Hornocker Wildlife Institute

ECOLOGY OF SYMPATRIC BROWN BEARS AND HIMALAYAN BLACK BEARS IN THE SIKHOTE-ALIN BIOSPHERE RESERVE, RUSSIA

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IN THIS UPDATE

Introduction

In the southernmost Russian Far East Province of Primorye, the Asian/Manchurian and northern Boreal life zones converge, resulting in a unique assemblage of large carnivores. Since 1992, the Hornocker Wildlife Institute (HWI), together with Russian colleagues in the Sikhote-Alin Biosphere Reserve (SABR), have been researching the ecology and interactions of three of these carnivores; Asian black bears (*Ursus thibetanus*), brown bears (*Ursus arctos*) and Siberian, or Amur tigers (*Panthera tigris altaica*). This research is conducted under the umbrella of HWI's Russian-American Siberian Tiger Project™ (STP) and hence, our focus on bears has been largely opportunistic. From 1992-1997, we radio-collared eleven brown and nine Asian black bears which were captured incidentally in snares set for Siberian tigers. These were the first bears ever radio-collared in the Russian Far East. Currently, one Asian black bear and two brown bears are being radio tracked. We have opportunistically collected data on home range, habitat use, food habits, interspecific interactions among both bear species and tigers, daily and seasonal activity patterns, winter dens, and genetics from radio collared bears while collecting data on tigers. In addition, five students from Moscow State University, Russia, collected data during the summers of 1993, 1994, and 1995. One of these students returned in November, 1996, as a Ph.D. student and has been collecting data on Asian black bears for his dissertation.

Project Significance

The southern Russian Far East is the only area in the world where these two bear species and Siberian tigers are found together. Asian black bears are listed in the Russian Red Data Book as endangered and brown bears are declining throughout most of their range worldwide. There are two major conservation threats for both tigers and bears in the Russian Far East. The short-term threat is poaching of the carnivores and their prey, and the long-term threat is habitat degradation and destruction, primarily associated with timber extraction. Poaching has increased dramatically with the dissolution of the Soviet Union in 1992 and the opening of Russian borders. While the rate of timber harvest has not increased as poaching has, foreign interests in Russia's vast forest have increased dramatically. The southern portion of the Russian Far East has timber reserves accessible through ports along the Sea of Japan, and has therefore attracted many buyers from Pacific Rim countries (including Canada and the United States). This set of factors may detrimentally affect bear populations through habitat loss and fragmentation as well as through increased road density. An increase in roads may affect mortality through poaching, legal hunting depredations, automobile-bear collisions. Hence, pressures on both bear species are mounting and with it, the need for sound scientific data on which to base management recommendations. The pristine conditions in the SABR provide an excellent opportunity to collect data that will define the ecological conditions necessary to support bear populations. These data provide a basis for comparison with data on bears from disturbed areas outside of the SABR. In addition, the STP has created the infrasturcture necessary to conduct such a cooperative Russian-American radio-telemetry study on other species, such as the bears.

Because of our Siberian Tiger Project™, the bear research program can minimize expenses. Most of the equipment and supplies necessary are already in place, including a helicopter, radio receivers for telemetry, capture and immobilization supplies, vehicles, and computer equipment. Telemetry flights are one of the most expensive aspects of wildlife research in the Russian Far East, but half of the cost can be deferred by locating bears while on flights focused on tigers.

Objectives

Project objectives include:

1. Begin full-time monitoring of radio-collared bears of both species.
2. Estimate average home range size and spacing characteristics of both species.
3. Describe and compare food habits and habitat use.
4. Describe daily and seasonal activity patterns.
5. Estimate den entry and emergence dates and describe den site characteristics.
6. Examine reproductive and mortality rates (only anecdotal data expected).
7. Examine interspecific interactions between both bear species and interactions between bears and tigers.

Methods

We will collect telemetry locations of radio-collared bears for home range and spacing analyses from the air on weekly telemetry flights and from the ground by vehicle and on foot. Home range size and boundaries will be estimated using several current analysis methods. Data on food habits will be collected through analysis of scats from both marked and unmarked bears, and by examining feeding sites occupied by known bears. Habitat use patterns will be analyzed using a state-of-the-art geographic information system (GIS) that HWI has already installed at SABR. Data coverage layers incorporated into this GIS include habitat type, elevation, and drainage and road networks, which have already been developed at SABR. Activity data will be collected by sampling the radio-signals from individual bears every five minutes throughout 24 hour periods to determine if the signal is active (fast pulse rate) or inactive (slow pulse rate). An automatic activity data recorder will capture this information. Den entry and emergence dates will be estimated to within seven days via weekly telemetry flights. Den site characteristics will be examined from the ground after bears have left their dens in spring. Anecdotal data on reproduction and mortality will be gathered by observing tracks of young and investigating the scene of death, respectively, for radio-collared animals. Necropsies will be performed on dead animals when possible. Data on interspecific interactions will be collected by 24-hour ground monitoring when marked individuals of different species are in close association. Also, location and activity data will be analyzed to detect spatial or temporal attraction or avoidance.

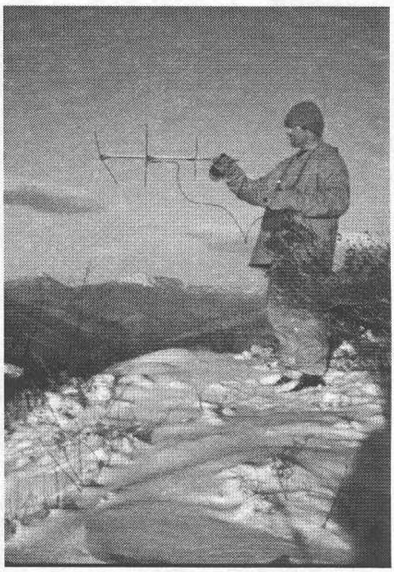

Photo: J. Goodrich

Bart Schleyer, Capture Specialist

Capture Activities

During our spring and fall trapping seasons (May 12 to June 28 and October 9 to November 13, 1998 respectively), in addition to setting snares for tigers, we set baited snares for bears. In the spring of 1998, we captured and equipped five Himalayan black bears (four adult males and one sub adult male; ID numbers 30, 31, 32, 33, and 35; Table 1) with standard VHF radio collars. We also recaptured Himalayan bear 28 and changed his radio collar. During our 1998 fall trapping, we captured one adult male Himalayan bear (ID number 36) and equipped him with a satellite collar (see below for details).

Radio-tracking Activities

Non-denning season

From May 1998 to January 1999, we tracked two female brown bears and seven male Himalayan black bears (Table 1). We are currently only tracking five of the seven Himalayan bears because one bear died (ID number 36) and one bear's collar failed (ID number 22).

Bears often move long distances, sometimes out of our normal helicopter search range, and it is not uncommon for us to lose the signal of a radio-collared bear. Thus, during our fall trapping season, 1998, we began experimenting with new telemetry techniques that will allow us to track bears long distances and avoid the loss of data. On November 12, we captured an adult male Himalayan black bear (ID number 36; Table 1) and equipped him with a satellite telemetry collar. To our knowledge, this is the first Himalayan black bear ever fitted with a satellite collar and the second animal of any species ever fitted with such a collar in the Russian Far East. The first animal was a tiger that we captured several days prior to this bear. We radio-tracked Himalayan bear 36 for 28 days (Table 1) until one of our radio-collared tigers killed and ate him. Although we located him several times using his VHF transmitter, we were able to locate him only once via satellite (of eight possible satellite location days). Satellite signals may have been blocked by forest canopy, the bear's body mass, or a combination of the two. Our future plan is to place a satellite collar on a bear in an area with deciduous forest canopy, because bear 36 inhabited coniferous forest. This will allow us to test the hypothesis that forest canpoy blocks satellite collar transmission.


Photo: B. Schleyer

The research team immobilizes a brown bear.

Brown bears 21 and 29 continue to move within their usual home ranges; Bear 21 in the Sheptoon drainage and bear 29 in the Blogodotna and Hunta-mi areas. Both bears, however, made forays outside of their usual home ranges in late fall before returning to their core areas to begin hibernating. Bear 29 is a young female and has not yet given birth. The reproductive status of bear 21 is currently unknown.

Himalayan bear 28 was an orphaned bear cub that we radio-collared and released into the wild when he was one and one-half years old (Table 1). For most of the summer, he stayed in the Kabonya area feeding on a diet similar to other Himalayan bears in this area. When we recaptured him, he was in good condition, thin but with a good hair coat and similar to the one orphaned Himalayan bear of the same age that we captured this year (bear 30). In September, bear 28 moved 10 km southeast to the Nevademka area were he stayed until mid-November when he returned to the Kabonya area and hibernated. One of our field technicians saw him in September and again described him as being in good condition.

Himalayan bears 32 and 33 continue to use the Nevademka area where they were captured. Bear 30 left the Nevademka area shortly after his capture and we have not located him since. Bear 35 moved to the Serebryonka River basin in early July and continues to use that area.

Non-denning season

Bears 21, 29, and 28 emerged from their winter dens between April 16 and April 23, 1998. Bear 22's emergence date is unknown because we lost his signal about one year ago and only relocated him on May 31, 1998; we again lost his signal directly after that.

Brown bears 21 and 29, and Himalayan bears 28, 32, 33, and 35 began hibernating in the fall between November 12 and 26, 1998. It is unclear whether bear 36 was in a den when he was killed and eaten by a tiger on December 9, because his radio-collar was not equipped with an activity sensor and fresh snow covered tracks from where he was killed by the tiger.

In March 1999, we plan to visit the den sites of brown bears 21 and 29 and Himalayan bears 28, 32, 33, and 35 to accurately describe their den types and gain a better understanding of den site selection.

Table 1. Summary of tracking data from radio collared bears (*Ursus arctos*) between initial capture dates and January 1999, as part of the Siberian Tiger Project™.

ID	Date captured	Last located	Total Number Locations (VHF)	Number Locations (VHF)*	Number Locations (Satellite)	Comments
Brown bears (*Ursus arctos*)						
21	06/13/96	11/28/98	22	5	--	
29	05/29/97	11/28/98	57	13	--	
Himalayan black bears (*Ursus thibetanus*)						
22	05/17/96	06/04/98	15	--	--	collar failure
28	04/19/97	11/28/98	79	34	--	recaptured 06/13/98, new collar
30	05/30/98	06/06/98	6	--	--	
32	06/05/98	11/28/98	56	49	--	
33	06/20/98	11/28/98	45	40	--	
35	06/23/98	11/28/98	8	7	--	
36	11/12/98	12/09/98	10	--	1	killed and eaten by tiger

*Collected since June 30, 1998.

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