



Tiger Conservation in the greater Leuser landscape and the greater Bukit Barisan Selatan landscape of Sumatra

Background

There are currently approximately 300 wild tigers in Indonesia that persist in four main landscapes on the island of Sumatra; the Leuser landscape in the north, the Kerinci-Seblat landscape in the center-west, the Bukit Tigah Puluh landscape in the center-east, and the Bukit Barisan Selatan landscape in the south (Figures 1 and 2). The greater Leuser landscape currently has about 70 tigers and can potentially hold about 250, Kerinci-Seblat currently has about 140 tigers and can potentially hold about 240, Bukit Tigah Puluh has approximately 40 and can potentially hold about 65, and greater Bukit Barisan Selatan currently has about 50 tigers and can potentially hold about 75 tigers.

WCS-Indonesia's overall tiger conservation program in Sumatra

WCS-Indonesia has been working with the Government of Indonesia and a number of local partners since the late 1990s to achieve a full recovery of the tigers and other wildlife of the greater Bukit Barisan Selatan (BBS) landscape. WCS-Indonesia has also been working with the Government of Indonesia and a number of local partners since 2007 to achieve a full recovery of the tigers of the southern half of the greater Leuser landscape. WCS-Indonesia is committed to work in both of these landscapes over the multiple years it will take to achieve the recovery of the tiger populations.

There are three main direct threats to tigers in both the Leuser and BBS landscapes: habitat loss, direct killing of tigers by poachers, and killing of tiger prey by poachers. The severity of each of these threats, however, is different between the two landscapes. In Leuser *habitat loss* is a growing problem, particularly since the civil unrest that had previously been prominent in Aceh essentially ceased in 2005, which has enabled agricultural expansion (Figure 3). *Direct killing of tigers* is a very strong threat in Leuser. Most of the direct killing of tigers in Leuser is done as a consequence of human-tiger conflict. Much of the frontier of the Leuser landscape is a graded mixture of agricultural settlements mixed with secondary rainforest. This mixed habitat is a tremendous draw for wild pigs, whose plunder of agricultural crops has enabled a population boost in wild pigs. Following the wild pigs into this mixed habitat are tigers, who prey upon the pigs and upon domestic cattle. In response to the wild pigs, farmers place many snares, which end up also capturing many wild tigers (Figures 4 and 5). Once captured by the snares, local villagers often sell the tiger parts to traders connected to international wildlife trade syndicates (Figures 6 and 7). *Killing of tiger prey* in Leuser is

a growing problem, with snaring and other targeted hunting techniques on the rise since the 2005 peace accord.

In BBS, habitat loss is a very severe threat due to the thin, linear nature of the greater BBS landscape (Figure 8). Direct killing of tigers (again most frequently through human-tiger conflict) and killing of tiger prey are also ever present threats in BBS, but conservation interventions (described below) by WCS in collaboration with the Government of Indonesia and local partners appear to have reduced these threats to a level where tigers are recovering, albeit slowly.

To address the threats to tigers in both Leuser and BBS, WCS-Indonesia works closely with the provincial and federal governments of Indonesia and local NGOs to undertake the following interventions: a robust, continuous, on-the-ground anti-poaching effort across the whole BBS landscape and the southern half of the Leuser landscape (Figure 9); teaching and installing human-tiger conflict mitigation techniques in local communities living in and adjacent to both Leuser and BBS (Figures 10); outreach and education in local communities living in and adjacent to Leuser and BBS in support of the anti-poaching and human-tiger conflict mitigation efforts (Figures 11 and 12), and regular monitoring of tiger and tiger prey population numbers to determine if the conservation efforts are successful (Figure 13). In both landscapes WCS-Indonesia has not yet determined the set of conservation interventions that will fully stop the threat of habitat loss. However in the Leuser landscape the collaborative efforts of WCS-Indonesia and the Government of Indonesia on the anti-poaching patrols are beginning to have some success stopping new illegal encroachments (Figure 14), and in the BBS landscape WCS-Indonesia is several years into a program to build a carbon-financed forest conservation program. All of these interventions are ongoing and will require steady funding over the long-term to ensure the recovery and then maintenance of the tiger populations of both Leuser and BBS.

Option 1 - Human-tiger conflict mitigation on Sumatra

The human-tiger conflict mitigation efforts of WCS-Indonesia, called Wildlife Response Units, consist of several main activities. The first is a systematic gathering of information on the geographic distribution of the locations and frequencies of human-tiger conflict. Due to the dynamic nature of both tiger behavior and land-use change in Sumatra, WCS-Indonesia employs dozens of community wardens across both landscapes who regularly and systematically check for human-tiger conflict incidents in all the villages in and adjacent to Leuser and BBS (Figure 15).

The second main activity of the Wildlife Response Unit is the construction of affordable and easy-to-maintain tiger-proof livestock pens in all villages affected by human-tiger conflict (Figure 10). The construction of such tiger-proof pens is an immediate benefit to local communities and builds trust for tiger conservation activities. The third main activity is regular outreach and education activities regarding tigers, human-tiger conflict

mitigation and tiger conservation in villages in and adjacent to Leuser and BBS (Figure 11 and 12). This outreach also builds trust.

The fourth main activity of the Wildlife Response Unit is the employment of an individual trained in veterinary techniques who lives in the area of Leuser most prone to human-tiger conflict (Figure 16). This individual himself and also in collaboration with other trained veterinarians living in the region rush to situations where tigers have been snared but are alive and when it is possible then tigers are removed from the snares, treated and released. The final main activity is the checking for and regular dismantling of illegal snares (Figure 17).

When unchecked, the severity of the threat of human-tiger conflict in both Leuser and BBS can be extremely high, with at least dozens of tigers killed or removed per year. But the Wildlife Response Unit has reduced the number of tigers killed or removed from BBS and the southern half of Leuser by 90%. Your support for the Wildlife Response Unit to continue its direct, on the ground efforts to protect tigers.

Option 2 - tiger and tiger prey research on Sumatra

The regular monitoring of tigers and tiger prey of the WCS-Indonesia's tiger conservation programs in Leuser and BBS consists of several main activities. The first is formal camera-trapping exercises in both landscapes to determine tiger population densities using mark-recapture statistical approaches (Figure 2). Assessments of tiger population densities enable WCS to determine if the tiger conservation interventions are successful and to provide a transparent and scientifically-endorsed assessment of the status of tigers in Leuser and BBS. A related initiative is the periodic assessment across Sumatra of tigers and other large mammals using "occupancy" based statistical approaches. Occupancy approaches provide index values rather than absolute densities, but they are very powerful and an increased index value is a clear sign of a greater number of tigers. WCS is a core member of a consortium of NGOs and researchers who regularly undertake occupancy-based studies on the distribution and density of large mammals across Sumatra using a shared and scientifically robust methodology (Figures 18 and 19). These camera-trapping and occupancy efforts are also tremendous at training young WCS-Indonesia staff in wildlife science and statistical methods and further act as a magnet for talented young Indonesia interested in wildlife and wildlife science who wish to pursue their interests in a meaningful way.

A second major research initiative is periodic assessments of the status of tiger prey. Much of the Leuser and BBS landscapes are primary rainforest, where animal densities are naturally low and thus WCS here too uses occupancy based statistical approaches, which are more suitable for low-density situations. Prior occupancy studies also revealed that tiger prey species are found throughout the Leuser and BBS landscapes (Figure 20).

A third major research initiative is regular assessments of tiger habitat in Leuser and BBS through remote sensing, GIS, satellite imagery and other mapping technologies (Figure

8). Habitat loss is a significant threat in both Leuser and BBS and hence high-quality data on the status of habitat is critical to finding solutions.

GPS collaring of tigers, although not yet an active WCS initiative, is politically acceptable, technically feasible and would very much help in providing insights into finding even more effective solutions to human-tiger conflict.

Your support for WCS-Indonesia's tiger and tiger prey research efforts will enable regular, transparent, scientifically rigorous assessments of the status of tigers, tiger prey and tiger habitat in the Leuser and BBS landscapes. This scientific information will enable the collaboration between WCS-Indonesia and the Government of Indonesia to respond to the threats to tigers in a timely and adaptive fashion. Given the dynamic nature of the threats to tigers in Sumatra, such rapid course corrections will be necessary for the recovery of wild tigers across the both the Leuser and BBS landscapes.

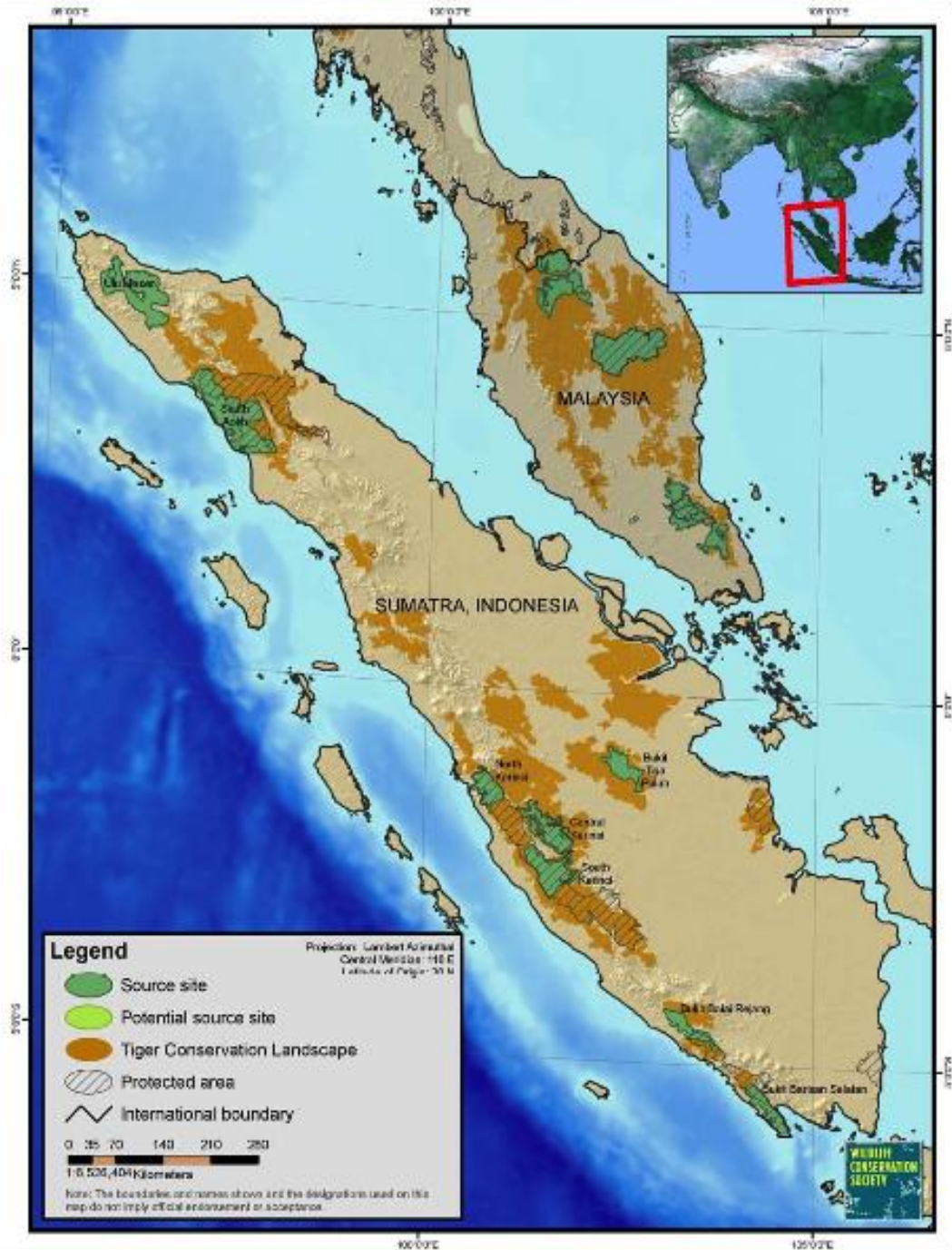


Figure 1 – tiger habitat and tiger landscapes on the island of Sumatra. The greater Leuser landscape includes the area from Ulu Masen to South Aceh. WCS works primarily in the southern half of the Leuser landscape. The Kerinci-Seblat landscape includes the North Kerinci, Central Kerinci and South Kerinci areas. The greater Bukit Barisan Selatan landscape includes the Bukit Balai Rejang area.



Figure 2 – Tiger camera trap photo taken in 2010 from the heart of the Leuser tiger landscape



Figure 3 – illegal land clearance inside Leuser.



Figure 4 – A recipe for disaster; fresh tiger, wild pig and motorbike tracks from the edge of the Leuser landscape. Humans encroach upon the habitat to make a mosaic of secondary forests and agriculture, which is a heaven for wild pigs. Tigers follow the wild pigs, then get caught in pig snares or embroiled with livestock or humans, almost always with negative consequences (see Figure 5).



Figure 5 – Two tiger cubs caught in a snare in the southern region of the Leuser landscape



Figure 6 - A whole tiger skin confiscated during a collaborative anti-poaching effort between WCS and Government of Indonesia authorities in the Leuser landscape.



Figure 7 - Hundreds of wildlife parts, including tiger bones as shown in this picture have been confiscated from an art shop in Jakarta. The suspects were arrested during a collaborative effort between WCS and the Government of Indonesia. The suspects are now being tried in court.

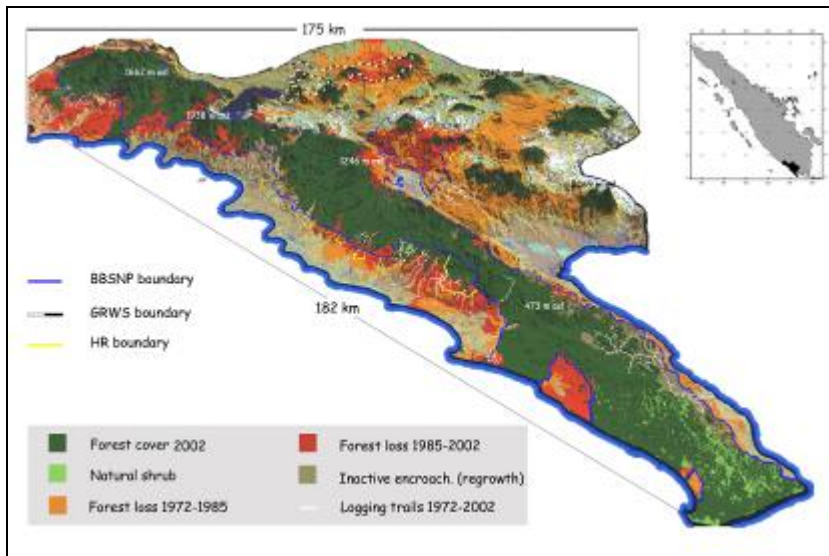


Figure 8 – habitat loss in BBS. Note the linearity of the BBS. Not depicted on this map and further northwest is the Bukit Balai Rejang Forests, which are part of the greater BBS landscape. The forests of Bukit Balai Rejang also suffer from high deforestation, but perhaps fortunately they are somewhat less linear.



Figure 9: Patrol team arresting illegal poachers in Gunung Leuser National Park area.



Figure 10: To reduce human-tiger conflict, WCS staff regularly work with villagers to construct tiger proof enclosures for domestic livestock. Such enclosures are deliberately inexpensive to construct and maintain and rely on simple, readily available materials such as barbed wire. Tiger proof enclosures range in size depending on local conditions. WCS has worked with local villages to construct hundreds of such tiger proof enclosures across the Leuser and BBS landscapes.



Figure 11 – WCS-Indonesia staff undertaking outreach activities related to tiger conservation and human-tiger conflict mitigation in a village near BBS.



Figure 12 – WCS-Indonesia regularly undertakes conservation education efforts related to tigers with children and adults in the communities living near the BBS and Leuser landscapes.



Figure 13 – Systematic research into tiger numbers is a major effort for WCS-Indonesia staff.



Figure 14: Patrol team with 3 elephants from Aras Napal Elephant Training unit after destroying 35 hectares of illegal oil palm plantation inside Gunung Leuser National Park.

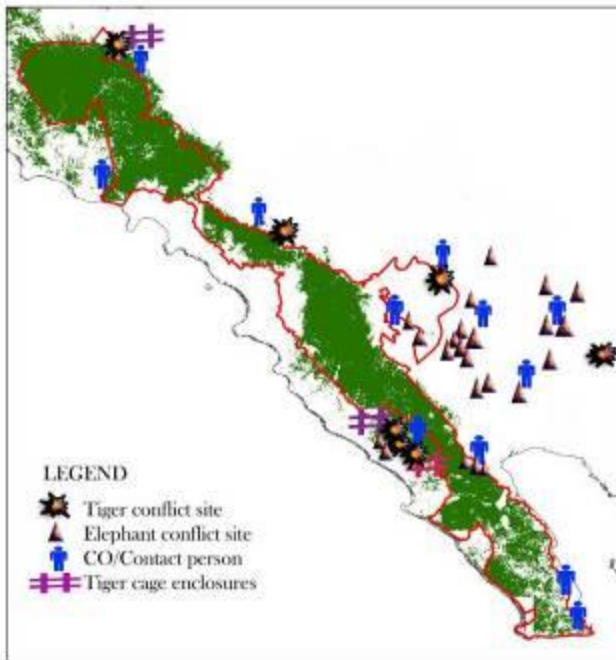


Figure 15 – locations of human-tiger conflict and community wardens in BBS. WCS also runs an extensive human-elephant conflict mitigation effort, which uses the same staff as the human-tiger conflict mitigation project. The # sign indicates villages within which many tiger proof enclosures have been constructed.



Figure 16 – WCS staffperson trained in veterinary health treating a young tiger caught in a pig snare at the scene. The tiger later had to have its front leg amputated and is now in captivity



Figure 17 – the removal of illegal snares that can capture tigers is a major component of the human-tiger conflict mitigation effort.

Sumatra-Wide Survey

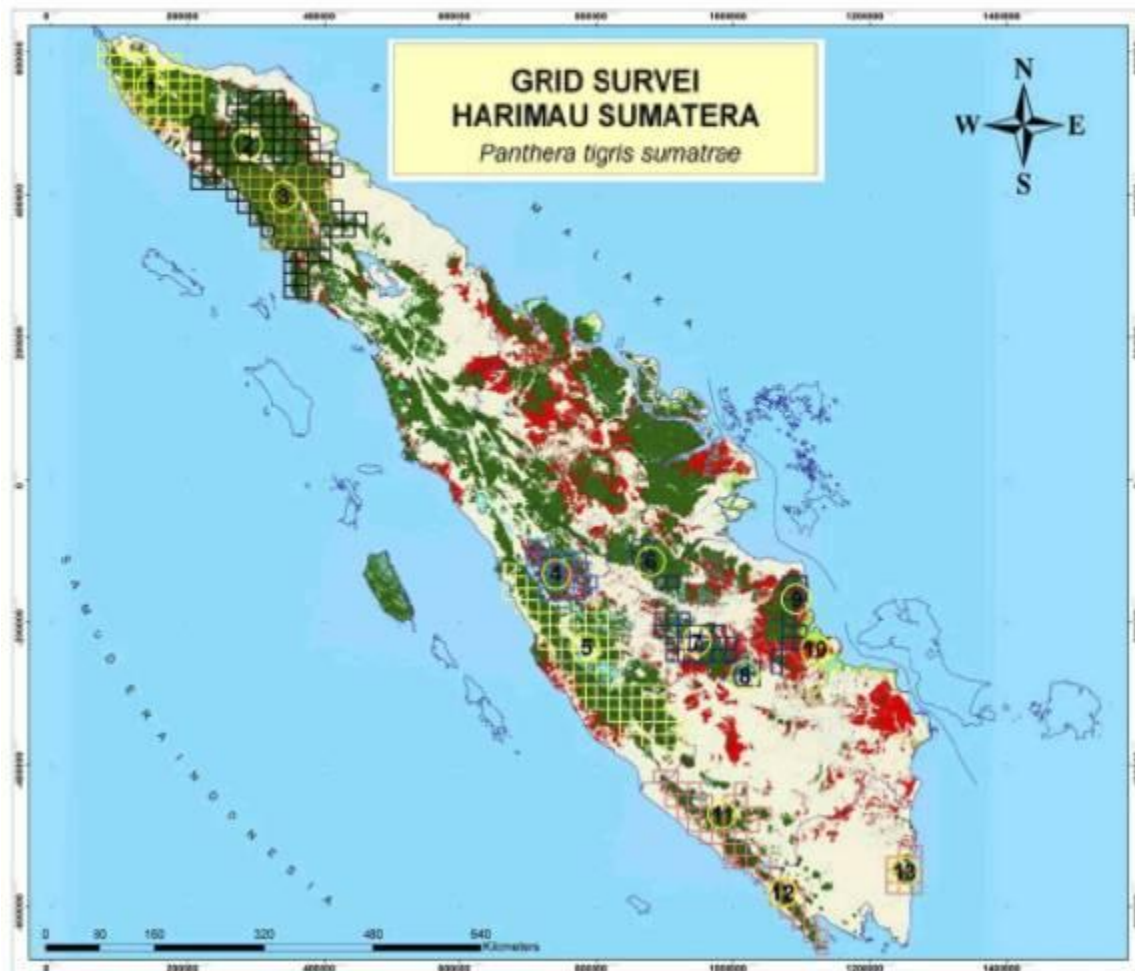


Figure 18 – WCS is a member of a consortium of NGOs and researchers interested obtaining information about the status and distribution of tigers, elephants and other large mammals on Sumatra. The consortium uses a shared methodology such as standardized maps and shared occupancy-based statistical approaches.

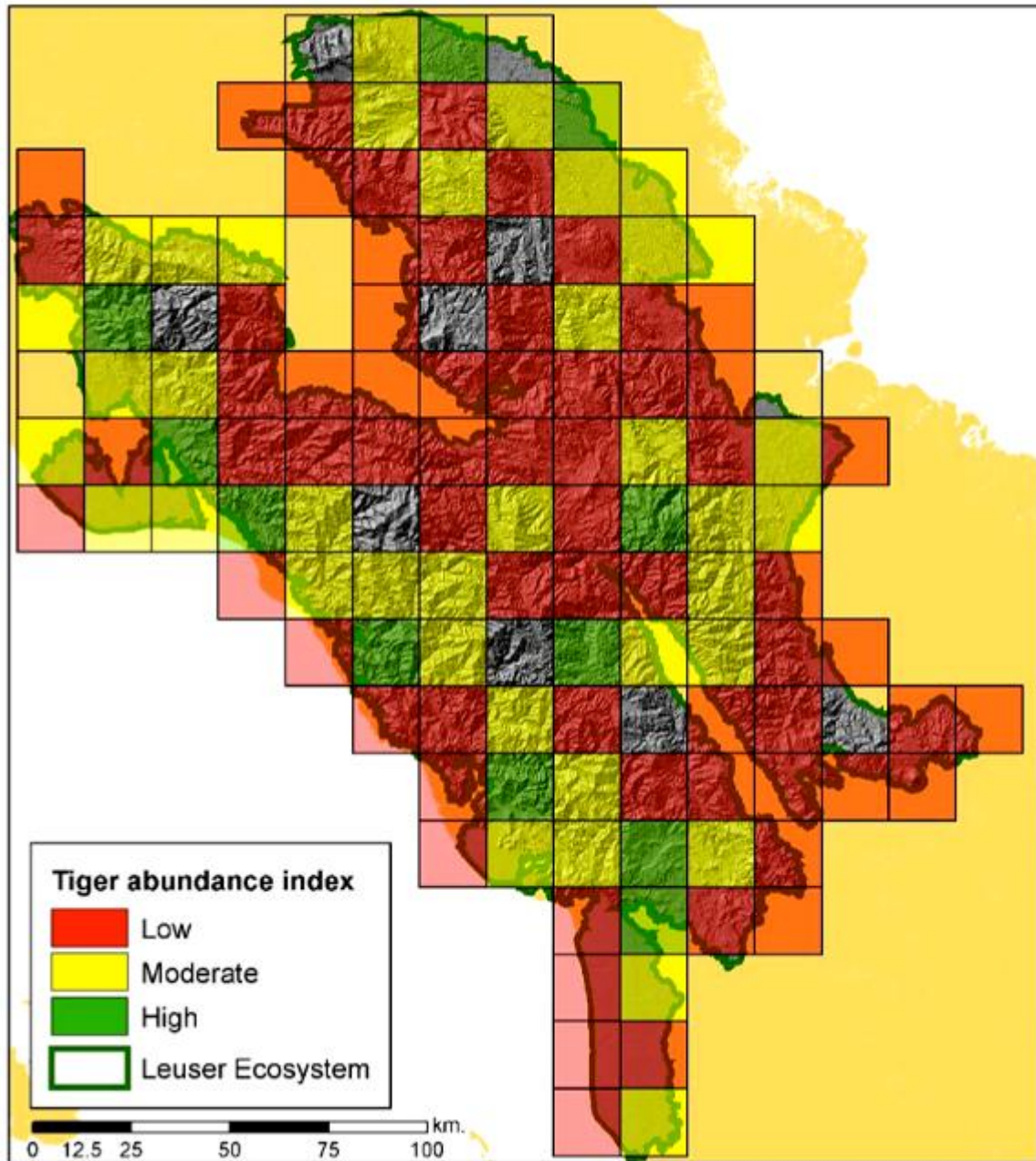


Figure 19 – Tiger abundance indices from occupancy data collected in 2008 for the Leuser landscape.

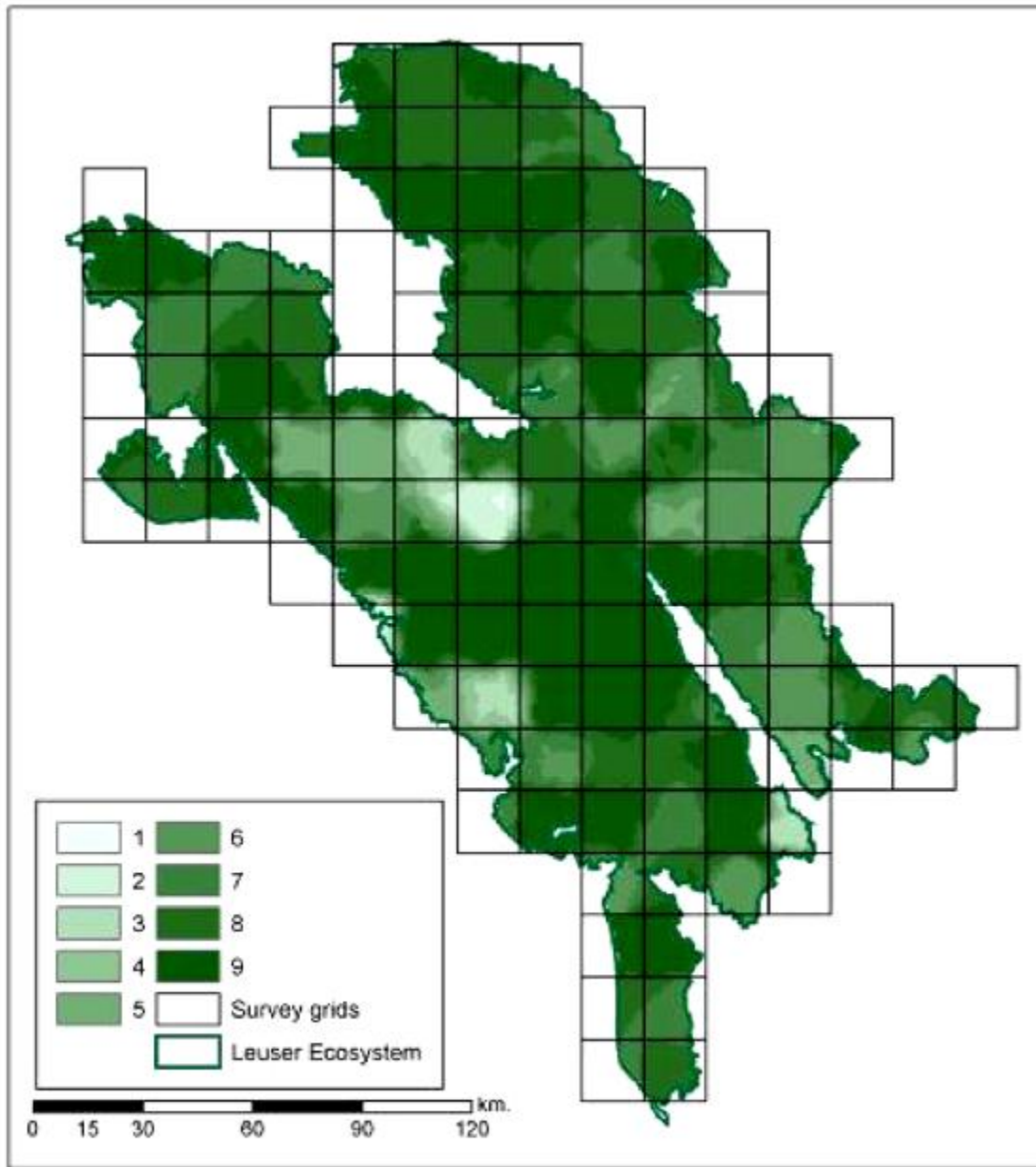


Figure 20 – Prey abundance indexes from occupancy data collected in 2008 for the Leuser landscape.