SUN
BEAR

CONSERVATION OF SUN BEAR
(Helarctos malayanus)
IN MYANMAR

OIKOS

2016–2020

CONSERVATION OF SUN BEAR
(Helarctos malayanus)
IN MYANMAR

is a project promoting the conservation of one of the least known bear species in the world and of its habitat in Myanmar, a country considered to have the largest expanse of potential species range in mainland Southeast Asia. The Sun Bear Project has increased understanding of the status of the species in two regions of Myanmar (Rakhine and Sagaing), improved the long-term protection of forest habitats through sustainable and community-based management, trained local people and shared information about the sun bear with government decision makers and local communities.

This publication presents the approaches, activities, lessons learnt and results of the project; it is based on end-line data collection and analysis and is enriched with testimonies from beneficiaries and representatives of local authorities, reflecting on project design, implementation and impact.

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18,000 CAMERA TRAPPING DAYS over three field seasons

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32 SPECIES OF MEDIUM AND LARGE MAMMALS recorded on camera traps in Htamanthi Wildlife Sanctuary (Sagaing)

COMMUNITY FORESTS

In Sagaing, the management plan for the sustainable use of 18,486 acres of forests was produced, leading to the recognition of

12 COMMUNITY FORESTS

In Southern Rakhine
17 COMMUNITY FORESTS for a total of more than 2,500 acres were supported, involving 530 members of the local communities

32,400 TREES were planted for reforestation operations

COMMUNITY GUARDIAN GROUPS

10 COMMUNITY GUARDIAN GROUPS (each made of 10 local people) were formed and trained in 10 villages in Southern Rakhine

5 COMMUNITY PATROLLING GROUPS were created in Sagaing, leading to the removal of about 100 metal and nylon snares in the first year of monitoring

KNOWLEDGE & AWARENESS RAISING

450 VILLAGERS in Rakhine and Sagaing attended awareness-raising campaign events

5,100 STUDENTS from 64 schools involved in the sun bear environmental campaign

800 TEACHERS' HANDBOOKS

and

7,500 COMIC BOOKS produced and distributed

ILLEGAL TRADE SURVEY

80 VILLAGES INVESTIGATED for the hunting and illegal trade of bears and other wildlife

459 VILLAGERS INTERVIEWED about the hunting and illegal trade of bears and other wildlife

1,700 USD/KG selling price of bear gallbladder in Sagaing

150-3000 USD selling price of 4 sun bear paws in Rakhine

50-200 USD selling price of sun bear bile in Rakhine

PROJECT FACTSHEET

Sector: Biodiversity conservation
Lead Partner: Istituto Oikos
Other Partners: Wildlife Conservation Society (WCS), Rakhine Coastal Region Conservation Association (RCA), University of Insubria, University of Milano Bicocca, Nature and Wildlife Conservation Division, Forest Department – Ministry of Natural Resources and Environmental Conservation of Myanmar (MONREC)
Budget: € 1,115,249
Duration: 2016-2020

The Sun Bear Project focused on the protection of one of the least known bear species in the world, through an integrated program of field monitoring, community-based forest management and protection, education and awareness-raising campaigns, training of local people, and pilot anti-poaching schemes. The sun bear is listed as Vulnerable on the IUCN Red List. It is found in tropical forest habitats of Southeast Asia; Myanmar, in particular, is considered to have the largest expanse of potential species range in mainland Southeast Asia.
The main achievements of the Sun Bear Project include:
• a better understanding of sun bear distribution and a check list of other wild animal species present in Southern Rakhine and Sagaing, thanks to data collected over 18,000 camera trapping days and other field activities
• promotion of the improved management of 21,000 acres of forest habitats through a sustainable and community-based approach
• a regular patrolling schedule for 15 established Community Guardian Groups against poaching and illegal logging
• rural village communities sensitised towards sun bear and biodiversity conservation thanks to the involvement of 5,550 people through environmental campaigns in the schools and villages of the study area
• successful training and capacity building of local people
• increased national and international attention focused on sun bear conservation in Myanmar
• a Sun Bear Conservation Action Plan for Htamanthi Wildlife Sanctuary, Rakhine Yoma Elephant Range Wildlife Reserve and surrounding areas.

The project is the result of a partnership between Istituto Oikos and the Wildlife Conservation Society, both experienced in the field of community forest management, ecological monitoring and wildlife conservation, and with the support of other research institutes, a local NGO, and the cooperation of the Forest Department of Myanmar.
The project was co-financed by Fondation Segré, the Italian Agency for Development Cooperation, UNDP, World Animal Protection, Keidanren Nature Conservation Fund, Fondation Ensemble and 8X1000 Waldensian Church.

Legend

- ▪ regional capitals of Myanmar
- 🟩 sun bear project area
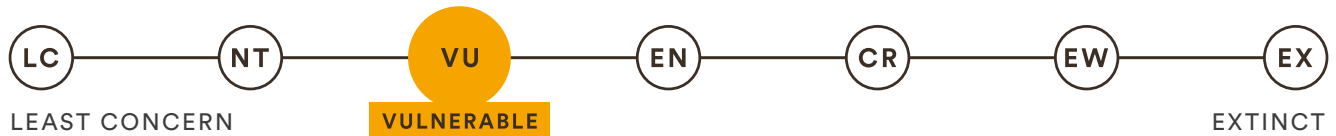
100 0 100 200 300 400 km

SUN BEAR IN MYANMAR

Common name: Sun bear or Malayan bear (English), XquiX (Myanmar national language)
Scientific name: *Helarctos malayanus*

IUCN RED LIST STATUS

LC — NT — **VU** — EN — CR — EW — EX

LEAST CONCERN   **VULNERABLE**   EXTINCT
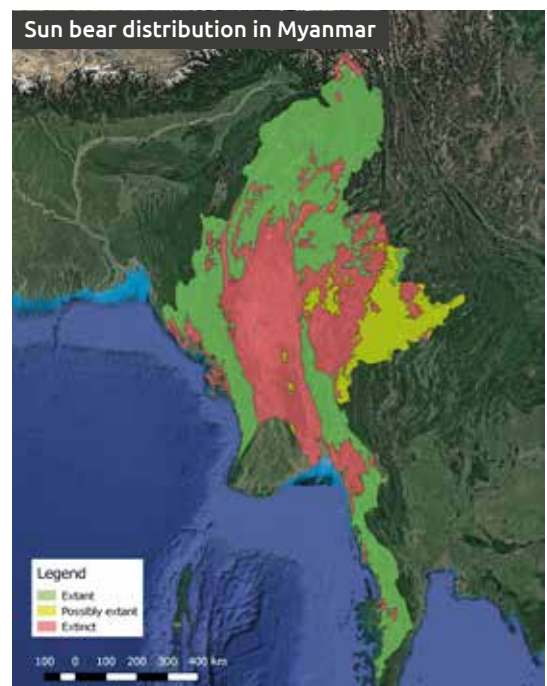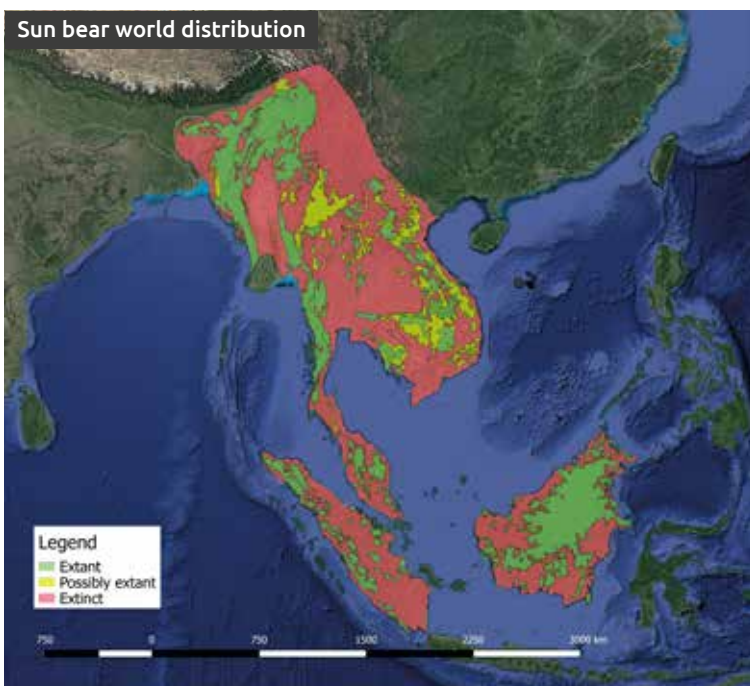
CURRENT POPULATION TREND: Decreasing

DISTRIBUTION

Historically present within Southeast Asia from Borneo and Sumatra to Southern China and Assam (India), sun bears today are sparsely distributed in India, Bangladesh, Myanmar, Thailand, Lao PDR, Cambodia, Vietnam, Malaysia, Brunei and Indonesia while their presence in China remains uncertain. The area they occupy is decreasing through much of their former range and becoming increasingly fragmented with some patches being completely isolated. Myanmar is probably the country with the second greatest range area of the species (after Indonesia) but there has been no structured monitoring scheme before the present project.
The species is listed as Vulnerable on the IUCN Red List.

Sun bear world distribution

Legend
Extant
Possibly extant
Extinct

Sun bear distribution in Myanmar

Legend
Extant
Possibly extant
Extinct

PHYSICAL DESCRIPTION

Sun bears are the smallest members of *Ursidae*. Their average weight varies according to food availability, region and sex, generally ranging from between 25 to 80 kg; they grow to around 120-150 cm, including a 5 cm-long tail.
Sun bears exhibit a unique combination of a heavily domed skull, short and robust lower jaw, short nose, and low eye position, giving them a stout appearance. Their black coat is adorned with a white or yellowish patch on the chest (a rising sun, according to legend); their fur is short to avoid overheating in the tropical weather but thick and coarse enough to provide protection from twigs, branches, and rain. Their hind limb musculature and tendon structure is uniquely well suited for climbing trees.

HABITAT

Sun bears are a forest-dependent species, favoring interior mature and/or heterogeneously structured primary forests. In Myanmar they occupy seasonal evergreen and deciduous forests, spanning from lower elevations to higher altitudes, where they are sympatric with Asiatic black bears. However, they also use selectively logged areas and have been observed in plantations, agricultural lands, orchards and at the edges of forests, where they may be considered pests.

Sun bears inhabit a warm, humid climate, characterized by low seasonal and diurnal temperature fluctuations ranging from 23°C to 30°C.

DIET

Generalist omnivores, sun bears have the longest canine teeth relative to skull size of all bears and an unusually strong bite: the robustness of their skull and dentition are adaptations for tearing into hard substrates, such as logs and termite mounds, for food; they particularly favor stingless bees, whose nests they access by chewing through the wood of living trees. Their exceptionally long tongues seem to be another adaptation for feeding on insects. Other primary food sources for sun bears are honey and fruit.

REPRODUCTION

Sun bears are the only *Ursidae* species capable of reproducing at any point during the year, although wild populations may exhibit some seasonality in reproductive activity. Female bears use cavities of either standing or fallen large hollow trees as birthing sites. They give birth to one (more frequently) or two cubs.

SOCIAL HABITS AND BEHAVIOUR

Both diurnal and nocturnal behavior has been documented, but little is known about their social structure. Sun bears seem to be largely solitary, except when with their offspring, but they occasionally occur in pairs, and may congregate to feed from large fruit trees. Average home-range estimates from Borneo and Peninsular Malaysia range from 7 km² to 27 km², with daily movements affected by food availability.

There are no reports of sun bears hibernating.

INTERACTION WITH PEOPLE

Although relatively small, sun bears are known to be fierce and aggressive if disturbed: this has resulted in people fearing the species, which is frequently hunted in retaliation. Crop and orchard raiding and, more rarely, attacks on livestock have contributed to the culling of the species by local communities.

THREATS

Sun bears in Myanmar are threatened primarily by deforestation and poaching for consumption and commercial use (for gall bladders, bile, meat or pet trade). An additional threat is human-bear conflict, due to sporadic crop raiding or alleged attacks on people.

SIGNS OF SUN BEAR PRESENCE

• Claw marks (typical scratches the bears leave on tree trunks when climbing to reach the canopy and feed on fruit or reach their nests)
• Nests (peculiar formations in the canopy of trees used by the animal to rest when the ground is particularly wet or when they feel exposed to danger)
• Feeding sites (typical holes made by the bears in the bark of trees to reach honey)
• Footprints and scats.

FURTHER INFORMATION
- Scotson, L., Fredriksson, G., Augeri, D., Cheah, C., Ngoprasert, D. & Wai-Ming, W. 2017. Helarctos malayanus . The IUCN Red List of Threatened Species 2017
- Crudge, B., Lees, C., Hunt, M., Steinmetz, R., Fredriksson, G., & Garshelis, D. (2019) (Eds) Sun Bears: Global status review & conservation action plan, 2019-2028. IUCN SSC Bear Specialist Group / IUCN SSC Conservation Planning Specialist Group /Free the Bears / TRAFFIC.

SUN BEAR

1. SUN BEAR MONITORING: AN INNOVATIVE APPROACH TO IMPROVING KNOWLEDGE OF THE ECOLOGY AND CONSERVATION STATUS OF THE SPECIES IN MYANMAR

MONITORING FOR BETTER CONSERVATION

Size and distribution of wild animal populations are key elements in determining their conservation *status*, especially for species at risk of extinction. The Malayan sun bear is one of the least known bear species and is considered **Vulnerable by IUCN**, although there is insufficient robust data on its presence across its distribution range. Myanmar is part of its native range: the country is considered to have **the largest potential range** of the species in mainland Southeast Asia, but with huge areas currently referred to as "unknown".
In this context, information on its status and distribution becomes fundamental for management and to support the planning of proper conservation strategies.

MONITORING CONCEPTS AND FIELD PRACTICES

The sun bear is very difficult to study in the wild for its hidden behavior and for the complexity of realizing field researches in its typical habitat.
The project, therefore, used two monitoring methodologies: **camera traps and signs of presence** recorded along line transects, to collect new information about sun bears in the study areas and to find an efficient and reliable way of monitoring this species on the Myanmar mainland.
Eight survey sites were selected in two regions of Myanmar with different habitat types as well as different protection levels: in Rakhine, near the Rakhine Yoma Elephant Range Wildlife Reserve, and in Sagaing, inside the Htamanthi Wildlife Sanctuary.
Thirty camera traps were positioned around each site and activated for about **45 days** during the dry season. The positioning of the camera traps took about 10 days in each area due to the difficulties in accessing the project sites. The equipment was checked after 15 days to monitor the functioning of the cameras and the level of the batteries. After 50 days, the cameras were collected, the videos downloaded from the memory cards and delivered to the research centre for scientific analysis. The same method of data collection through camera traps was repeated for 3 consecutive years (2016/2017, 2017/2018 and 2018/2019); the same areas were monitored so that data could be compared and to strengthen the power of the abundance models for the target species.
During the camera trapping missions, **transect surveys** were also carried out. Each site was covered by a transect network, for a total length of approximately 80 km: surveys were repeated over a 5-day period every 45 days, in two different portions of each pilot area, and tracked using GPS receivers. This activity was also repeated three times. The following sun bear tracking signs were recorded by marking the GPS position, taking pictures and collecting information about the age and characteristic of the sign:
• claw marks
• nests
• feeding sites
• footprints and scats

SUN BEAR STARRING

Thanks to the great survey effort, with a total of **18,000 camera trapping days**, 243 videos of sun bears were recorded. Both detection and occupancy varied greatly across study sites: in more dense habitat (e.g. evergreen forest), for instance, there was lower detection than in open habitat (e.g. degraded forest).
To perform occupancy models for Southern Rakhine, **198 independent sun bear presence points** from camera traps were included in the analysis. Environmental characteristics were also integrated to be able to factor in sun bear habitat preferences. The **potential distribution map** shows a higher presence of the species far from human-populated areas along the coast and where evergreen forests are better conserved, although the species was occasionally recorded in bamboo and degraded forest areas. It appears that there is a low-density distribution of sun bears at the project sites; the bear was found most frequently in the southernmost zone of the sites surveyed, in an area still characterized by the presence of large trees and evergreen forest.

The daily activity pattern of the sun bear was also modeled to understand when the species is most active and the impact of human disturbance on the bears. It was noted that **sun bears are active all day**, with a peak around midday, when human activities decrease; the bears' main activity peak is at sunset. Sun bears can thus be considered "cathemeral", meaning they are active both during the day and at night.

A total of **313 km of transects** were recorded during the surveys and **116 bear signs** registered just in the study area of Southern Rakhine during the first year: the large quantity of data collected, which far exceeded the expectations and aims of the project, was delivered to the scientific team and used to evaluate the information collected through camera traps and to validate the presence models.

A comparison of the two monitoring methodologies (camera trap and transect) demonstrates that **camera-trapping is more reliable** because it is less susceptible to misinterpretation and statistical error. As well as species abundance and distribution, camera traps can provide useful information on daily/nightly activity rhythms, contribute to checklists of the faunal community and also help in assessing the intensity of human activities in the study area.
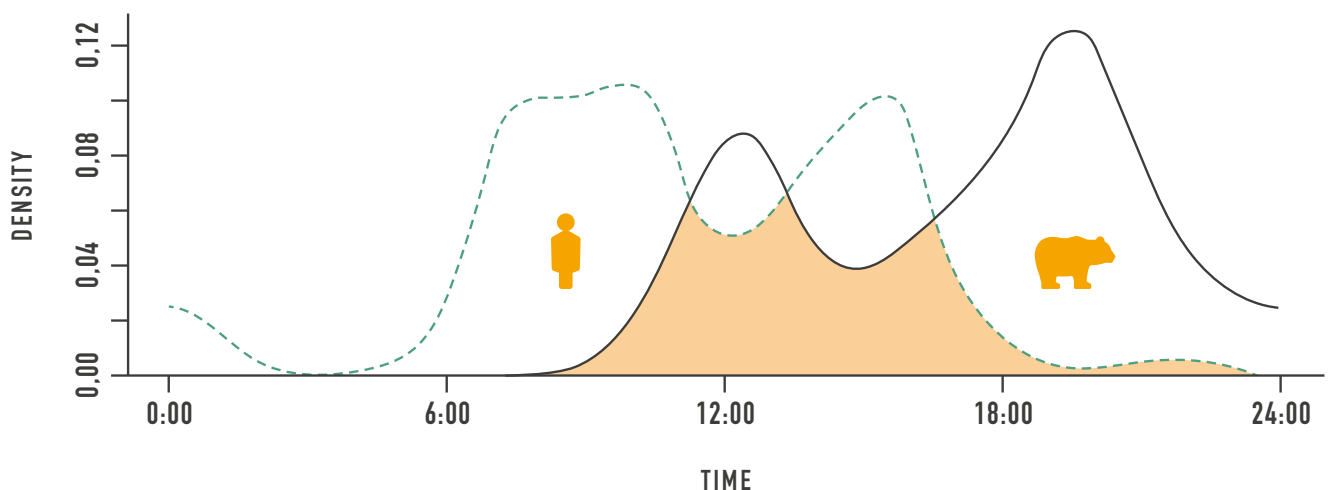
Helarctos malayanus (black line) and *Homo sapiens* (blue dotted line) activity patterns for Rakhine survey sites

SUN BEAR

OTHER SPECIES STARRING

Camera traps favored the compilation of an updated checklist of the medium-large mammals present in Rakhine and Sagaing. Several videos of highly threatened and charismatic species were recorded in both study areas including the Asiatic black bear (both in Sagaing and Rakhine), the tiger (in Sagaing), the Clouded leopard (both areas), the Asian elephant (both areas), the dhole (both areas) and the Sunda pangolin (both areas). Three species were recorded for the first time in the Rakhine Yoma Elephant Range Wildlife Sanctuary: the binturong (*Arctictis binturong*), the red serow (*Capricornis rubidus*) and Phayre's leaf monkey (*Trachypithecus phayrei*). For species with a sufficient number of localizations, a distribution model was realized, which will contribute to the identification of priority conservation areas.

LEGEND
- 🟢 Least Concern
- 🔵 Near Threatened
- 🟡 Vulnerable
- 🟤 Endangered
- 🔴 Critically Endangered

Medium and Large Mammals Checklist
Rakhine Yoma Elephant Range Wildlife Sanctuary, Rakhine 2019

COMMON NAME	SCIENTIFIC NAME	CONSERVATION
Leopard Cat	*Prionailurus bengalensis*	🟢
Asian Golden Cat	*Catopuma temminckii*	🔵
Marbled Cat	*Pardofelis marmorata*	🔵
Clouded Leopard	*Neofelis nebulosa*	🟡
Asian Palm Civet	*Paradoxurus hermaphroditus*	🟢
Large Indian Civet	*Viverra zibetha*	🟢
Binturong	*Arctictis binturong*	🟡
Sun Bear	*Helarctos malayanus*	🟡
Asiatic Black Bear	*Ursus thibetanus*	🟡
Dhole	*Cuon alpinus*	🟤
Golden Jackal	*Canis aureus*	🟢
Crab-eating Mongoose	*Herpestes urva*	🟢
Malayan Porcupine	*Hystrix brachyura*	🟢
Asiatic Brush-tailed Porcupine	*Atherurus macrourus*	🟢
Indian Muntjac	*Muntiacus muntjac*	🟢
Sambar	*Rusa unicolor*	🟡
Red Serow	*Capricornis rubidus*	🔵
Gaur	*Bos gaurus*	🟡
Wild Boar	*Sus scrofa*	🟢
Northern Pig-tailed Macaque	*Macaca leonina*	🟡
Phayre's Leaf Monkey	*Trachypithecus phayrei*	🟤
Asian Elephant	*Elephas maximus*	🟤
Sunda Pangolin	*Manis javanica*	🔴

Medium and Large Mammals Checklist
Htamanthi Wildlife Sanctuary, Sagaing 2019

COMMON NAME	SCIENTIFIC NAME	CONSERVATION
Leopard Cat	*Prionailurus bengalensis*	🟢
Marbled Cat	*Pardofelis marmorata*	🔵
Asian Golden Cat	*Catopuma temminckii*	🔵
Tiger	*Panthera tigris*	🟤
Clouded Leopard	*Neofelis nebulosa*	🟡
Asian Palm Civet	*Paradoxurus hermaphroditus*	🟢
Large Indian Civet	*Viverra zibetha*	🟢
Masked Palm Civet	*Paguma larvata*	🟢
Spotted Linsang	*Prionodon pardicolor*	🟢
Binturong	*Arctictis binturong*	🟡
Yellow-bellied Weasel	*Mustela kathiah*	🟢
Back-striped Weasel	*Mustela strigidorsa*	🟢
Yellow-throated marten	*Martes flavigula*	🟢
Greater Hog Badger	*Arctonyx collaris*	🟡
Large-toothed Ferret Badger	*Melogale personata*	🟢
Sun Bear	*Helarctos malayanus*	🟡
Asiatic Black Bear	*Ursus thibetanus*	🟡
Dhole	*Cuon alpinus*	🟤
Crab-eating Mongoose	*Herpestes urva*	🟢
Malayan Porcupine	*Hystrix brachyura*	🟢
Asian Brush-tailed Porcupine	*Atherurus macrourus*	🟢
Indian Muntjac	*Muntiacus muntjak*	🟢
Sambar	*Rusa unicolor*	🟡
Chinese Serow	*Capricornis milneedwardsi*	🔵
Gaur	*Bos gaurus*	🟡
Wild Boar	*Sus scrofa*	🟢
Northern Pig-tailed Macaque	*Macaca leonina*	🟡
Stumped-tailed Macaque	*Macaca arctoides*	🟡
Rhesus Monkey	*Macaca mulatta*	🟢
Asian Elephant	*Elephas maximus*	🟤
Chinese Pangolin	*Manis Pentadactyla*	🔴
Sunda Pangolin	*Manis javanica*	🔴
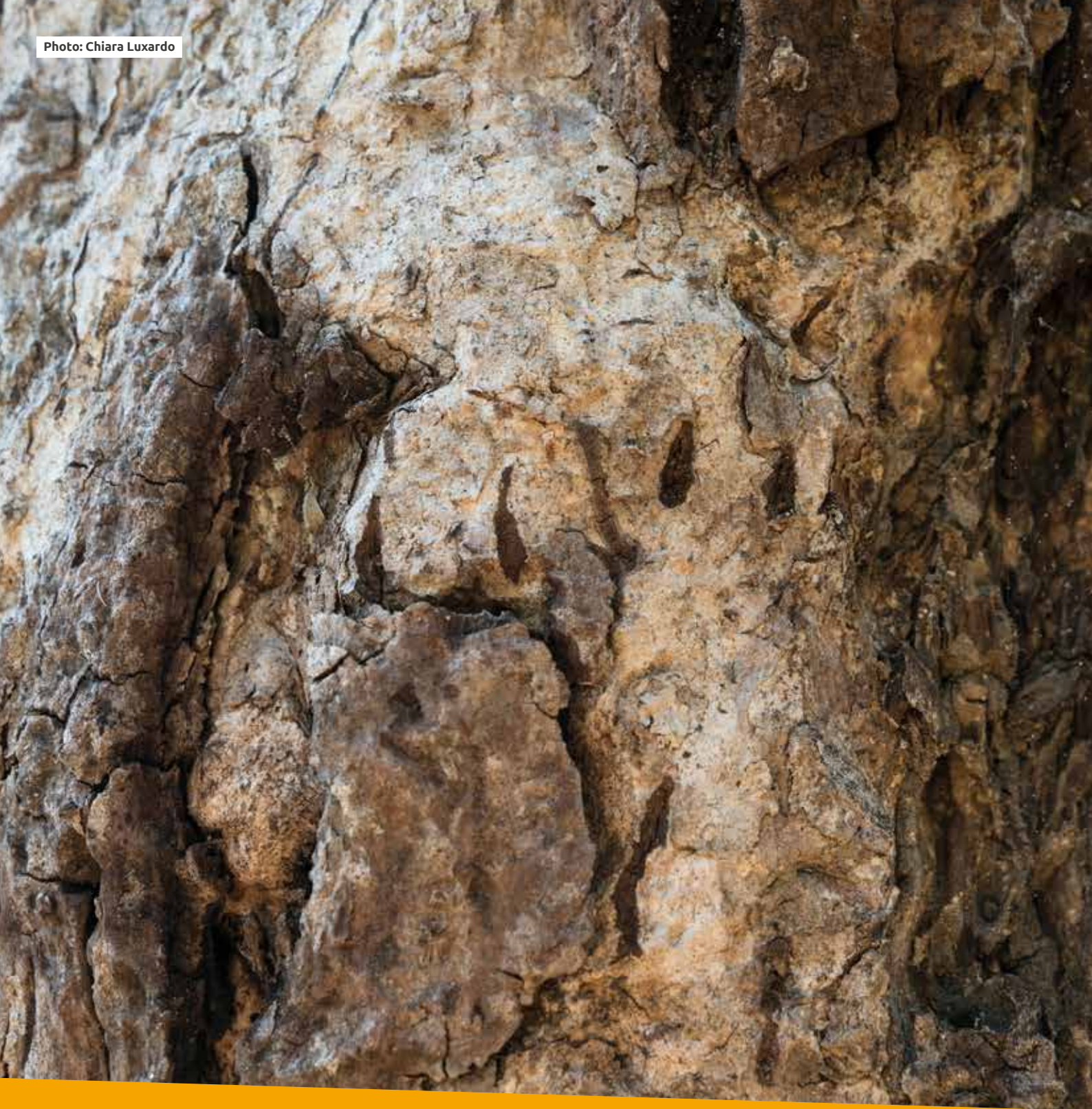
SUN BEAR

"While carrying out forestry activities, we found 3 places with sun bear tracks and signs in our Community Forest area. We understood that the bear had been looking for honey in a tree, because we found the remains of a beehive and bees at its roots. It is good to find those tracks and signs in our forest because it means that our forest is growing denser and once more becoming a natural habitat for wildlife".
U Ko Soe Win, CF Member from Tone Taw – Rakhine

2. HABITAT RESTORATION: COMMUNITY FORESTS AND COMMUNITY MANAGED BUFFER ZONES AS A TOOL TO REDUCE HABITAT LOSS AND FRAGMENTATION

THE ROLE OF COMMUNITY FORESTS AND COMMUNITY MANAGED BUFFER ZONES

Myanmar rural communities heavily depend on forest products (building materials, firewood, non-timber forest products) resulting in **severe pressure on the natural habitat** of the sun bear and other wild species.

In addition, large areas of forest are being taken over by rubber and teak plantations. Although the local communities have been using the forest areas surrounding their villages for decades, with customary rights transmitted from generation to generation, there is no legal documentation confirming their ownership of the land. On the other hand, the Forest Department, the authority responsible for managing Myanmar's permanent forest estate, is committed to devolving forest rights to local communities in line with the National Forest Master Plan (2000-2030) and the Community Forestry Instructions (issued in 1995 and reviewed in 2019). The role of **community participation in forest management** is further reinforced by the Myanmar National Environmental Policy (2019) and the Myanmar Climate Change Policy (2019).

Within the current legal framework, communities can apply to the Forest Department for the certification of Community Forests linked to a 30-year management plan (renewable), formalizing and regulating their access to and use of forest resources.

The Community Managed Buffer Zone is an initiative promoted in Sagaing to foster the inclusion and participation of local communities in the management system of the forest land around the Htamanthi Wildlife Sanctuary.

PARTICIPATORY FOREST PLANNING AND MANAGEMENT

The selection and site identification of **Community Forest User Groups (CFUGs)** are the most important elements for the success of the community forest.

CFUGs should be formed primarily by forest users and aim to include women and the most vulnerable households. The formation of CFUGs was achieved through a participatory stakeholder analysis to identify key groups, analyse their interest/influence/power, and understand potential conflicts. For the primary groups, a 3R analysis (Rights, Responsibilities, Returns) was conducted.

Site identification was based on an accurate identification of the beneficiaries of each forest area. Precise boundaries were marked by GPS on existing maps; the size of each site was tailored to the CFUG's management capacity and land tenure classification was verified.

Participatory assessment gave a clear picture of each target village, the forest resources and the relationships between the two. Participatory tools such as historical timelines, seasonal calendars, transect walks, resource maps, ranking, probing and problem trees were used.

A village profile was drawn with the contribution of demographic and physical data from the local authorities. Deeper analysis included the profiles of representative households, livelihood systems, forest users, land tenure and use rights.

A **management plan** was developed - based on the village profile and the forest resource assessment - which is a basic requirement of the Community Forest Instructions and a management guide for the CFUGs.

A **training program** was designed and implemented to empower local communities to be the leading actors of the CF process. Each CFUG received a **small grant** to cover the costs of materials and equipment for nursery construction and planting, the purchase of seeds, transportation, water supply improvement and so on.

SUSTAINABLE FORESTS FOR WEALTHY LOCAL COMMUNITIES

The project supported the creation and management of **13 Community Forests** in southern Rakhine benefitting 530 households. Over 2,000 acres have been officially certified by the FD as Community Forests so far. This is expected to increase with 4 new groups having recently started the application process.

The initiative has directly benefited **over 2,500 people** (members of Community Forestry User Groups and their relatives). They were given technical and institutional support to create and/or manage community

forests and improve their relations with local authorities.

The local community is now allowed to extract non-timber forest products such as herbs, mushrooms, bamboo, and to use firewood obtained during clearing operations carried out according to the management plan. In addition, part of the forest can be used for forestry, ensuring an income for the user groups. Nevertheless, in degraded areas where illegal logging has impoverished biodiversity and vegetal biomass, **up to 25% of the land is destined for reforestation**.

The project has also supported the process of coordinating the Community Forests of Southern Rakhine in their exploration of the potential to create clusters and enterprises. A **market analysis** has been carried out to investigate marketable products sustainably harvested from community forests and to scope the opportunities for establishing Community Forest Enterprises (CFE). By linking the Community Forests to the local market, the long-term sustainability of the initiative has been guaranteed.

In Sagaing the management plan for the sustainable use of **18,486 acres of forests** was compiled and the handover process from the General Administration Department to the Forest Department has started. This process will soon permit the implementation of forest conservation activities and thus lead to the certification of 12 Community Forests. In the long term, the management of such forests will be organized into higher level conservation bodies, which will ensure that part of the territory is dedicated to the constitution of a **protected area**, directly managed by local communities in collaboration with the Forest Department.

"Our Community Forest area is 106 acres, run by 31 user members. We have been certified by the Forest Department to manage our forest and to produce forest products according to our management plan for 30 years. Thanks to all the work done, now we have the chance to reduce illegal logging, illegal charcoal burning in the forest and illegal hunting. And we can also officially harvest the non-timber forest products in the forest".

U Win Naing Oo, Member of CFUG from Kyar Pyit Kone village – Rakhine

3. LOCAL COMMUNITY ENGAGEMENT: EMPOWERING VILLAGERS TO TAKE PART IN WILDLIFE AND FOREST ECOSYSTEM CONSERVATION

THE NEED FOR LOCAL COMMUNITY ENGAGEMENT

One of the main threats to the sun bear in Myanmar is **poaching**, which is carried out both by members of rural villages for subsistence use and pest control, and by professional hunters for **illegal trade**. It is also reasonably common for bears to be found in the wild by local people and captured to be sold on the black market for extra income. Local authorities do not usually have the resources to patrol the territory against poaching and other illicit activities such as illegal logging.

In this context, the project has fostered community engagement in territorial **patrolling**, providing economic support within a sustainable framework. The involvement of the communities living in the buffer zone of Rakhine Yoma Elephant Range Wildlife Reserve and Htamanthi Wildlife Sanctuary was thus closely linked to the development of Community Forests and Community Managed Buffer Zones. **Community Guardian Groups** were appointed to patrol "community goods" (i.e. forests, wildlife) against poaching, illegal logging and forest burning. Such groups represent both a preventive countermeasure and a system to improve the flux of information from the village level to the local authorities, permitting environmental crimes to be reported rapidly and directly to the Forest Department and to the police.

Community Guardian Groups were compensated for the services offered to the community by means of a small fund, to be used according to the **"revolving fund" scheme**, which had already been implemented in the study areas during previous projects. The revolving fund ensures the long-term sustainability of the project: patrolling missions are not paid a salary but have access to a reliable loan for productive activities (purchasing seeds, working tools, livestock), which can be used for community development activities.

A NEW COMMUNITY PATROLLING SYSTEM IN TARGET AREAS

10 Community Guardian Groups, each made of 10 local people, were formed in 10 villages of Southern Rakhine. Training was provided on topics including biodiversity conservation, equipment and reporting, patrolling, revolving funds, and each CGG was equipped with **GPS receivers, cameras and smart phones**. Specific meetings were also organized to raise awareness regarding the conservation of sun bears and other wild species; decisions on the terms of reference of the Groups were made together with the communities and there were discussions with the authorities on Myanmar's updated National Wildlife Law.

Once they had obtained official recognition from the Forest Department, Community Guardians performed **two patrolling missions per week** (during the dry season) in sensitive and strategic areas. They looked for poachers' tracks, illegal logging sites, snares, and reported their findings to the authorities: discoveries were shared in real time with project staff and with the Forest Department by means of an online group Viber app; groups were also provided with a hotline number to report emergency cases requiring the immediate intervention of the authorities. This activity was monitored in the first phase through the collection of patrolling datasheets and double-checking information. Once the patrolling system was considered fully effective, the 10 Groups were given access to the revolving funds through the establishment of a **management committee**, and were able to start using them for community development activities. Since the beginning of the activity, a minor presence of intruders inside the Community Forest was reported by the Community Guardian Groups members of Southern Rakhine.

In Sagaing, a similar activity was set up, implementing community patrolling in 5 villages. Community Guardian Groups also took part in project field activities. Within the first year of their activities, monitoring and patrolling in this area led to community participants **removing about 100 metal and nylon snares**, mainly targeting large mammals like bears, tigers, and tiger prey species. Although revolving funds were not planned for Htamanthi Wildlife Sanctuary, the project encouraged the communities involved in the Community Forests process and community patrolling/surveillance to consider depositing some percentage of their compensation allowance into a **community shared fund** to support the establishment of sustainable small businesses.

"The Revolving Fund supports the livelihood of our community contributing to our main activities, such as agriculture and livestock. We are committed to sustaining the Fund for long time and to using it to support our Community Forest and social development activities".
U Tin Wi, Chairman of CGG and CFUG from So Bon village – Rakhine

4. AWARENESS RAISING: THE SUN BEAR AS A VALUE AT LOCAL, NATIONAL AND INTERNATIONAL LEVEL

THE IMPORTANCE OF AWARENESS-RAISING ACTIVITIES FOR SUN BEAR CONSERVATION

At the beginning of the project, members of the local communities of Southern Rakhine and Sagaing appeared to be ill-informed about bears: their knowledge of the sun bear—and other local bear species, including the Asiatic black bear—was based more on **tales and legends** than on direct personal knowledge or experience, or factual information. The alleged aggressiveness of the bears and their sporadic raids of crops, orchards and livestock formed the basis of a **constant persecution of the species**, which was also hunted for meat and for other commercial uses. Even though local communities tend to be frightened by bears, the species represents, in fact, an exceptional source of income for the poorest households.

For this reason, **awareness-raising activities** were fundamental, a key axis of the whole project, the glue that kept conservation actions together.

ACTIVITIES AND FIELD PRACTICES

At a local level, communication and education activities increased knowledge about the sun bear, **reducing misconceptions and false information**, and changing the attitudes of community members alerting them to the harmful behavior that compromises the success of conservation activities.

The project focused on communicating to local people the role of the sun bear within the whole forest ecosystem, and its importance in the conservation of local forests and the wellbeing of village communities. This, in turn, engendered a positive image of the sun bear in terms of territorial identity.

At a national level, communication activities concentrated on increasing the public perception of the importance of biodiversity conservation and exposing mistaken beliefs and legends regarding wildlife. The project also attracted the attention of the **international scientific community** to Myanmar's biodiversity and the urgent need to develop adequate environmental conservation strategies.

THE SUN BEAR IN SCHOOLS

Education programs in the project areas have been at the basis of the project's entire awareness-raising campaign.

In Southern Rakhine, **64 schools** within the study area were initially contacted: their teachers took part in training on biodiversity, sun bear ecology, conservation problems and the correct behavior in the event of encountering a sun bear. The aim was to raise teachers' awareness of sun bear conservation issues as well as to understand local perspectives concerning wildlife. Above all, though, the aim was to initiate a **dialogue** with those who can really make a positive difference in changing opinions and behavior within local communities.

Teachers were then directly involved in the development of scholastic material such as:

• **a teacher's handbook**, in Burmese language and in English, aimed at expanding the science curriculum, focusing on biodiversity (with a section on wildlife and the sun bear), climate change, hygiene, nutrition, waste management. The handbook includes activities to engage students on each topic: an active learning approach was developed to stimulate students' curiosity and motivation, as well as promote understanding and analysis

• **a comic** on Nutrition, Environment, Community engagement and Pollution, featuring a sun bear character as the link between the community children and the forest, casting a positive light on the animal

• **a poster** on Biodiversity portraying 13 of the wildlife species present in Southern Rakhine State, including the sun bear.

These resources were distributed to students and teachers in 64 schools of Southern Rakhine, Community Forest villages within the project area, township administration departments, township education departments, health centres, the Rakhine Coastal Association and Environmental Education Centre at Kyeintali, and the Forest Department in Nay Pyi Taw.

Oikos educators then undertook **two education campaigns** targeting students and village communities in Southern Rakhine and including: awareness-raising exercises on sun bear biology, ecology and conservation; a drawing competition; a drama competition (public event), forest trips (short trekking for high school students inside sun bear habitat) and a song competition. These campaigns reached a total of **2,932 people**, as follows:

2017/2018
• **2,086 students from 23 schools**
• **455 adults (342 from 8 villages were reached by** *ad hoc* **awareness events + 113 people participated in the school events)**
2018/2019
• **2,647 students from 32 schools**
• **285 adults attending the events**
2019/2020
• **416 students from 7 schools**
Within the same campaign:
• **500 key chains were produced and distributed during the second drama competition**
• **500 stickers with project logos were produced and distributed during the first drama competition**
• **a photo exhibition "Rakhine Stories" was held at Myanmar Deitta Gallery in Yangon. Photos of forests, people from Rakhine and the sun bear monitoring campaign were displayed along with the screening of some of the videos from camera traps**

In Sagaing, the school environmental campaign was conducted in 25 villages, reaching a total of **2,457 students** and involving more than 100 villagers, with about 30 community guardians.

THE SUN BEAR IN THE MEDIA

To celebrate **International Bear Day** (4 April, 2017) a bear-dedicated day was launched on the main Wildlife Conservation Society social networks. A **competition** for the best articles, poems and slogans was held online and a song on sun bear conservation was created and published.

The Myanmar Bear Conservation page was periodically updated and the Facebook page for Myanmar Bear Conservation continued posting regularly. Consequently, the interest of the local media in bear ecology, conservation, and threats to the sun bear was maintained and articles about the project appeared regularly in national and international media.

THE SUN BEAR AS PART OF THE GOVERNMENT AGENDA

Project partners attended **various national workshops**, such as that concerning the Myanmar National Red List of Threatened Species, promoted in collaboration with IUCN. In March 2018, **the first meeting fully dedicated to bears in Myanmar** was organized within the project, representing a first big step towards the conservation of the two species of *Ursidae* in Myanmar. A total of 60 participants from local NGOs, international NGOs, universities, zoos and government representatives attended the meeting, which included a specific training course on sun bear monitoring for Forest Department staff as a side event.

These efforts have contributed to **drawing the government's attention to bear conservation** in Myanmar and will hopefully lead to the establishment of a sun bear working group, with Myanmar nationals and international experts.

The sun bear in Myanmar has gained growing attention at international meetings, especially those concerning South East Asian biodiversity: obviously a number of problems must be overcome and they are not easy to solve, but the process of saving Myanmar's bears must begin with sharing knowledge, data and best practices between all the stakeholders involved.

"I really enjoyed the school trip into the forest! I particularly loved the photo competition on biodiversity because it allowed me to notice many plants, insects and small animals I have never paid attention to before. Now I feel that I want to share what I learnt about wild animals and the difficulties they are facing today with the other people in my village".
Thunn Thinza Oha, Middle School student from Kway Gaing village - Rakhine

5. ILLEGAL WILDLIFE TRADE: TWO SURVEYS TO ILLUSTRATE THE PHENOMENON

Illegal trade of wildlife in Myanmar is a **serious threat** to many native animals. Among the numerous species of wildlife traded in markets throughout the country are the two bear species: the Asiatic black bear and the sun bear.

Surveys and interviews were organized in villages in Sagaing and Southern Rakhine to collect information about and acquire quantitative data on the threats of hunting, trade in bears and wildlife trade markets. This activity, carried out both at the beginning and at the end of the project to monitor the effects of other project activities on illegal trade, also helped to identify trade in other wildlife species.

2016/2017: FIRST SURVEY

The interviews and direct observations carried out in 16 villages within or around Htamanthi Wildlife Sanctuary in Sagaing recorded a total of **11 wildlife species hunted**; in Rakhine Yoma Elephant Range Wildlife Reserve and surrounding area (16 villages surveyed) there were 15 recorded species. The two bear species were among these, listed as normally hunted for meat and body parts. Flint guns, spears, snares, knives, dogs, nets, slingshots and crossbows were recorded as common weapons for poaching, confirming that the main purposes of the hunt were **subsistence use and pest control**.

Representing 7% (Sagaing) and 9% (Rakhine) of the hunted species, bears are sold as meat to neighbours or for their gallbladders to traders (3 cases in Sagaing, 2 in Rakhine).

2019: SECOND SURVEY

The second survey was conducted in both Rakhine and Sagaing through:
• **interviews** in the area where local communities were already involved in project conservation activities
• **undercover** investigation at the east side of the Rakhine Wildlife Reserve and at the southern border of Htamanthi Wildlife Sanctuary in Sagaing.

The main objective of the survey was to **better understand the impact** that poaching by the local communities and external hunters has on the sun bear and other threatened wildlife.

The survey revealed that most members of the local communities in the western part of the project site in Rakhine consider themselves to be occasional hunters and kill or capture bears and other wildlife for local consumption, to trade, as pets or because of human-bear conflict. Most of the hunters reported targeting mainly wild boars and deer but that they can make use of other wildlife captured in their traps, including bears. The animals captured are usually consumed locally or sold at the local market, depending on the species and price of the products at various locations. A different situation was highlighted in the eastern part of the Rakhine Yoma Elephant Range Wildlife Reserve, where the absence of control and the easy accessibility from central Myanmar facilitates the presence of **gangs of professional poachers** on hunting raids: the main targets of these groups are elephants and gaur. Bears are typically hunted for their most valuable body part, the **bile**, the price of which varies from between USD 50 to 200 depending on size. Sun bear **paws** also have a high economic value: their price (if all four are sold) varies from between USD 150 to 3000. **Fresh bear meat** has the same value as that of other animals like the gaur and muntjac.

The survey, carried out in 24 villages in Sagaing, demonstrated that the wildlife species most threatened by illegal trading are **tigers, pangolins and bears**, whose price is very high due to demand from China and India (in the survey area bear gallbladders were priced at USD 1700/kg). Smuggling wildlife body parts is still very easy in the area, and seizure does not seem to be very effective. Wildlife products usually travel towards Kachin, in the north, where previous studies highlighted a traffic of bear products to Yunnan (China): it seems likely that Sagaing is one of the sources of such illicit traffic.

The survey interviewees in both Rakhine and Sagaing, reported **a decrease in wildlife hunting** after the implementation of conservation programs by the Sun Bear Project. People involved in conservation jobs declared that they had stopped or greatly reduced hunting, although they admitted to the possibility of returning to hunting activity in the absence of alternative incomes. Some villagers said that they had completely stopped poaching after the conviction of a group of hunters in a neighboring village and the establishment of the community forest within their community.

The survey, realized with the technical support of BANCA (Biodiversity and Nature Conservation Association), indicated that a combined approach of **law enforcement** and support for **local sustainable development** could be the key to effectively mitigating the problem of illegal wildlife hunting and trade.

"We collect GPS data and photo records when patrolling, and we inform other people in our village about what we are doing for wildlife conservation: thanks to these measures, we believe we can reduce poaching and illegal wildlife trade in our village!"
U Myint Tun, Chairman of CGG and Auditor of CFUG from Myo Kwin village – Rakhine

LESSONS LEARNT AND RECOMMENDATIONS: AN ACTION PLAN FOR THE LONG-TERM SUSTAINABILITY OF THE PROJECT

COLLABORATION WITH LOCAL AUTHORITIES AND INVOLVEMENT OF LOCAL NGOs AND COMMUNITIES

The Sun Bear Project has been possible thanks to the close collaboration with Local Government Authorities, both at local and at central level. The alliance with local administrations, the Forest Department and the Nature and Wildlife Conservation Division has strengthened the trust between local villagers and formal institutions, increasing the long-term sustainability of the project. **Tailor-made training courses** have increased the skills of government officers and technicians, favoring their engagement in the best practices experimented in the framework of the initiative.

A **participatory approach**, which has involved local non-governmental organizations and community leaders, has led to shared solutions for land management which are of great support to biodiversity conservation.

LONG TERM COST-EFFECTIVE MONITORING SCHEME PROVIDING RELIABLE RESULTS ON SPECIES DISTRIBUTION AND ABUNDANCE

Two occupancy-based sampling methods—camera traps and sign survey (using line transects)—were applied and compared to evaluate the presence of sun bears, which is a key element in determining their conservation status and consequently in addressing conservation actions. Overall, **camera traps** resulted as a more appropriate tool to study the species in tropical forest habitats: the project thus provides useful information to anyone planning a monitoring scheme to investigate the dimension and distribution of sun bear populations in the future. It has also permitted the compilation of a **check list of medium-large mammals** present in Rakhine and Sagaing.

Photo: Chiara Luxardo

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COMMUNITY FORESTRY TO IMPROVE LOCAL LIVELIHOODS, REDUCE DEFORESTATION AND CONSERVE BIODIVERSITY

Community forestry is a recognised best practice that helps rural communities address economic, environmental, and social challenges, improve tenure rights over forests, improve livelihood support, improve relations between communities and authorities and improve environmental conservation, thus contributing to multiple **sustainable development objectives** in the development of national low-carbon development pathways.

COMMUNITY ENGAGEMENT IN TERRITORIAL PATROLLING AND CONSEQUENT ECONOMIC SUPPORT AS A KEY FACTOR FOR LONG TERM SUSTAINABILITY

The institution of Community Guardian Groups in the areas where Community Forests were set up has proved to be an **effective measure to protect biodiversity**, engaging some members directly in anti-poaching routines and, most importantly, involving the community as a whole. Access to **financial credit** has turned out to be an important incentive and an effective tool to ensure the long-term sustainability of such an initiative. The surveys on illicit trade have indicated that a **combined approach** of law enforcement and livelihood support can effectively mitigate the problem of illegal wildlife hunting and trade.

EMBEDDING CONSERVATION EFFORTS INTO AN INVOLVING AND INNOVATIVE AWARENESS RAISING CAMPAIGN

As should always be the case, awareness-raising activities represented a key element of the whole project. The experimented educative methodology was innovative and aimed at involving students and members of the local communities in **interactive activities** rather than pursuing a mnemonic approach. **Drama contests, hands-on experience and forest trips** are some of the methods which have demonstrated their effectiveness, stimulating the curiosity and motivation of the people involved. The direct beneficiaries have given very positive feedback on the initiatives carried out, testifying to a fruitful understanding of—and serious commitment to—biodiversity conservation.

SHARING KNOWLEDGE, DATA AND BEST PRACTICES FOR CONSERVING SUN BEARS IN MYANMAR

Scientific conferences and papers published thanks to project activities have contributed to attracting government and international attention to the conservation of bears in Myanmar. The data collected and experiences gained in the 4 years of the Sun Bear Project are at the basis of the *Sun Bear Conservation Action Plan 2020-2029 – Rakhine Yoma Elephant Range and Htamanthi Wildlife Sanctuary* which will help institutions and local organizations carry on the work initiated in the framework of the Sun Bear Project.

SUN BEAR

Fondation Segré's mission is to help protect the biodiversity of our planet focusing on the protection of threatened species and, at large, their ecosystems. Sun bears are iconic, high on our priority list and the perfect so-called umbrella species: protecting their populations means also protecting a broader ecosystem. Istituto Oikos had been working in Myanmar on various community-oriented projects for years when Fondation Segré started discussing its interest in supporting conservation work in the country back in 2015.

Connecting all the above dots resulted in an obvious choice to start a very fruitful partnership with Istituto Oikos designing a project targeting conservation of sun bears but also largely benefitting the local communities. This has been one of the longest-term projects we at Fondation Segré have ever supported, showing our strong commitment to the cause and our full trust in the team. And we are proud to see the project coming to an extremely successful end.

Istituto Oikos has become the regional focal point for sun bear conservation, increasing the knowledge on the species, gathering experts from all over the world and engaging with multiple stakeholder to develop a concerted strategy to address the species' conservation threats and needs. Their strong relationship with the local communities in Rakhine has resulted in wonderful educational sessions with kids in schools and the development of key collaborations via the Community Guardian Groups and the Community Forest Groups, assuring a sustainability to all the conservation activities started over these past years.

We are very grateful to have had such a close and motivated partner to deliver a game-changing project in Myanmar. On a personal note, I will never forget the warm welcome of the communities working alongside Istituto Oikos and the excited glimpse in their eyes knowing they were participating in a program that was targeting their needs while recognizing the value of the ecosystem they were living in.

Caterina Boitani, Fondation Segré

SUN
BEAR

Cover photo: Free the bears