The Rufford Small Grants Foundation

Final Report

Congratulations on the completion of your project that was supported by The Rufford Small Grants Foundation.

We ask all grant recipients to complete a Final Report Form that helps us to gauge the success of our grant giving. We understand that projects often do not follow the predicted course but knowledge of your experiences is valuable to us and others who may be undertaking similar work. Please be as honest as you can in answering the questions – remember that negative experiences are just as valuable as positive ones if they help others to learn from them.

Please complete the form in English and be as clear and concise as you can. We will ask for further information if required. If you have any other materials produced by the project, particularly a few relevant photographs, please send these to us separately.

Please submit your final report to jane@rufford.org.

Thank you for your help.

Josh Cole, Grants Director

Grant Recipient Details	
Your name	Meghan Riley
Project title	Detecting Elusive Species: A quantitative analysis of methods for estimating Amur tiger abundances
RSG reference	24.06.07
Reporting period	September 20, 2007 through September 20, 2008
Amount of grant	£4500
Your email address	Mriley8@uwyo.edu
Date of this report	September 16, 2008

1. Please indicate the level of achievement of the project's original objectives and include any relevant comments on factors affecting this.

Objective	Not achieved	Partially achieved	Fully achieved	Comments
Test six sampling methods for estimating Amur tiger abundance in Sikhote-Alin Biosphere Zapovednik (SABZ).		X		While all six of our sampling methods were attempted in SABZ, this objective was only partially achieved because logistical constraints kept us from testing each method with equal effort. Camera-trapping and the setting of hair snares for DNA sample collection were carried out to the degree we had hoped. However, the opportunistic collection of DNA samples (hair and scat) and photographs of tiger tracks from backtracking in the snow was hindered by uncooperative weather (below average winter snowfall) and cultural difficulties (Russian technicians being disinclined to traverse predefined transects in search of tiger tracks).
Identify individual tigers using DNA from hair and scat samples.	X			Despite the fact that numerous hair and scat samples were collected and stored appropriately to maintain the integrity of the DNA, the bureaucratic process for obtaining export permits proved too difficult. Accordingly, the samples are still in Russia although we maintain some hope of getting them to a laboratory in the U.S. for analysis yet.
Identify individual tigers from their scat using scent dogs.		X		We were able to get 24 of our 26 scats from our first sampling session in summer of 2007 processed by dogs and three individual tigers were identified. However, due to health issues, the dogs were unable to process our scats from the subsequent fall, winter, and spring sampling sessions. Fortunately, an alternate dog trainer has offered to do the analyses in Moscow and we anticipate that all scats will be processed by the end of 2008.
Identify individual tigers from camera-trap photographs.			X	This objective has been achieved as individual tigers have been identified for all of the photographs we developed with tigers in them except for a handful of images that were too close to the

				camera or too blurry to use.
Calculate tiger abundances using data from each sampling method.		X		This objective is partially achieved as camera-trapping is the only method that has garnered sufficient tiger identifications for mark-recapture analyses to generate abundance estimates. We are optimistic that further scat processing by dogs and the transport of hair and scat samples to the U.S. for DNA analysis will allow us to estimate abundances for more of our candidate methods.
Compare methods using a rubric to determine which method should be recommended to SABZ for tiger monitoring purposes.		X		A rubric has been designed and each of the candidate methods has been scored according to it. However, the scores are incomplete as of yet since some scores hinge on the precision and cost of abundance estimation. Since only camera-trapping has yielded abundance estimates thus far, a final comparison of methods is not possible yet.
Recommend best method to SABZ staff for future tiger monitoring.	X			Because data analysis is ongoing, we are unable to make a recommendation to the reserve at this time, but we fully expect to by spring of 2009.

2. Please explain any unforeseen difficulties that arose during the project and how these were tackled (if relevant).

The only major unforeseen difficulty encountered during the course of this project has been our inability to procure export permits for our hair and scat samples. We were aware from the beginning that Russian bureaucracy would delay our exporting our samples as early as we would like, but we had no idea that after a year of trying to get the paperwork in order we would still lack written permission. Since we first began the permitting process, the required paperwork has changed and the Russian government has become stricter with all of their visa and permit issuing, especially to foreigners.

3. Briefly describe the three most important outcomes of your project.

By testing six candidate methods for estimating Amur tiger abundance in SABZ over the course of a full calendar year, we have determined which techniques are feasible in this environment and which aren't. Accordingly, we can eliminate inappropriate techniques from consideration by the reserve as monitoring tools.

In the course of conducting a pilot study across the entire reserve we have effectively laid the groundwork for future monitoring by SABZ staff. Since we have taken the time find and map out the best locations for sampling sites, the implementation of a monitoring program to be carried out by the reserve has been facilitated in that they won't need to do any of the initial reconnaissance or

trial and error learning themselves. Furthermore, we can advise them as to the pitfalls associated with whatever monitoring scheme they choose to implement, helping them to avoid wasted time and money.

This study has also proven that the abundance of Amur tigers can indeed be estimated using mark-recapture technology. Up until now it was believe that Amur tigers occur at densities that are too low to allow mark-recapture based sampling techniques to work. Previous population estimates have been derived from indices rather than direct estimation. Our work has shown that a more statistically rigorous and accurate method can be employed for tigers even in the Russian Far East.

4. Briefly describe the involvement of local communities and how they have benefitted from the project (if relevant).

The local community in Terney was involved to a slight extent in that the majority of our technicians were locals. By their being involved in this project it gave them a greater appreciation of their local tigers as a natural resource and source of pride. The enthusiasm with which they participated in this project and shared their experiences with friends and family members helped to raise local consciousness of the tigers that share the region.

The village of Terney has also benefited from the project in that my Russian student collaborator and I both wrote articles for the local paper about our work and sharing photographs of local tigers from the camera-traps. This too gave the people of Terney a chance to become familiar with the tigers that live adjacent to them in SABZ.

5. Are there any plans to continue this work?

The fieldwork aspect of this specific project has come to a close, although sample and data analysis are ongoing. Furthermore, my Russian collaborator, Sveta Soutyrina, will likely be testing sampling techniques for estimating Amur tiger abundance outside of SABZ and throughout the tiger's range in Primorski Krai in the coming months.

6. How do you plan to share the results of your work with others?

Upon completion of data analysis, I plan to share the results of this project by sending a report to SABZ staff in Russia, giving presentations at professional meetings, publishing scientific journal articles, and defending a thesis derived from it here at the University of Wyoming.

7. Timescale: Over what period was the RSG used? How does this compare to the anticipated or actual length of the project?

This grant was used for the full twelve months allocated (September 20, 2007 through September 20, 2008). This period began after the start of the project and ended before the project's conclusion (April 2006 through April 2009 – anticipated end date).

8. Budget: Please provide a breakdown of budgeted versus actual expenditure and the reasons for any differences. All figures should be in £ sterling, indicating the local exchange rate used.

Item	Budgeted Amount	Actual Amount	Difference	Comments
Local Labour	£1,000.00	£1,000.00	£0	This money was used to pay two local Russian technicians for their help.
Purchased Services	£2,000.00	£500.00	£1,500.00	The bulk of this item was intended to pay lab costs for DNA extraction and analysis of our hair and scat samples. However, we were unable to procure the necessary export permits for said samples before the reporting date, so the samples could not be processed.
Riley Salary	£1,000.00	£1,000.00	£0	This money was used for my room and board.
Gas/Local Travel	£500.00	£500.00	£0	This money was used to buy gas for our work vehicles.
Data Analysis and Management	£0	£1,500.00	£1,500.00	We were unable to spend the money intended for paying lab costs related to DNA analyses due to problems with the permitting process for exporting samples. These funds were redirected towards the identification of individual tigers from photographs, data analysis, and database management.
TOTAL	**£4,500.00**	**£4,500.00**	**£0**	

9. Looking ahead, what do you feel are the important next steps?

Important next steps for this project include organizing the data into a comprehensive database, conducting the data analysis, writing up the results, and recommending a plan for monitoring the population of Amur tigers in SABZ based on our results. Ultimately, this project will have been a success if the reserve implements the recommended sampling method and is able to reliably track population changes as they relate to management decisions in the long term.

10. Did you use the RSGF logo in any materials produced in relation to this project? Did the RSGF receive any publicity during the course of your work?

Yes, I included the RSGF logo on my University of Wyoming website (http://uwstudentweb.uwyo.edu/M/MRILEY8/) under the heading of "supporting organizations". It is my intent to include the logo in any future presentations relating to this project as well as mentioning RSGF in all published articles that result from this project.

11. Any other comments?

I would like to give a heartfelt thanks to everyone at Rufford Small Grants. I could not have carried out this project without your generous support and I am so grateful for having had it. Thank you!