

## Reintroducing Wolves to Hokkaido (Japan): Possibilities and Challenges Based on a Comparison with Mongolian Nomads' Relationships with Wolves

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**Bio:** Dr. Buho Hoshino is head of the Laboratory of Environmental Remote Sensing in the Department of Environmental Science, College of Agriculture, Food and Environmental Sciences. An expert in remote sensing, Professor Hoshino is the senior member of the Committee on Space Research (COSPAR), USA. He is the leader of major projects such as satellite tracking of wildlife (Tibetan antelope) and livestock as well as a habitat analyst of Mongolian gray wolves. In 2018, he was awarded Best Environmental Scientist by the Mongolian Ministry of Environment and Tourism.

**Abstract:** On northern Japan's Hokkaido Island, wolves (*Canis lupus*) have been extinct for 100 years. As a result, the sika deer (*Cervus nippon*) population has increased in recent years, causing damage to agriculture and to the forestry and fisheries industries and leading to an increase in train and automobile traffic accidents. On the other hand, wolves live in Mongolia where stock-farming is the main livelihood. Yet nomadic livestock herders have coexisted with wolves for centuries. The main reason for this successful coexistence in the Mongolian steppes can be attributed to the nomads' understanding of wolf ecology. This understanding has led to the development of ways for humans and apex predators to interact with one another in this ecosystem. We also discovered that livestock damage caused by wolves in Mongolia is minimal because there is sufficient prey (e.g., red deer) and because the wolves and their prey do not live in proximity to humans. We note there has never been a documented attack by a wolf on a human in Mongolia. Our investigation of the habitat of wolves in Hustai National Park (HNP) in Mongolia gave us a base of information to assess the challenges that might occur if wolves are reintroduced into Hokkaido. Based on our habitat assessment of the island, we were able to estimate the carrying capacity of wolves on Hokkaido. We concluded that Hokkaido Island can successfully support approximately 1,300 wolves with a prey base of up to 100,000 sika deer.

## Using Remote Cameras to Estimate Wolf Pup Survival in the Greater Voyageurs Ecosystem

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**Bio:** Andrea Hynes began her graduate work investigating wolf pup survival at Northern Michigan University in the fall of 2021. Prior to beginning her Master's work, Andrea spent two years researching wolves in the northwoods of Minnesota while working as a technician on the Voyageurs Wolf Project. Andrea has also participated in research to monitor goshawks in the mountains of central Idaho and was involved in a non-invasive study of jaguars in Belize.

**Abstract:** Pup survival rates are important to many aspects of wolf ecology, including pack size and structure and population density. However, estimating pup survival in densely forested ecosystems proves challenging as observations of wolves and their pups are rare. The aim of this study is to describe a promising method to calculate wolf pup survival rates in the Greater Voyageurs Ecosystem (GVE) and other densely forested ecosystems. Using locations from GPS-collared adult wolves, we visited wolf dens in early May during the years 2019-2021 and counted the size of 17 litters. After obtaining litter sizes we deployed numerous remote cameras at dens and throughout known pack territories to capture video observations of wolf pups and determine the number of surviving pups through the summer, fall and winter. This approach proved successful, and we were able to estimate annual pup survival for all 17 litters. The average pup survival rate was 24%, but rates varied by year with the lowest pup survival rate in 2020 at 7% and the highest rate in 2021 at 35%. We conclude that the combination of den visits in the early spring and subsequent deployment of remote cameras across territories is a viable approach for estimating pup survival. We believe that our methods and findings will be beneficial to wolf researchers, managers, and biologists.

