

**RAPID QUANTITATIVE ASSESSMENT OF TIGERS IN SOUTHERN SUMATRA:  
IDENTIFYING THREATS AND PRIORITIES WHILE DEVELOPING  
THE TOOLS FOR AN ISLAND-WIDE STATUS ASSESSMENT**

**INTERIM REPORT**

to

**21<sup>ST</sup> CENTURY TIGER**

from the

**WILDLIFE CONSERVATION SOCIETY**

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## Summary

This report details activities in the period July 2006 through June 2007. We give details of progress towards each objective and its outputs. The project activities have concentrated on identification of potential tiger habitat in southern Sumatra, technical meetings to develop common methodologies, field surveys using the agreed methodology, and public awareness initiatives.

## Progress by June 2007

The project has seven major objectives: A narrative summary of progress against each is given below:

**Objective 1:** *To assist the Indonesian Department of Forestry develop a collaborative group of stakeholders committed to the conservation of Sumatra's large mammals.*

Although tiger conservation activities have been going on in many sites in Sumatra for years, they have not been well coordinated. After several informal discussions with PHKA (Indonesia's CITES Management Authority) and other stakeholders, we identified three immediate priorities for Sumatran tiger conservation:

**First**, there has never been a systematic and comprehensive field assessment of the status of large mammal species found on the island, so there is no baseline against which to evaluate the interventions of Government, NGOs, and donors. Such an evaluation is needed by the Department of Forestry of Indonesia to meet its obligations under the international conventions for biodiversity conservation. To conduct a systematic assessment as ambitious as an island-wide survey, the Department of Forestry will require that all stakeholders agree and support the methodology and that the adopted methodology is capable of providing the basis for a long-term monitoring program. To address this requirement, WCS conducted a technical workshop to develop a common survey methodology in Bogor on October 9 – 10, 2006. The workshop was attended by 24 participants from 11 major organizations working in tiger conservation. Following the workshop, several informal coordination and technical meetings were held by WCS and collaborating partners. In addition, technical communications through e-mail have also been maintained among collaborating partners. Notes of the Bogor meeting are included as Appendix 1.

**Second**, the existing Sumatran tiger strategic plan is already more than 13 years old. However, it is still quoted by many organizations for various conservation purposes as it remains the only plan available. The existing document, however, is increasingly out-of-date and may no longer be appropriate in all current situations and thus needs to be revisited and updated. Several informal discussions with PHKA has indicated that updating the strategic plan has become the central issue for PHKA as the management authority.

**Third**, there is a strong indication of increased tiger-human conflicts in Sumatra. Several records of tiger-human conflicts have been reported in Gunung Leuser NP, Tesso Nilo NP, and Bukit Barisan Selatan NP, while special attention must also be given to the West Sumatra region where conflicts have been frequently reported over the past three years. Such conflict can become a major threat to the continued existence of Sumatran tigers locally, as it typically leads to the death or inappropriate relocation of the tigers concerned. There is therefore a need to formulate a

comprehensive and effective mitigation protocol that is applicable to both local and regional levels, and is understood and followed by management authorities. To address these problems, WCS initiated a technical meeting regarding the Sumatran tiger strategic plan and tiger-human conflict mitigation in Bogor on June 13, 2007. The meeting was attended by 13 participants representing seven major institutions working on Sumatran tigers. This meeting led to a second round of technical meetings hosted by PHKA in Jakarta on June 28, 2007. One of the important conclusions of this meeting was to hold two rounds of focus group discussions, and a strategic planning workshop from August 27-31, 2007. This will, for the first time in more than ten years, bring all tiger conservation stakeholders to the same table and allow the Department of Forestry to present in the clearest terms its needs for the long-term conservation of Sumatran tigers, and vice versa. Such a process highlights the important role of WCS in conserving tigers and large mammals at the national level. Meeting notes are included as Appendix 2.

**Objective 2:** *By the use of the collaborative group, to assist the Department of Forestry to assimilate current knowledge about rapid status and threat assessment methods for tiger. To develop a pilot methodology for the rapid assessment of tigers.*

From the technical meeting held October 9 – 10, 2006 in Bogor, a common rapid methodology was agreed to by the major stakeholders working on tigers in Sumatra. Such a method is now being used by all participants, with some additional variations aimed at meeting specific objectives of each organization involved in the survey. The beauty of this initiative is that each organization uses its own resources in surveying its 'own' sites using the standardized methodology, and shares the results with the group. By doing this, the pooled data can be analyzed together for the creation of the first ever Sumatran large mammal atlas. In summary, the workshop led to four main agreements: 1) a common rapid methodology to assess tiger and large mammal population status, 2) collaborative work on a time-series Sumatra-island wide survey led by PHKA, 3) a common survey protocol adapted from the WCS Tigers Forever initiative, and 4) a centralized database of Sumatra tiger and other large mammals held by PHKA. To maintain consistency in sampling design and data collecting, a draft of survey protocol has been developed by WCS. Such a protocol is highly compatible with the WCS Tigers Forever protocol and will be kept updated and revised as more experience is gathered by partners from its first implementation in the field. The latest draft of the protocol is included as Appendix 3.

**Objective 3:** *To undertake a literature and remote-sensing based selection of potential survey sites for an initial pilot survey in southern Sumatra.*

Because conservation resources for large mammals are focused on relatively few, geographically limited studies, most of them being national parks, we can answer in great detail about the numbers of species or individuals in certain areas, but can say little with confidence about their status nationally or even regionally. The solution to this problem requires a large-scale response, abandoning preconceptions on where wildlife should be and conducting a rapid sweep survey of a large area irrespective of habitat type to build an atlas of wildlife survival.

A rigorous remote-sensing analysis has been conducted by WCS in order to identify potential tiger habitats across Sumatra. The WCS landscape lab has generated a map of forests and

deforestation across the main island of Sumatra. We acquired Landsat-5 Thematic Mapper (TM) for 1990, and Landsat-7 Enhanced Thematic Mapper (ETM+) for 2000. For scenes with cloud cover greater than 25% we analyzed additional cloud-free Landsat sub-scenes. Images collected in 1990 and 2000 were co-registered to NASA's Geocover, a set of ortho-rectified images from the 1990s (Tucker et al. 2004). The Geocover ortho-rectification process uses Global Positioning System (GPS) data and accounts for elevation to produce an image set with a root mean square error (RMSE) of <50 m.

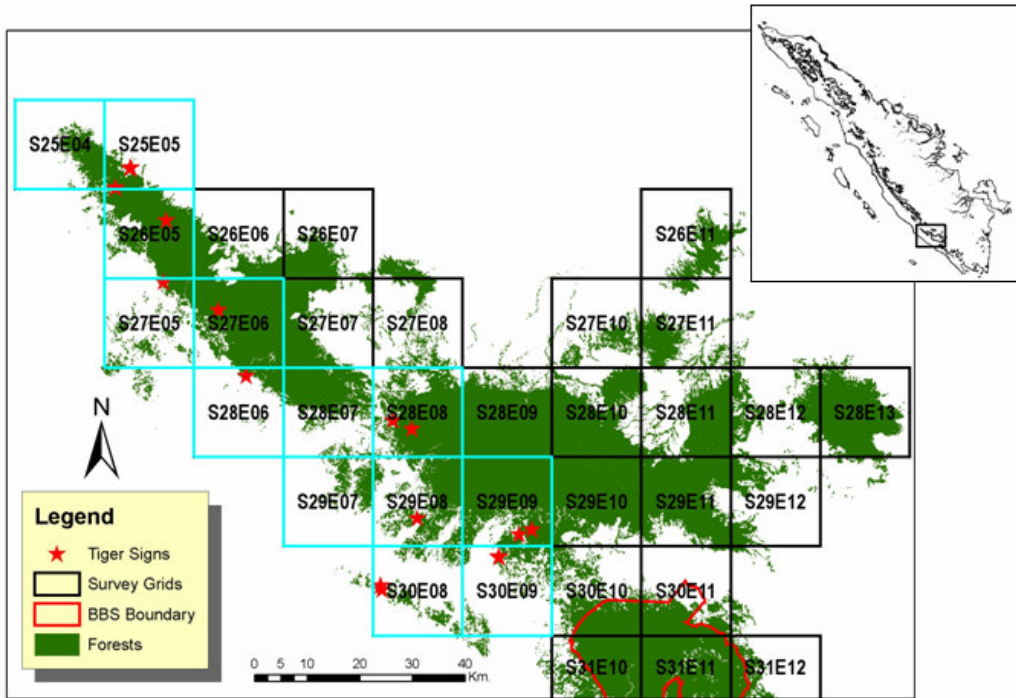
We defined 'deforestation' as the complete removal of forest cover over an area equivalent to  $\geq 1$  ha. We defined the 'forest' class as non-modified forest areas of old-growth vegetation dominated by closed-canopy tree cover ( $\geq 50\%$ ). We defined the 'mangrove' class as areas of forest on coastal areas. 'Non-forest' comprised a large continuum of land cover classes: human settlements, *Imperata cylindrica* grasslands, and re-growth areas dominated by shrubs and young forest trees, paddy fields and tree crops. Tree crops included coffee and pepper gardens, cinnamon, coconut, rubber, acacia and oil palm plantations, orchards and old-growth agro-forest dominated by *Shorea javanica*, rubber, mixed fruit gardens and benzoin and candlenut. However, we did not include any re-growth in the analysis (Non-forest in ~1990 and Forest in ~2000) because it was technically impossible to measure by satellite alone. We also did not classify other human land-use mosaics in the analysis since it requires a large scale of ground-truthing data points across Sumatra. Such data points will be collected along with the island-wide survey activities to be used further in identifying and classifying human land-use matrices. Thus, we will use forest covers larger than 25,000 ha (an average home range of tigresses) in this map as indicative of potential tiger habitats. A low resolution copy of the base map is included as Appendix 4.

**Objective 4:** *To test the survey methodology at the pilot study sites.*

Using the standardized methodology, WCS has conducted a series of surveys in Bukit Barisan Selatan National Park (BBSNP) and the adjacent Bukit Balai Rejang Selatan Forest Complex (BBRS) to test the applicability of the method. Our leading role in trialing the new Sumatra-wide method in BBSNP has led to our provision of training to three staff members of ZSL and four members of WWF. Both organizations are adopting the new method. These joint exercises also sought to standardize our implementation of the method. Field staff from WCS received reciprocal training from ZSL staff in Jambi. In addition, we trained four students of the University of Bengkulu, and one member of Yayasan Ulayat Bengkulu in survey techniques. The survey in the BBRS forest complex is underway.

Since April 2007, a total of 13 grids have been surveyed in southern Sumatra. Tiger signs have been discovered in ten grids (see figure). This becomes the first ever systematic survey done in the complex with actual discoveries of tiger signs. Based on this preliminary result, we believe the region holds a significant number of tigers. However, most tiger signs were found in close proximity with human presence, and/or in heavily degraded forests, such as in S29E08, S30E08, and S30E09, so that tiger-human conflict would be potentially high. Some photos of the survey underway in BBRS are included as Appendix 5.

We expect to complete our survey in BBRB within the next three months, and to start a survey in BBSNP afterward. In collaboration with the Leuser International Foundation, another extensive survey is also underway in Gunung Leuser NP, implementing the same protocol.



*Tiger signs in Bukit Balai Rejang Selatan forest complex, survey grids. Grids highlighted in light blue are surveyed grids.*

To further test the survey methodology, WCS in collaboration with ZSL have selected several areas as the pilot study sites, including Bukit Dua Belas National Park, Riau, Bukit Raja Mandara/Gumai Pasemah/Bukit Balal (TCU 157), Bukit Barisan Selatan/Semidang Bukit Kabu/Bukit Hitam/Bukit Dingin/Gunung Dempo/Gunung Patah/Bepagut/Muara Duakisim (TCU 158), Dangku (TCU 154) and Way Waya. To carry out the surveys, a sub-grant agreement has been signed between WCS as the grantor and ZSL as the grantee. This agreement aimed to conduct a rapid survey in Bukit Dua Belas NP. Such an agreement mandates ZSL to conduct surveys of wildlife occupancy across six survey cells (17x17km) using the agreed methodology, and to analyze the results and report estimated occupancy values for key species, relative abundance and distribution. The survey itself is still underway. An interim report will be delivered by ZSL in August 2007.

**Objective 5.** *To use the field surveys as a vehicle to spread awareness about tiger conservation, including conflict mitigation and law enforcement.*

A mobile unit named CIMO (Conservation Information Mobile) has been launched on May 31, 2007, at the Indonesian Department of Forestry headquarters in Jakarta. Beginning from Tanjung Karang, the capital city of Lampung province, this mobile unit has now started its journey for an awareness campaign to all main cities in Sumatra. The ultimate target of this mission is to collect a million

signatures from local communities and the general public in order to deliver a ‘green message’ for conserving Sumatran forests and biodiversity. At the local level, the unit will also conduct on-the-ground conservation awareness road shows along the journey, such as conservation exhibitions, puppet shows, video shows, leaflets and disbursement of other campaign materials. Some photos of the CIMO in action are included as Appendix 6. In addition, accompanying the survey and to spread out the importance of conserving tigers and their habitats in the BBS/BBRS region, WCS continues to publish its activity in local and national newspapers. An example is included as Appendix 7. In this case expert opinion was requested by a local newspaper regarding a case of illegal possession of tiger parts.

**Objective 6.** *To analyse and present the results of the southern Sumatra rapid assessment together with recommendations for priority interventions and follow-up action.*

Work is still underway and this objective will be accomplished by the completion of the field survey in all survey sites. A summary of some preliminary results is presented in the following table.

GRID ID	TOTAL KM	FOOTPRINT	OCCASIONS	OTHER SIGNS
S25E05	13	P	1	SCT, SCM
S26E05	20	A	0	SCM
S27E05	30	P	1	
S29E09	18	P	2	SCT
S30E08	10	P	1	SCT
S29E08	21	P	1	SCT
S30E09	11	P	1	SCT, SCM
S28E08	27	A	0	SCT
S28E06	4	P	1	
S27E06	31	P	2	

*Note: P = presence; A = absence; SCT = scats; SCM = scrapemarks*

**Objective 7.** *To use the results from the initial surveys to develop a statistically robust plan for a repeatable island-wide assessment of large mammal status and to develop a strategy for the implementation of that island-wide survey, led by the Department of Forestry and conducted by Department of Forestry staff and non-government stakeholders.*

An agreed common methodology resulting from the technical workshop in Bogor is being implemented by collaborating partners, including WWF in Tesso Nilo forest complex, Riau, FFI/DICE in Kerinci Seblat NP, ZSL in Jambi, WCS in BBSNP and BBRS forest complex, and WCS and LIF in Gunung Leuser NP. The efforts among sites will be comparable and repeatable. In the surveys, collaborating partners have involved staff of the regional Department of Forestry agencies, including BKSDA, and national parks. As enough data is collected, a technical meeting will be conducted to undertake preliminary analyses and to evaluate the effectiveness of the method. Work is still underway, and we expect to conduct such a technical meeting within the next two months. This initiative has been highly considered by PHKA as one of the most important issues in the upcoming strategic plan workshop.

### **General conclusions**

1. Based on the field findings of the survey, we believe that the BBRS complex serves as potential habitat for Sumatran tigers.
2. Upon the completion of this rapid survey, we recommend conducting camera-trapping to get a better understanding of tiger numbers in the region. Its close proximity to the BBSNP allows a good chance to create corridors between these regions.
3. We feel the project period reported here has been highly successful in many regards, but challenges remain. We hope our period of reflection has strengthened our strategy for the implementation of this project. We are optimistic and excited about the future.