

THE SIBERIAN TIGER PROJECT™
ECOLOGY AND CONSERVATION OF THE SIBERIAN TIGER

Final Report to the
Save The Tiger Fund at the National Fish and Wildlife Foundation
Grant STF-97-082-033
1 July 1997 - 31 May 1998

Maurice Hornocker and Howard Quigley
Co-Directors, Siberian Tiger Project™
Dale Miquelle
Regional Coordinator, Siberian Tiger Project™
John Goodrich, Linda Kerley, and Evgeny Smirnov
Field Coordinators, Siberian Tiger Project™

Hornocker Wildlife Institute, Moscow, Idaho
P.O. Box 3246
University of Idaho
Moscow, ID 83843
208-885-6871
208-885-2999 (fax)
email: hwi@uidaho.edu
Web page: www.uidaho.edu/rsrch/hwi

EXECUTIVE SUMMARY

During the past year, the Siberian Tiger Project™ was fully active in field research activities and conservation programs in the Russian Far East. Seven tiger captures were made, including two new female tigers. We have already lost contact with one of these females and fear that she may have been killed illegally. However, we are following the other one closely as she establishes her territory within the study area. More than 400 locations were obtained on these and other study animals. Unusual movements were noted this year, probably a result of the loss of one study animal, Tiger 15, and a wild boar die-off the previous year. Thirty-seven kills made by tigers were also documented and Project field personnel are working with local authorities on tiger depredation problems.

Along with the field research program, a variety of companion activities continue to strengthen the foundation for conservation of this tiger sub-species. These activities include the honing of tiger census techniques, community-based wildlife and forest products management, environmental education locally and nationally in Russia, land-use planning programs and proposals, and field research on other significant wildlife species.

INTRODUCTION

The primary purpose of this report is to describe the Siberian Tiger Project™ field research activities, and directly related education and conservation programs. Thus, below, we provide the current status of radio-collared tigers in the Sikhote-Alin Zapovednik, our efforts to collar additional tigers in the area, re-capture activities, an update on personnel, a brief review of data obtained, environmental education work, and other issues and activities in the Russian Far East. However, in the space utilized here, we cannot nearly begin to adequately portray the effort currently underway to secure a future for Siberian tigers and their native habitat. What is currently underway – or has taken place over the reporting period of this document – is but a small window on the energies, activities, and resources necessary to reach this point. Below, a brief history of this underpinning will add perspective to the activities of the past year. The depth and breadth of the Siberian Tiger Project™ activities are all planned to provide the most effective and efficient route to secure the future for the Siberian tiger.

Field research efforts of the Siberian Tiger Project™ were begun in January, 1992, after nearly two years of planning by the Hornocker Wildlife Institute (HWI) and Russian cooperators. Maurice Hornocker and Howard Quigley, of HWI, along with more than a dozen Russian biologists, established two main goals for the Project. First, through a combination of modern and traditional field methods, we endeavored to create the best possible documentation of tiger ecology in the Russian Far East. Second, we wanted to utilize the data on Siberian tiger ecology to develop and implement programs for its survival.

The use of radio telemetry is an essential part of the study of large, secretive carnivores. Of course, in order to place these radio transmitters on study animals, they must be captured and safely anesthetized. The initial captures of all Siberian Tiger Project™ study animals have been made with the use of the Aldrich spring activated foot snare. This technique is commonly used in North America, but had never been used in Russia prior to our activities. We have now made 18 such captures. However, recapture of these previously-captured animals is very difficult and time consuming using foot snares; and, recapture is essential for continued monitoring of study animals due to the finite battery life of the radio collars (about 30 months). Thus, we developed the technique of helicopter capture for recapturing study animals; nine such captures have been performed.

The combination of capture and recapture techniques has allowed the Project to monitor a large percentage of the tigers within the study area, and maintain long-term contact with individuals. This continuity creates a history on study animals that is important for analyzing a variety of tiger behaviors, but most importantly reproduction and mortality. For example, we have now followed one of our study animals, Tiger 01, since February, 1992, through dispersal from her mother, three litters of her own, and dozens of kills she has made.

The continuity, support, and enthusiasm of personnel on the Project has also been an important part of its success. From the beginning, the Siberian Tiger Project™ has built and maintained a totally integrated team of Russians and Americans. Our Russian field coordinator, Evgeny Smirnov, has remained throughout the Project. Dale Miquelle, the original American field coordinator of the Project, has now moved into the position of

regional coordinator for all Siberian Tiger Project™ activities in the Russian Far East. John Goodrich and Linda Kerley are now in their fourth year as field coordinators. Kola Reebin and Losha Kostera carry out much of the day-to-day responsibilities of radio-tracking, kill documentation, and capture, and have for six and four years, respectively. Bart Schleyer has now acted as capture specialist for the Project for six years, performing all helicopter recaptures and most snares captures.

In 1994, with two years of field data in hand, the Siberian Tiger Project™ expanded into a variety of conservation-related activities. A geographic information system (GIS) was established at the Sikhote-Alin Reserve headquarters in Terney; the mapping capabilities of the GIS have been critical to our ability to analyze tiger habitat use in the study area and extrapolate those conclusions to conservation planning issues throughout Siberian tiger range. In 1994, we undertook an analysis of education needs related to tiger conservation. As a result, we began an annual calendar/poster campaign, supplied small grants to local schools to improve programs, and helped fund summer ecology camps near Terney. The Project has also conducted tiger surveys, analyzed biodiversity region-wide, supported anti-poaching teams, undertaken community development projects, and a variety of field science studies related to tiger conservation. Some of these activities are described further on page 7.

CAPTURE ACTIVITIES

Ground trapping activities are undertaken annually from late spring through fall, focusing on areas where unmarked tigers are known to exist. We trapped in the Koorima River basin from 1 October, through 23 November, 1997, for Tiger 03's cubs. We recaptured Tiger 03 on 11 October, and captured Tigers 25 and 26 on 20 and 23 November, respectively (Table 1). Both new tigers were young (one and one-half to two years old) females and both are probably cubs of Tiger 03, who had killed an elk near the trap line on 18 November, remaining in the area until 23 November. Tiger 26 was captured within a kilometer of the kill site and had a full stomach at the time of capture, indicating she could have been at the kill made by Tiger 03. Tiger 25 was captured about four kilometers from the kill, also with a full stomach, but never returned to the kill site. Rather, within a week she left the Koorima drainage and did not return. Hence, there is a small chance that Tiger 25 is not the cub of Tiger 03. Genetic analyses will provide the answer to their relatedness.

We trapped in the Nevedeemka area from 12 May, through 28 June, 1998. We captured one young female tiger and equipped her with a radio collar (Table 1).

Helicopter captures are also undertaken annually. This technique was developed by the Project to assure recapture of previously collared study animals when collar battery life was waning. These recaptures are an essential element of the continuity of data collection we have obtained. We recaptured Tigers 01, 16, and 20 from the helicopter in March to change their radio collars (Table 1). Tigers 01 and 16 were captured on the first attempt, but Tiger 20 was very difficult to recapture due to the fact that he ran from the helicopter and hid in patches of conifer trees. We accumulated five and one-half hours of flight time, in three flights, to recapture Tiger 20.

STATUS OF RADIO-COLLARED TIGERS

Tiger 01. – Tiger 01 was in fair to good physical condition when recaptured from the helicopter in March (Table 1). She was very thin, weighing only 114 kilograms, and rib, shoulder and hip bones were prominent, but her hair coat was in good condition. Her teeth were in very good condition and none of her canines were broken.

Tracks found in mid-December, 1997, indicate that Tiger 01 had a new litter of three cubs. The cub tracks were five and one-half to six centimeters in width, indicating that the cubs were probably born in late September.

Livestock killing by a tiger continues in Tiger 01's home range. Seven horses were killed between 1 November, 1997, and 20 February, 1998, on a farm at the mouth of the Bilombay River at the north end of her home range (about 35 kilometers north of Terney). The rate of livestock killing has decreased since then and no livestock were reported killed near Terney in 1998.

Tiger 03. – Tiger 03 was in good physical condition when recaptured in October, 1997. We have not located her together with Tiger 25 or Tiger 26 (her suspected offspring) since their capture, although she was within three kilometers of Tiger 26 when located from the helicopter on 21 February.

In early February, 1998, Tiger 03 left her home range and began using part of the former home range of Tiger 15. She primarily uses the Koonalayka and Hanov drainages and occasionally the southeast portion of the Koorima drainage, which is part of her former home range. Her neighbor, Tiger 25, uses the remaining portion of Tiger 15's former home range. It is still unclear if Tiger 25 is the daughter of Tiger 03. We have never located the two together and once we monitored Tiger 25 as she moved through an area where Tiger 03 was on a kill. Although Tiger 25 spent over 12 hours within two kilometers of Tiger 03 and passed by within 300 meters of Tiger 03, she did not approach Tiger 03.

Although it has been two years since her last litter of cubs, we have not found evidence that Tiger 03 has given birth to a new litter.

Tiger 15. – We last located Tiger 15 in late October, 1997. We failed to find any evidence of her tracks during intensive surveys of every major drainage in her home range in December and January, 1998. Thus, we believe that she was poached in late October, 1997. At four-months-old, her most recent litter would not have survived.

Tiger 16. – Tiger 16 still travels within his normal home range. He was located together with Tiger 25 on 14-16 February, 1998, and tracks indicated that they were mating.

Tiger 16 was in very good physical condition when recaptured in March (Table 1) and weighed 198 kilograms with a full stomach. At the time of his capture, he was together with Tiger 25 on a kill. Tiger 16 still travels within his usual home range, which is now divided between female Tigers 03 and 25. We have located him together with Tiger 03 as well as Tiger 25.

Tiger 20. – Tiger 20 was in fair physical condition when recaptured in March, 1998 (Table 1). He was very thin with prominent shoulder, hip, and rib bones, and had an unusual number of minor cuts and abrasions, although his hair coat was in good condition. He weighed only 170 kilograms with a prominently full stomach, as opposed to 202 kilograms when we captured him in November, 1995. Also, both of his lower

canines were broken at the gum line and one upper canine was broken in half. He had a complete set of canines when captured in 1995. Snowtracking following his March capture revealed that his full stomach was the result of scavenging a roe deer that probably died of starvation.

Tiger 21. – From January, 1998, to date, we located Tiger 21 in the Isakov River drainage, an area approximately 12 kilometers west of her previously known home range boundary. Whether this reflects an unusual foray, or an expansion or shift in her home range is unclear at this time.

Although Tiger 21 was an adult when we first caught her in December, 1995, we have found no evidence that she has produced cubs. However, because much of her home range is inaccessible, we have poor data on this tiger and it is possible she has given birth to cubs, but very unlikely that she has raised cubs to dispersal age.

Tiger 22. – We tracked Tiger 22 in the snow for several days in late January, and early February, 1998. Although his stride was normal, it was clear that he was not putting full weight on his leg that was broken in June, 1996. Also, his foot was bleeding slightly, possibly from the toe that he lost in January, 1997, from an unrelated injury. Distance between daily locations is usually three to five kilometers for Tiger 22, considerably less than that for other radio-collared adult male tigers. This information suggests that Tiger 22's injuries may affect his movements and hence may affect his ability to capture prey, maintain a territory, and breed.

Since his initial foray to the north in August, 1997, Tiger 22 was located in the Korima River drainage in late November, 1997, and in the upper Djigitofki River drainage in late January and early February, 1998. Both of these areas are well within the central portions of Tiger 20's home range and constitute significant movements out of the area which Tiger 22 used for the first 13 months following his capture. He spent over two weeks in the upper Djigitofki area and made at least one kill there.

In March, this tiger moved into the Haunta-mi and Koonalayka area and killed an elk. After spending nearly two weeks in this area, he returned to his former home range (i.e., the Shepton and Veterdoy drainages). We have detected no unusual forays since, but he continues to move only three to five kilometers per day. We last found his tracks on 19 March, and it was clear that he was still limping and bleeding from his injured hind leg.

The reasons behind these movements out of his original home range are unclear and may be a combination of several factors. First, Tiger 22 was young when captured and may have not yet successfully secured a territory, or if he had, that territory may have been subsequently usurped by another male tiger. Second, his ability to secure and maintain a territory may have been hindered by injuries to his leg. Third, prey densities within his original home range are low because of a die-off in the boar population in the winter of 1996-1997, and because of poaching and over-hunting. Thus, he may have left the area in search of prey. This hypothesis is supported by the movements of Tiger 21 out of the same area. Additionally, atypical movements by other tigers have been common this year. For example, snow-tracking data indicated that at least two other unmarked male tigers were in Tiger 22's territory in the Djigitofki area. At the same time, in late January, tracks of unmarked male tigers were found twice within the home range of Tiger 16. Also, Tiger 03 forayed well into the previous home range of Tiger 15 in February.

Tiger 23. – Since her capture, Tiger 23 remained within her natal home range except for a foray in late February into the Toonsha drainage approximately 12 kilometers south of her natal home range. This area was part of the original home range occupied by her mother, Tiger 04, before Tiger 04 shifted her home range to the Bilombay drainage in 1995. We now consider Tiger 23 the resident female of the upper Bilombay River drainage.

Tiger 25. – Tiger 25, a one and one-half to two-year-old female, was captured on 20 November, 1997, near Shishaveetna Creek, part of the Korima River drainage system (Tables 1 and 2). She is probably Tiger 03's cub; Tiger 03 was on a kill about four kilometers away at the time of Tiger 25's capture and Tiger 25 had a full stomach. However, Tiger 25 did not return to the kill and within a week she had moved to the east, out of Tiger 03's home range and into Tiger 15's former home range. She has remained in this home range since and primarily moves within the Blogadatna, Haunta-mi, and Inacov drainages.

Tiger 26. – Tiger 26, a one and one-half to two-year-old female was captured on 23 November, 1997 in the Korima River basin (Tables 1 and 2). She was captured within a kilometer of an elk killed by Tiger 03. The capture was made on the same day as Tiger 03 made her kill. And, Tiger 26 was captured along the same trail that Tiger 03 used when she left the kill. Hence, we are reasonably confident that Tiger 26 is the cub of Tiger 03.

Tiger 26 dispersed from her natal home range between 21 February and 24 March, 1998. On 24 March, we located her on the divide between the Bilombay and Kema Rivers, about 50 kilometers north of her natal home range. We have not been able to locate her since, despite extensive searching.

Tiger 27. – Tiger 27 is a young female tiger (estimated to be three years old) who weighed 109 kilograms when captured at Nevedeemka on 15 May, 1998 (Table 1). She was in good physical condition with apparent body fat on rump and back and a good hair coat, although she had numerous ticks. Her nipples were small, indicating that she has never produced cubs. Since her capture, we have located her several times in the Djigitofky drainage primarily upstream from the confluence of Kozliny Creek with the Djigitofky River. We have found two of her kills, an elk and a boar, the latter which was usurped by a bear.

FOOD HABITS

We located 37 kills made by six marked and an unknown number of unmarked tigers between 1 July, 1997 and 31 May, 1998. Sixty-two percent were elk, 19 percent were boar, and 19 percent included a variety of species such as badger, brown bear, dog, and a tiger that was killed by a truck and eaten by Tiger 16.

TIGER DEPREDATIONS

We are currently working with Vladimir Shiteenin, leader of the Amba Anti-Poaching Teams of the State Committee for Ecology, to develop a protocol for dealing with problem tigers. The protocol is to first attempt to discourage tigers from killing livestock, e.g., by scaring them from domestic animals that they have already killed. If

this proves unsuccessful, the next step will be to try to capture and move the animal, especially if it is young, and the last resort will be to kill the tiger. An important part of the program will be the development of techniques to discourage tigers from killing domestic livestock. Also, we are involved with training Shiteenin personnel in capture and handling techniques. Anatoly Hobitnov, a member of the local anti-poaching brigade spent a week on our trap line in May and was present for the capture of Tiger 27. In addition, we hope to bring over Veterinarians Kathy Quigley and Douglas Armstrong for one month to train personnel in immobilization and handling.

Tigers continue killing livestock within Tiger 01's home range, although, most depredations this spring have been at the farm on the Bilombay River, on the northern edge of her range. The anti-poaching brigade led by Boris Litveenov has visited the farm with Evgenny Smirnov on two occasions this spring to attempt to scare the tiger from the area. However, the tiger did not return on either occasion.

Evgenny Smirnov is developing an insurance program for livestock depredations. Farmers will buy insurance and will be compensated from this fund when their animals are killed by tigers.

PERSONNEL

Losha Kostera and Kola Reebin continue working as the principal Russians conducting field work on the Project. Their primary responsibilities are radiotracking from the ground and assisting with trap lines. Kola is also the main mechanic and Losha does about 50% of the aerial radiotracking. We have continued to train Kola in capture and handling techniques and he is becoming proficient at administering drugs and collecting all samples and data. Although Losha has received some capture and handling training, we hope to train him more intensively during future trapping seasons. Losha has continued his biology studies as a correspondent student with the university in Vladivostok, and left for Vladivostok in May, for six weeks to take annual exams.

Alexei Zborovsky, a student from Moscow State University, returned to Terney in March to collect data on den sites, home range, movements, and habitat use of Himalayan black bears.

Evgenny Smirnov spends little time in the field. However, he is currently involved in several projects including working with Vladimir Shiteenin in developing a protocol for dealing with problem tigers and the development of an insurance fund for compensating tiger depredations on domestic livestock.

Igor Nikolaev worked for the Project in October, and November, 1997, as an assistant on the trap line and we hope to hire him again for future trapping seasons.

In April, we hired Sasha Reebin, Kola Reebin's brother, as an assistant to Losha Zabrovsky; he is currently on full time. Like Kola Reebin, he has little biological education or experience, however he is a quick learner and a hard worker and has been a very helpful addition to the Project.

OVERVIEW OF SIBERIAN TIGER PROJECT™ ACTIVITIES

This reporting year brought with it a slightly re-organized approach to science and conservation efforts in the Russian Far East that we feel will increase our overall effectiveness. First, we were able to obtain Dale Miquelle as the full-time coordinator of

the Siberian Tiger Project™ activities in the region. With his experience as the first field coordinator of the Project from 1992 to 1995, his two years of experience with USAID (United States Agency for International Development) in Vladivostok, and his developed understanding of Russian Far East politics and ecology, the Project regained an exceptional voice for conservation science in the region. In addition to this change, the Hornocker Wildlife Institute began an important partnership with the Wildlife Conservation Society (WCS) directing activities in the Russian Far East. The Wildlife Conservation Society has a long and distinguished history in science and conservation throughout the world. This HWI/WCS partnership will strengthen the Siberian Tiger Project™ and open new potentials for our work in Russia. And, these potentials only seem to grow.

Although this report has primarily dealt with progress and potentials of the tiger field research, it is important to take stock in the entire suite of activities that make up the Siberian Tiger Project™. For instance, along with the radio telemetry work on tigers, we have begun work that we hope will define the movements of tiger prey, specifically, elk and wild boar. This work will employ radio telemetry on the two species and allow us to characterize seasonal movements for much of the east slope of the Sikhote-Alin Mountain chain. In another broadly-based design, we have a two-pronged project to quantify the variation in tiger track censuses and then model the results range-wide. Results will provide a design for tiger monitoring which will minimize effort but maximize reliability.

An important part of conservation activities in a changing world is flexibility and the ability to recognize opportunities. Two such opportunities in the Russian Far East are the new ability to locally control non-timber forest products (including wildlife) and the development of land-use policy. We are now working with two groups in creating strategies to empower their management of non-timber products, and we hope to identify more groups in the future. In land use planning, we have two proposals for tiger habitat planning in both Primorye and Khabarovsk provinces. These proposals have gained favorable reviews from various levels of government and non-government groups and could set the stage for tiger conservation for years to come.

The Siberian Tiger Project™ continues to be the main driving force in Siberian tiger conservation. All of the above activities will continue in the upcoming year, along with field research on bears, surveys of both Siberian tigers and Amur leopards in China, many education activities locally and regionally in Russia, and the completion of a new English documentary on the Project. Because of this comprehensive approach, the future looks brighter for the Siberian tiger.

Table 1. Notes about animals captured and collared 1 July 1997 through 31 May 1998.

Capture Date	I.D. ¹	Method	Est. Age	Sex	Physical condition ²	Notes
10/11/97	Pt03	Snare	7-9	F	Good	
11/20/97	Pt25	Snare	1.5	F	Excellent	Possibly Pt03's cub.
11/23/97	Pt26	Snare	1.5	F	Good	Possibly Pt03's cub.
3/10	Pt16	Helicopter	7-8	M	Very good	
3/15	Pt01	Helicopter	6	F	Fair to good	
3/19	Pt20	Helicopter	9-11	M	Fair	
5/15	Pt27	Snare	3	F	Good	

¹Pt=*Panthera tigris*.

²Rated as poor, fair, good, very good, or excellent based on body weight, estimated body fat, i.e., observer ability to see and feel bones, and hair coat condition.

Table 2. Summary of tracking data from radio collared tigers on the Sikhote-Alin Reserve, 1 July 1997 - 31 May 1998.

Tiger Number	Dates tracked		Number of Locations
	from	to	
01	97/07/01	98/05/31	23
03	97/07/01	98/05/31	86
15	97/07/01	97/10/27	53
16	97/07/01	98/05/31	99
20	97/07/01	98/05/31	33
21	97/07/01	98/05/31	22
22	97/07/01	98/05/31	49
23	97/07/01	98/05/31	18
25	97/11/20	98/05/31	103
26	97/11/23	98/05/31	7
27	98/05/15	98/05/31	5