


# Marine Wildlife Surveys



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**Agency Information Meeting**  
**29 November 2007**

# Primary Objective

- Determine whether birds or mammals classified as threatened, endangered, or of conservation concern occur in the marine waters near the proposed Port site:
  - Steller's Eider, Kittlitz's Murrelet
  - Sea Otter, Steller's Sea Lion, Beluga Whale

# Secondary Objectives

- Describe the seasonal distribution and abundance of birds and mammals near the proposed Port site
- Document breeding activity by birds and mammals near the proposed Port site (little survey effort in 2006–2007)

# Methods

8 boat-based wildlife surveys (2004–2006)

- Year-round (spring, summer, early & late winter)
- Nearshore surveys
- Offshore surveys

20 fixed-wing bird surveys (2004–2005)

- Spring and fall migration
- Included Chinitna Bay (2005)

# Methods

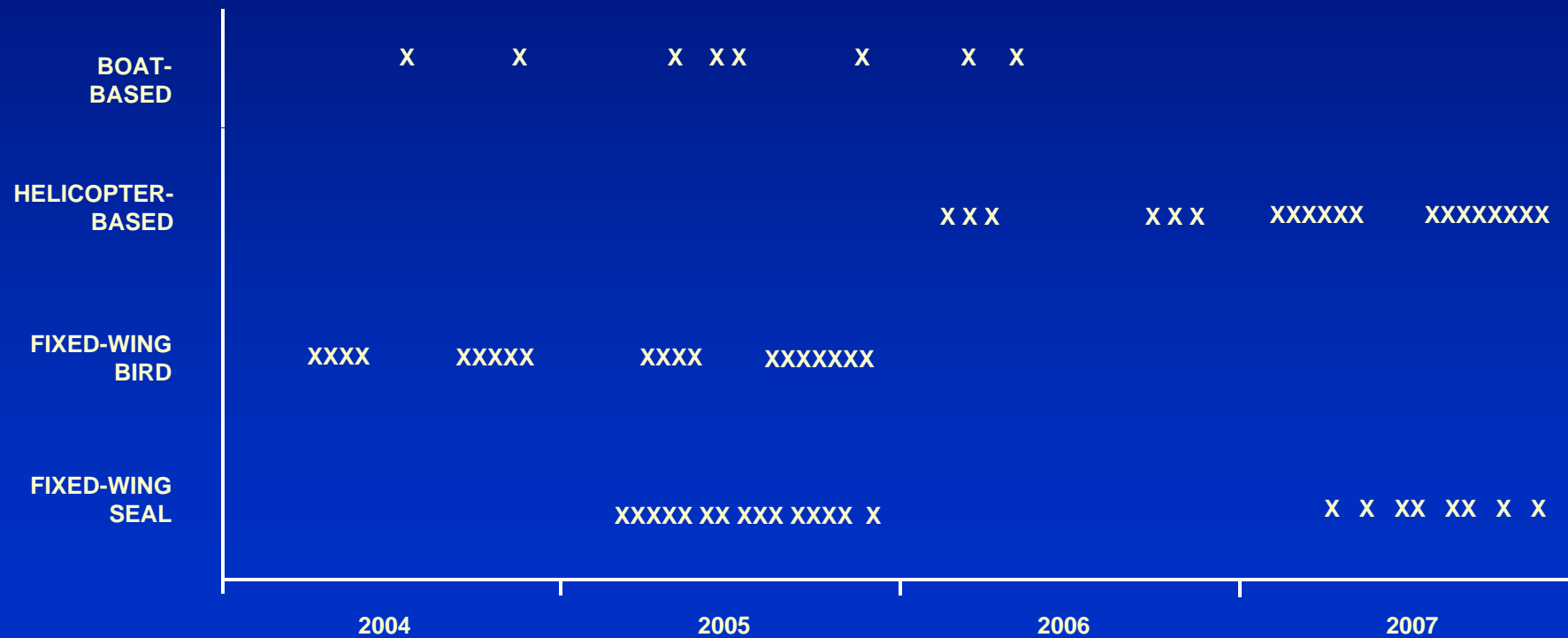
20 helicopter-based wildlife surveys (2006–2007)

- 6 in 2006, 14 in 2007
- Emphasize Steller's Eiders and Sea Otters
- Include Chinitna Bay (starting 2007)

27 fixed-wing Harbor Seal surveys (2005, 2007)

- 19 in 2005, 8 in 2007
- Seasonal use & population estimation
- Include Chinitna Bay

# Sampling Effort



## Recent Work (2006–2007)

- The bulk of the 2006–2007 work has been helicopter-based wildlife surveys and fixed-wing seal surveys
- The helicopter surveys replace fixed-wing bird and boat-based wildlife surveys and include all wildlife species
- They also improve our ability to monitor Steller's Eiders and wildlife in the offshore zone, which is not sampled well with boats

# Helicopter-based Wildlife Surveys

- Robinson R-44 helicopter
- Flown at 80–130 km/h and ~150 m asl
- Avoid low tide (hauled-out seals) if possible
- Complete nearshore survey
- Offshore surveys for bird flocks  $\geq 5$  birds and all marine mammals
- All Steller's Eiders and Sea Otters recorded, no matter where seen
- All locations mapped



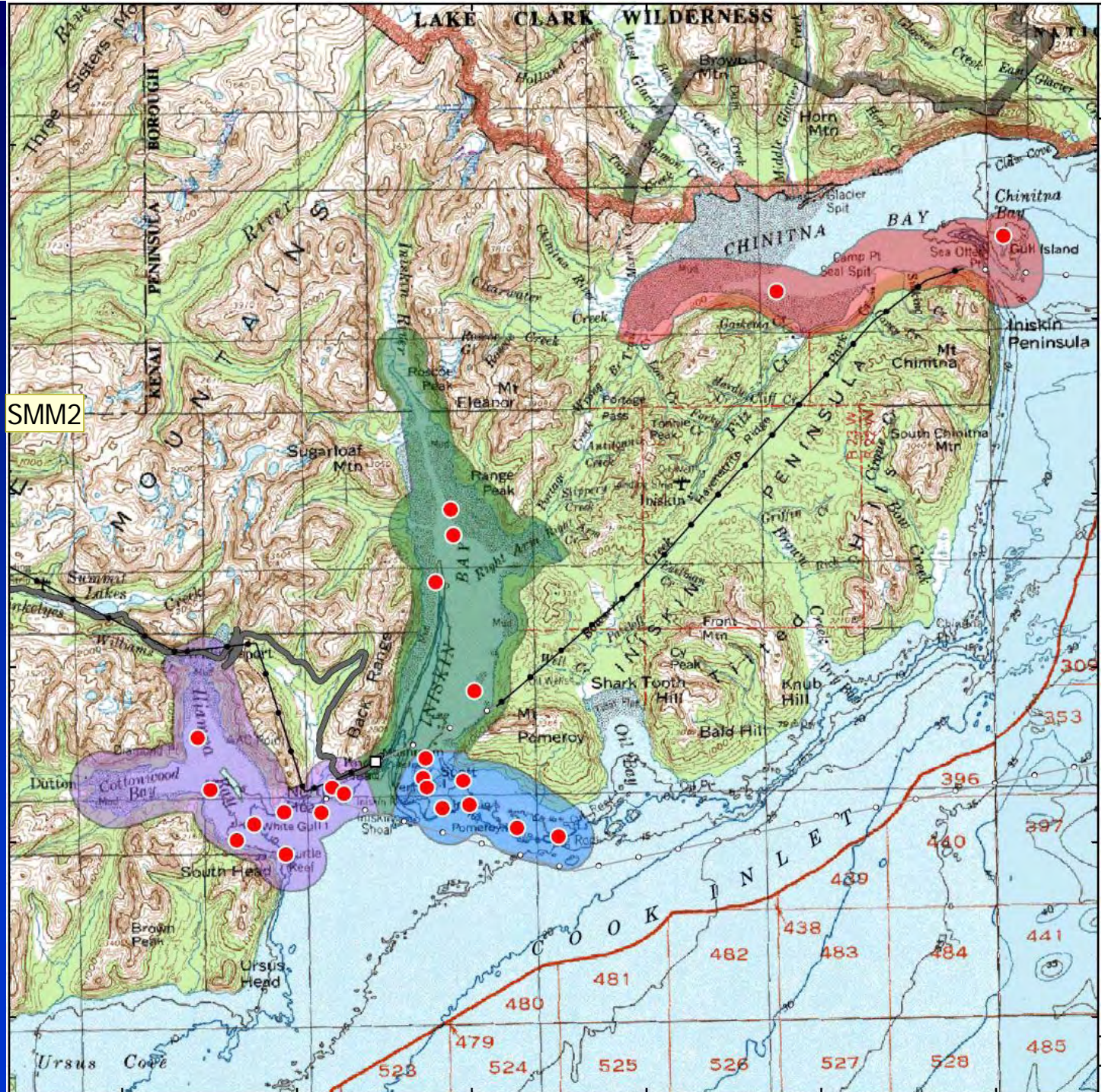
# Helicopter -based Wildlife Surveys



# Fixed-wing Seal Surveys

- Cessna 206 or Piper Super Cub
- Flown at 1,000 ft (~300 m) asl
- Within 2 hr of low tide
- Survey of consistently-used haulouts
- Occasional other haulouts used (e.g., mudflats)
- All group sizes estimated and photographed for later counting
- All locations mapped

# Fixed-wing Harbor Seal Surveys



**Slide 11**

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**SMM2**

Include symbol and description? i.e., what are the red dots?

Steve Murphy/, 16-Nov-07

# Highly Seasonal Environment!



February, April 2006



March 2006

# Birds



# Results

- 16 Helicopter-based surveys so far
- ~31,300 birds of 34 species
  - Several records of Steller's Eiders

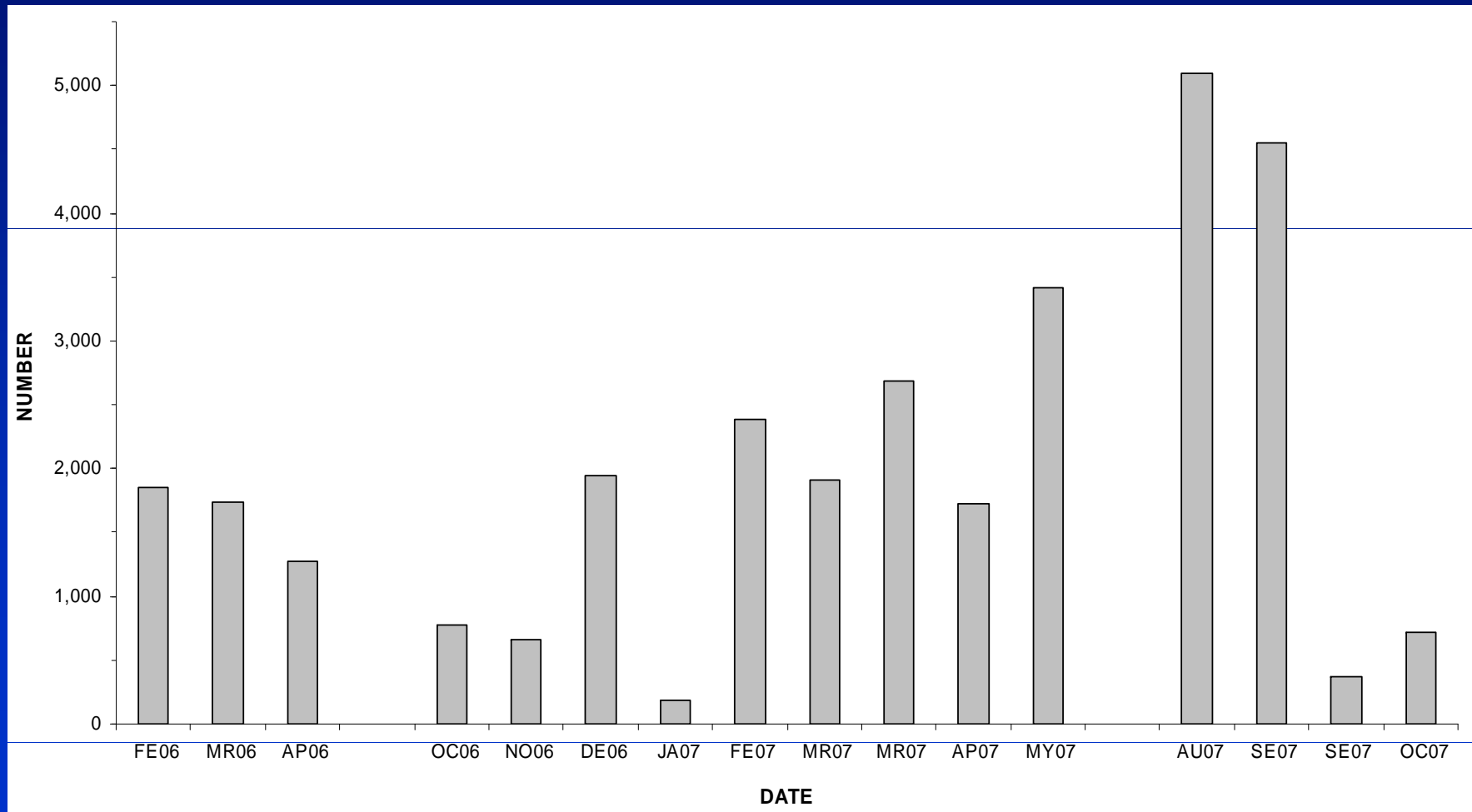
# Abundance (Helicopter)

Substantial seasonal and interannual variation in total numbers of birds

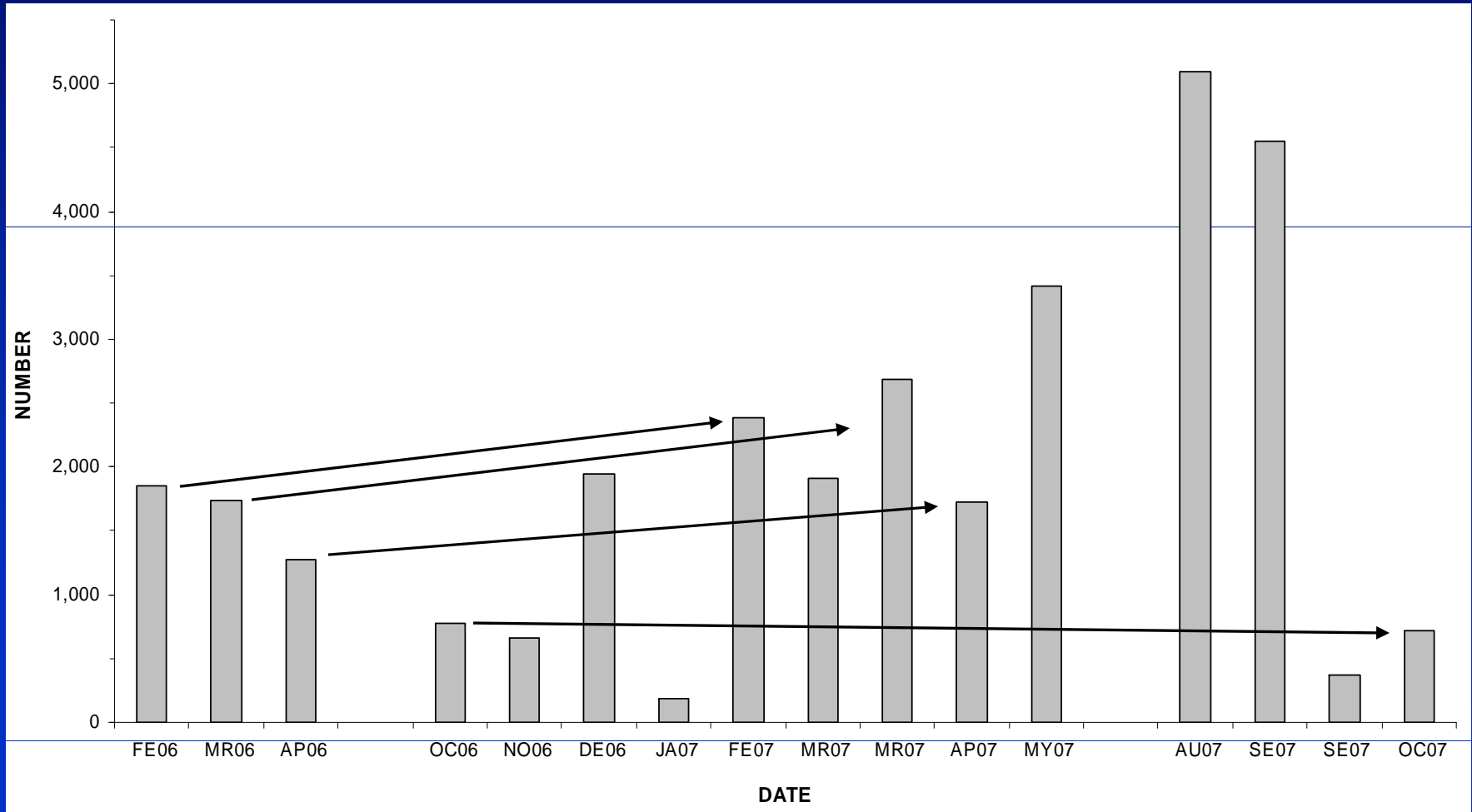
- High in spring (matches results of boat-based and fixed-wing surveys)
- Highest in fall (matches results of fixed-wing surveys)
- Lowest in late fall and winter
- Interannual variation



# Abundance (Helicopter) Seasonal



# Abundance (Helicopter) Interannual



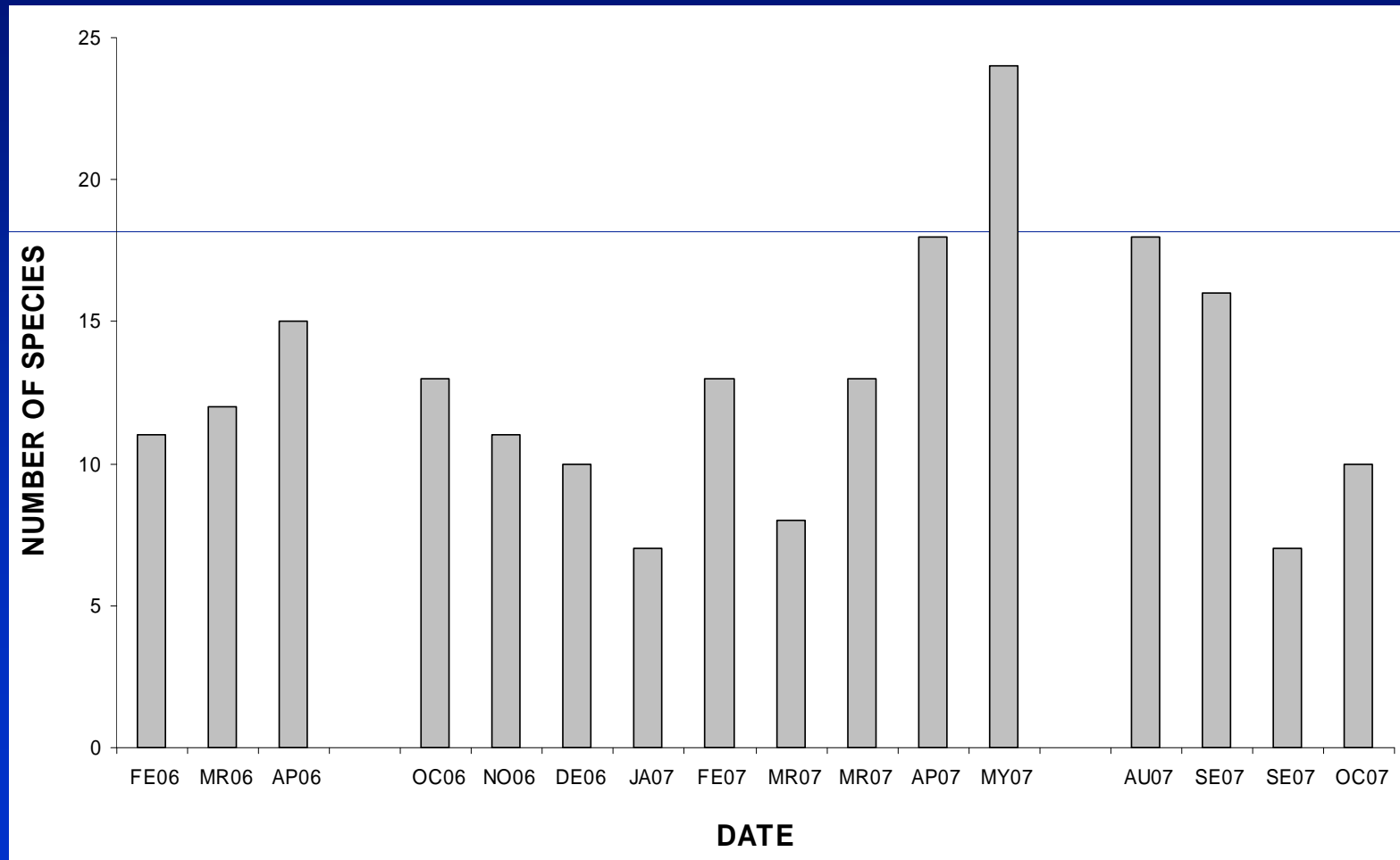
# Species–richness (Helicopter)

Substantial seasonal variation in richness

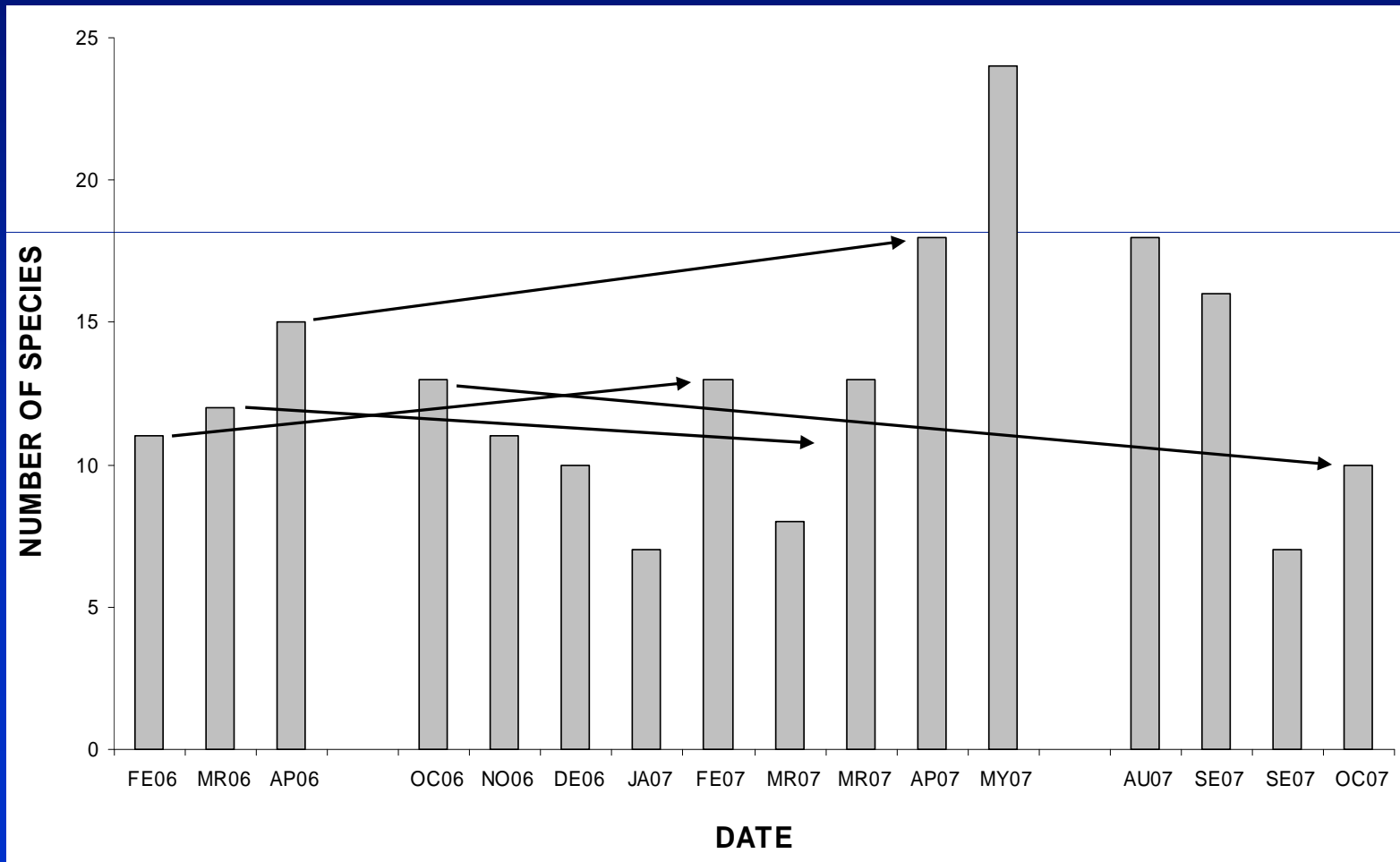
- Highest in spring and fall migrations (spring high matches results of boat-based surveys)
- Lowest in mid- to late winter (matches results of boat-based surveys)
- Not as many species as boat-based surveys, probably because of timing of surveys and limitations of sampling type
- Interannual variation

# Species-richness (Helicopter)

## Seasonal



# Species-richness (Helicopter) Interannual



# Species-composition (Helicopter)

System is numerically dominated by waterfowl

- ~21,800 (70%) of ~31,300 total birds were waterfowl
- ~20,500 (94%) of all waterfowl were diving ducks
- Dominated numerically by scoters (~9,000), Long-tailed Ducks (~5,000), Steller's Eiders (~2,200), and Harlequin Ducks (~1,800)

# Species-composition (Helicopter)

Seabirds are second in abundance

- ~8,700 (28%) of ~31,300 total birds were seabirds
- ~8,000 (92%) of all seabirds were gulls
- Cormorants also are important

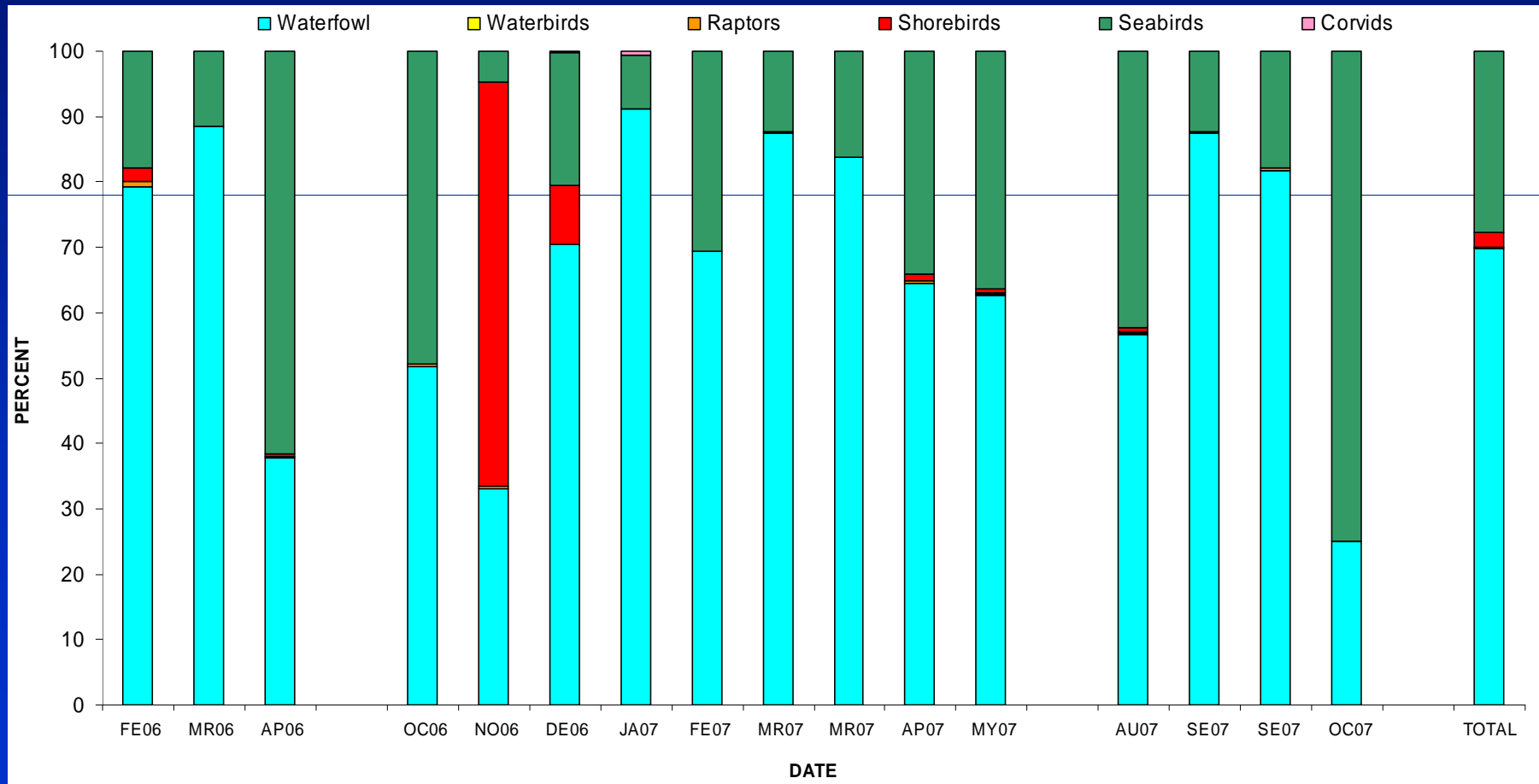
# Species-composition (Helicopter)

Shorebirds are under-represented

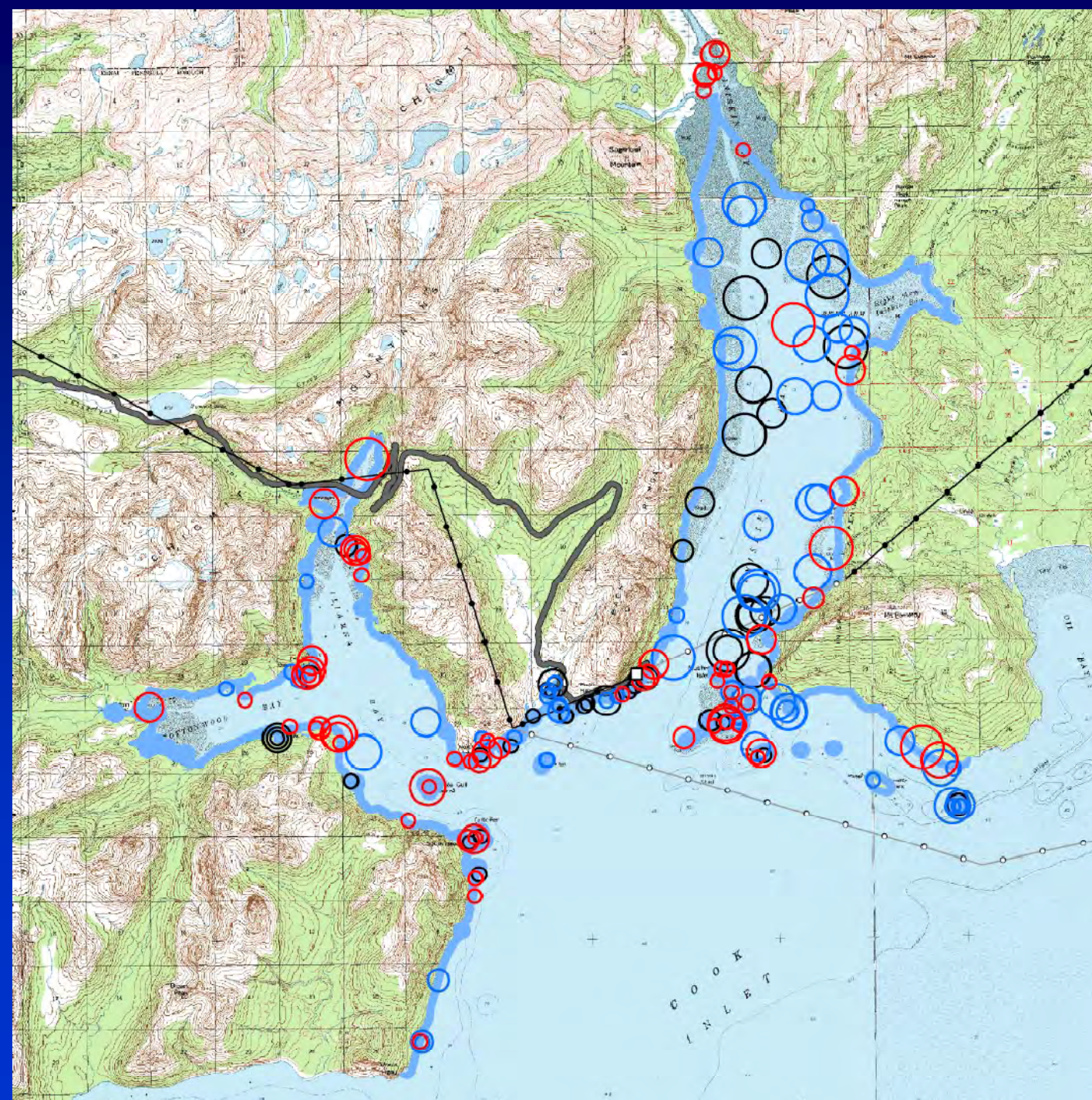
- Occur in large numbers in spring
- BUT occur in large numbers only during a very brief period (~1 week)
- Timing of surveys not optimized for shorebird migration



# Species-composition (Helicopter)



# Birds (Helicopter) Feb–Apr 2006



## Abundance

| Number of Individuals <sup>1</sup> |           | Season |          |
|------------------------------------|-----------|--------|----------|
| ○                                  | 1 – 10    | ○      | February |
| ○                                  | 11 – 25   | ○      | March    |
| ○                                  | 26 – 50   | ○      | April    |
| ○                                  | 51 – 100  |        |          |
| ○                                  | 101 – 250 |        |          |

<sup>1</sup>Only concentrations of  $\geq 25$  birds are shown outside the 200-meter nearshore survey area.



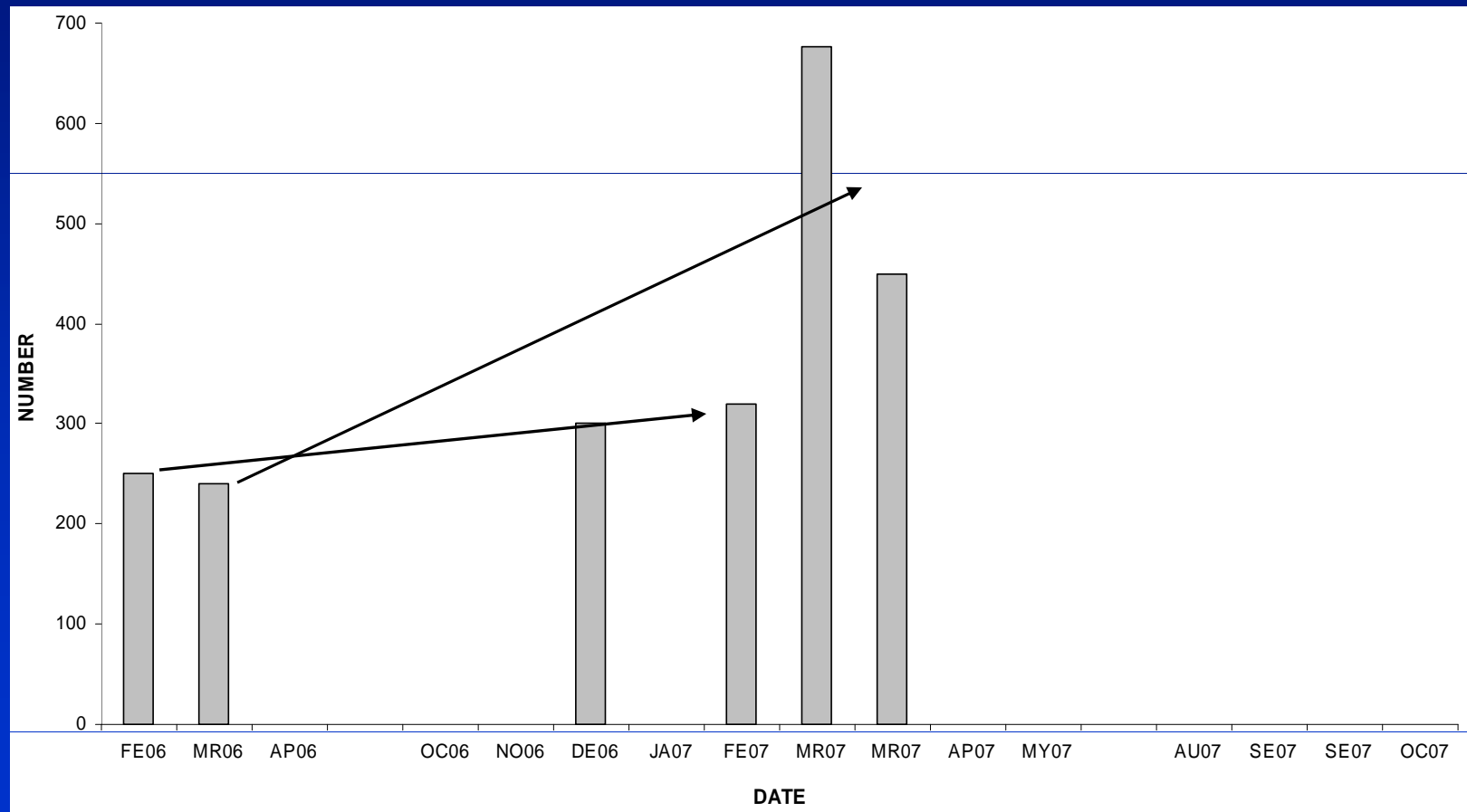
# Steller's Eider



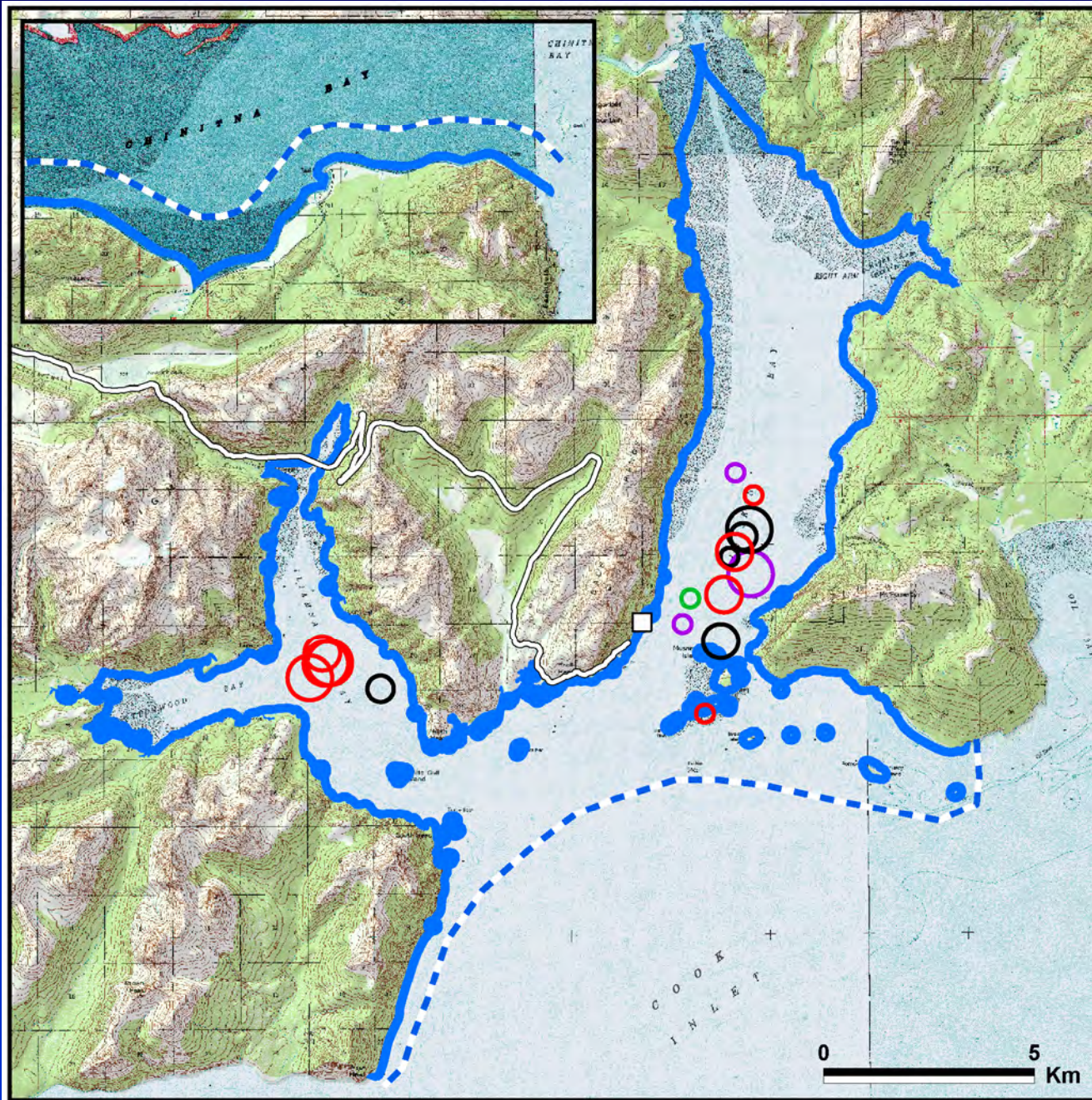
# Steller's Eider

- Seen only Dec to early Apr
- Primarily in centers of bays, especially Iniskin
- Also seen in Iliamna Bay
- Not recorded in Chinitna Bay so far
- 240–675 birds seen on a survey
- Often segregate in single-species flocks

# Steller's Eider Seasonal Patterns (Helicopter)



# Steller's Eider (All data) 2004–2007



**Number of  
Individuals**

- 1 – 50
- 51 – 100
- 101 – 250
- 251 – 675

**Month**

- December
- February
- March
- April



**~300 Steller's Eiders Dec 2006**

# Summary (Birds)

- At least 67 bird species occur or probably occur within the area (all survey types)
- Seasonal pattern of species-richness (highest in spring and fall migration, lowest in mid- to late winter)
- Species-composition dominated by waterfowl and seabirds, with large numbers of shorebirds in spring (Iniskin, Chinitna) and sometimes in winter (Rock Sandpipers)



# Summary (Birds)

- Large numbers of waterfowl migrate through the area (>8,600 at times on fixed-wing surveys—2005)
- Hundreds–thousands of threatened Steller's Eiders but no Kittlitz's Murrelets seen
- Several seaduck species molting and wintering (Harlequin Ducks, scoters, Long-tailed Ducks)

# Summary (Birds)

- 21 species of conservation concern recorded
- Ongoing helicopter-based surveys to study use of the area by Steller's Eiders and concentrations of birds

# Mammals



# Results

16 Helicopter-based surveys so far

- ~4,400 Sea Otters
- 12 Harbor Porpoises
- 4 Beluga Whales (+ 23 off-survey)

# Results

- Overall system clearly dominated numerically by Sea Otters in winter—but highly seasonal
- Harbor Porpoises occasionally seen, especially in spring (similar to boat-based surveys)
- Harbor Seals seen throughout area all year, but not focus of helicopter sampling
- Beluga Whales seen in 2007—in both Chinitna and Iliamna bays

# Species–richness & –composition (Helicopter)

- Only 1–2 species recorded on any survey, so no plots of richness or composition
- Primarily Sea Otters (>99%)
- A few Harbor Porpoises, Beluga Whales, and Harbor Seals

# Sea Otter

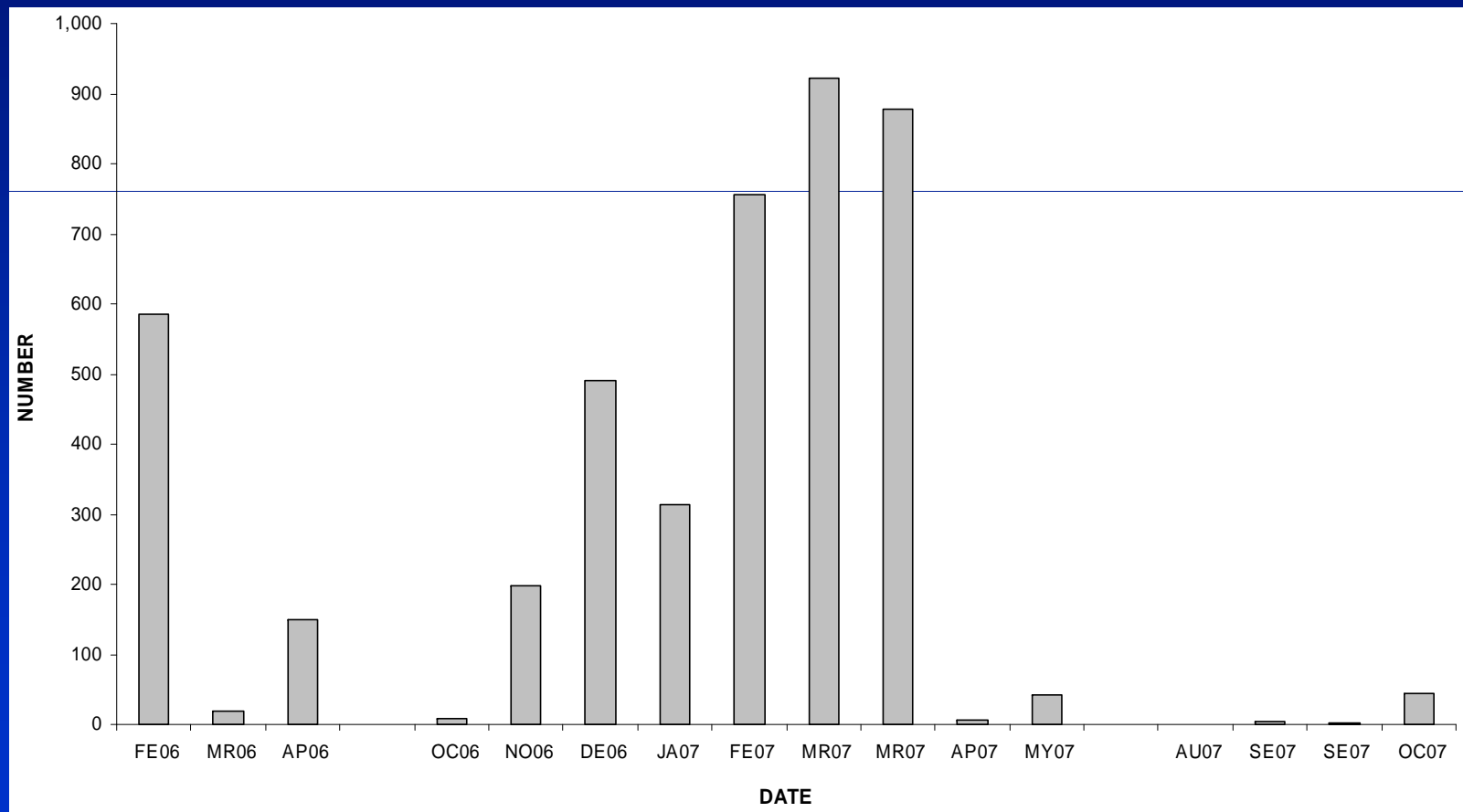


# Sea Otter (Helicopter)

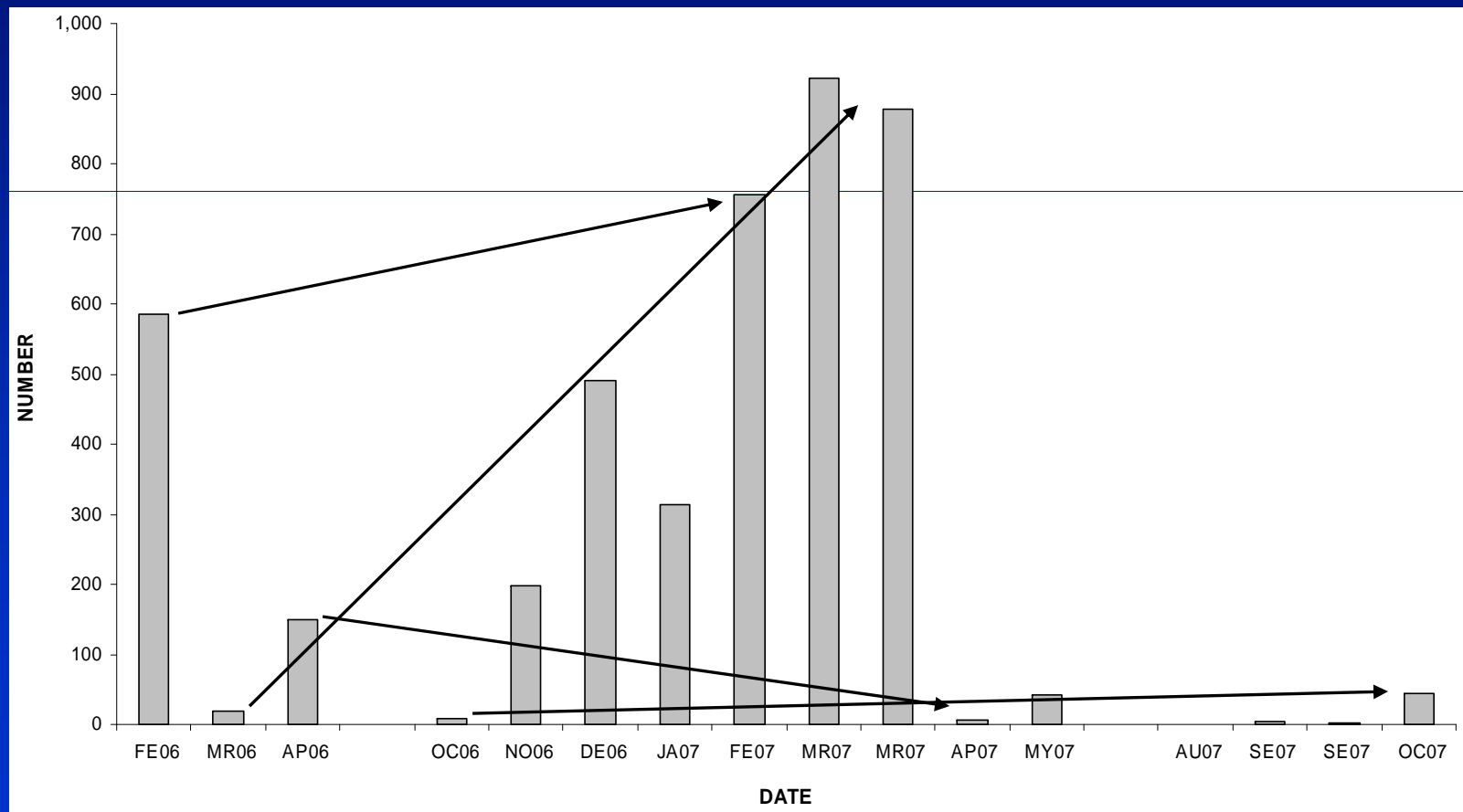
- Present primarily in fall and winter, especially Nov–Mar
- Distributed throughout entire area, but especially common near Iniskin Islands
- Movements related to bad weather and sea ice?



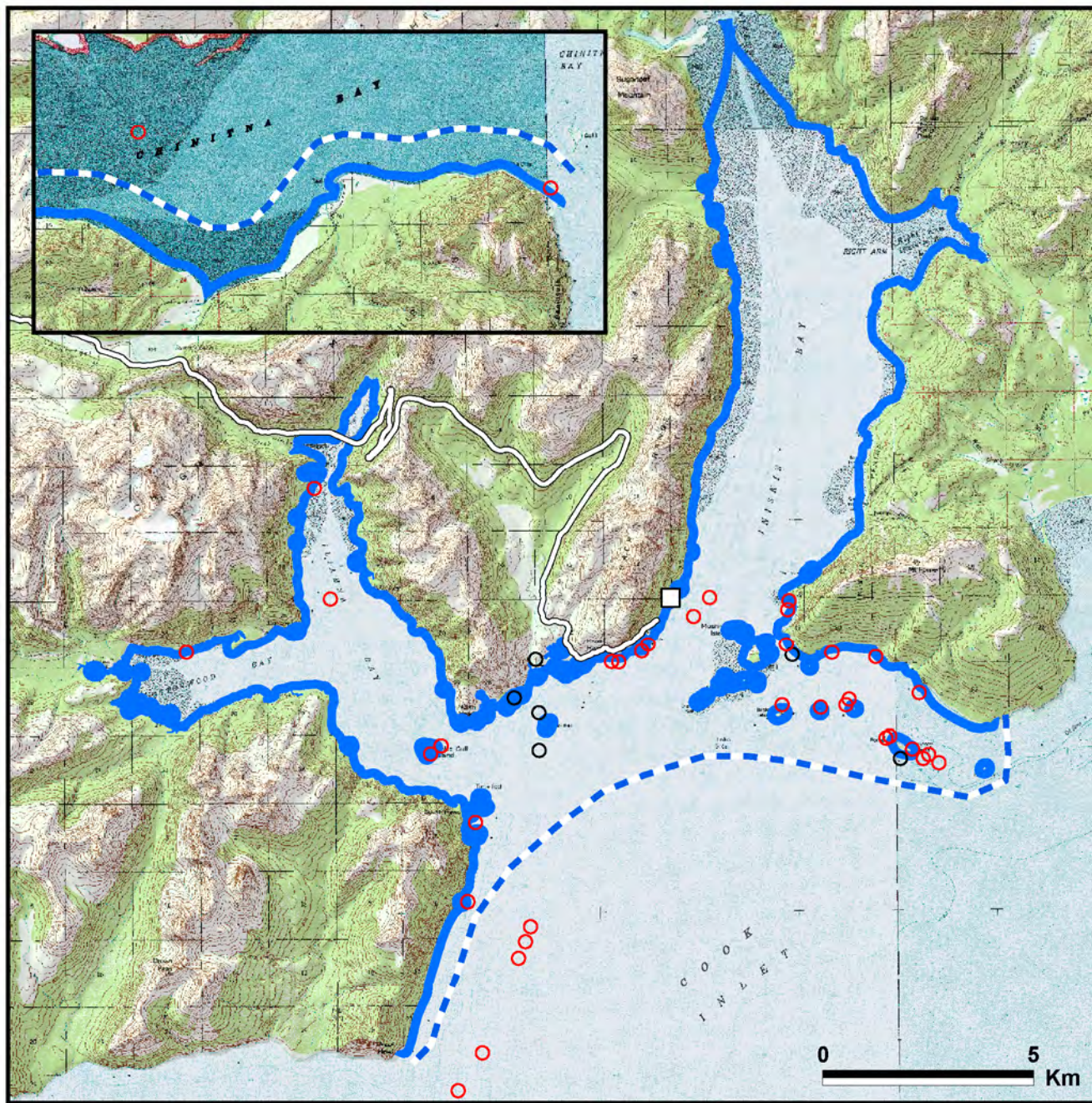
# Sea Otter Abundance (Helicopter) Seasonal



# Sea Otter Abundance (Helicopter) Interannual



# Sea Otter Distribution (Helicopter) Aug–Oct 2006–2007



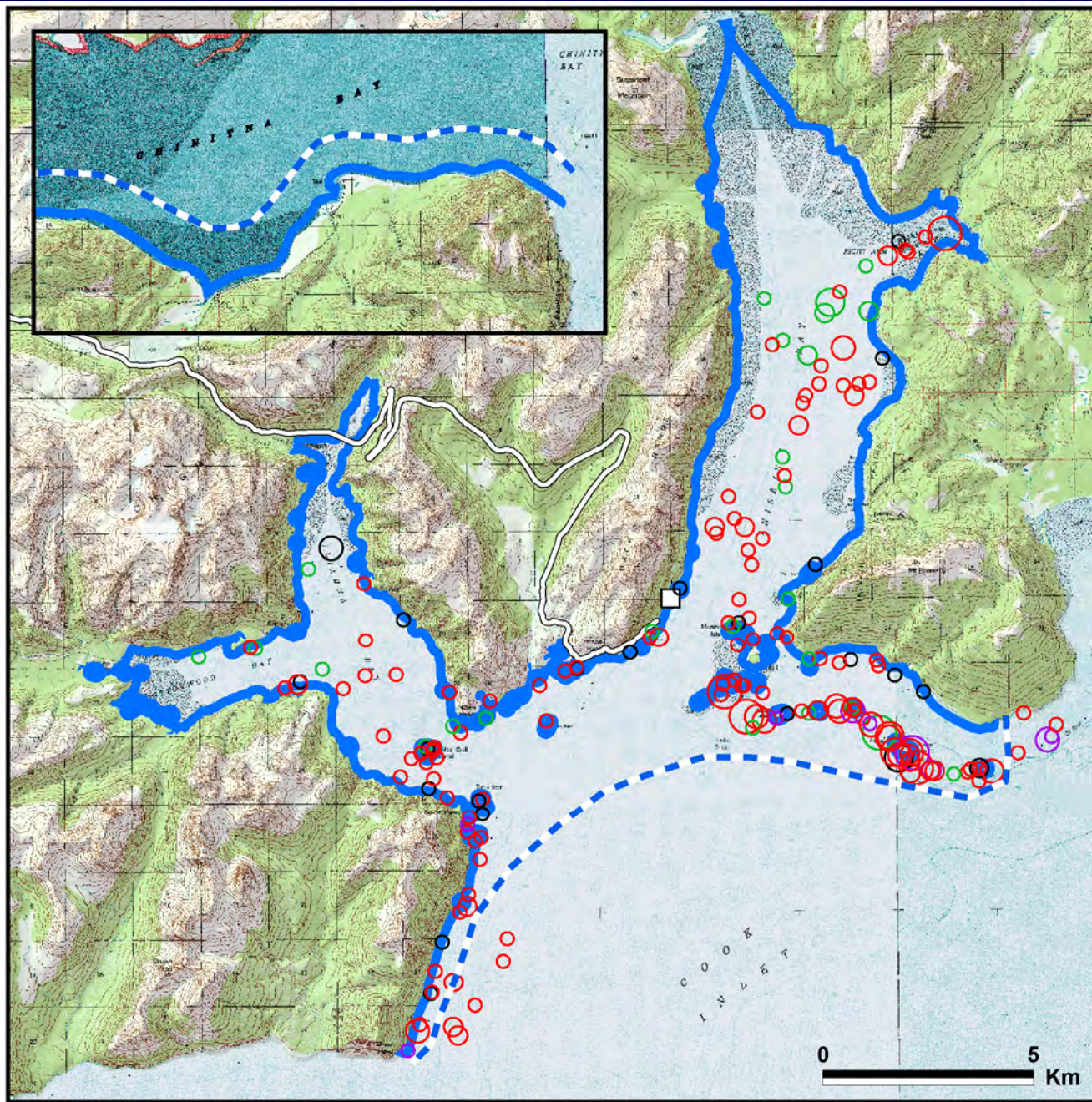
**Number of  
Individuals**

- 1 – 10
- 11 – 25
- 26 – 50
- 51 – 150
- 151 – 325

**Month**

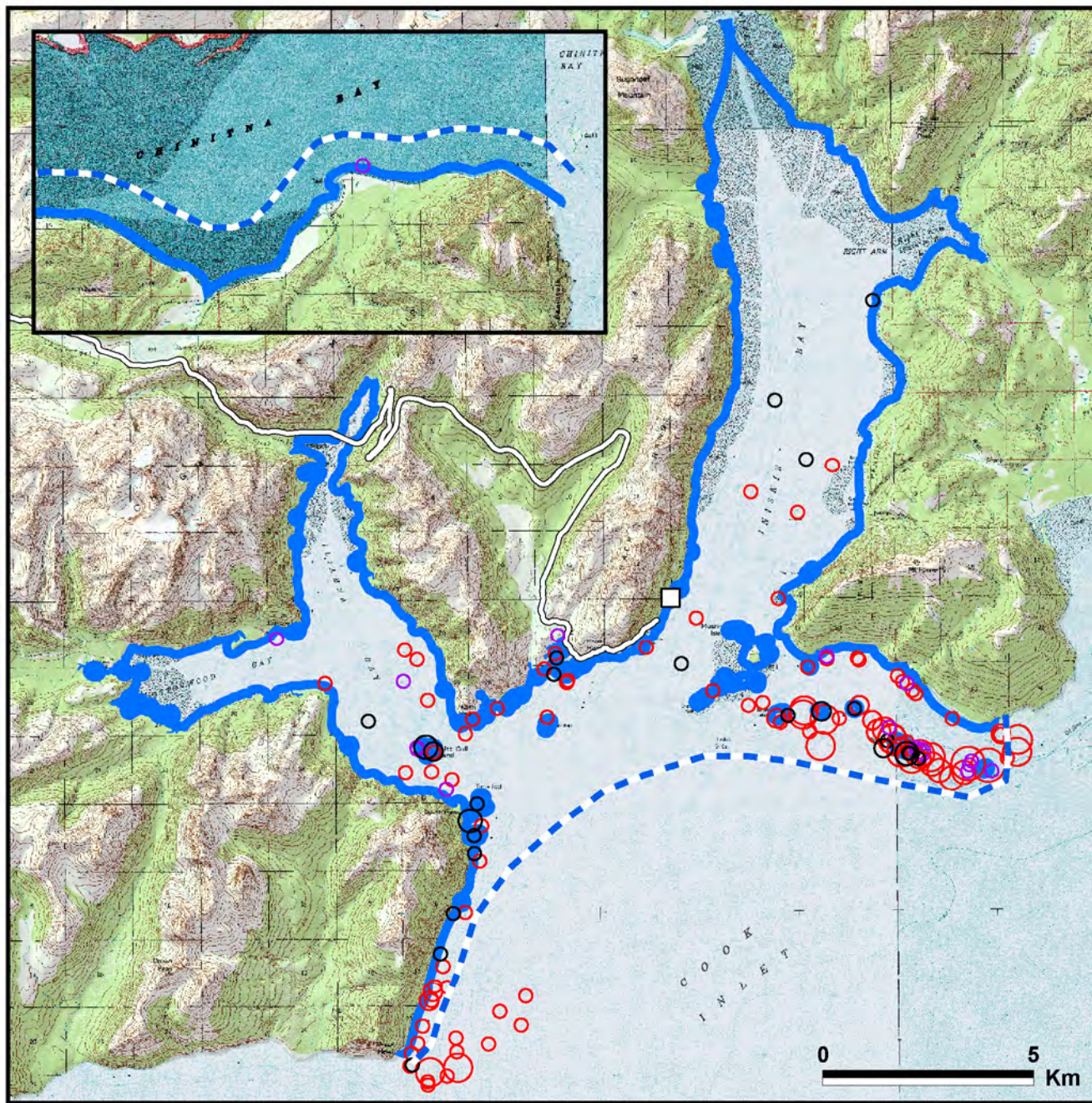
- September
- October

# Sea Otter Distribution (Helicopter) Nov–Feb 2006–2007



| Number of Individuals |           | Month |          |
|-----------------------|-----------|-------|----------|
| ○                     | 1 – 10    | ○     | November |
| ○                     | 11 – 25   | ○     | December |
| ○                     | 26 – 50   | ○     | January  |
| ○                     | 51 – 150  | ○     | February |
| ○                     | 151 – 325 |       |          |

# Sea Otter Distribution (Helicopter) Mar–May 2006–2007



| <u>Number of Individuals</u> | <u>Month</u> |
|------------------------------|--------------|
| ○ 1 – 10                     | ○ March      |
| ○ 11 – 25                    | ○ April      |
| ○ 26 – 50                    | ○ May        |
| ○ 51 – 150                   |              |
| ○ 151 – 325                  |              |

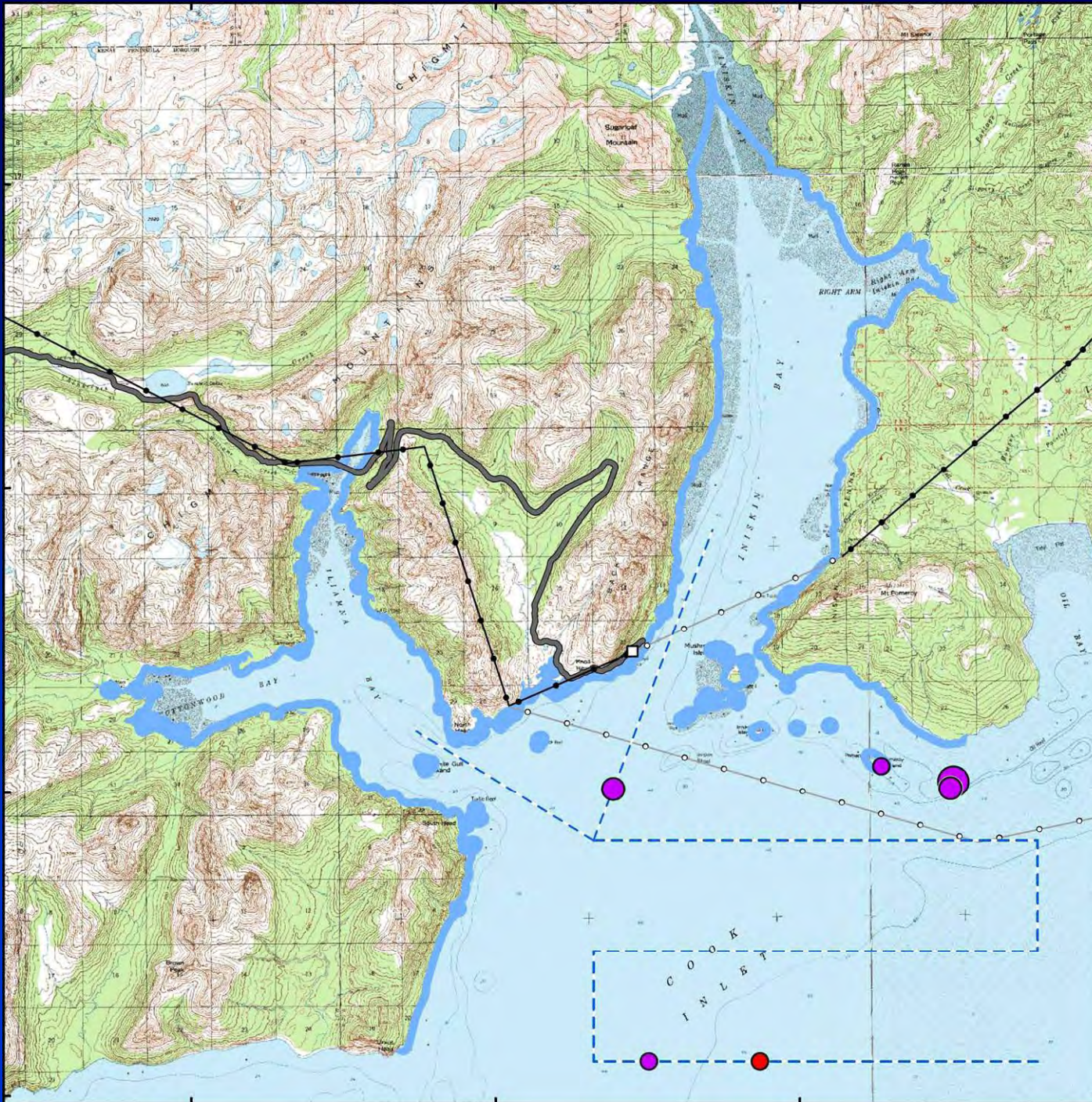
# Steller's Sea Lion



# Steller's Sea Lion (Helicopter)

- Not recorded on helicopter surveys so far

# Steller's Sea Lion (Boat) 2004-2006



## Number of Individuals

Spring

Summer



1



3-4



33

C O L E T



# Harbor Seal

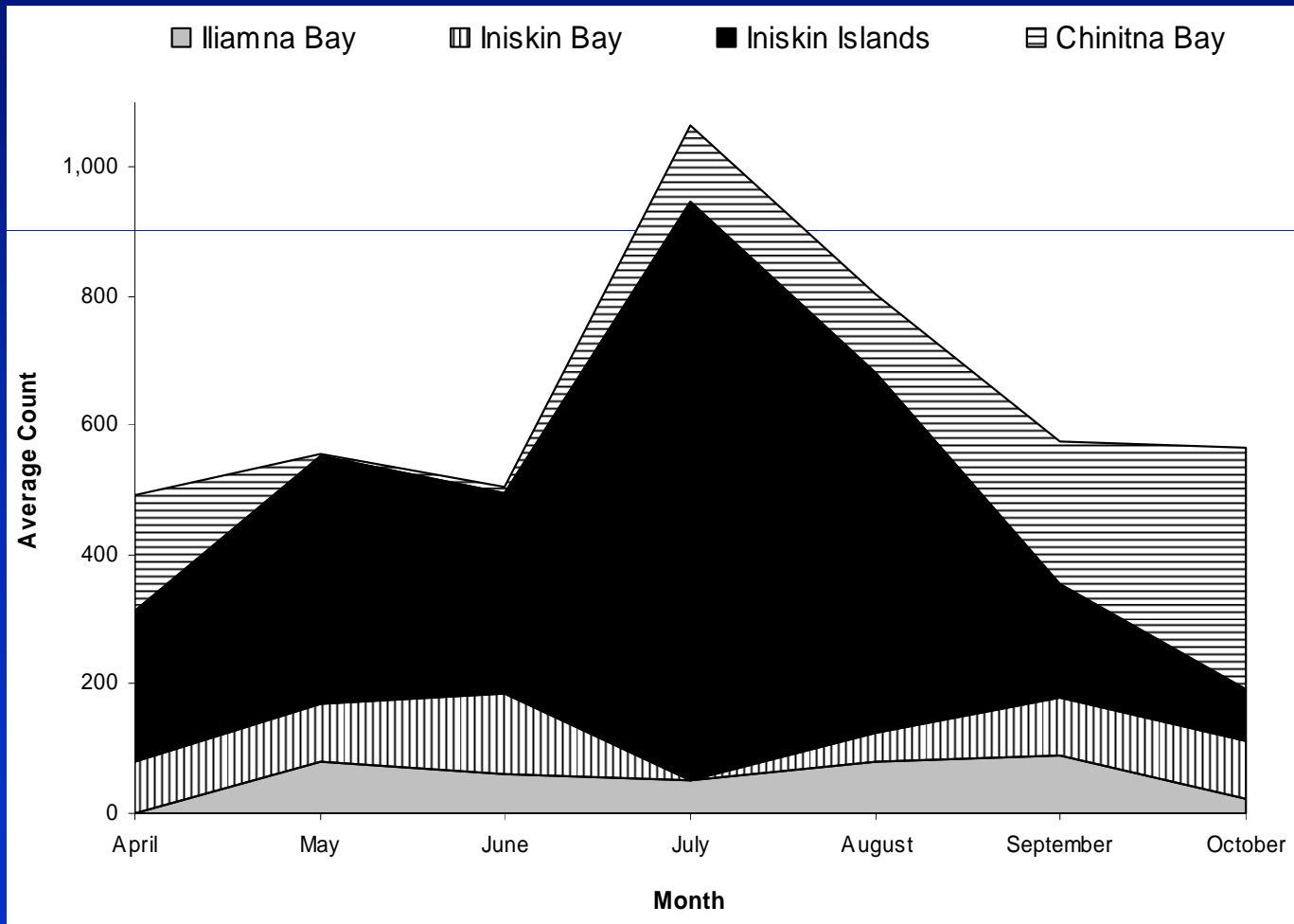


# Harbor Seal Seasonal Patterns (Helicopter)

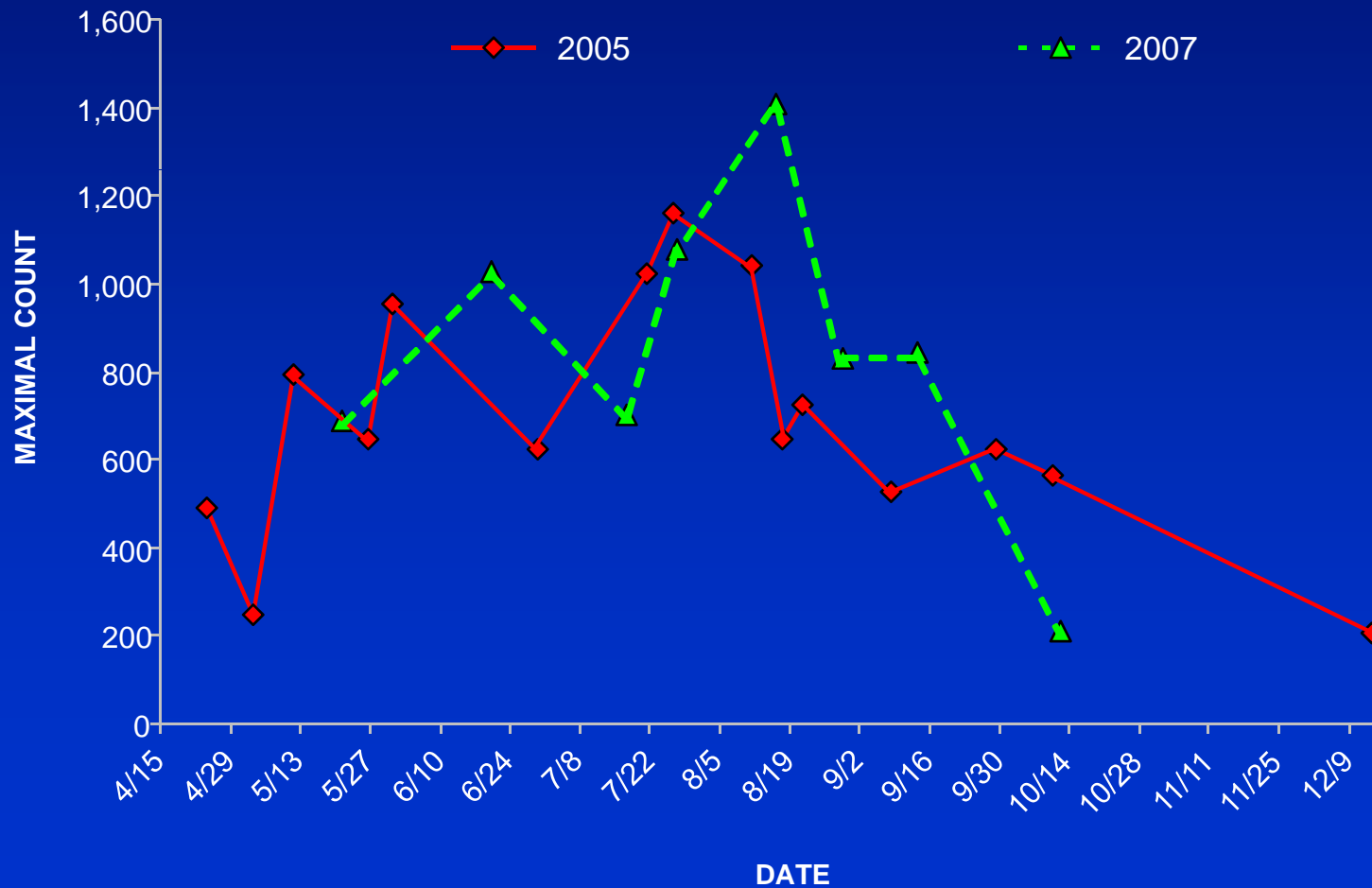
- Not surveyed consistently—want to avoid chance of disturbance

# Harbor Seal — 2005

## Seasonal Patterns (Fixed-wing)



# Harbor Seal — 2005 vs. 2007 (Fixed-wing)



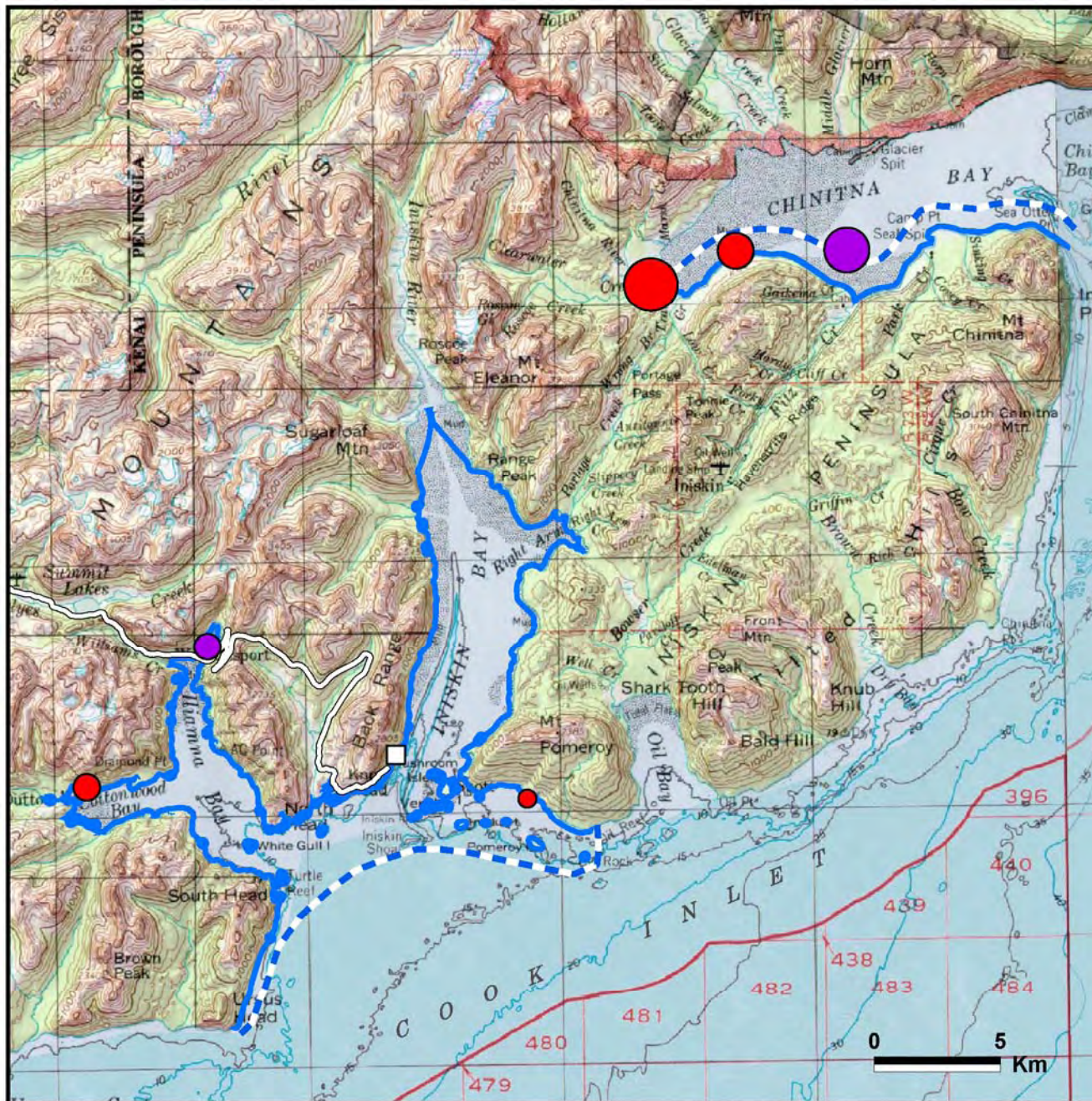


**Beluga Whale**

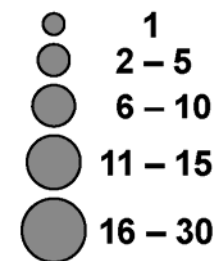
# Beluga Whale

- Previous records in the area (1997), but none until recently
- Suddenly appeared in fall 2007
- First seen in Chinitna Bay by ADFG personnel in mid-Sep 2007 (25–30, including ~10 calves)
- Seen by us in Chinitna Bay (7+) and Iliamna Bay (1 cow/calf) in late Sep 2007
- Seen by us in Chinitna Bay mid-Oct (14) and in Iliamna Bay in late Oct 2007 (3+, included calf)

# Beluga Whale 2004–2007 (all in 2007)



**Number of  
Individuals**



**Month**



# Summary (Mammals)

- At least 9 marine mammal species occur within the area
- Seasonal pattern of species-richness (highest in spring, lowest in late winter—boat surveys)
- Species-composition dominated by Harbor Seals (spring–summer) and Sea Otters (fall–winter)
- 5 Species are of conservation concern (Sea Otter, Steller's Sea Lion, Harbor Seal, Gray Whale, Beluga Whale)



# Summary (Mammals)

- Steller's Sea Lions occurred in spring, with one record in summer
- Cetaceans rare overall
- Beluga Whales occurred in fall 2007
- ~1,450 Harbor Seals associated with this area in 2005 (~27% of all seals in western Cook Inlet)



# SPECIES LIST (BIRDS)

|                             |                         |                          |
|-----------------------------|-------------------------|--------------------------|
| Greater White-fronted Goose | White-winged Scoter     | Double-crested Cormorant |
| Emperor Goose               | Black Scoter            | Red-faced Cormorant      |
| Brant                       | Long-tailed Duck        | Pelagic Cormorant        |
| Trumpeter Swan              | Bufflehead              | Bald Eagle               |
| American Wigeon             | Common Goldeneye        | Golden Eagle             |
| Mallard                     | Barrow's Goldeneye      | Merlin                   |
| Northern Shoveler           | Common Merganser        | Peregrine Falcon         |
| Northern Pintail            | Red-breasted Merganser  | Black-bellied Plover     |
| Green-winged Teal           | Red-throated Loon       | Semipalmated Plover      |
| Canvasback                  | Pacific Loon            | Black Oystercatcher      |
| Greater Scaup               | Common Loon             | Unidentified yellowlegs  |
| Common Eider                | Horned Grebe            | Spotted Sandpiper        |
| Steller's Eider             | Red-necked Grebe        | Marbled Godwit           |
| Harlequin Duck              | Western Grebe           | Ruddy Turnstone          |
| Surf Scoter                 | Short-tailed Shearwater | Black Turnstone          |

# SPECIES LIST (BIRDS/MAMMALS)

|                                |  |                        |
|--------------------------------|--|------------------------|
| Surfbird                       | Pigeon Guillemot                       | Sea Otter              |
| Western Sandpiper              | Marbled Murrelet                       | River Otter            |
| Rock Sandpiper                 | [Kittlitz's Murrelet—not recorded yet] | Steller's Sea Lion     |
| Dunlin                         | Horned Puffin                          | Harbor Seal            |
| Red-necked Phalarope           | Tufted Puffin                          | Minke Whale*           |
| Unidentified dowitcher (SBDO?) | Gray Jay                               | Gray Whale*            |
| Pomarine Jaeger                | Black-billed Magpie                    | Beluga Whale           |
| Parasitic Jaeger               | Common Raven                           | Harbor Porpoise        |
| Bonaparte's Gull               |  | Dall's Porpoise        |
| Mew Gull                       |  |                        |
| Herring Gull                   |  |                        |
| Glaucous-winged Gull           |  |                        |
| Black-legged Kittiwake         |  |                        |
| Caspian Tern                   | Protected under the ESA or of          |                        |
| Common Murre                   | conservation concern                   | * Seen only off-survey |