



**Amur Tigers and Far Eastern Leopards in Russia:
Research, Training, and Capacity Building
in the Russian Far East**

**INTERIM REPORT
TO
21ST CENTURY TIGER
FROM THE
WILDLIFE CONSERVATION SOCIETY (WCS)
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PROJECT SUMMARY

In October 2006, the Wildlife Conservation Society's (WCS) Russia Program began a telemetry-based field research project designed to collect ecological and biomedical data on Amur tigers and Amur leopards in southwestern Primorsky Krai (Primorye). The goal of this project is to develop an ecological and biomedical database on the subpopulation of Amur tiger ecology in Southwest Primorye for use in conservation planning. Most importantly, data are needed to identify movement corridors (or the lack thereof) between this population and the main population to the north, and between Russia and important habitats in China; and to identify problems associated with inbreeding and disease for both tigers and leopards in the area.

Our research is focused on the Neshinskoe Hunting Lease, which is leased by the Pacific Ocean Naval Fleet Hunting Society, with whom WCS has been working for several years. Field methodology is similar to that used for the Siberian Tiger Project in the Sikhote-Alin Biosphere Zapovednik (SABZ). We conduct captures to collect blood, tissue, and other samples necessary to identify problems associated with disease and inbreeding for these small populations, and to fit animals with tracking devices. Adult tigers and leopards are fitted with VHF collars to collect data on a variety of ecological and biomedical parameters, e.g., identifying movement corridors between subpopulations and countries, sources of conflict between human activities and tiger and leopard conservation, and areas of conflict and compatibility between tiger and leopard conservation.

This project also includes an important training and capacity-building component. In an attempt to produce the next generation of conservation biologists in the Russian Far East, WCS has established an intensive program to support talented Russian and international graduate students in the fields of wildlife and conservation biology. Together with the Siberian Tiger Project, our research program on tigers and leopards serves as a vehicle to train such graduate students.

This project is conducted under a cooperative agreement with the Institute of Biology and Soils (IBS), Far Eastern Branch of the Russian Academy of Sciences.

Our current report describes field research on Far Eastern leopards and Amur tigers in Southwest Primorsky Krai and training and capacity-building efforts for the period from July 1, 2009 to December 31, 2009.

PROJECT OBJECTIVES

Our objectives under this grant were as follows:

- Capture and collar animals to maintain a study size of four tigers and four leopards.
- Conduct biomedical evaluations of tigers and leopards to identify potential inbreeding and disease-related problems in Southwest Primorsky Krai; collect blood samples for disease and genetic analyses.
- Monitor captured tigers and leopards, through radio-tracking and snow-tracking, to collect data on:
 - annual and seasonal home range size, daily and seasonal movements, land tenure system, and social structure;
 - reproduction (timing of breeding and birth, litter sizes, interval between litters);
 - rates and causes of mortality;
 - dispersal and long range movements, particularly in the Russia/China border area;
 - food habits and prey biomass requirements to estimate tiger pressure on prey;
 - habitat use;
 - relationship between tigers and leopards, including interactions and avoidance, and overlap in space, habitat, and diet.
- Continue our training and capacity building activities for this project, including training and support of existing personnel (one biology student, one senior scientist from IBS, and two field assistants), and attempt to identify other biology students to work on the project.

PROGRESS

Ecological and Biomedical Research

Field research for this project takes place in the Nezhinskoe Hunting Lease and part of Leopardovyi Federal Zakaznik, or wildlife refuge (see Figure 1), which represents some of the best remaining habitat for tigers and leopards in Southwest Primorsky Krai, Russia.



Figure 1. Southwestern Primorsky Krai, including location of protected areas (northern part of Leopard Refuge rose colored, and study area shaded in red diagonal hash-marks).

Capture activities. Capture activities were conducted from September 17 through November 15, 2009. A total of 30 foot snares were set throughout the capture site; some snares were reset and moved during the capture season. The capture team consisted of John Goodrich, Ph.D. (WCS), Alexander Rybin (WCS), John Lewis, Ph.D. (Wildlife Vets International), Samantha Earle (WCS), Viktor Starozhuk (WCS), Deena Matyukhina (WCS), and Alyona Salmanova (WCS, graduate student). We also provided training to several veterinarians and international colleagues who participated in our capture activities: Misha Goncharuk, a recent graduate in wildlife medicine from the local Ussuriisk Agricultural Academy, who has worked with the Zoological Society of London; Tammy Peterson, a veterinary assistant from the United States; Kholis, a Malaysian veterinarian working on human-tiger conflicts for WCS, and Joe Smith, a tiger biologist working for the NGO Panthera.

Unfortunately, we did not capture any tigers or leopards; a female Asiatic black bear and two sika deer were captured. We began using slightly modified snares this past fall to increase safety, but this may have inadvertently led to our difficulty capturing leopards, whose paws are significantly smaller than those of tigers. We estimated that we may have had more than ten incidences when leopards stepped into snares, but the snares did not tighten sufficiently, and the animals continued onward. We found several deer carcasses that we attempted to use as bait, surrounding them with snares, but although one leopard fed on the deer carcasses, we were nonetheless unsuccessful in capturing her.

Radiotracking. We are currently radio-tracking and snow-tracking four leopards (two males, two females, see table 1). Two of our study animals, the male Pp02 and female Pp04, live almost exclusively on the territory of Leopardovyi Zakaznik. We currently

have adequate sample sizes to estimate their home range sizes, which range from 145 km² (for a female) to 444 km² for one male. Unlike tigers, we are finding significant overlap in home ranges, at least of males, suggesting that territoriality may not be as strong in leopards. It appears the male Pp01 and the female Pp03, who live on the territory of Neshinskoye Hunting Lease, maintain much larger home ranges, with Pp01's territory estimated at 444 km², and Pp03's at 273 km² – nearly twice as large as the home range of our other female, Pp04. This may be due to lower prey densities on the territory of Neshinskoye Hunting Lease in comparison to Leopardovyi Zakaznik. In addition, our telemetry data are indicating much large home ranges for female leopards than those previously estimated based on best expert judgment, which is an important discovery. We have not observed seasonal migrations for any of our study animals, although it appears that home range sizes in the summer are larger than in the winter months. We are conducting ongoing data analysis of location data in order to further understand home range and habitat requirements.

Table 1. Number of radio- tracking locations of leopards in Southwest Primorsky Krai, July 2007 – December 2009

Leopard No.	Sex	Age (yrs)	Dates		Number of locations	Notes
			From	To		
Pp01	m	13-15	01.07.2007	12.31.2009	221	
Pp02	m	10-11	01.07.2007	12.31.2009	138	
Pp03	f	4-5	15.10.2007	12.31.2009	211	
Pp04	f	9-10	18.10.2008	12.31.2009	125	

During the winter months, we conduct snow tracking on foot as well as radio-telemetry. This past winter we had our first visual sighting of a leopard, as we accidentally came across Pp03; radio signals indicated that Pp01 was close by, and therefore we are hopeful that Pp03 may have a litter later this spring. In addition, at the beginning of the winter we also observed tracks of a new leopard in our study area. From tracking on foot we believe there are three un-collared leopards in our study area, one female and two males, including an adult male whose tracks we found together with the tracks of Pp04 this winter.

We are also aware of two tigresses with cubs living in our study area, whose tracks we encountered throughout the summer of 2009. Although without radio-tracking we cannot determine the exact fate of these juvenile tigers as they dispersed, tracking on foot leads us to conclude that one of the mothers has divided her territory with her female cub. We also discovered tracks of an adult male tiger at the beginning of this past winter who remains in our study area.

We collected 110 scats of both tigers and leopards in 2009, which will be used for genetic analysis and analysis of diet. Unfortunately, we only found 9 kills during the winter of 2009-2010, including seven sika deer, one roe deer and one wild boar. Over this past

winter we also observed over 20 sika deer that died from starvation or exhaustion due to unusually high amounts of snow.

Population Monitoring: Camera trapping. Although camera trapping was not proposed as one of our activities for this grant, we include this information as it provides useful information on the status of tigers and leopards in Southwest Primorye, and represents an important part of our overall efforts in this region. WCS has used camera trapping to monitor the leopard and tiger populations in our study site at the northern end of their range in SW Primorye annually since 2002; ISUNR has conducted similar work further south since 2005. In 2009 our field team conducted camera-trapping from late February-May. We set up 21 pairs of camera traps (42 cameras total) throughout our study area, which are visited approximately once every 2 weeks in order to check film and replace batteries. We identified 9 leopards and 5 tigers in 2009. Leopard numbers appear to be lower than average over the study period for the past two years (Figure 2). While the decline is not dramatic, it is of concern, since this is considered the best available habitat for leopards, and a source site for the entire population.

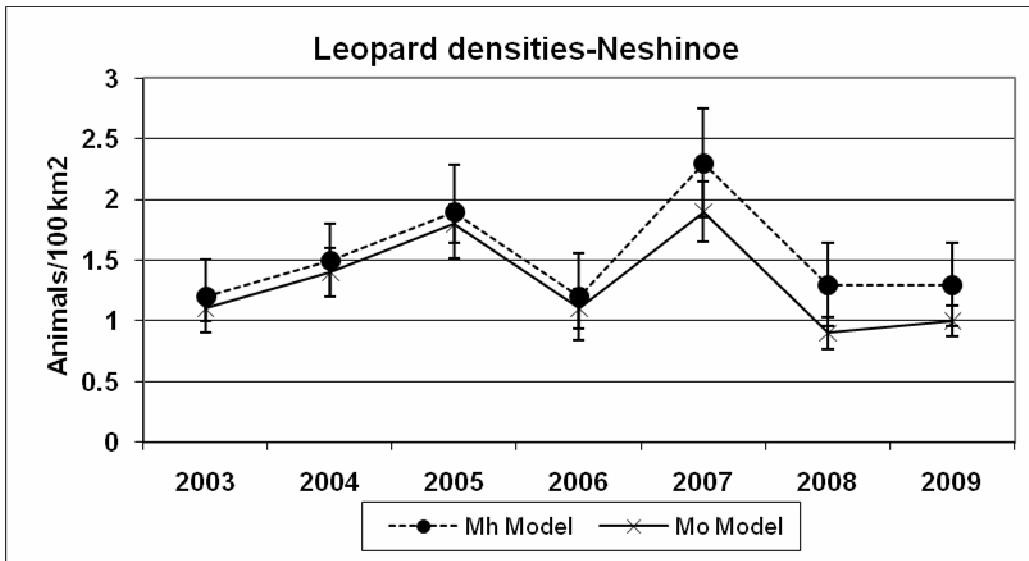


Figure 2. Leopard densities in our Nezhinskoe study area in Southwest Primorye, based on 7 years of camera trap data.

In contrast, our photographs of 5 tigers represent the highest number of individual tigers ever recorded in our study area through camera trapping. Most importantly, this figure includes two females, which were identified in 2008 results as well (suggesting residency for both), and represents an important increase over previous years. Although there are commonly reports of poaching in this population, the data from our relatively small study area suggests that at in least in our region, numbers are holding steady. The addition of a second adult female has the potential to double reproduction in the region.

Table 2. Numbers of tigers photographed in Neshinoe camera trapping study site, Southwest Primorye, 2003-2009.

Sex	Year						
	2003	2004	2005	2006	2007	2008	2009
Males	2	2	3	2	1		3
Females	1	1	1	1	1	2	2
Unknown adults		1			1	2	
Cubs	1						
Total	4	4	4	3	3	4	5

Training and Capacity Building: Supporting Young Russian Scientists

During the reporting period, we supported three Russian graduate students at our Amur tiger and Far Eastern leopard research project in Southwest Primorye:

- Alexander (Sasha) Rybin has been working with us for 12 years and completed a second Bachelor’s degree in biology in 2008, focusing on camera-trapping of Far Eastern leopards. In the fall of 2009 Sasha entered a Ph.D. program at the Institute of Biology and Soils, Russian Academy of Sciences Far Eastern Branch, where he is continuing his research on monitoring the Far Eastern leopard population. In between studies, Sasha leads organization and implementation of our camera-trapping studies on leopards and tigers in SW Primorsky Krai each spring and participates in tiger and leopard captures and radio- and snow-tracking. As one of our best Russian capture and immobilization specialists, over the past two years Sasha has also led WCS’s response to several tiger-human conflict situations in the southern part of tiger range in the RFE.
- Alyona Salmanova began working with WCS while an undergraduate at Far Eastern State University, where she completed her undergraduate thesis research on the application of radio-tracking in studies of Amur tiger ecology. In 2007 she enrolled in a Master’s program and joined WCS’s field crew studying tigers and leopards in SW Primorsky Krai. Alyona defended her Master’s thesis in the spring of 2009, and subsequently enrolled in a Ph.D. program at Far Eastern State University in the fall, where for her dissertation she will seek to expand her research on Far Eastern leopard habitat use. While gathering material for her dissertation, Alyona works as a field technician on our project, where she is engaged in radio-tracking, snow-tracking and camera-trapping of leopards and tigers, and has now participated in two fall capture seasons (in 2008 and 2009).
- Deena Matyukhina began working as a field assistant on our tiger and leopard research project in SW Primorsky Krai at the end of 2008, and in the summer of 2009, she enrolled in a Master’s program in environmental monitoring at Far Eastern State University. For her Master’s research, Deena is using data from the Amur Tiger Monitoring Program to assess anthropogenic impacts, particularly logging, on tiger and prey densities, as well as reproductive rates. Before beginning her collaboration

with WCS, Deena had been engaged in conservation projects, but never in scientific field research. She continues to work with us full time as a field assistant while we collaborate on her Master's research, which is allowing her to learn radio-tracking, snow-tracking and camera-trapping techniques, as well as GIS and new statistical approaches. Deena gave her first presentation at a scientific conference this fall when she presented a comparison of tiger and ungulate densities between protected areas and adjacent territories. Along with other students working with WCS, she gave a professional presentation that was well received.

In addition to the students described above, a young British biologist, Samantha (Sam) Earle, began working with us as a field technician on our tiger-leopard project at the beginning of 2009. Sam completed her M.Sc. in Conservation Science at Imperial College London in 2008 with a thesis focused on the European captive population of Far Eastern leopards. With her energy, enthusiasm, and easy-going nature, Sam has been an invaluable addition to our field team. She plans to enroll in a Ph.D. program at Durham University in the fall of 2010, focusing her research on leopard-prey relationships, and we look forward to supporting her research efforts that will be a part of her dissertation.

CONCLUSION

We sincerely appreciate 21st Century Tiger's role as a key partner in our ongoing efforts to protect the remaining Siberian tigers in the Russian Far East. Our training activities continue apace, enhanced by our new research station in Terney, and our field research program in Southwest Primorye are providing important data needed for conserving Amur tigers and leopards and understanding interactions between tiger and leopard populations. We are grateful to 21st Century Tiger for its long-term partnership in our conservation programs.

SELECTED RECENT PUBLICATIONS

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