Arctic Network

Bering Land Bridge N Pres. • Cape Krusenstern NM
Gates of the Arctic NP & Pres. • Kobuk Valley NP • Noatak N Pres.

Brown Bears Resource Brief

June 2011, no. 18

Long-term Monitoring

How will we monitor brown bears in the Arctic Network?

We conduct aerial direct-count surveys of brown bears to estimate population abundance and the probability of occupancy (presence/absence from an area). We will track population trends over time, and use occupancy estimates to evaluate the long-term spatial distribution of brown bears. We have completed 5 aerial surveys since 2005 in 4 survey areas across ARCN. During each 7-10 day survey, 4-6 pilot-observer teams systematically search 20-40% of the total sample units to locate bear groups by flying contours in mountainous terrain or evenly spaced transects on flat terrain. For each group located the observer photographs individuals and records the group composition and location. Some survey units are re-sampled by a second team. Since bears are not uniquely marked, photographs are necessary to determine whether each bear group was seen by only one or both teams. We do not see 100% of the bears present during a survey, but re-sampling units enables us to estimate the number of undetected bears in an area. To compare among survey areas of different sizes, the abundance estimates are converted to bear density estimates.

Management Applications

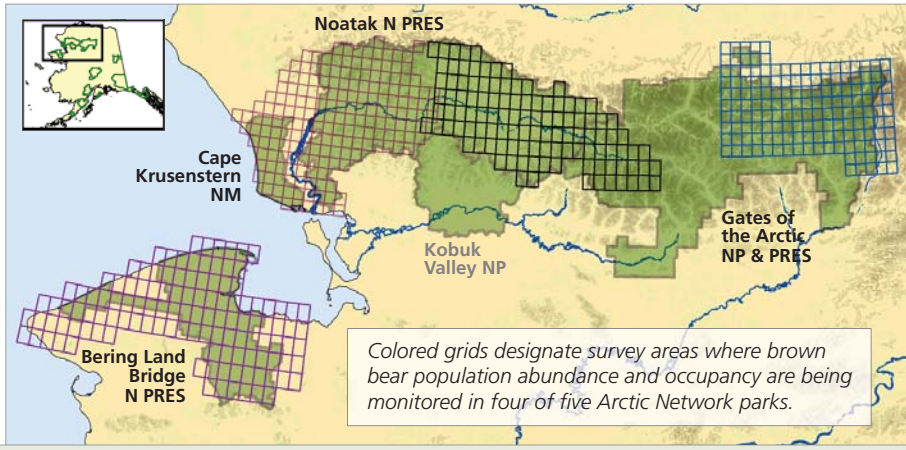
How can monitoring protect brown bears in the Arctic Network?

Brown bear abundance and density estimates are key parameters in managing brown bear populations and their harvest. Additionally, occupancy estimates provide statistical information about trends in brown bear distribution. These surveys will provide estimates of bear abundance, density, and trends in bear distribution, all of which are necessary to understand and manage the effects of human activities and developments that directly affect brown bear survival in ARCN and northwest Alaska.

Preliminary Objectives

What do we want to know about brown bears in the Arctic Network?

- Long-term trends in bear abundance and density within 4 survey areas.
- Trends in bear occupancy in each survey area.
- Estimated, total annual human-caused mortality within each park unit.
- Acceptable harvest rates to maintain healthy populations.
- Probability of population decline as a function of total annual mortality.



Colored grids designate survey areas where brown bear population abundance and occupancy are being monitored in four of five Arctic Network parks.

Importance

Why are brown bears important in the Arctic Network?

Brown bears occupy 43 countries, but are most abundant in Russia, Alaska, and Canada. Alaska accounts for more than 50% of the remaining North American brown bears and has the second largest population worldwide. The management of bears and protection of bear habitat is specifically mandated within the enabling legislation for 10 of 16 Alaska NPS units and brown bears are wilderness and national park icons. Brown bears utilize a broad range of habitats and require large areas free from human threats. They have been viewed as an "umbrella species" that confers protection to other co-occurring species with smaller habitat requirements. Human activities pose a threat to the long-term viability of brown bear populations worldwide because of habitat loss and fragmentation, and human-caused mortality. Baseline abundance and distribution data are lacking for brown bear populations in the Arctic Network (ARCN), yet brown bears are found in every habitat type in these parks. ARCN park units may ultimately provide a refuge for brown bears in northwest Alaska because there are increasing demands for oil, gas, coal, and minerals on adjacent public and private lands.

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