

## APPENDIX I. DESCRIPTIONS OF 17 MYANMAR TIGER SURVEY SITES

### 1. Alaungdaw Kathapa National Park (AKNP)

**Location:** Lies between 22°14' - 22°29'N and 94°17' - 94°36'E between the Chindwin River floodplain and Myittha River valley in Sagaing Province, approximately 100 mi (160 km) west of Mandalay.

**Elevation:** 100 - 3,440' (30 - 1048m).

**Survey area:** Centred on Mindon Camp covering an area of 152 sq. mi (390 km<sup>2</sup>).

**Description:** The area is dissected by a number of high elevation 2000-4000+' (700-1219m) ridges that run in a north-south direction, and is drained by the Patolon and Taungdwin Rivers that flow northwards into the Chindwin River.'

**Vegetation:** Varies from Dry Upper Mixed Deciduous (DUMD) forest on the high ridges and slopes to Moist Upper Mixed Deciduous (MUMD) forest on lower slopes. Bamboos are common in the under storey on lower slopes. Semi-Indaing forest, high Indaing forest or Pine forest occur in patches on the tops of some high ridges.

**Access:** Alaungdaw Kathapa is accessed from the east by road from Yinmarbin, and via a newly constructed road that links India with Mandalay and cuts through the northwest of the park. Walking distance from the nearest road was 1 day.

**Rainfall:** The area is subject to two monsoons, a southwest monsoon which brings most of the yearly rainfall between May and October, and heaviest between August and September. Mean annual rainfall is 588" (1,507mm). Water is available year round in the major drainages with smaller tributaries mostly drying up by the end of March.

**Human impact and landuse:** The park is surrounded almost completely by cultivated land but inside the park the only settlements are of park staff, mahouts and a monastery. Government camps and religious pilgrimages pose threats to wildlife. Other threats are hunting for wildlife trade, extraction of non-timber forest products, livestock grazing and fishing.

### 2. Thaungdut (TD)

**Location:** Lies between 24°17' - 24°30'N and 94°30' - 94°43'E in the Homalin Township, Sagaing Division and includes with Kabaw Valley.

**Elevation:** 432 - 2,314' (130 - 695m).

**Survey area:** Covers an area of 82 sq. mi. (210 km<sup>2</sup>) 10mi (16km) from Thuangdut village.

**Description:** The survey area is surrounded by Thaungdut Reserve Forest in the east, southeast and by Kabaw Valley in the north and northwest. The Nantanyit Chaung runs south to north between Minthamee Mountain 1,871'(570m) and Nantanyit Mountain 3,545' (1,080m) and enters the Chindwin River near Thaundut village.

**Vegetation:** Varies from DUMD forest, MUMD forest, to Indaing forest. Bamboos such as Myin Wa, Tin Wa, Wa Bo, Wa Nipa, Theik Wa, Kya Khet Wa, as well as rattan are common.

**Access:** Thaungdut village is accessible by boat along the Chindwin River year-round. It takes about 2 days travel by boat from Monywa. From Thaungdut village the survey area can be accessed by elephant or on foot.

**Rainfall:** 74 - 99" (188 - 251mm) of rain per annum.

**Human Impact and Landuse:** Timber extraction has occurred in the area for several years, with the Myanmar Timber Enterprise still extracting hard wood, mainly Teak. Hunting, timber cutting, and intrusions by elephant workers and fishermen are threats

to wildlife in this area. There were no signs of human settlements or cultivation in the area at the time of survey.

### 3. Htamanthi Wildlife Sanctuary (TMT)

**Location:** Lies between 25°16' - 25°44'N and 95°19' - 95°46'E. It is bounded to the N by Nampilin Chaung, to the E and SE by Pali Taung, Temein Taung, and New-ta-mein Taung 1,000 - 2,000' (304 - 609m) and the Uyu River, to the S by numerous streams, and to the W by the Chindwin River.

**Elevation:** 490 - 1,100' (149 - 335m).

**Survey area:** Covers an area of 205sq. mi (526 km<sup>2</sup>).

**Description:** Vegetation is primarily tropical evergreen forest with dense bamboo and rattan undergrowth. Mixed deciduous teak forest is also found on higher slopes in the eastern part of the sanctuary.

**Access:** The area is accessible by boat from Homalin, the nearest town, 57 mi. (91km) and a 2 day journey away.

**Rainfall:** 136" (3,491mm) per annum. The area is drained by the Nampilin, Nam Emo, Nam Ezu, Nam Pagan and Nam Yanyin all of which flow W into the Chindwin River.

**Human impact and landuse:** No permanent human settlements exist inside the sanctuary but the area is used by Lisu hill tribes who hunt wildlife, and by local people who fish and extract non-timber forest products. Oil drilling occurs in the area.

**Location:** Lies between 23°31' - 23°43'N and 94°51' - 94°57'E. The area includes parts of Lawthar, Pyaungtha, Maingwan, Mahamyaing and Nonsabai Reserve Forests.

**Elevation:** 226 - 2,071' (68 - 631m).

**Survey area:** 78 sq. mi. (200 km<sup>2</sup>).

**Description:** The landscape is characterized by evergreen, mixed deciduous and Indaing (Dipterocarp) forests. The area is drained in the W by the Kaedan Chaung which originates at Honan Taung Dan 2,017' (614m) and flows into the Chindwin River. In the E the Pyaungthwe Chaung drains into the Mu River.

**Access:** Reached on foot from Aungchanthar Village, 20mi. (32km) away on the Monywa-Khanti highway

**Rainfall:** 46 - 69" (117 - 175mm) per annum.

**Human impact and landuse:** Timber extraction from the surrounding areas has taken place since 1973. At present two private companies are extracting dipterocarp timber from part of the area. Numerous current and old settlements occur in the area. Cattle grazing is taking place. Oil drilling occurred in the past.

### 4. Mahamyaing (MHM)

**Location:** Lies between 23°31' - 23°43'N and 94°51' - 94°57'E. The area includes parts of Lawthar, Pyaungtha, Maingwan, Mahamyaing and Nonsabai Reserve Forests.

**Elevation:** 226 - 2,071' (68-631m).

**Survey area:** 78 sq. mi. (200 km<sup>2</sup>).

**Description:** The landscape is characterized by evergreen, mixed deciduous and Indaing (Dipterocarp) forests. The area is drained in the W by the Kaedan Chaung which originates at Honan Taung Dan 2,017' (614m) and flows into the Chindwin River. In the E the Pyaungthwe Chaung drains into the Mu River.

**Access:** Reached on foot from Aungchanthar Village, 20mi. (32km) away on the Monywa-Khanti highway

**Rainfall:** 46 - 69" (117 - 175mm) per annum.

**Human impact and landuse:** Timber extraction from the surrounding areas has taken place since 1973. At present two private companies are extracting dipterocarp timber from part of the area. Numerous current and old settlements occur in the area. Cattle grazing is taking place. Oil drilling occurred in the past.

#### 5. Nankamu (NKM)

**Location:** Lies between 24°03' - 25°15'N and 94°57' - 96°12'E between Paungbyin and Pinlebu Townships. It includes parts of Sanda, Kaingshe and Paungbyin Reserved Forests. In the N it is bounded by the catchment of Thetla Chaung, a tributary of the Chindwin River, to the E by Zibu Taungdan 2,319 - 2,910' (706 - 886m), a catchment of the Mu River, to the S by the Namkawin and Kodan Chaung, tributaries of the Chindwin River.

**Elevation:** 186 - 2,100' (56 - 640m).

**Survey area:** 94 sq. mi. (243 km<sup>2</sup>).

**Description:** Vegetation is dominated by moist upper mixed deciduous forest, with evergreen forest and Indaing forest.

**Access:** The area is accessible by the newly constructed Pinlebu-Paungbyin Road. Paungbyin Town is 300 mi (482km) from Monywa. The base camp was 25 mi (40km) from from Paungbyin.

**Rainfall:** Averages 91" (2,342 mm) per annum

**Human impact and landuse:** Teak extraction occurred in the area 15 years ago. Bamboo and mushroom collecting occurs along trails in the area.

#### 6. Saramati (SRMT)

**Location:** Lies between 25°20' - 25°43'N and 94°50' - 95°40'E. To the N it is bounded by the Saramati Range, to the E by the Chindwin River and Laytin Ridge 5,790' (1,764m), to the S by Lawpe Mountain 8,455' (2,577m) and W by the Myanmar - India border.

**Elevation:** 410 - 12,553' (124 - 3,826m)

**Survey area:** 254 sq. mi. (650 km<sup>2</sup>)

**Description:** Streams in the Saramati and Laytin catchments flow to the Nantalaik River, one of the principal tributaries of the Chindwin River. The survey area is contiguous with India's Shiloi Reserve Forest. Vegetation cover consists of evergreen, pine, moist hill evergreen and sub-tropical evergreen forest with bamboo under storey.

**Access:** The area is accessible by road from Layshi in the dry, or during the wet season on foot. Mt Saramati, in the N of the survey area is 40 mi (64km) from Layshi, accessible only on foot.

**Rainfall:** Averages 91" (2,342 mm) per annum

**Human impact and landuse:** Though sparsely populated, shifting cultivation occurs as high up as 7,000' (2,133m) elevation.

#### 7. Paunglaung Catchment (PLG)

**Location:** Lies between 19°52' - 20°17'N and 96°24' - 96°35'E in Pyinmana Township, Mandalay Division. It is bounded to the N by Yamethin Township, to the E by Pinlaung Township, to the S by Pyinmana Township, and to the W by Tatkan Township.

**Elevation:** 500 - 6,252' (152 - 1,905m)

**Survey area:** 134 sq. mi. (343 km<sup>2</sup>)

**Description:** Riverine evergreen and moist upper mixed deciduous (MUMD) forest occur in the lowlands with dry upper mixed deciduous (DUMD), Indaing (dipterocarp), grassland and alpine forest at higher elevations. The entire catchment is 1,779 sq. mi. (4,608 sq.km). A rugged mountain range dissects the area.

**Access:** Two days walk from Taunggya to the centre of the study area across a 6,000' (1,828m) mountain range.

**Rainfall:** 55 - 95" (140 - 241mm) per annum

**Human impact and landuse:** Numerous villages occur near the study area. Shifting cultivation occurs in the area, encroaching on the reserve forest. The area is sparsely populated owing to difficult access.

### 8. Panlaung Pyadalin Cave Wildlife Sanctuary

**Location:** Lies between 20°56' - 21°00'N and 96°16' - 96°27'E in Ywa Ngan Township, Shan State, 21 miles (33km) from Kinda Dam and Hydro Power Project

**Survey area:** Covers an area of 61 sq. mi. (157 km<sup>2</sup>) in the Kinda Dam area and includes two reserve forest areas, Panlaung and Pyadalin.

**Description:** The area is bounded by the Kinda Dam in the north, Ywa Ngan Township in the east, Thazi township in the south and Wan Twin Township in the west, respectively.

**Vegetation:** Riverine evergreen forest, Moist deciduous forest, and Dry deciduous forest each with diverse bamboo communities, and rattan.

**Access:** Panlaung-Pyadalin is accessible by road from Kume village, Myittha Township, 1 hour by boat from the Kinda Dam, and one hour's walk.

**Rainfall:** No data available

**Human Impact and Landuse:** Temporary human settlements occur in the area. Bamboo collection for making chopsticks is practiced. Timber extraction, non-timber extraction, fishing, hunting and cultivation are threats to wildlife. Roads passing through the wildlife sanctuary are used for extracting timber and moving cattle.

### 9. Central Bago Yoma (BGY)

**Location:** Lies between 19°02' - 19°15'N and 95°53' - 96°59'E, and includes parts of Sabyin, West Swa and Kabaung Reserve Forests. It is bounded to the N and E by the Sabyin River, to the E by the Swa River, to the W by the Bago Yoma Range 1,865' (568m), and to the S by the Pyu Mountain 1,537' (468m) and the Kabaung River catchment.

**Survey area:** 130 sq. mi. (334 km<sup>2</sup>)

**Elevation:** 330 - 1,885' (100-574m)

**Description:** The area is drained by the Sittaung River and its tributaries. Vegetation is characterized by DUMD forest, MUMD forest and evergreen forest. Bamboos are common in the under storey.

**Access:** The area can be reached by 3 days walk from Swa Dam, to the west of Swa Town on the Yangon-Mandalay highway about 200 mi. (320km) from Yangon by road.

**Rainfall:** 126" (3,235 mm)

**Human impact and landuse:** Large scale extraction of teak and other hardwood, and other signs of human encroachment including bamboo and rattan collection, hunting and fishing was observed during the study period. No evidence of cultivation or permanent human settlement was observed in the study area.

### 10. Northern Rakhine (RN) (Paletwa and Kaladan river catchments)

**Location:** Lies between 21°05' - 21°22'N and 92°21' - 92°29'E is located between and contains the northern Kalapanzin River catchment, Saingdin Ridge and northern Mayu Range.

**Survey area:** 69 sq. mi. (177 km<sup>2</sup>)

**Elevation:** 710 - 2,494' (216-760m)

**Description:** The area is bounded to the N by the Myanmar –Bangladesh border, with the Saingdin River to the E, the Obru and Pairwan Rivers to the S, and the Mayu Range in the W. Vegetation is characterized by sporadic evergreen forest in ravines with extensive Kayin bamboo patches. Forest covers approximately 40% of the survey area. Bamboo is more common in shifting cultivation areas at lower altitudes with dry evergreen forest at higher elevations. Due to logging and bamboo cutting, degraded secondary growth occurs on undulating slopes.

**Access:** The survey area is accessible by boat along the Mayu and Kalapanzin Rivers, and during the dry season by 6' wide paths cleared by the UN.

**Rainfall:** (no data available)

**Human impact and landuse:** A number of tribal settlements occur in areas fringing the forest. The lower Kalapanzin River valley is fertile and supports large villages (100-1,000 households) of Bengali people. Hunting, shifting cultivation and extraction of non-timber forest products all occur in the area.

### 11. Rakhine Elephant Range (RER)

**Location:** Lies between 18°01' - 18°59'N and 94°36' - 94°45'E on the western side of the Rakhine Yoma Range.

**Survey area:** 57 sq. mi. (146 km<sup>2</sup>)

**Elevation:** 252 - 3,416' (77 - 1,041m)

**Description:** The area is dissected by a series of tall ridges running north to south range from 2000' - 4000'. The area is drained by the Tandwe, Salu and Kyeintali Rivers that flow westwards into the Bay of Bengal. Vegetation includes semi-evergreen, mixed deciduous and secondary tropical moist forest, and bamboo brake.

**Access:** The study area was 3 days walk from Bogale Village, which is 48 mi. (77km) from Gwa by road. Gwa Town is 180mi (289km) NW of Yangon by car.

**Rainfall:** (no data available)

**Human impact and landuse:** Thirty-three villages surround the Elephant Range consisting of Rakhine tribes (82%) and Chin tribes (18%). They farm rice and groundnut, practice shifting cultivation, and practice commercial hunting of wildlife.

### 12. Hukaung Valley (HKV)

**Location:** Lies between 26°36' - 26°42'N and 96°34' - 96°53'E in the newly declared Hukaung Valley Wildlife Sanctuary (2,493 sq. miles; 6,459 km<sup>2</sup>).

**Survey area:** 525 sq. mi. (840 km<sup>2</sup>)

**Elevation:** 193 - 1,307' (59 - 398m)

**Description:** To the N an upland area 6,758' (2,060m) divides the Tarung-Tawan watershed and Gedu River catchment, with the Kumon Mountains to the E, the Nambyu and Nampyek River catchments in the S and the Tarung River and old Ledo Road to the W. Vegetation is predominantly dense lowland evergreen forest interspersed with meadows.

**Access:** The area lies 20 miles (32km) N of Tanaing and can be accessed during the wet season by boat and during the dry season by baggage elephant. The Ledo Road is paved for 90 miles (149km) of its length providing year-round access from Myitkyina.

**Rainfall:** 91" (2,339 mm)

**Human impact and landuse:** Apart from a 5 acre shifting cultivation area near Tawang River there were no permanent human settlements in the area.

**13. Kaunglaungpu (KLP)**

**Location:** The survey area is located in the Kran River and Phet River catchments between 26°44' - 26°53'N and 97°53' - 98°04'E.

**Survey area:** 127 sq. mi. (326 km<sup>2</sup>)

**Elevation:** 200 - 9,080' (61 - 2,767m)

**Description:** These rivers along with the Shinyan and Hteei Rivers drain the area. The area is covered in natural forest (40%) consisting of tropical evergreen, subtropical hill, warm and cool temperate rainforest and alpine. The remainder (60%) is secondary forest damaged by shifting cultivation in former times. These areas are dominated by bamboo, teat trees, phetwin, and old woody lianas. Extraction of some hard woods was taking place.

**Access:** This area is reached from Putao by road to Mabweza (63mi.; 101km). The survey area is accessed by a 63mi. (8 day) walk on foot passing Sunnochat Mountain.

**Rainfall:** (no data available)

**Human impact and landuse:** Intensive shifting cultivation has transformed natural forests into secondary forests. Threats to tigers and prey include a new road built from the China border, timber extraction, non-timber forest product extraction, mining, subsistence hunting and wildlife trade with China.

**14. Sumprabum (SPB)**

**Location:** The survey area lies 9 mi. (15km) east of the Kumon Range and 10 mi. (17km) W of Sumprabum at 26°29' - 26°36'N and 97°21' - 98°28'E.

**Survey area:** 130 sq. mi. (334 km<sup>2</sup>)

**Elevation:** 460 - 4,950' (140 - 1,508m)

**Description:** It is bounded to the N by the Chaukan Pass and hills that receive snow in winter. The Hukaung Valley lies to the W, with Myitkyina Township to the S. The area is drained by the Hpungchan, Hpung-in and Mali Rivers in the east and northwest, and from the south by the Magyeng River. Vegetation is tropical evergreen, sub-tropical moist hill forest, and subtropical wet hill forest. Bamboos and rattan species occur in the under storey. Some swampland occurs in the area.

**Access:** The area is reached on foot from Sumprabum. Sumprabum is 131 miles (210km) N by road from Myitkyina.

**Rainfall:** 91" (2,339mm)

**Human impact and landuse:**

The area is sparsely populated (3.8 people/sq. mi.; 2.5/sq.km), with local people practicing shifting cultivation.

**15. Momeik-Mabain (MB)**

**Location:** The survey area is located between 23°45' - 23°55'N and 96°43' - 96°51'E and includes parts of Manpon, Nampa and Namme Reserve Forests.

**Survey area:** 133 sq. mi (340 km<sup>2</sup>)

**Elevation:** 426 - 1,965' (130 - 599m)

**Description:** It is drained by the Maingthar and Namme River. Alluvial plains dominate the survey area with some rugged, rocky peaks including Parhoke Mountain 3,101' (945m), Wantu Mountain 3,003' (915m) and Kweanung Mountain 2,393'(729m). Vegetation comprises evergreen, MUMD and Indaing forest.

**Access:** From Mabain the study area is accessed by boat (18 mi.; 29km), then by cart (12 mi.; 19km), then on foot (18mi.; 29km). Mabain is 38mi. (61km) by ferry from Momeik. Momeik is 156mi. (251km) from Mandalay.

**Rainfall:** 52" (1,338mm)

**Human impact and landuse:** Development of roads and infrastructure for gold mining has taken place since 1988 resulting in forest disturbance and pollution of natural drainages. Over 300 residents inhabit four goldmines in the forest. In the dry season, miners turn to bamboo and rattan cutting and resin tapping.

#### 16. Myintmoletkat (MMLK)

**Location:** The survey area lies in the Htaung Pru Reserve Forest between 11°45' - 11°38' N and 99°07' - 99°03' E in Taninthayi and Bokpyin Townships, Myeik District.

**Survey area:** 120 sq. mi. (310 km<sup>2</sup>)

**Elevation:** 110 - 2,264' (33 - 690m)

**Description:** The eastern portion is drained by the Naukpyan, La Mu, Tabalat, and Ngawun Streams which flow into the Little Taninthayi River. To the west the Monoron Stream flows into the Lenyar River to the south. The area is partially low-lying with swamp and grassland that is annually flooded, interspersed with mixed evergreen - bamboo forest groves on higher ridges. The area lies on both sides of the new Taninthayi-Bokpyin highway, and is partially under cultivation for rice and areca palm with some shifting cultivation.

**Access:** By road from Myeik (58mi).

**Rainfall:** The area has two monsoons with a prolonged wet season from June – November, and annual rainfall of around 160" (4,127 mm).

**Human impact and landuse:** Base camp was situated 3 miles (5km) S of Htaung Pru Village containing 15 households, with a further 38 households in adjacent Manoron Village.

#### 17. S. Taninthayi (TNTY)

**Location:** The survey area lies in the Pe River Valley at 13°30'N and 98°38'E in Thayetchaung Township, Dawei District.

**Survey area:** 110 sq. mi. (285 km<sup>2</sup>)

**Elevation:** 208 - 2,010' (63 - 612m)

**Description:** Pe River Valley is bounded to the N by the Mintha Reserve Forest, to the E by Myintmoletkat Mountain 6,801' (2,072m) to the S by the fork of the Pe and Plauk Rivers and on the W by Pe Mountain 2,720' (829m). Vegetation is characterized by a mosaic of riverine evergreen forest (30%) with sporadic secondary growth (30%) and shifting cultivation and orchard (40%). Areca palm and catechu plantations dominate the cultivated areas.

**Access:** The area is accessible from the Dawei-Myeik Highway, 53 mi. (85km) south of Thayetchaung, and on foot 15 mi. (24km) east of Pedat.

**Rainfall:** The area has two monsoons with a prolonged wet season from June – November, and annual rainfall of around 161" (4,127 mm).

**Human impact and landuse:** Due to the security situation, permanent settlements no longer exist in the area and farmers are permitted only weekly access to maintain and harvest their lands.