SIBERIAN TIGER PROJECT: Long-Term Research, Training, and Tiger-Human Conflict Mitigation in the Russian Far East

INTERIM REPORT

TO

21ST CENTURY TIGER

FROM THE

WILDLIFE CONSERVATION SOCIETY (WCS)

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PROJECT SUMMARY

The Amur or Siberian tiger (*Panthera tigris altaica*) remains severely threatened, although it does show some signs of recovery due to the multi-year commitment of the Wildlife Conservation Society (WCS) and others. As a classic landscape species inhabiting a variety of human-influenced terrains, tigers compete with man for critical habitat and resources. Their populations remain perilously low and, in the Russian Far East, international efforts to save them from extinction have been conducted for more than 15 years. We are heartened, though, by signs of recovery, including a decline in poaching and a growing scientific understanding of the species' requirements.

WCS's Siberian Tiger Project (STP) began in 1992 when the Siberian tiger's ecology and status were little known outside the Soviet Union, although it was clear that populations were extremely low. STP objectives were simple: apply good science to tiger conservation to amass the best possible information on the ecology and dynamics of the species, creating the necessary database for conservation planning that would allow Siberian tigers to recover.

In the intervening years, the STP has been productive on three fronts: (1) increasing local capacity to address human-tiger conflict with a Tiger Response Team (TRT) endorsed by the Russian government's Inspection Tiger, a division of the Ministry of Natural Resources, which is gradually developing protocols for dealing with problem carnivores; (2) continuing to enhance our large tiger database with the goal of creating a comprehensive Siberian tiger conservation plan – the research focus this year is on cub mortality and dispersal, tiger impact on prey populations, improved tiger density studies, and the interaction between populations, social structure, and poaching – and; (3) training the next generation of Russian conservation biologists.

PROJECT OBJECTIVES

Tiger-Human Conflicts:

- Continue to assist Inspection Tiger with tiger-human conflicts, conduct necessary interventions, and monitor outcomes.
- Continue TRT field training.

Training and Capacity Building:

- Complete construction of housing and office for graduate students (the building is already in use).
- Continue training current students; search for at least two new students.

Research Program:

- Collect the best scientifically-based data to support solid conservation planning.
- Continue radio-tracking cubs; begin ascertaining number of prey removed by tigers; field test various density estimation techniques.

PROGRESS

Tiger-Human Conflicts

Inspection Tiger did not request our help on any conflict situations during the report period (July 1 – December 31, 2007), which is not unusual because conflicts more often occur in late winter.

Training and Capacity Building:

While we are still putting the finishing touches on our office building (Photo 1), it is fully occupied with permanent offices for Drs. Dale Miquelle, John Goodrich, Ivan Seryodkin, and provides temporary office and living facilities for visiting graduate students and scientists. Currently, two graduate students (one studying tigers, the other studying fish owls) and a new field assistant are living there and using the office facilities. Additionally, there is computer access and office space for field technicians to easily access data forms, maps, etc.

Photo 1. WCS office, Terney, RFE, Fall 2007. ©WCS

STP graduate students during the report period include Svetlana Sutyrina (University of Irkutsk) and Meghan Riley (University of Wyoming), who are working together on a tiger population density estimation project (see Research section below for details).

In August 2007, Dr. Ivan Seryodkin (Institute of Geography, Far Eastern Branch, Russian Academy of Sciences, and WCS) came onboard as the STP Russian Field Coordinator. First joining with WCS in 1999, he recently finished his PhD on the brown bears that he radio-tracked as part of the STP, working under esteemed tiger specialist Dr. Dimitri Pikunov of the Institute of Geography. Ivan has also worked on the WCS Kamchatka brown bear project for several years, and fills the role of Evgeny Smirnov, who retired from the Sikhote-Alin Biosphere Zapovednik (SABZ) and WCS a few years ago. However, Ivan has taken on additional responsibilities, including financial management and, eventually, grant writing. One of the many benefits of hiring Ivan is that he has greatly enhanced our training and capacity-building efforts by attracting new students. He brought on a graduate student who is studying bears in Khabarovsky Krai, and who worked for STP in summer and fall of 2007 to gain practical field experience and will likely return for further training in 2008. Additionally, he has made arrangements for one student from Moscow State University and another from the Institute of Biology and Soils (Far Eastern Branch, Russian Academy of Sciences) to join the STP this summer to begin collecting data for their dissertations.

Research

- ***Background and update on radio-collared tigers:*** We monitored two adult female tigers (Pt55 and Pt56), one juvenile female (Pt80), and one adult male (Pt85) during the study period (Table 1). Pt56 was with a litter of three cubs born in summer 2006. We recaptured Pt55 to change her collar, which had failed

Table 1. Location data from collared tigers on Sikhote-Alin Zapovednik, July-December 2007.

Tiger no.	Sex	Age	Dates tracked from	Dates tracked to	Days tracked	Number locations total	Number locations report period	Notes
55	f	6	10/24/2002	12/31/2007	1,894	303	8	Collar batteries died. Recaptured 10/2007.
56	f	6	10/24/2002	12/31/2007	1,894	607	61	
80	f	2	10/13/2006	11/20/2007	403	209	77	Poached 11/2007.
85	m	8	10/14/2007	12/31/2007	78	6	6	Moved out of study area.

earlier in the year. Additionally, we captured adult male Pt85 that we had believed moved into the area to replace Pt49, the resident male who was poached in late 2006. Camera-trapping photos indicated that Pt85 was the resident male from the neighboring territory to the north. However, he eventually returned to his original territory and camera-trapping data indicate that a new male has moved

in. This male was photographed in a territory further north in both 2006 and 2007, suggesting he was a resident adult there. We will attempt to capture this male to fit him with a radio-collar this coming spring.

- ***Cub mortality and dispersal patterns:*** No cubs were born during the study period. However, we radio-tracked one tigress (Pt80) born to Pt35 in autumn 2005. Pt35 was poached early in 2007 and Pt80 settled in her mother's territory. However, she was an unusual tiger, moving less than normal, and less than her two sisters when she was a cub. Additionally, she displayed little fear of humans and was frequently observed on the main road through SABZ. We attempted to scare her from the road using signal rockets and fireworks on several occasions, with little apparent effect. In November of 2007, we lost contact with her signal and assume she was poached. That we did not observe her tracks in winter, and she was not photographed in camera traps, supports this assumption. She had been our most frequently photographed tiger, see Photos 2 and 3.

Photo 2. Tigress Pt80 dozes nonchalantly on the edge of the paved road through SABZ just ten meters from an STP vehicle. This behavior eventually led to her being poached, despite best efforts of STP personnel to scare her from the road. Photo by J. Goodrich/©WCS.

- ***Impact of tigers on prey populations:*** We expect to fit tigers with GPS collars in May and June 2008 to begin this aspect of the study.

- ***Comparison of techniques for estimating tiger densities:*** Our graduate students, Svetlana Sutyrina and Meghan Riley, successfully conducted camera-trapping to estimate tiger density in two separate areas (southern and central) on SABZ, demonstrating that camera-trapping can be used on tigers, even when they exist at very low densities (Table 2).

Table 2. Capture-recapture density estimates for Amur tigers from camera trapping in two different study areas on Sikhote-Alin Zapovednik, July – December 2007.

Area	Area with camera traps (km2)	Effective area (km2)	Density 100 km2 Model M(0)	Density 100 km2 Model M(h)
Southern SABZ[1]	496	1,328 ± 90.3	0.8± 0.4	0.9 ± 0.3
Central SABZ	540	1147	0.6 ± 0.3	0.8 ± 0.2

Additionally, they began collecting samples (scat, hair, urine, blood from tracks, photos of tracks) to estimate tiger numbers using non-invasive genetic techniques, "sniffer dogs" that can identify individual tigers, and identification of individuals from their tracks. To collect hair, they tested Velcro hair-snags scented with Calvin Klein's *Obsession* – a perfume that attracts tigers (and other cats) at WCS's Bronx Zoo. However, wild tigers seemed to ignore or perhaps even avoid the scent, so hair was collected from natural rub trees. Preliminary results suggest that collecting sufficient samples to estimate density from any one type of DNA or sniffer-dog samples (scat, hair, blood, or urine) would probably be too labor intensive, but using *all* types of samples, combined, may be an efficient way to monitor tiger populations.

Photo 3. A camera-trap photo of collared tigress Pt80 taken as part of a study to compare techniques for estimating Amur tiger density. Pt80 was our most photographed tiger until she was poached in November 2007. This was the last photo taken of her. Photo ©WCS.

- ***Relationship between poaching, social structure, and population dynamics:*** From 1992 to 1999, tiger density in our core study area was relatively stable. Although poaching rates were moderate to high, this seemed to have had little effect on population density because poached animals were quickly replaced by immigrants. Because tigresses are territorial, we mistakenly assumed that they maintained territories just large enough to meet the energetic demands of raising cubs, as is typical of most carnivores. In 2004, however, we detected dramatic changes in land tenure, density, and reproductive output in our core area. This suggests that when tigers are well protected from human-induced mortality for long periods, female adult density may increase dramatically. We found that when survivorship of adult females was high, the mothers divided their territories with their daughters once the daughters matured. We realized that the population had not been at carrying capacity because immigrating females maintained territories much larger than was necessary to meet their energetic demands, presumably so that they could then "donate" half their territory to their daughters. This complex relationship between poaching, social structure, and population dynamics took us more than 12 years to decipher, illustrating the importance of long-term research.

  The winter of 2006-2007 was marked by heavy poaching on the study area and we lost adult females Pt35 and Pt37 as well as adult male Pt49. This

marked the end of the period of stability that followed the heavy poaching in the late 1990s. It appeared that the population had reached carrying capacity, but instead of all female cubs dispersing, both Pt35 and Pt37 appeared to be attempting to expand their home ranges to allow juvenile daughters to settle in their natal home ranges. Unfortunately, both tigresses were poached during this period of expansion, making results inconclusive.

CONCLUSION

We sincerely appreciate the 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 the new research office in Terney. We stand ready to continue our efforts to assist the government's Tiger Response Team when reacting to tiger-human conflicts; and our research program is yielding important data on cub mortality, tiger density estimates, and the complex relationship between poaching, social structure, and population dynamics. We are grateful to 21st Century Tiger for its long-term partnership in this important conservation program.

SELECTED PUBLICATIONS

Goodrich, J. M., L. L. Kerley, E. N. Smirnov, D. G. Miquelle, L. McDonald, H. B. Quigley, M. G. Hornocker, & T. McDonald. *In review.* Survival Rates and Causes of Mortality of Amur Tigers on and near the Sikhote-Alin Biosphere Zapovednik. Journal of Zoology. (*accepted with minor revisions*)

Goodrich, J. M., D. G. Miquelle. *In press*. Tiger Telemetry. In: Tilson, R. and P. Nyhus (eds.) Tigers of the World. Noyes Press.

Miquelle, D. G., J. M. Goodrich, L. L. Kerley, D. G. Pikunov, Y. M. Dunishenko, Yu. M. Aramiliev, V. V. Smirnov, E. N. Nikolaev, I. G. Salkina, G. P. E. Zhang, I. V. Seryodkin, C. Carroll, V. V. Gapanov, P. V. Fomenko, A.V. Kostyria, A. A. Murzin, H. B. Quigley, & M. G. Hornocker. *in press*. Science-Based Conservation Of Amur Tigers In Russian Far East And Northeast China. In: Tilson, R. and P. Nyhus (eds.) Tigers of the World. Noyes Press