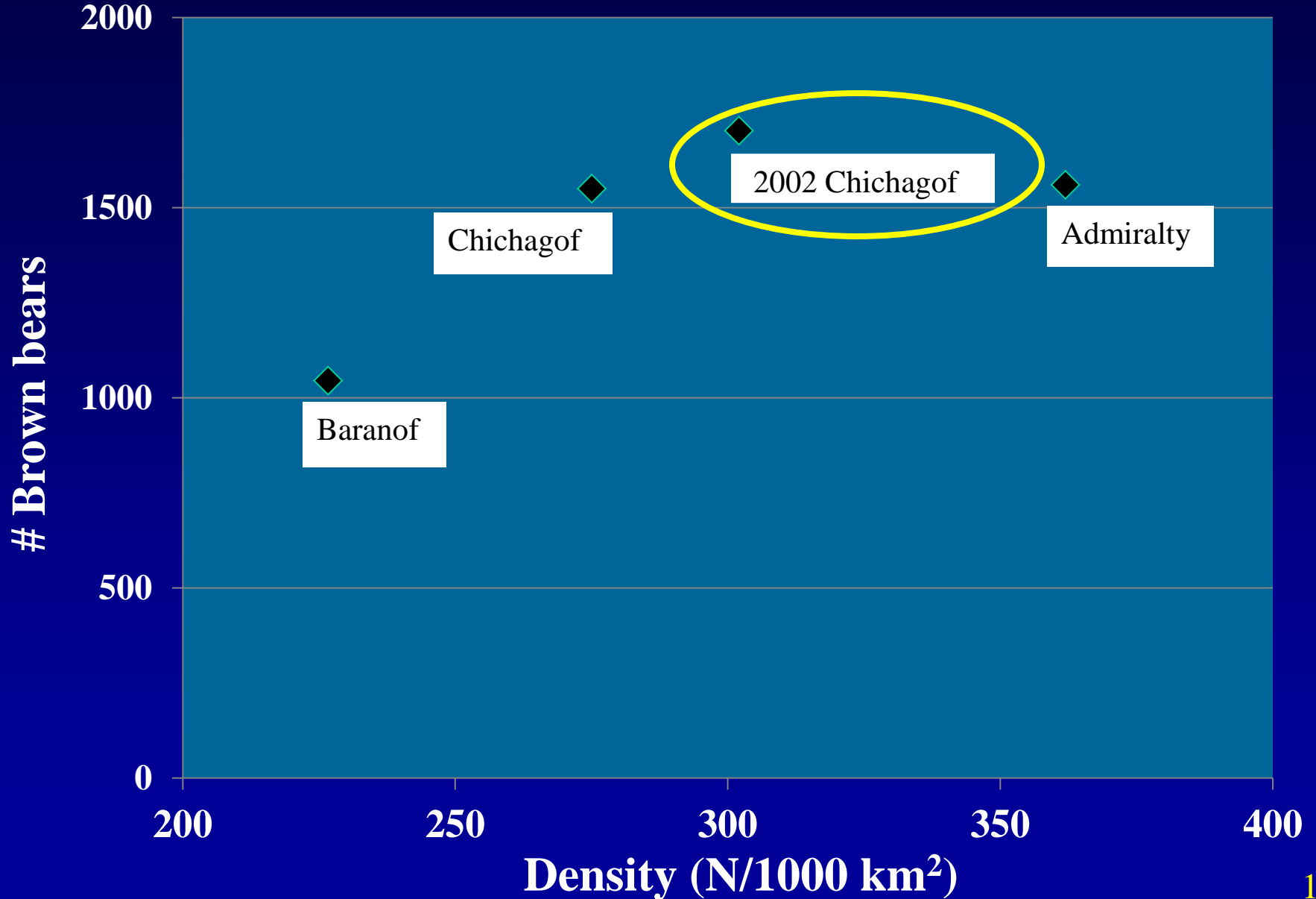
- 69 collared (17%)
- @ high elevation
- 6 replicate surveys
- 257 total bears

2002 Study

- 44 collared (10%)
- 23 @ low elevation; 21 @ high elevation
- 9 replicate surveys
- 458 total bears



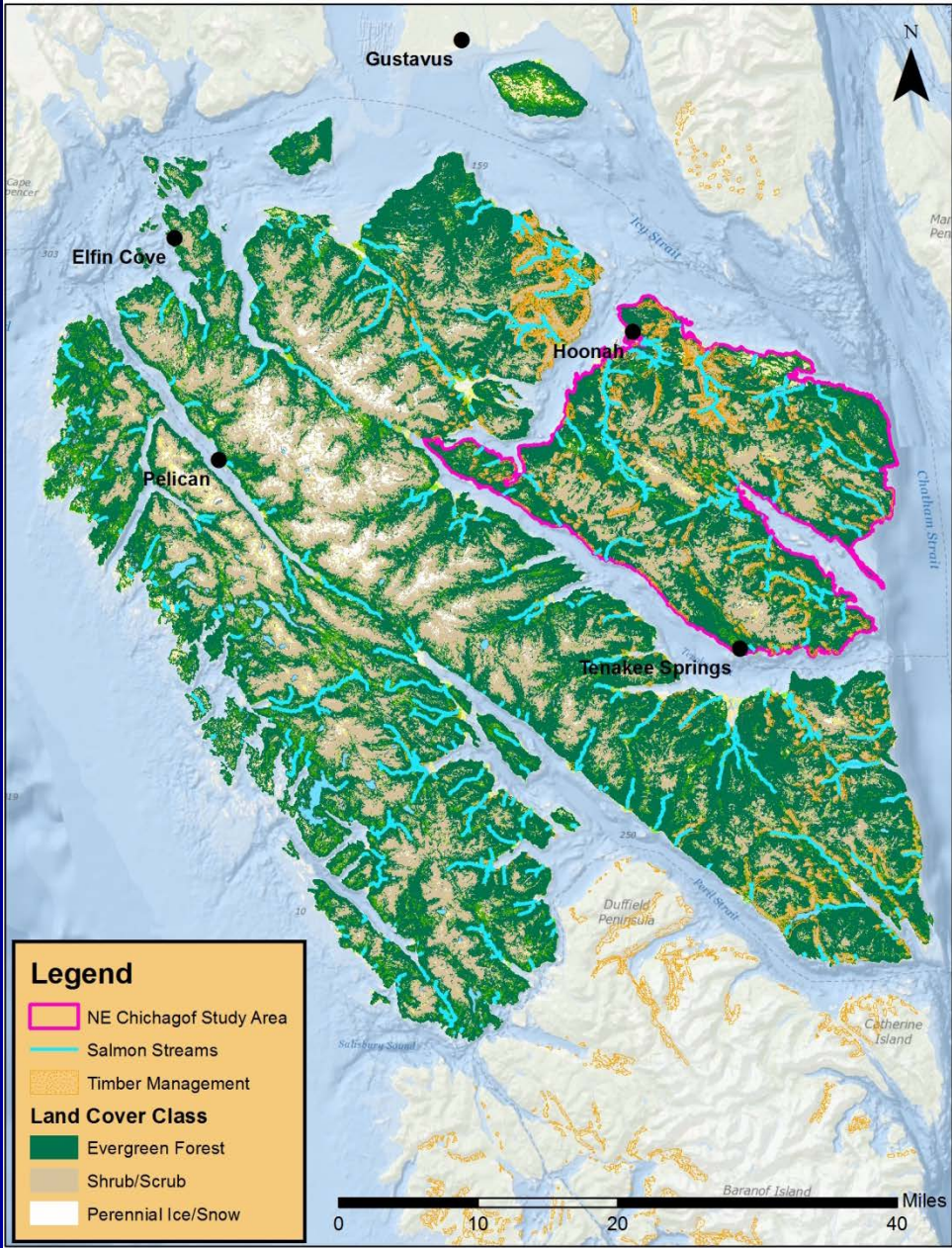
Brown Bear Population and Density



NE Chichagof Issue

- 2002 NE Chichagof estimate
 - Obtained after completion of the Brown Bear Management Strategy
 - Is higher and more precise than the 1992 estimate
 - Applied to NE Chichagof, but not the entire island
 - Differing habitat capabilities
 - Higher salmon stream density (27%) than remainder of Chichagof

NE Chichagof Habitat and Salmon



Summary

- Harvest has steadily increased over past 5 decades
- Population estimates: Admiralty, Baranof, Chichagof
- Density estimates: Admiralty, Baranof, Chichagof
 - Ranged from 227 – 362 bears / 1000 km²
- 2002 Northeast Chichagof estimate – less bias, more precise, increased brown bear abundance
- Dept has successfully managed brown bear harvest for high population levels, providing for all uses and users