SABAH FORESTRY DEPARTMENT

FOREST MANAGEMENT UNIT 10 (FMU10): TAMBUNAN CONSERVATION AREA MANAGEMENT PLAN (CAMP) VERSION 2

(FMU10: CAMP Ver. 2)

This Second Revised Conservation Area Management Plan (CAMP),
Referred to as **FMU10: CAMP Ver. 2** is
Approved and shall cover the period from
01.01.2017 to 31.12.2026

(DATUK MASHOR MOHD. JAINI)
CHIEF CONSERVATOR OF FORESTS, SABAH

Dated: 14/11/17

1. SITE CONSERVATION CONTEXT OF FOREST MANAGEMENT UNIT (FMU 10)

1.1 Objective of the FMU10: CAMP Ver. 2

Under the mid – term review as documented under the Revised Conservation Area Management Plan (CAMP) for FMU 10, which was approved by the Chief Conservator of Forests Sabah *(formerly the Director of Forestry)* in the year 2013, a new set of CAMP has to be prepared by the Management Planning Core Team (**MPCT**) including the Resource Persons Group (**RPG**) for FMU10 towards the end of 2016. This new document, also known as the Second Revised CAMP for FMU10, is referred to as **FMU10: CAMP Ver. 2** (*FMU10: CAMP Version 2*).

The rationale and management objectives of FMU10: CAMP Ver. 2 is as follows:

1.1.1 Area, Site's Name and Location:

The whole of the FMU 10 (Tambunan) is located in central Sabah, between longitude E 116^{o} 21' 13. 8" and E 117^{o} 01' and latitude N 5^{o} 27'N and 5^{o} 52'N. For management and identification purposes under this FMU10: CAMP Ver. 2, the area and the site's name is known as the Forest Management Unit Number 10 or FMU10 (Tambunan). As of December 2016, the FMU10 consisted of the Nuluhon Trusmadi Forest Reserve with a total size of 74, 736 hectare (ha) and the Sg. Kiluyu Forest Reserve with a total area of 1, 068 ha. Both are Class 1 (Protection) Forest Reserves, with a total size of 75,804 ha.

In late 2016, an area totalling 12,241 ha was excised out from the neighbouring Trusmadi Forest Reserve (FMU 5: Class II Forest Reserve) in Ranau. The whole area was gazetted as a Class I Forest Reserve and known as the Nuluhon Trusmadi (Extension) Forest Reserve. The total area for FMU 10 (Tambunan) as of January 2017, is therefore 88,045 ha (Figure 1). Figure 2 denotes the locality of the FMU10. The historical background of FMU10 is further described under the following **Sub Chapters 1.2 and 1.3**.

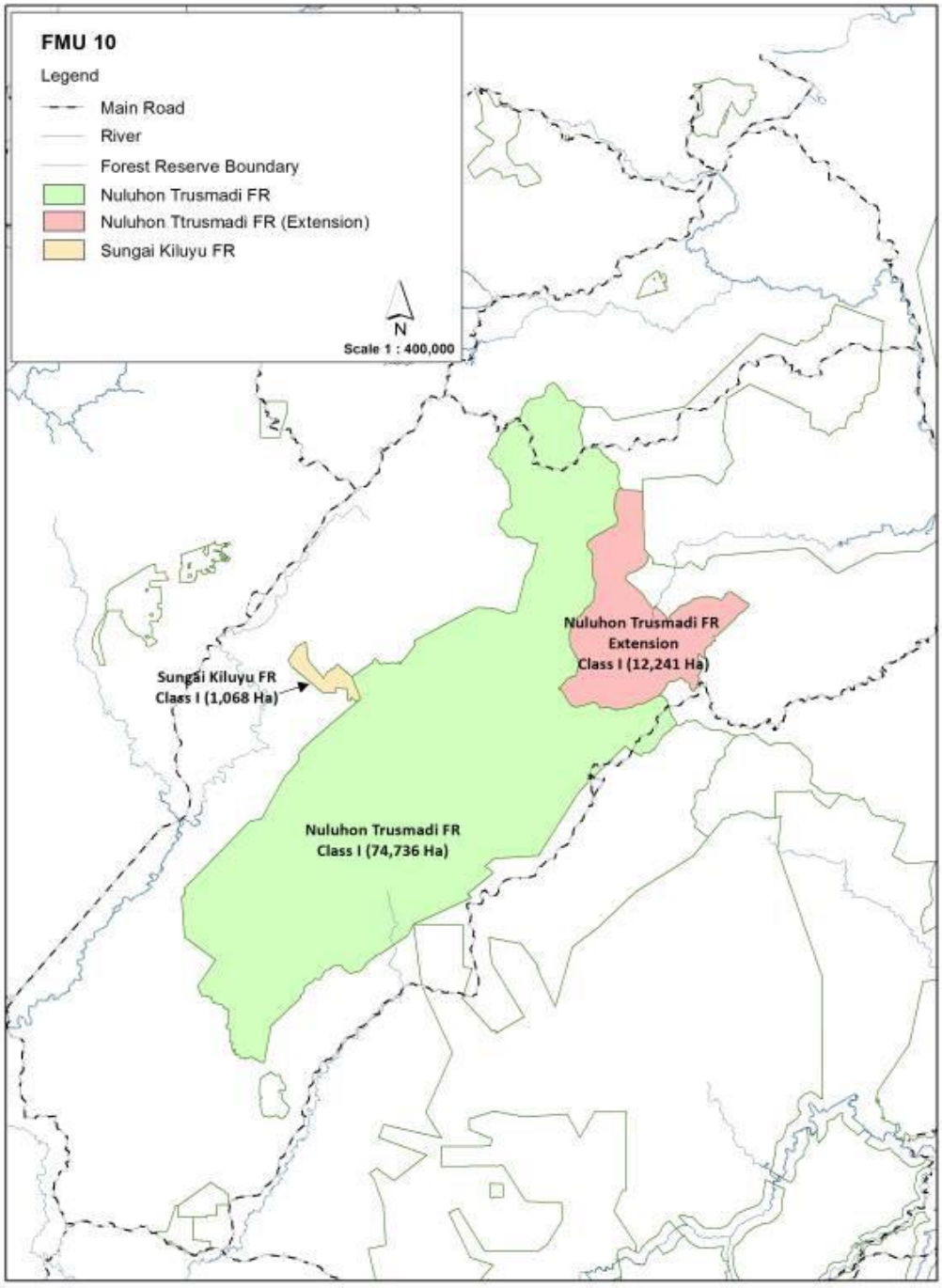

Figure 1: The Forest Reserves in FMU 10 (Tambunan)

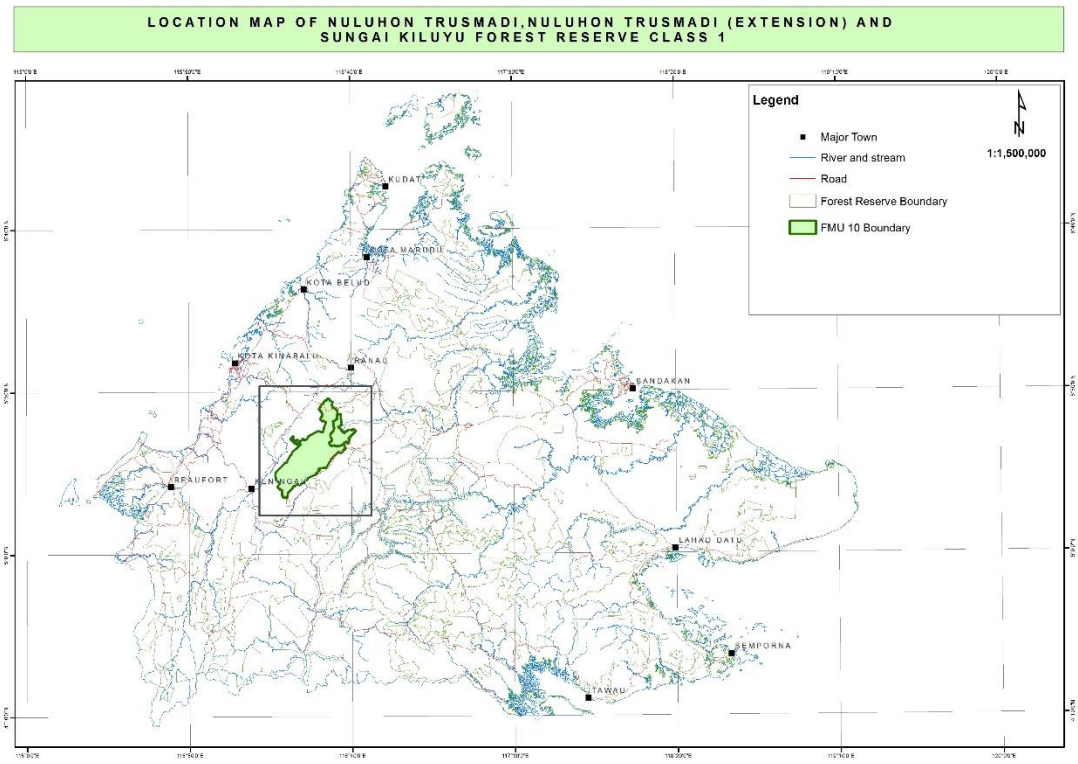

Figure 2: The Location of FMU 10

1.1.2 Function

The FMU10 (Tambunan) has been deliberately delineated as a Forest Conservation Area by the Sabah State Government since 2009. A conservation area is an area that has the potential to be an ecologically functional system, which means that it supports all the flora and fauna species native to the area and that sustaining ecological processes, such as the hydrological or the succession cycles and the other dynamic processes are occurring. Its status as a Class 1 Forest Reserve also indicated that commercial harvesting or collections of any flora and fauna are not allowed by the Sabah Forestry Department (SFD) in FMU10

The management zones and prescriptions advocated under this FMU10: CAMP Ver. 2 however allows for a limited non-conservation usage, namely, ecotourism including mountain climbing activities, controlled hunting, community woodlots and non – commercial flora and fauna including insect collections. The major conservation activities focused on forest restoration, conservation of the target species and habitats as well as boundaries protections and conservation awareness programs.

1.1.3 Conservation Management Zones:

A total of six (6) Conservation Management Zones were identified by the MPCT for FMU10 to cater for the different usage and conservation management prescriptions (**Table 1 and Figure 3**).

As mentioned earlier, encroachment, commercial timber harvesting or large scale collections of any terrestrial or aquatic flora and fauna from this FMU are strictly prohibited. Any infringements of the prohibited activities by any individuals or communities will result in the prosecution of such acts as prescribed under the Forest Enactment 1968; the Wildlife Conservation Enactment 1997 and the Wildlife Regulations 1998; as well as the Sabah Biodiversity Enactment 2000.

Table 1: Functions of the Management Zones in FMU10

Item	Function
Zone 1:	Conservation Area covering all intact Upland Mixed Dipterocarp Forest (UMDF) and Lower Montane Forest (LMF) vegetations with an approximate area of 42,000 ha in the Nuluhon Trusmadi, all areas in both the Sg. Kiluyu and the Nuluhon Trusmadi (Extension) Forest Reserves
Zone 2:	Aquatic Protection Area that include all water bodies (rivers and streams) and their buffer zones. This zone may cover an approximate area of 4,000 ha
Zone 3:	Forest Restoration Area covering an approximate area of 22,000 ha of largely burnt and encroached areas
Zone 4:	Controlled Hunting Area that extends over some 6,000 ha in the Ulu Monsok and Ulu Rompon area.
Zone 5:	Eco tourism Area covering three (3) climbing routes to the peak of Mount Trus Madi. It may cover an estimated area of 1,000 ha
Zone 6:	Adventure Tourism Area operated by Borneo Jungle Area (BJG) under an Occupational Permit (OP) covering an area of 10.63 ha

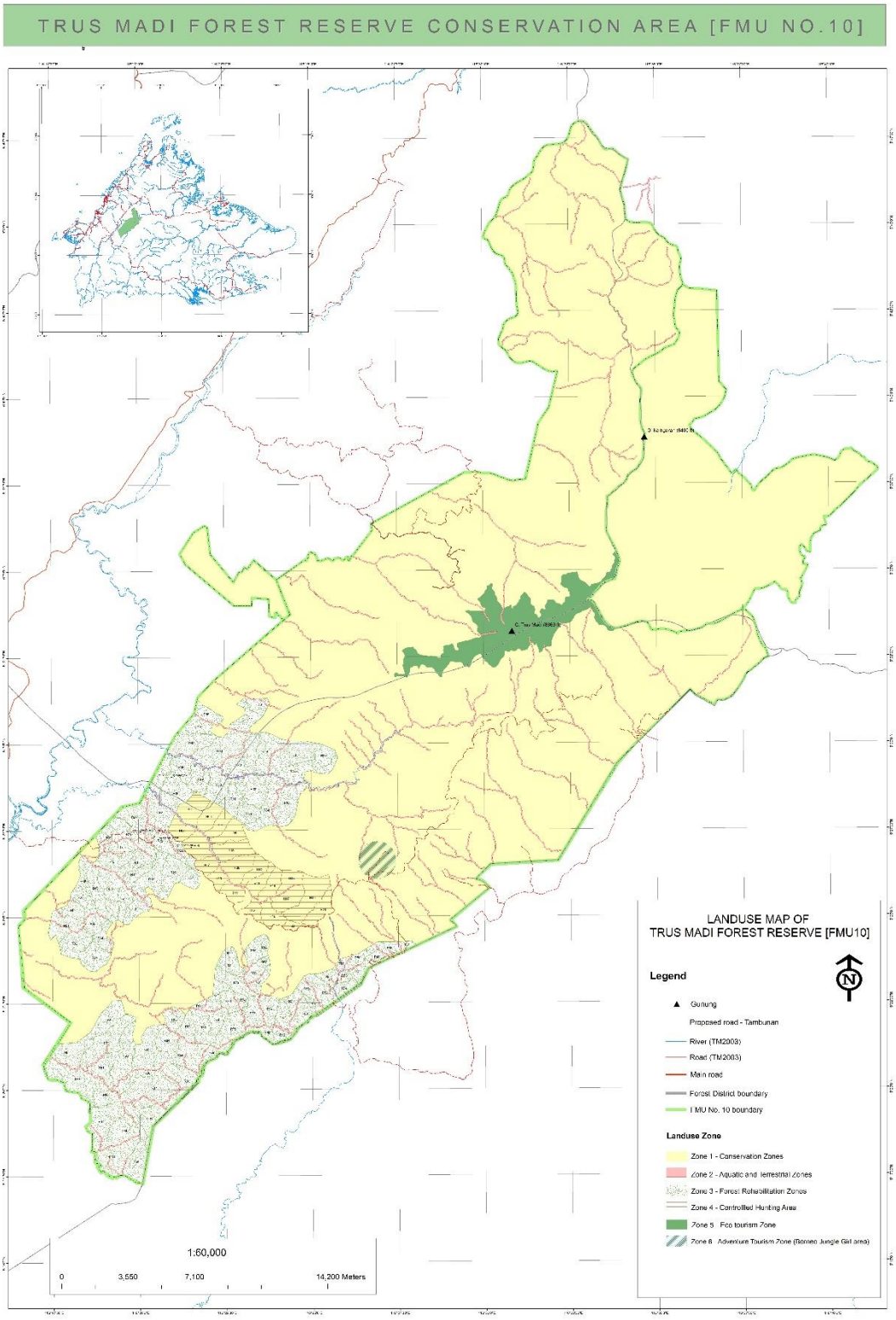

Figure 3: The Management Zones in FMU 10 (Tambunan)

1.1.4 The Conservation Targets and Strategies:

This FMU10: CAMP Ver. 2 prescribes the revised conservation targets and the goals as well as the corresponding revised strategies that would enhance and alleviate the conservation status of the targets. It also prescribes the subsequent monitoring actions to assess the effectiveness of the conservation efforts**.**

The revised Conservation Targets under this FMU10 CAMP Ver. 2 (**Table A**) as described earlier under the forwarding chapter are:

1) The Upland Mixed Dipterocarp Forest (UMDF)
2) The Summit Scrub (SS), and
3) The Hornbills.

The strategies for implementation are reduced from the previous twelve (12) to ten (10) under the FMU10 CAMP Ver. 2 (**Table C**). **Chapters 2** and **5** justified further regarding the selections of these targets and strategies respectively for under this FMU10.

1.1.5 High Value Conservation Forest (HCVF)

A total of six (6) types of HCVF areas as defined by the Forest Stewardship Council (FSC) were listed in the Toolkit (WWF, 2009). In the original CAMP in 2009 and the revised CAMP in 2013, no HCVF areas were identified by the MPCT. Theoretically, in accordance to the descriptions under the HCVF Toolkit for Malaysia, the whole of the FMU10, which is classified as a Class 1 Forest Reserve, could perhaps be considered as equivalent to an HCV 1.1 area. For practical reason however, the MPCT decided to only identify and listed the smaller areas in FMU10 using the relevant standards under the HCVF Toolkit. Identification of those areas was done under an Adhoc HCVF Team (Mohd Nooh, 2015).

As recommended by the Adhoc HCVF Team, the MPCT decided to establish only two (2) of those listed categories under the said Toolkit. **Table D** in the forwarding Chapter describes the two (2) HCV categories that were established in FMU10, namely, HCV 1.3 and HCV 5. The identified sites, management descriptions and recommendations, the strategic actions and poroposed measurable indicator in monitoring the conservations of these two (2) HCV categories in FMU10 are described in **Table 2, Table 3, Table 4 and Table 5.**

Table 2: The HCV areas identified and established in FMU 10

HCV	Definition under the HCVF Toolkit	Area identified and established in FMU 10
HCV 1.3: Endemic	"Any forest containing endemic species as identified by FRIM, MNS, SFC, Forestry Departments and published literature, particularly in high concentration or highly restricted distribution, can be considered HCV 1.3".	An endemic species of *Nepenthes X trusmadiensis,* a hybrid species between *N. lowii* and *N. macrophylla* is found at the summit scrub area. The relevant site has been demarcated and two temporary plots established at GPS reading of N 05 33.07.4' and E 116 30.54.8' (Mohd Noor, 2014). The summit scrub is also a Conservation Target under the FMU 10: CAMP ver.2.
HCV 5: Basic Needs of Local Communities	"Forest area is fundamental to meeting basic needs of local communities".	A water intake source point's site at Sg. Kaintona for the water gravity system for Kg. Sinua had been demarcated on the ground at GPS reading RS 763942 BOR 610358 (Mohd Noor, 2014).

Table 3: The Management Description and Monitoring Recommendation of HCV 1.3 in FMU 10

No	Parameter	Management Descriptions
1	The Site for HCV 1.3	An endemic species of *Nepenthes x trusmadiensis* is found at the summit scrub area. The relevant site had been demarcated and two temporary Plots established using the Global Positioning System (GPS) mechanism which was recorded as **N 05 33.07.4' and E 116 30.54.8'** (Mohd Nooh, 2015)
2	Current Management Recommendations	• Mapping of the area. • Erecting proper signs on site. • Updating summary on the population density and health assessment of the species on the FMU10's website. • Population density and health assessment of N.X Trusmadiensis by Tambunan Forestry Staff.
3	Recommended Strategic Actions	• The SOP 17 has been developed. It covers the management recommendation above. The MPCT may want to further refine the SOP. • Prohibition of the collections of any specimens or sample of the species from the summit area (included in SOP17). • Restricting the movements of visitors to the designated space only at the summit (included in SOP17). • Briefing by Malims to Tourists on prohibitions and restriction (included in SOP17). • FMU10 Field staffs or the Honorary Forest Rangers to do random beg checking at the climbing check point. **Borang Pemeriksaan Barang dan Beg (*Borang FMU10 - 2*)** filled by checkers and filed. • Record of activities to be reported and updated on website. • SOP growth assessment of the species and Format of Reporting to MPCT to be refined by the Tambunan Forestry District Officer (DFO Tambunan).

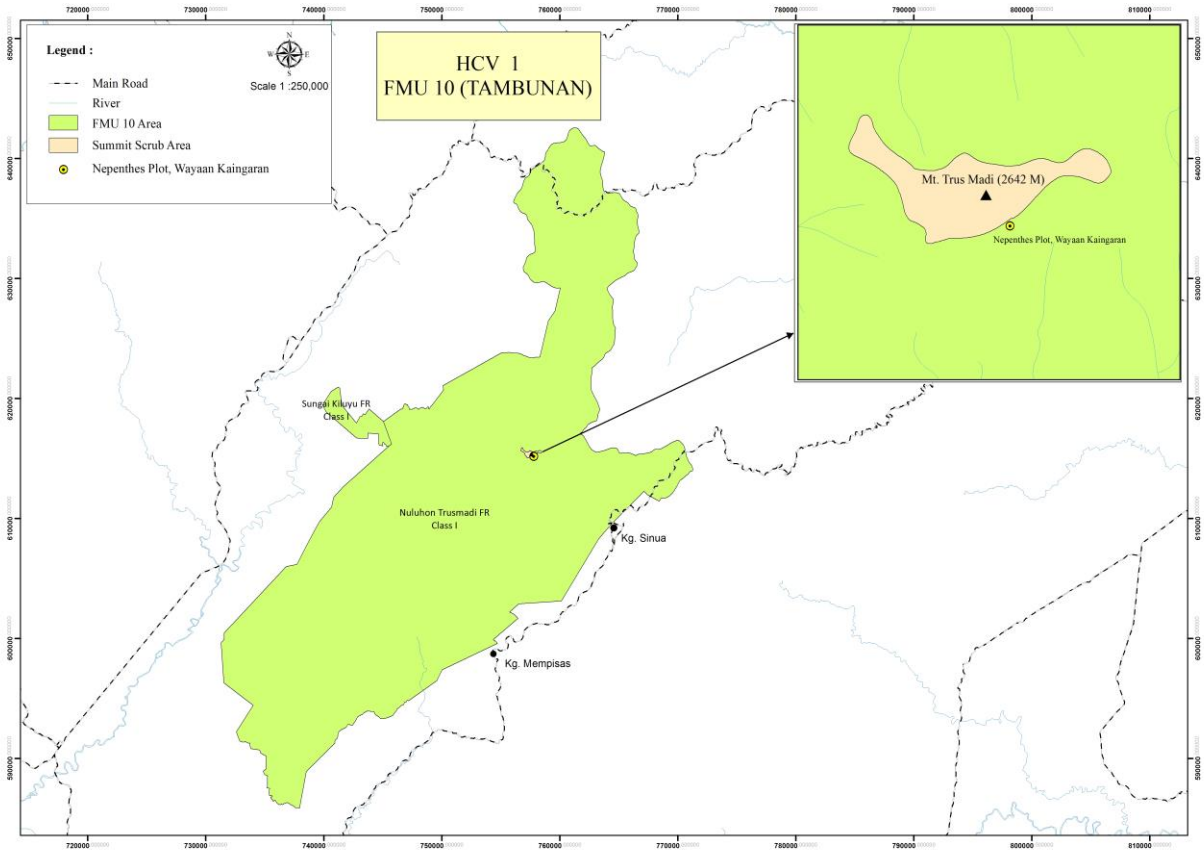

Figure 4: HCV 1.3 – Endemic species of of Nepenthes x trusmadiensis is found at the summit scrub area

Table 4: The Management Description And Monitoring Recommendation of HCV 5 in FMU 10

No	Parameter	Descriptions
1	The Site for HCV 5	A water intake source point's site at Sg. Kaintano for the water gravity system for Kg. Sinua had been demarcated on the ground with the GPS reading recorded as **RS 763942 BOR 610358** (Mohd Nooh, 2014)
2	Current Management Done	• Mapping of site. • Erecting proper sign on site. • Total Protection of the water source in FMU10 as classified under Management Zone 2 (Aquatic Protection). • Patrolling of the demarcated boundaries through ground and aerial surveillance done and reported on monthly basis to the DFO Tambunan and Keningau. • ***Borang FMU10 -* 1** (Ground or Aerial Surveillance) filled and filed after reporting by the Field Staff to both the Tambunan and Keningau District Forest Officers (DFO). • Any incidence of boundaries encroahments acted swiftly by the DFOs. • Report on the surveillance activities to be updated on website and reported in the Annual Work Plan (AWP). • Aerial surveillance to include the patrolling of the aquatic habitats in FMU10. • Mapping of the Zone 2 may need to be refined further by the MPCT. • Demarcation of the remaining Part C perimeter boundaries of Nuluhon Trusmadi Forest Reserve should be completed b the end of 2016.
3	Recommended Strategic Actions To Be Done	• Awareness programmes to include the HCVF Toolkit and importance of the HCV 5 agenda. • Awareness programmes to include an agenda on the conservation of the aquatic haabitats as well as impacts of other destructive activities to all kampungs if possible. • Report of the Awareness Programmes to be deliberated in the Quaterly Meetings of the MPCT for FMU10. • Water gravity system and the HCV 5 to be included as a permanent Agenda and minuted in the Communities Meeting between DFO Keningau and Kg. Sinua's Committee. • Summary of the water gravity system and the the HCV 5 minuted in the Committee Meeting with Kg Sinua to be updated on the FMU10 website and reported in the AWP. • Format of Reporting by communities for the water and the HCV 5 agenda need to be developed, including assigning management responsibilities to the villagers. It may be included under a relevant SOP. • Any complaints in the meeting to be acted swiftly by DFO Keningau.

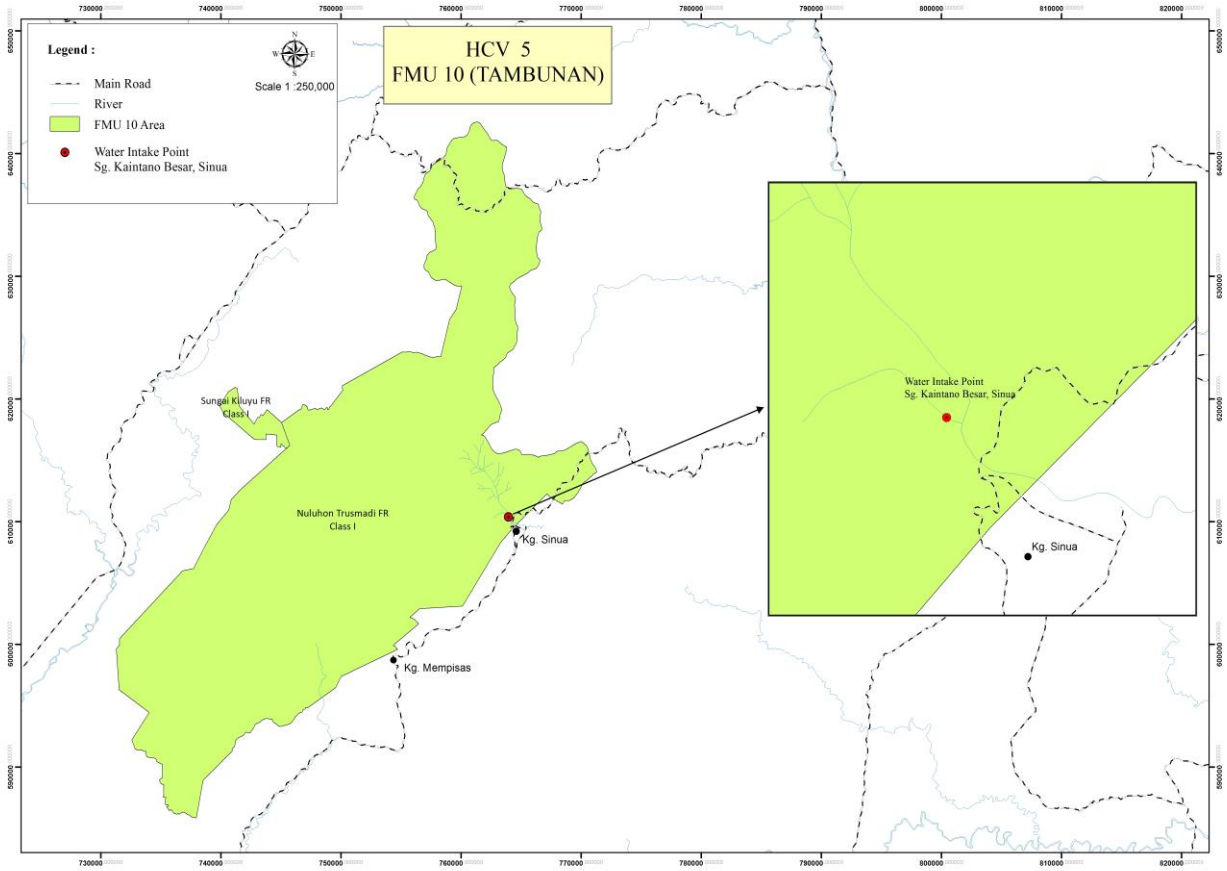

Figure 5: HCV 5 - Water intake source point's site at Sg. Kaintano for the water gravity system for Kg. Sinua

Table 5: The Proposed Measurable Indicator for Monitoring of HCV 1.3 and HCV 5 in FMU 10

a) HCV 1.3: Endemic

No.	Measurable Indicator	Methodology	Frequency	Responsibility
1.	Population density and health assessments	Physical inspections and direct measurements of species on temporary plots	Every 6 months	Tambunan Forestry Field Team
2.	Vegetation cover of plots undamaged	Visual inspection and observations on temporary plots to be developed by the MPCT	Every 6 months	Tambunan Forestry Field Team

b) HCV 5: Basic Needs of Local Communities

No.	Measurable Indicator	Methodology	Frequency	Responsibility
1.	Number of complain received by DFO Keningau	Borang Aduan Air (to be developed by MPCT)	Anytime	Kampung people
2.	Investigation done in accordance to complaints received	Indicating action taken on Borang Aduan Air (to be developed by MPCT)	Upon received of complaints	Keningau Field Staff
3.	Area and site undamaged	Visual inspections and observations on site (SOP to be developed)	Twice a year	DFO Keningau

1.1.6 ***Policy Statement***

The MPCT for FMU10 (Tambunan) is fully committed to the FSC principles and Criteria as well as the principles of Sustainable Forest Management (SFM) as follows:-

I) To manage the FMU10 following the principles of SFM as prescribed by the FSC Principles and Criteria and other relevant International Standards, as well as the relevant National Standard namely that of the Malaysian Timber Certification Council (MTCC).

II) To respect all applicable laws in the country, including State Forest policies, environmental policies, legislations and regulations, and international treaties and agreements.

III) To protect the FMU10 area from illegal harvesting, settlement and other unauthorised activities.

IV) To provide employment and services contracts to local communities outside FMU10 area wherever possible.

V) To identify and protect all sites with potential special cultural, ecological, economic or religious signifificance to local communities.

1.2 Legality

Under the earlier CAMP for this FMU10, the conservation area then was one (1) part of the "Greater" Trus Madi Forest Reserve, a Class 2 Forest Reserve with an area of 74, 736 ha**.** The other part of the "Greater" Trus Madi Forest Reserve with an area of 101,161 ha is located in FMU 5 (Ranau) which is licensed to Anika Desiran Sdn Bhd under the Sustainable Forest Management Licence Agreement (SFMLA 10 / 1997).

The "Greater" Trus Madi Forest Reserve was firstly gazetted in 1962, which covered an area of 75,692 ha. In 1984, it was re-gazetted as a Class II (Commercial) Forest Reserve covering an area of 184,527 ha. Another gazette was done in 1992, reducing the whole of Trus Madi Forest Reserve Class II into a size of 175,897 ha**.** The last re-gazette was done for this portion of the Trus Madi Forest Reserve (FMU10) on the 18th May 2010, making the area into a Class I Forest Reserve.

To avoid confusion among the public and to differentiate the respective areas of FMU10: Class 1 Forest Reserve and the FMU 5: Class II Forest Reserve; a name change for this particular area under FMU10

was done in 2011. The portion under FMU 10 was renamed as **NULUHON TRUSMADI FOREST RESERVE (CLASS 1)**. The FMU5 area on the other hand still retained its identity as **TRUSMADI FOREST RESERVE (CLASS II)**.

Sg Kiluyu Forest Reserve, a newly gazetted Class I (*Protection*) Forest Reserve, was included as part of this FMU 10 in the 18th May 2010, Since then, the FMU 10 was officially recognised as comprising of two (2) forest reserves, i.e. the Nuluhon Trusmadi Forest Reserve (74, 736 ha) and the Sg. Kiluyu Forest Reserve (1, 068 ha). The total area for FMU 10 (Tambunan) up to the end of 2015 was 75, 804 ha.

An extension area covering 12,241 ha, taken out from the FMU5 area in the north eastern side of FMU10, was included as a new area under FMU10 known as the Nuluhon Trusmadi (Extension) Forest Reserve in late 2016.

As of the end of 2016, the total area for the FMU10 (Tambunan) is 88,045 ha **(Table 6).** It comprised of three (3) Class I Forest Reserves, namely, the Nuluhon Trusmadi, the Sg Kiluyu and the Nuluhon Trusmadi (Extension).

Table 6: The Forest Reserves in FMU10

Item	Forest Reserves	Forest Reserve Class	Acreage (Ha)
1	Nuluhon Trusmadi	I	74, 736
2	Sungai Kiluyu	I	1, 068
3	Nuluhon Trusmadi (Extension)	I	12,241
TOTAL	**-**	**-**	**88,045**

1.3 Boundaries and Administrative Jurisdictions

The FMU 10 is bordered by three (3) state administrative as well as forestry districts and a state sub-district. Physically, FMU 10 encompassed the Tambunan District on the western borders, the Keningau Districts on the southern borders, and the Ranau Districts on the northern borders and the Sook Sub-District on the eastern border. The Keningau Forestry District managed some 47,772 ha of the area, and 27,964 ha are within the Tambunan Forestry District's jurisdiction, while the remaining area of 12,241 ha is under the Ranau Forestry District's jurisdiction.

The outer western, southern and eastern boundaries of the Nuluhon Trusmadi Forest Reserve cover a total length of 136,400 metres (m). Some 124,153 m had been physically demarcated on the ground by the end of 2012 and maintained by the end of 2016. The whole boundaries for Sg. Kiluyu Forest Reserve stretching some 19,900 m was demarcated by the end of 2013. However by the end of 2016, the survey work has yet to be endorsed and approved by the Land and Survey Department. The Boundaries demarcation activities done up to the end of 2016 are further deliberated in **Sub Chapter 8.1**. The newly established Nuluhon Trusmadi (Extension) Forest Reserve boundaries measuring some 68,550 m are not demarcated on the ground yet.

1.3.1 Brief History of Forest Utilisation

Logging activities in the greater Trus Madi Forest Reserve began in the 1970s' through the issuance of several short - term licences. A number of long term licences namely to Syarikat Tenju Sdn Bhd and Makmuran Sdn Bhd were issued in the late 1980s' and to Megabountiful Sdn Bhd in early 1990s'. Since 2002, logging licences had ceased to be issued in this Nuluhon Trusmadi Forest Reserve. No logging was ever done in the Sg Kiluyu Forest Reserve. The Nuluhon Trusmadi (Extension) Forest Reserve was under the FMU5 (part of) which was licensed under the SFMLA to Aneka Desiran Sendirian Berhad.

1.4 Physical and Ecological Context

The general characteristics of FMU 10 are described as follows:

1.4.1. Topography

The topography of FMU 10 comprises mainly of mountainous landscape on the northern part and rolling hill towards the southern part **(Figure 6)**. Mount Trus Madi with an altitude of 2,642 m which is the second highest mountain in Malaysia is located in the Nuluhon Trusmadi Forest Reserve. This mountain

is located in the middle of the approximately 80 km long Trus Madi Range which is partly in the FMU10 area. There are other unexplored peaks within FMU10. Mount Kaingaran (2,560 m) is located along the boundaries of the Nuluhon Trusmadi and the Extension area. Running parallel to the Trus Madi Range on the west coast is the Crocker Range State Park, which was gazetted in 1981. The area is managed by the Sabah Parks. Approximately 50 km to the north of FMU10 is Mount Kinabalu with an altitude of 4,101 m is the highest peak in Malaysia.

1.4.2 Climate

The climate is hot and humid in the lowland with mean annual temperature of 27^{o}C. This mountain range is the major water catchments area for numerous rivers including Kinabatangan, the longest river in Sabah. The annual rainfall for the southern part is between 2500 millimetre (mm) and 3000 mm, whereas the interior part is between 2000 mm and 2500 mm and the northern part is between 1500 mm and 2000 mm **(Figure 7)**. The upper portion of Sg Kiluyu forest reserve however received less than 1500 mm.

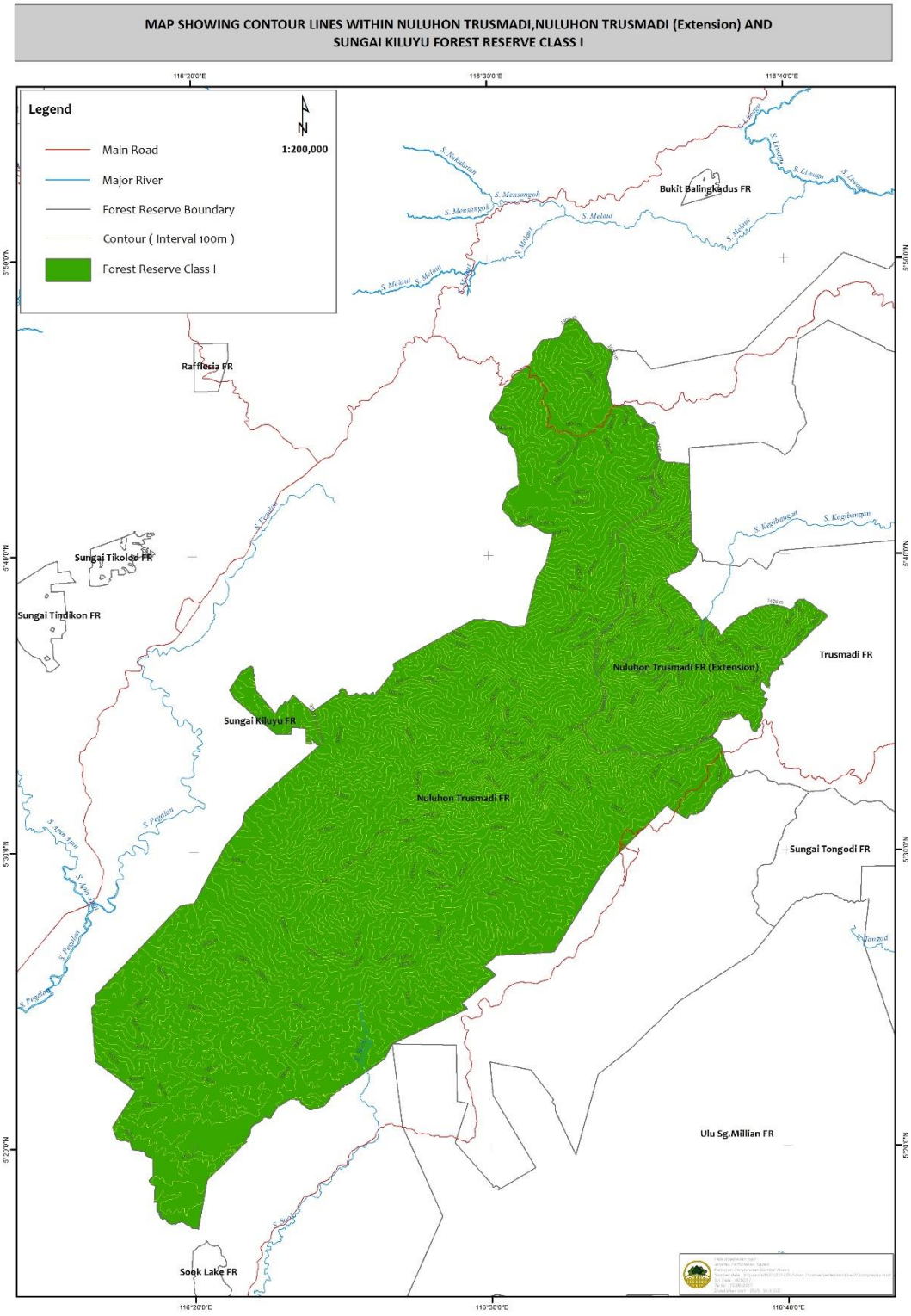

Figure 6: Topography of FMU 10 (Tambunan)

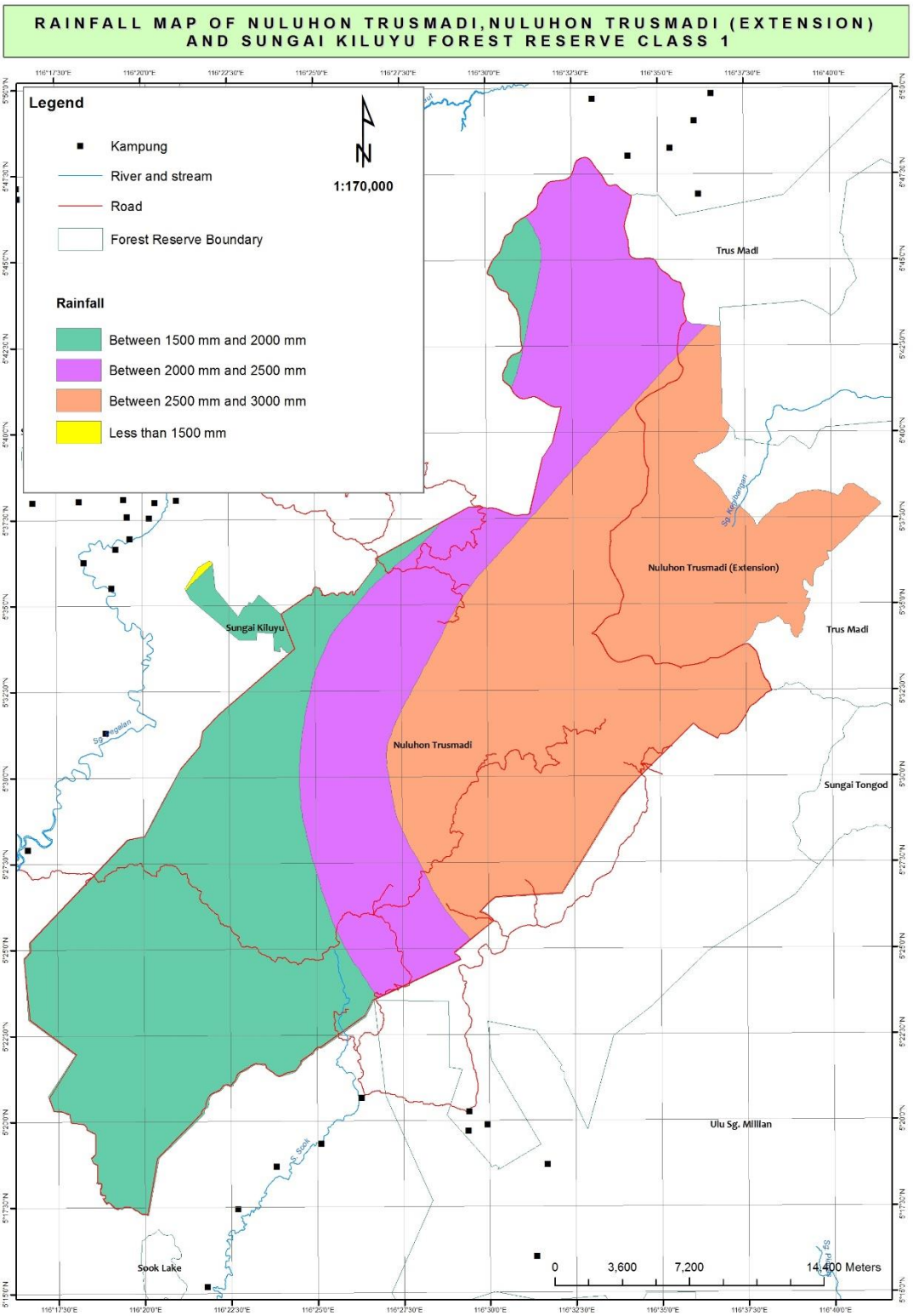

Figure 7: Annual Rainfall Distribution in FMU 10 (Tambunan)

1.4.3 Soil Association

The soil within FMU10 comprises dominantly of Trus Madi and Crocker association, which covers approximately 47,993.12 ha, and 25,804.96 ha respectively **(Figure 8)**. The Lokan association occurred on an area of 895.71 ha and Sinarun association extended over an area of 42.22 ha.

The Trus Madi Association occurs above 1,200 m on the Crocker Range and extensively on the Trus Madi Range reaching 2,580 m at the summit of Mount Trus Madi. The range is composed of sandstone, shale and siltstone, the sandstone being coarse-grained, often quarzitic and with many characteristics of greywacke. Dipterocarp forest covers the lower slopes of the association below about 1,350 m and also extends upwards beyond this height in sheltered valleys. It gives way to an oak/conifer forest dominated by Fagaceae and Lauraceae species. Above 1,950 m leafy hepatics and mosses in what can be described as a moss forest cover low trees and shrubs. Species include Ericaceae, Podocarpaceae, Fagaceae, Theaceae, Lycopodiaceae, Burmaniaceae, Myrsinaceae, Guttiferae and Myrtaceae.

The Crocker Association is the most extensive association in Sabah. It occurs on extensive mountain ranges. Amplitudes are in excess of 300 m and slopes are normally greater than 25°. Ridge crest and valley bottoms are narrow and landslips are common. The mountains are formed of interbedded sandstone and mudstone. Much of the association is under lowland Dipterocarp forest. The association is quite unsuitable for agricultural development largely because of the steepness of the majority of slopes. The Lokan Association is the second most extensive association, throughout Sabah, with major developments such as in the foothills of the Crocker Range on the west and northeast coasts. The whole association is under lowland Dipterocarp forest.

The Sinarun Association occurs on strongly dissected terrace remnants of formerly extensive inland plain at heights of about 450 m. Parent materials comprise medium- to fine-textured, sometimes pebbly, alluvium overlying sandstone and mudstone. The alluvium often forms capping on the hills with sandstone and mudstone outcroppings on lower slopes.

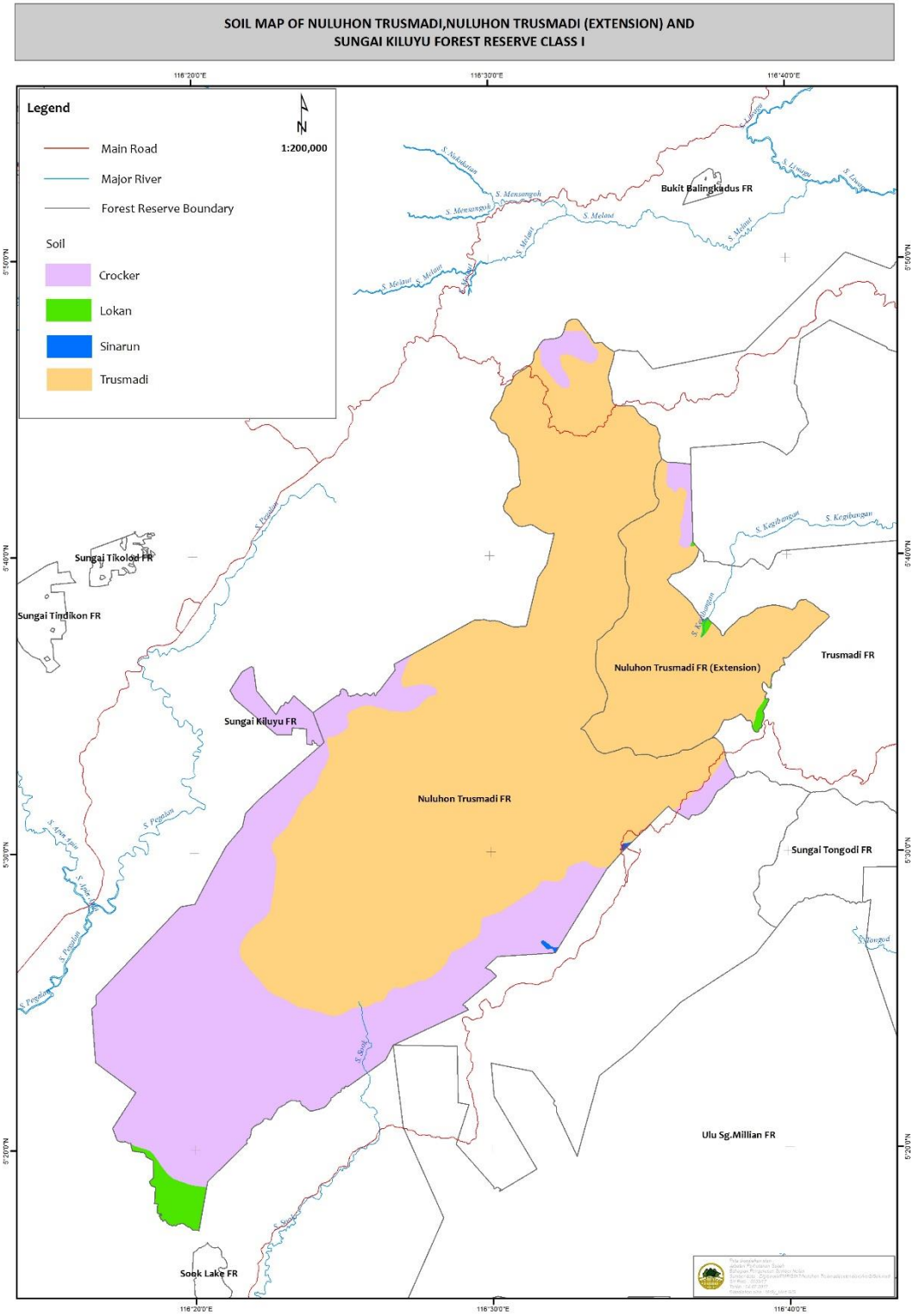

Figure 8: Soil Associations in FMU 10 (Tambunan)

1.4.4 Vegetation

The dominant vegetation type **(Figure 9)** of FMU 10 comprises of the Lower Montane Forest (1,500 – 2000 m above sea level (ASL), which covers an area of 41,970.98 ha approximately and is located mainly at the northern part of the forest reserve. The southern part is covered by Upland Hill Dipterocarp Forest (600 – 1, 499 m ASL), which covers an area of approximately 32,127.40 ha, and a small fragment of Mixed Lowland Dipterocarp Forest (.0 – 599 m ASL) at 637.62 ha approximately, located close to the borders of the forest reserve.

The other vegetation type found in this FMU is the Upper Montane Forest (2,000 – 2,500 m ASL) occupying an area of 2,219.66 ha. The summit scrub, including the peak of Mt. Trus Madi, occupies an area of 29.90 ha. Kitayama et.al[1], found that the lower and upper montane forests on Nuluhon Trusmadi are very similar to those on Mt. Kinabalu, both in the species composition and appearance. However, the floristic richness per site in several locations i.e. the summit scrub exceeds that in ecologically comparable sites on Kinabalu.

To date about 1,396 species of over 171 families and 563 genuses of vascular plants had been recorded in the Nuluhon Trusmadi Forest Reserve. For the non – vascular plants specifically the mosses, a total of 63 species from 33 genuses and 21 families were recorded. Thus, a total of 1,459 species from 192 families and 596 genuses had been recorded in the Trus Madi Forest Reserve until the end of 2012. A total of 57 species are found to be endemic to Borneo. The Biodiversity Expedition done in November 2011 in the Sinua area discovered some 260 newly recorded species.

A Botanical field survey was done for the Sg Kiluyu Forest Reserve in February 2015. The forests of the area are of mixed stratums **(Figure 10).** The poor forest dominated 527 ha of the area, while 340 ha are dominated by the moderate forest growth. Another 210 ha of the area could not be ascertained due to obscuration by clouds. The botanical survey recorded 549 taxa, of which 125 taxa were found to be endemic to Borneo, including 19 taxa that are endemic to Sabah (John et.al, 2016). However none of the recorded species are endemic to Sg. Kiluyu Forest Reserve.

[1] Kitayama, K., Kulip, J., Nais, J., and Biun, A. (1993). Vegetation survey on Mount Trus Madi, Borneo: A Prospective New Mountain Park. Mountain Research and Development 13(1): 99 –105.

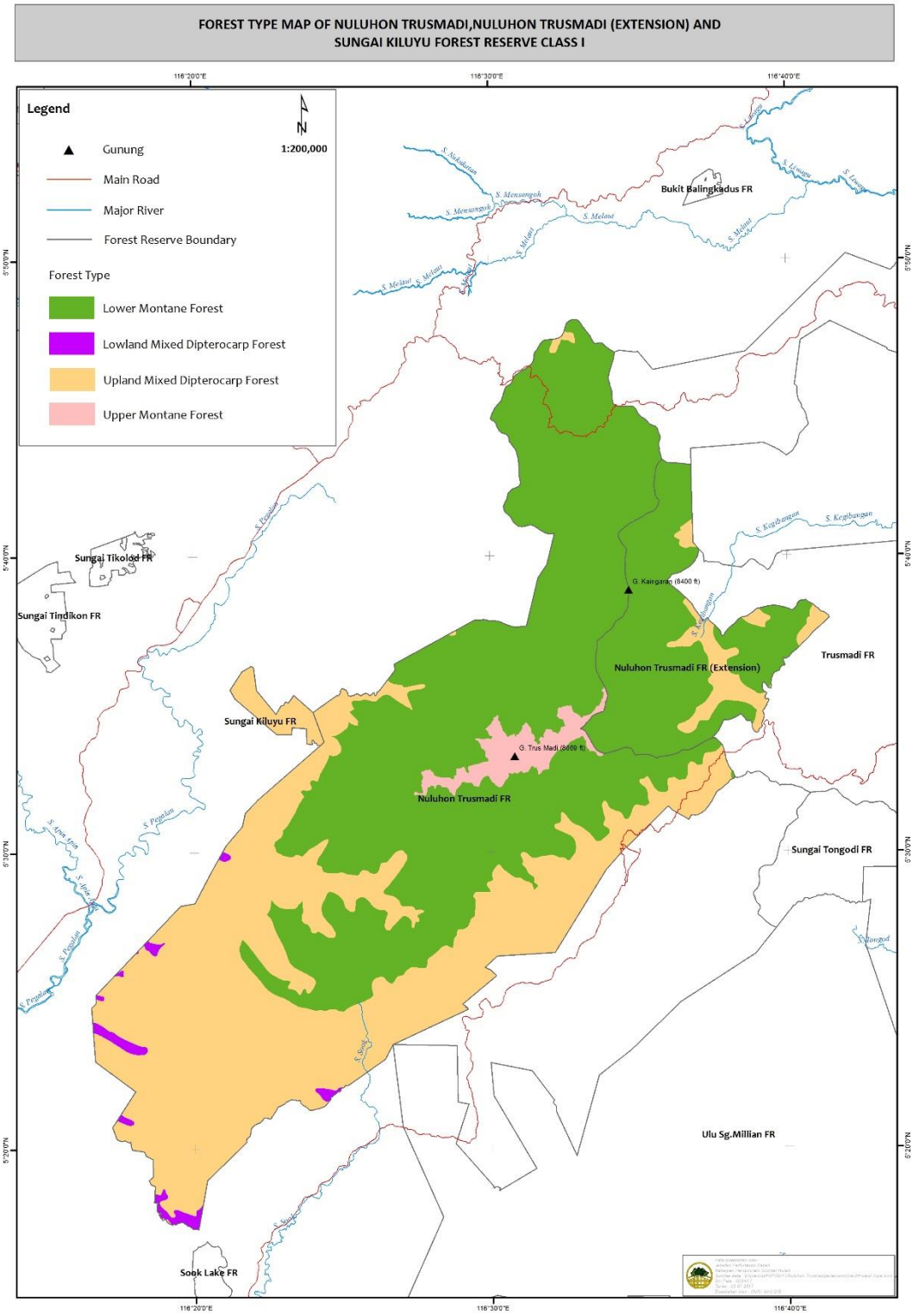

Figure 9: Dominant Vegetation Types in FMU 10 (Tambunan)

John et.al also found that there were four (4) species that are listed under the International Union Conservation on Nature's (IUCN) categories as Vulnerable (VU) as follows (**Table 7**):

- One (1) species as Endangered (EN) and
- One (1) species as Critically Endangered (CR) from this reserve
- Four (4) taxa, namely from the Tetrastigma species are listed under Schedule 1, Part II, classified as Totally Protected Species under the Sabah Wildlife Conservation Enactment 1997.
- Another 18 taxa, of which 7 belonged to the Orchids Taxa;
- Ten (10) of the ginger taxa and
- One (1) of the *Arenga undulatifolia,* fall under the Schedule 2, Part II, Protected Plant Species under the same Enactment.

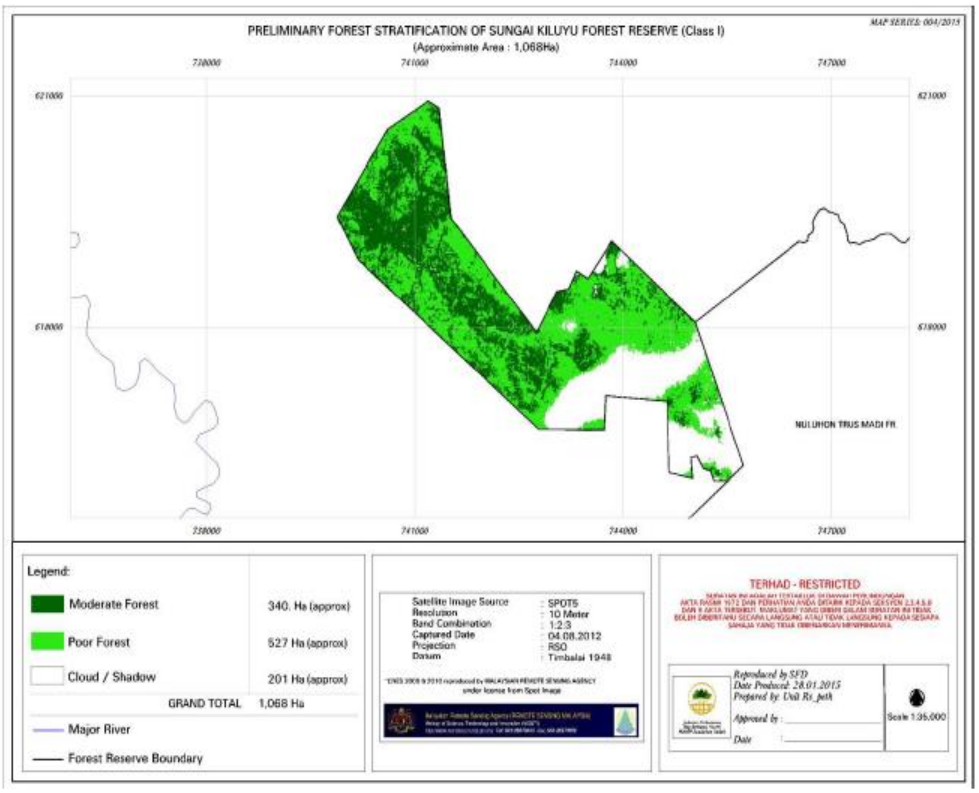

Figure 10: The Forest Stratum in Sg Kiluyu Forest Reserve

Table 7: List of Plant species Under the IUCN Red List found in Sg Kiluyu Forest Reserve

Species	Family	IUCN's Listing
Dipterocarpus kunstieri	Dipterocarpaceae	CR (NT) *
Hopea sangal	Dipterocarpaceae	CR (NT) *
Parashorea malaanonan	Dipterocarpaceae	CR
Shorea argentifolia	Dipterocarpaceae	EN
Shorea gibbosa	Dipterocarpacea	CR (LC)*
Shorea faguetiana	Dipterocarpaceae	EN (LC)*
Kokoona leucociada	Celastraceae	VU
Aglaia cumingiana	Meliaceae	VU
Aglaia ramotricha	Meliaceae	VU
Monanthocitrus oblancolata	Rutaceae	VU

The Awareness Team would need to include these new found informations regarding the flora of Sg Kiluyu Forest Reserve in its program for the kampungs surrounding the area in the future. Botanical field survey will be done in the Extension area located in the Ranau Forestry District as soon as budget and manpower allows it. An Aerial reconnaissance may be done together with the FSC Auditor as on ground accessibility is not possible from both Sinua and Ranau at the time of this write-up.

1.4.5 Wildlife

Prior to the formulation of the CAMP for FMU10, a number of wildlife surveys were done by the Sabah Wildlife Department (SWD) in various locations of the Nuluhon Trusmadi Forest Reserve from 2000 until 2007 (Rahim, 2009). SWD, a member of the MPCT continued to do these surveys in 2010 until 2012 focusing in the Pangas area located in the Keningau Forestry District (Rahim, 2013). Until the end of 2012, a total of 35 mammal species, 144 birds' species, two (2) species of Reptiles and one (1) species of butterfly were recorded in the Trus Madi Forest Reserve (**Table 8).**

Table 8: Wildlife Inventories Done by SWD in FMU10 since 2009

No	Date Of Inventory	Results Of Inventory
1	15-21/07/2010	10 species of mammals and 25 species of birds and 1 butterfly
2	16-19/03/2011	10 species of mammals and 54 species of birds and 2 reptiles
3	25-28/04/2011	11 species of mammals and 47 species of birds and 1 butterfly
4	10-15/10/2011	10 mammal species and 20 bird species and 2 reptiles
5	10-15/09/2012	14 species of mammals and 41 species of birds

A number of the mammals and birds recorded in the surveys belonged to the protected species list under the Wildlife Conservation Enactment 1997 (**Table 9**). Two (2) mammals species recorded in the surveys were classified as Fully Protected Animals. They were the Sun Bear (Beruang Madu) or *Helarctos malayanus* and the Clouded Leopard (Harimau Dahan) or *Neofelis nebulosa*. The hornbills and the Rajah Brooke's Birdwing, two (2) of the Conservation Targets under this FMU 10 were also classified as protected species under the Sabah Wildlife Conservation Enactment 1997 (Rahim, 2009). Rahim (2013) listed the fauna recorded in the Nuluhon Trusmadi Forest Reserve from the surveys done from 2009 until 2013. Wildlife surveys have yet to begin in the Sg. Kiluyu Forest Reserve and the Nuluhon Trusmadi Extension Forest Reserve.

In 2015 the MPCT decided to implement the appropriate wildlife surveys in FMU10. This activity was made possible due to the recruitment of a trained officer in Wildlife Surveys, Pengawas Hutan (PH) Mohd. Faizal Basirin. Two (2) methodologies of animals' recordings were employed by the FMU10 Wildlife Team headed by PH Mohd Faizal Basirin.

Table 9: Wildlifes Recorded in Nuluhon Trusmadi Forest Reserve under the Protected Lists of the Sabah Wildlife Conservation Enactment 1997

Item	Species	Status Of Protection Under The Wildlife Conservation Enactment 1967
1	Beruang Madu/ Sun Bear (*Helarctos malayanus)*	Fully Protected
2	Harimau Dahan/ Clouded Leopard (*Neofelis nebulosi)*	Fully Protected
3	Hornbills	Protected
4	Rajah Brooke's Birdwing Butterfly	Protected

The first method employed was the Night Spotting. It was a three (3) night's wildlife observation on three (3) tracking points along the Haji Ali Hassan road from KM6 to KM44.30 in the Pangas area. The observations were done from 1900 hours until 0400 hours the next day for three (3) consecutive nights. The details of the activities are as follows:

- The Night Spotting crew was made up of a driver, and two (2) field staff. The driver's duty was to drive the double cabin vehicle at a certain speed of not more than 15 km/hr along the designated tracking points of Jalen Haji Ali Hassan.

- One (1) of the field staff would be holding a spot light while standing at the back of the slow moving double Cabin vehicle. His duty was to shine the spot light from the left side to the right side confirming to a 180 degrees movement paced at a timing of around 10 to 20 seconds. This movement would continually be repeated until the vehicle reached the final designated destination of the tracking points

- The other field staff would be responsible to record the animals sighted or spotted within the range of the 180 degrees of the spot light. This means all animals sighted from the left to the front and to the right side and vice versa would be recorded.

The second methodology was to capture wildlife's' daily sightings employing the systematic Camera Trapping. The cameras were positioned at four (4) strategic locations. These nights spotting and the Camera Trappings methodologies revealed the active presence of wildlife's activities in the Nuluhon Trusmadi Forest Reserve in 2016 (**Table 10 and 11**). Some of the wildlifes sighted were the mousedeers (**Plate 1**), the beardered pigs, sambar deers (**Plate 2**), macaques, pangolins, wild fowls and the sun bears. The summaries of these surveys had been put up on the FMU10 website.

Table 10: Wildlifes sighted in Nuluhon Trusmadi Forest Reserve using Night Spotting Method in 2016

Wildlife Sighted	Number of Individuals Animal Sighted
Kijang (Deers)	12
Babi (Bearded Pig)	24
Musang (common palm civet)	4
Harimau Dahan Clouded leopard	2
Landak (Pangolin)	1
Keluang (Flying Fox)	1
Payau (Sambar deer)	16
Monyet (Macaques)	2

Note:

- Night Spotting was done Three Times in a month

Plate 1: A Mousedeer Image captured by Camera Trapping during the day

Plate 2: Images of Deers captured by Camera Trapping during the Night

Table 11: Wildlifes sighted in Nuluhon Trusmadi Forest Reserve using the Camera Trapping Method in 2016

Wildlife Captured on Camera	Frequency Captured by the Camera Trap (%)
Payau (sambar deer)	24.1
Landak (Pangolin)	17.5
Monyet (Macaques)	19.3
Beruang Madu (Sun Bear)	4.3
Musang (Common Palm Civet)	1.3
Kijang (Deer)	0.9
Tupai (Squirrel)	0.4

Note: The frequency of assessments of the Camera traps was done once a month by the Team.

The Wildlife Monitoring using Morning Drive Sighting continuously conducted in 2017 and 2018. The Morning Drive Sighting Methodology shows the active presence of wildlife's activities in the Nuluhon Trusmadi Forest Reserve in 2017 (Table **12**) and 2018 (Table **13**).

Table 12: Summary of Wildlife Identified via Morning Drive Sighting in 2017.

Species	Number(s)				G.Total
	Q1	Q2	Q3	Q4	
Kijang *(Muntiacus hermaphroditus)*	4	4	3	5	**16**
Payau *(Rusa unicolor)*	1	3	1	1	**6**
Babi Hutan *(Sus barbatus)*	1	6	3	4	**14**
Kera *(Macaca fascicularis)*	1	-	-	4	**5**
Musang Tenggalung *(Viverra tangalunga)*	1	-	-	-	**1**
Pelanduk *(Tragulus kanchil)*	2	-	-	-	**2**
Tupai *(Scuridae)*	1	-	1	-	**2**
Helang *(Haliastur)*	1	-	-	1	**2**
Total:	**12**	**13**	**8**	**15**	**48**

Table 13: Summary of Wildlife Identified via Morning Drive Sighting in 2018.

Species	Number(s)				G.Total
	Q1	Q2	Q3	Q4	
Kijang *(Muntiacus hermaphroditus)*	7	3	4	3	**17**
Payau *(Rusa unicolor)*	1	2	1	1	**5**
Babi Hutan *(Sus barbatus)*	5	2	-	-	**7**
Kera *(Macaca fascicularis)*	-	-	3	-	**3**
Enggang *(Buceros rhinoceros)*	2	-	-	-	**2**
Total:	**15**	**7**	**8**	**4**	**34**

Note: The frequency of monitoring using Morning Drive Sighting was conducted once in every quarter by the team.

1.5 Human Context

State lands as well as alienated lands and numerous kampungs surround the FMU 10 in all directions, except for the north – eastern part, classified as FMU 5 area, which is managed under the SFMLA Anika Desiran Sdn Bhd. Under the initial CAMP for FMU10, only five (5) Kampungs outside of the Nuluhon Trusmadi Forest Reserve were assessed. The MPCT also noted that there were no established kampungs in FMU10, although encroachments were detected in Nuluhon Trusmadi Forest Reserve. No encroachments were detected in the Sg Kiluyu Forest Reserve (Rahim, 2013).

Data collection for other kampungs and the extent of encroachments was made a priority by the MPCT. The objectives were, firstly, to collect relevant informations regarding the current socio-economic status of the communities outside of the Nuluhon Forest Reserve and Sg Kiluyu Forest Reserve and the FMU10's conservation efforts impact of their socio – economic activities; and secondly, to recommend appropriate mitigation measures regarding relevant communal issues to be addressed and managed under the CAMP for FMU10.The Social Baseline Survey (SBS) activities were finally completed and analysed in middle 2016. Reports by Jasni Abdullah as well as the Social Impact Assessment (SIA) were presented to the MPCT by Awangku Effendy Pg Mahmud.

1.5.1 Communities outside FMU10

A total population of 7,199 people was estimated to be living outside FMU10 based on the data from the kampungs enumerated (**Table 14**). A total of 1,345 families were living in 1,016 houses across the twenty (20) kampungs**.** The kampungs had a total estimated size of 287.69 ha.

The characteristics of the communities outside FMU10 could be summarised as follows:

a) General Demography

The population was mostly of Dusun and Murut ethnic groups. Majority were practicing the Christian and Muslim faiths.

b) Cultural Norms and Economic Activities

The people were initially culturally hill shifting cultivators and lowland farmers, although permanent farming is more popular nowadays. Generally the people were of the poor to medium range in terms of their household income level.

Table 14: Demography of the Kampungs enumerated outside FMU10

No	CODE NO	KAMPUNG	Year Established	No of Houses	No of Families	Population	Main Economic Activity	Ethnicity	Kampung size (acres)
1	1	PANGAS ULU	1968	30	43	230	Farming	Dusun	5
2	2	KEPAYAN BARU	1960	70	106	500	Farming	Dusun	1
3	3	LINSUDAN	1976	66	56	380	Farming	Dusun	20
4	4	LUANTI BARU	1959	51	124	401	Farming	Dusun	11
5	5	MARASAK	1959	42	53	292	Farming	Dusun	62
6	5A	PANUI	1968	32	50	250	Farming	Dusun	62
7	6	MARAPUK	1958	120	140	900	Farming	Dusun	20
8*	6A	KAIMADANG	NA	NA	NA	NA	NA	NA	NA
9*	6B	MAILO/ SODOMON	NA	NA	NA	NA	NA	NA	NA
10	7	SINUA	1945	89	120	623	Farming	Dusun Lobou	123
11	8	TUAWON	1915	45	52	315	Farming	Dusun	85.06
12	9	SINARON	1972	50	51	319	Farming	Dusun	25
13	10	MANGGARIMOT	1975	39	38	217	Farming	Dusun	70
14	11	MANSIAT	1950	50	50	305	Farming	Dusun	30
15	12	LALAPAKON	1973	48	58	210	Farming	Dusun	NA
16	13	SESELUNGON	1977	30	37	231	Farming	Dusun	19.397
17	14	NANDAGAN	1962	42	79	376	Farming	Dusun	63.62
18	15	MEMPISAS	1960	18	22	101	Farming	Dusun	15
19	16	BT.LUNGUYAN	NA	85	105	630	Farming	Dusun	NA
20	17	MONSOK ULU	1961	20	39	263	Farming	Dusun	25
21*	18	MONSOK TENGAH	NA	NA	NA	NA	NA	NA	NA
22	19	PONONOBURAN	NA	50	67	349	Farming	Dusun	50
23	20	KAINGARAN	NA	39	55	307	Farming	Dusun	12
			TOTAL	**1,016**	**1,345**	**7,199**	-	-	**699.077 (287.69 ha)**

Note: * These three (3) Kampungs were not enumerated under the SBS as all of the Ketua Kampungs had refused to fill in and submitted back the relevant Forms to SFD

1.5.2 Encroachments in FMU10

The analysed data revealed an encroached acreage of 2,977.62 ha by 519 individuals with an average acreage of 5.737 ha **(Table 15).** This figure represented some 3.93 percent of the total area of FMU10 as of the end of 2016. However, as of January 2017, with the inclusion of the newly added area for FMU10, the figure represented only 3.38 percent of the total area of FMU10.

1.5.2.1 Recommended Action

The MPCT will address the issue of cultivations and encroachments as instructed by the Pekeliling Pengarah Bil. 12/2004 (Pencerobohan Dalam Hutan Simpan) **JPHTN/PP 100-4/1/KLT.2 (85)** dated 27th July 2004. The circular stated that all encroachments done prior to 17th August 1998, will be reviewed with the intention to revise the Cabinet's decision under **JKM/PHB(S) 700-1/01/1, 1998**. The gists of actions to be undertaken by the DFO Keningau in the relevant report submission to the Chief Conservator of Forests are as follows:

a) Total area Encroached
b) Types of Cultivations and its age
c) Lists of encroachers and background
d) Map of the encroached area
e) Past Actions taken on the activities

The MPCT decided that further consultation will be held with all of the relevant encroachers on a free, prior informed consents basis to formulate the final recommendations to the Chief Conservator of Forests. Mitigation measures and affirmative actions would be undertaken by the DFO Keningau upon the approval of the Chief Conservator of Forests on the recommended strategic actions of the encroachments.

Table 15: The Estimated Encroached Areas in Nuluhon Trusmadi Forest Reserve

VILLAGES & ZONES			ESTIMATED ENCROACHED AREA (ACRE)	ESTIMATED NO OF ENCROACHERS (INDIVIDUALS)	VERIFIED AREA ENCROACHED (HA)	AVERAGE AREA ENCROACHED (HA)
No	VILLAGE	ZONE				
1	Kepayan Baru	Keningau	1,590	52	924.82	**17.785**
2	Linsudan	Keningau	60	43	167.40	3.893
3	Luanti Baru	Keningau	30	29	62.90	2.169
4	Marasak	Keningau	210	59	242.50	4.110
5	Panui	Keningau	765			
6	Marapuk	Keningau	NA	36	131.35	3.370
7	Kaimadang	Keningau	NA	16	58.54	3.66
8	Pangas/Mangas Rompangas	Keningau	NA	2	12.39	6.195
9	Warisan Tempurung	Keningau	NA	4	15.29	3.800
10	Barisan Baru/Semai Bakti (*no longer in existence)*	Keningau	NA	7	23.10	3.300
11	Kundasang Baru/Kilambang	Keningau	NA	25	162.15	6.486
12	Mailo	Keningau		16	156.80	9.800
13	Merampong	Keningau		6	64.40	10.733
14	Sinua	Sook	NA	35	137.62	3.932
15	Tuawon	Sook	1,200	39	99.84	2.560
16	Sinaron	Sook	NA	NA	NA	NA
17	Manggarimot	Sook	NA	NA	NA	NA
18	Mansiat	Sook	750	22	35.75	1.625
19	Lalapakon	Sook	275	25	88.10	3.524
20	Seselungon	Sook	NA	4	3.29	**0.823**
21	Nandagan	Sook	1,050	40	377.89	9.448
22	Mempisas	Sook	60	13	59.24	4.557
23	Batu Lunguyan	Sook	NA	19	33.47	1.762
24	Monsok Ulu	Tambunan	NA	NA	NA	NA
25	Monsok Tengah	Tambunan	NA	NA	NA	NA
26	Pononoburan	Tambunan	NA	NA	NA	NA
27	Kaingaran	Tambunan	NA	NA	NA	NA
28	Tohan Baru	Tambunan	NA	27	120.72	4.471
			5,990	**519**	**2,977.62**	**5.737**

"Konsultasi Penggunaan Tanah Dalam Hutan Simpan Nuluhon Trusmadi" with the encroachers had been conducted on the 18th July 2017. The consultation is based on the Cabinet's decision through JKM/PHB(S) 700-1/01/1, 1998; whichever encroachment occurs before 1997 are to be taken action as follows;

i. Total area encroached.
ii. Types of cultivation and its age.
iii. Lists of encroachers and background.
iv. Map of the encroached area.
v. Part action taken on the activities.

A total of individuals / encroachers invited about 401 people which consists of fifteen (15) villages; ten (10) villagers from Keningau District and five (5) villages from Sook District.

The consultation's objectives are as follows;

a) To give the encroachers to voice out through the concept *Free, Prior and Informed, Comment (FPIC)* during the consultation;
b) To give a full briefing to the encroachers on what actions to be taken by Sabah Forestry Department (SFD) in accordance the Cabinet's decision JKM/PHB(S) 700-1/01/1, 1998.
c) To records the encroacher's attendances (Attendance List and Photos) as the evidence of discussion between them and SFD;
d) To get the encroachers comment on their willingness to pay OP (Occupation Permit) encroached before 1997 and after 1997.

The outcomes of the consultations are as follows;

a) Total encroached areas for both Keningau and Sook District is 2,047.14 ha which are 1,311.19 ha before 1997 and 735.95 ha after 1997 respectively;
b) Total encroachers before 199 is 268 encroachers (1,311.19 ha) and collection Ops amounting RM10,832,7750.00;
c) Only (28) encroachers (Keningau District) agreed to pay OP with an amount of RM1,573,750.00 and a total area of 219.44 ha;
d) Total areas to be destroyed is about 1,091.75 ha (before 1997) and 735.95 ha (after 1997).

Preliminary report of the consultation for further action to be taken and to get concurrence from the Chief Conservator of Forests (CCF) as follows;

A. Pemberian OP

1) Only (28) are eligible to apply for OP (1997 timeline as per Circular Bil. 12/2004) based on their agreeable to pay;
2) Total area OP is 250.45 ha;
3) Collection estimated OP payment at the rate RM250.00/ha is RM1,457,000.00.

B. Destroying

1) About 168 villagers (included not eligible based on the 1997 timeline) disagreed to pay OP;
2) Total areas to be destroyed is 1,836.69 ha;
3) According to the rate (destroying) RM1,800/ha with a total of RM3,306,042.00 is required;
4) Based on the rate RM3,200/ha for restoration work required an amount of RM5,877,408.00 to proceed the work.

1.6 The Social Impact Assessment (SIA)

A full SIA report involving 18 kampungs and 343 respondents was presented by Awangku Effendy in April 2016 to the MPCT. Only two (2) major social impacts were assessed, namely the impact on water supply and the socio-cultural impact of the conservation efforts (Awangku Effendy, 2016). The main conclusions of the SIA were as follows:

a) The decision by the MPCT to include an aquatic management area under Zone 2 in FMU10 under the CAMP was justified by the positive impact on the sources of water supplies for the relevant Kampungs, which were harvested either through the Gravity System or directly from the rivers.
b) The communities had indicated that they were largely satisfied with the water quality derived from those water sources in FMU10.

c) Management of this agenda was taken on board by the MPCT through the establishment of the HCV 5 area for Kg Sinua and as a permanent topic for discussion in the Kg Sinua Community Meetings headed by the DFO Keningau.

d) The negative impact on the livelihood of the communities since the CAMP for FMU10 was implemented had resulted in various restrictions in entering the FMU10 area by the communities for collections of wild animals and other needs.

e) The SBS data indicated that the communities were aware of these restrictions once the CAMP for FMU10 was implemented. The Awareness Program will play a major role in educating the communities on the values of conservations and protecting the FMU10. The Awareness Program will need to take note on the need to continuously educate the communities regarding the conservation efforts in FMU10 and it should always be emphasised seriously by the MPCT in the AWPs.

1.7 Management of Visitor

Refer to 3.2.2.

2. CONSERVATION CAPACITY MEASURES

As in the initial CAMP, Conservation Capacity Measures are still important to be included in this Revised CAMP. It describes the planning team involvement in the revision process and the assessment of the abilities of existing conservation practitioners at FMU 10 to maintain or improve biodiversity health or abate threats. A biodiversity health assessment indicated a fair situation of its health. The following descriptions of Conservation Capacity briefly summarized the status of the conservation capacity challenges as well as the existing and future efforts to meet those challenges such as Forest Certification in the Conservation Plan for FMU10. **Table 16** describes the overall planning and management Capacities under FMU10: CAMP Ver. 2.

Table 16: Conservation Planning and Management Capacities under FMU10: CAMP Ver. 2

Key Success Indicator	Indicator Rating
Focused Staff Responsibility for Action Site (experience, responsibility, time)	High
Conservation Manager (Experience and exposure to 5 S Planning Framework)	High
Project Support Team Including Those Required For Forest Certification	High
Iterative, Adaptive Approach to Developing Conservation Strategies and Forest Certification	High
Continuous Funding	Medium
Sustainable Financial Support	Medium
Overall Project Capacity	**High**

2.1 Conservation Area Planning Teams

Two (2) planning teams were involved in revising the CAMP for FMU 10.The teams involved were as follows:

- Management Planning Core Team (MPCT)
- Resource Persons Group (RPG)

Memberships of the various planning teams are described as follows:

2.1.1 Management Planning Core Team (MPCT)

The main role of the Management Planning Core Team (MPCT) was in the development of the Conservation Area Management Plan (CAMP), identification and revision of the conservation targets, goals, threats and strategies for the FMU 10. The MPCT was established in 2009 under the leadership of Mr. Rahim Sulaiman (Deputy Chief Conservator of Forests (Management) (*formerly known as Deputy Director of Forests (Management)*). Outside partnerships were also included, catering for the planning and management of fauna and ecotourism development in FMU 10. Assistance from the Sabah Wildlife Department (SWD), Sabah Parks (SP) as well the District Offices of Tambunan and Keningau are still therefore needed by the MPCT for the Revised CAMP. As in the original planning for CAMP FMU10, the members would subsequently be assisting in implementing some of the strategies action plans and monitoring plans as well in the Revised CAMP FMU10. **Appendix 1 (a)** describes the memberships of the MPCT.

2.1.2 Resource Persons Group (RPG)

This group was established to provide expertise opinions that were lacking in the MPCT, especially on the subjects of the selected conservation targets. Therefore, Resource Persons were selected to provide expertise for the Rajah Brooke Birdwings, Hornbills Conservation Targets, Forest Plantations and the relevant strategies implementation. Additional Resource Persons with Forest Certification's experiences are also recruited later. **Appendix 1 (b)** listed the members of the RPG.

2.2 Stakeholder Engagement

In the formulation of the original CAMP that was approved in 2009, two (2) Local Stakeholders Meetings were done. A draft of the initial CAMP was deliberated during the two (2) workshops held in Keningau and Kota Kinabalu in October and November 2007 respectively. The main objective was to solicit comments from the other stakeholders with regards to the various strategies formulated under the previous CAMP, focusing on the creation of the Community Wood Lots in Tambunan. Both workshops resulted in the endorsement of this CAMP for FMU 10. In the subsequent mid – term reviews done in 2013 and 2016, a smaller engagement was done during both revisions due to limited budget and time. In

both occasions, briefings on the respective Drafts of the Revised CAMPs for FMU 10 were done in Keningau. The main objective was to disseminate information apart from soliciting feedbacks from the various stakeholders regarding the two (2) revised CAMPs.

Major consultation done during the revision exercise was on Forest Certification involving the MPCT, RPG and relevant field staffs. Since FMU 10 comes under three (3) different Forestry Districts Administrations, the Forest Certification's concept is therefore essential to be understood by all implementers of this revised CAMP. The main objective was to avoid confusions among the field staff and implementers with regards to their line of work and jurisdictions.

A Forest Communities Committee had been established for both Tambunan and Keningau Forestry Districts. Its major objective was to engage actively with the relevant Kampungs stakeholders twice a year, regarding Conservation and other relevant socio – economic activities in FMU10. A similar committee will be set up for Ranau, should the need arises.

2.3 Personnel and Organisational Structure

An Operational Office was established at the Keningau Forestry Office since 2010. Its set up was specifically to facilitate the strategies implementations under the CAMP FMU10. The Office currently has five (5) professional Foresters namely, Jafin Abu Bakar, Awangku Effendy Pg Mahmud, Haji Afifuddin Jadin, Clarice Alliun and Ricky Yolok. **Figure 11** describes the Organisational Structure under the MPCT and RPG in Implementing the Revised CAMP FMU10.

The current field staffs for FMU 10 is nineteen (19) personnel. However, the MPCT had decided to implement a "Field Staff Pooling" with those from Sook Forestry District and the Nabawan Forestry District. The proposed Staff Pooling was discussed in April 2017 and found to be feasible for implementations in FMU10, Sook Lake Forest Reserve and FMU12 (Pensiangan). All three (3) forest areas are currently under the leadership of DCCF (Management) and all of them shared a common agenda of forest conservation.

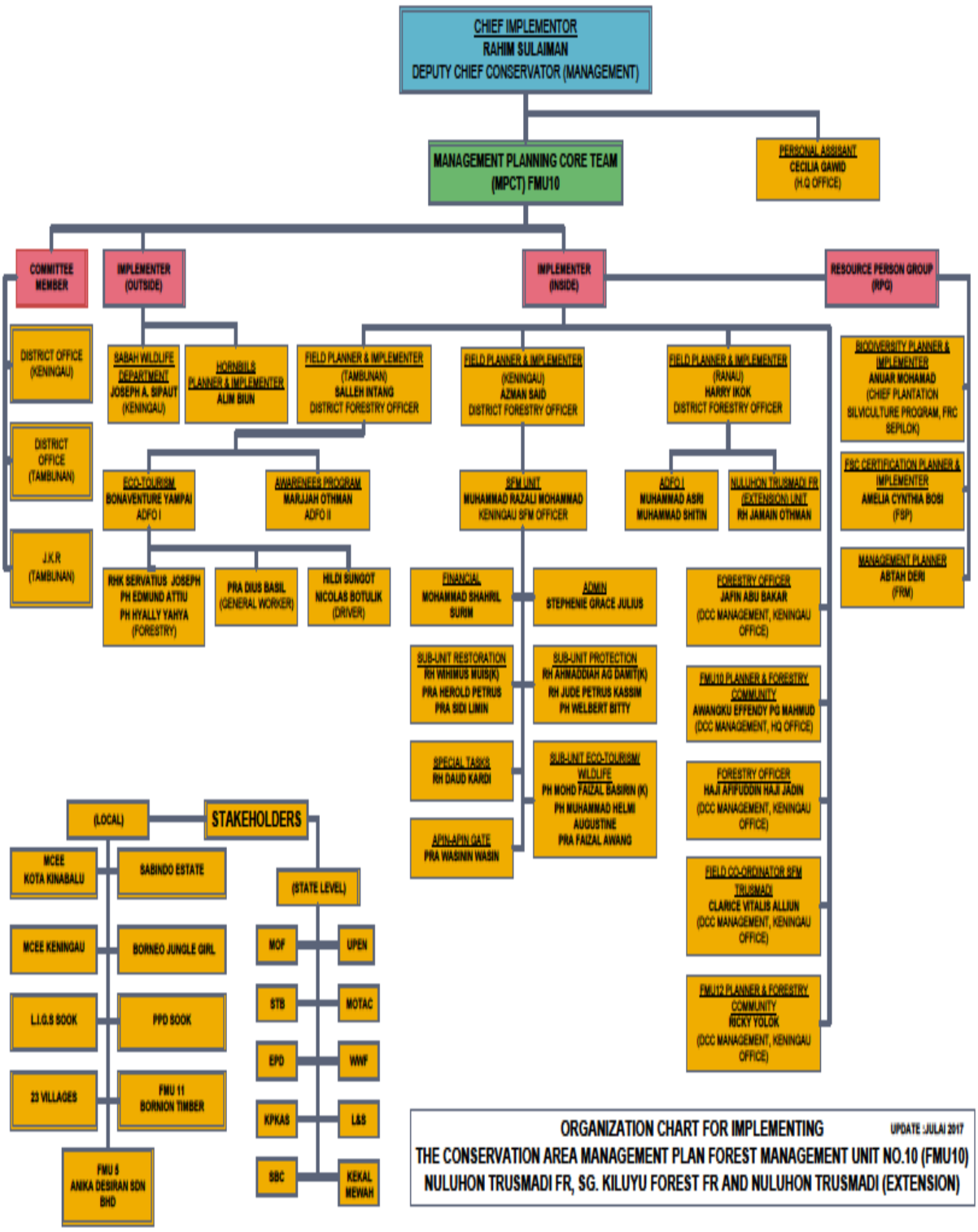

Figure 11: Organisational Structure for Implementing the FMU10: CAMP Ver. 2

The rationale for the staff pooling was to provide for sufficient manpower and expertise to both the Sook and Nabawan Forestry Districts in implementing their relevant strategies under the respective CAMPs. Provision for adequate funding was also a factor in the rationalisation of the pooling mechanism. **Table 17** describes the total numbers of field staff involved in the pooling. In addition, there are ten (10) staff specifically task to do forest nursery work from the Sook Forestry District that could be utilised in raising of seedlings and planting work for FMU10, Sook Lake and FMU12.

Table 17: Lists of Pooled Field Staffs from FMU10, Sook Lake and FMU12

No	Field Staff	Area of Control/ Jurisdiction	Forestry District
1	RH Wihimos Muis	Apin-Apin	Keningau
2	RH Ahmaddiah Ag Damit	Apin-Apin & Sinua	Keningau
3	RH Jude Petrus Kassim	Apin-Apin & Sinua	Keningau
4	RH Daud Kardi	Apin-Apin	Keningau
5	PH Welbert Bitty	Apin-Apin & Sinua	Keningau
6	PH Mohd Faizal Basirin	Apin-Apin & Sinua	Keningau
7	PH Muhammad Hilmi Augustine	Apin-Apin & Sinua	Keningau
8	PRA Mohd Faizal Awang	Apin-Apin & Sinua	Keningau
9	PRA Wasinin Wasin	Apin-Apin	Keningau
10	PRA Herold Petrus	Apin-Apin	Keningau
11	PRA Sidi Limin	Apin –Apin	Keningau
12	RHK Servatius Joseph	Kaingaran	Tambunan
13	PH Edmund Attiu	Kaingaran	Tambunan
14	PH Hyally Yahya	Kaingaran	Tambunan
15	PH Clement James Solisip	Kaingaran	Tambunan
16	PRA Dius Basil	Kaingaran	Tambunan
17	Driver Hildi Sungot	Kaingaran	Tambunan
18	Driver Nicholas Batulik	Kaingaran	Tambunan
19	RH Jamain Othman	Kaingaran Ranau	Ranau
20	RHK Johnny Raymond	Sook Lake	Sook
21	RH Richard Goumin	Sook Lake	Sook
22	RH Erati Ingkau	Sook Lake	Sook
23	PH Majilin Samad	Sook Lake	Sook
24	PH Julius Goidim	Sook Lake	Sook
25	RH Rahman Rahmat	Pamuntarian	Nabawan
26	RH Junaidi Hj Udut	Pensiangan	Nabawan
27	PH Maximus Lazarus	Pamuntarian	Nabawan
28	PH Eddie Anthonius Thomas	Pensiangan	Nabawan

Table 18: Lists of Nursery Staffs from Sook Forestry District

No	Field Staff	Area of Control/ Jurisdiction	Forestry District
1	RA Catherine Tambangan	Sook Lake	Sook
2	PRA Payak Sungkuon	Sook Lake	Sook
3	PRA Sundukan Sisiag	Sook Lake	Sook
4	PRA Marcus Lambigit	Sook Lake	Sook
5	PRA Juffay Tambangan	Sook Lake	Sook
6	PRA Kilipus Kakong	Sook Lake	Sook
7	PRA Paul Kungit	Sook Lake	Sook
8	PRA Matius Dangok	Sook Lake	Sook
9	PRA Josh Tambangan	Sook Lake	Sook
10	PRA Pedilis Muji	Sook Lake	Sook

The previous planning partners namely, Sabah Parks and Sabah Wildlife Department continued their supporting roles in implementing some of the revised strategies under FMU10: CAMP Ver. 2. The other partners such as JKR and the District Offices of Tambunan and Keningau are not involved directly in the strategies implementation. However, they remained as co – opted members of the MPCT largely due to their role as advisers in infrastructural experts in the case of JKR, and as regional and eco-tourism advisers in the case of the District Offices. These members will be called to attend the MPCT meetings as and when required. Other potential planning partners such as the Education Department Office, the Sook Sub- District, the Keningau and Tambunan Land and Survey Office and even the various relevant Jawatan Kuasa Kampungs may be invited to become Resource Persons under this Revised CAMP if and whenever necessary.

2.4 Existing Infrastructure

Since 2009, a number of infrastructures were constructed and maintained. **Table 19** describes the major infrastructures in FMU10. Annual maintenance was done on the various infrastructures as and when funding permitted such activities.

Table 19: The Major Infrastructures Constructed or Maintained in the Nuluhon Trusmadi Forest Reserve since 2009

No	Type of Infrastructures	Location
1	Gated Entrance Decorated with Rajah Brooke's Birdwing Image	Kaingaran Check Point, Tambunan
2	Base Camp consisting of Open Shed, Toilets, Kitchens, Surau and Overnight Sulaps Open Camping Ground and Walai Pagarawang	Mirad – Irad, Tambunan
3	Climbing Shade	Pagandadan Kitingan, Tambunan
4	13 km Gravelled All Weather Road (**Jalan HS Martyn)**	Kaingaran, Tambunan
5	9 km Old Road (**Jalan Jaafar Nyiro**)	Kaingaran, Tambunan
6	Walai Tingkoyodon (Rest House) (Accommodations for 20 Climbers near Taman Sulaiman)	3 KM from the Peak, Wayaan Kaingaran Tambunan
7	Pongingimpaan (Look Out Tower)	Jiran Point, Peak of Mt Trus Madi Tambunan
8	Gated Entrance	KM 0.2 Apin – Apin, Pangas. Keningau
9	Walai FMU10	KM 6 Jalan Ali Hassan, Keningau
10	Wildlife Guard Post	KM 6 Jalan Ali Hassan, Keningau
11	48 km Gravelled Road (**Jalan Ali Hasan**); only 6 km in good conditions	Apin – Apin, Pangas. Keningau
12	Fire Look Out Tower	KM 2, Jalan Ali Hassan, Keningau
13	Wayaan Mastan	Pagandadan Renjer to the Peak, 4.3 km, Keningau
14	Wayaan Mannan	Wokok Sinua to the Peak, 11.6 km
15	Pelantar Mannan	Starting Point Wayaan Mannan, Sinua
16	Lanting Sosodopon	Starting Point to Wayaan Mannan, Sinua

2.5 Standard Operating Procedure (SOP)

To date, a total of seventeen (17) SOP had been approved by the Chief Conservator of Forests under the CAMP FMU10 (**Table 20**). Except for a few, the majority of these SOPs are executed by the field staff of the Keningau, Tambunan and Ranau Districts' office in discharging their daily duties in the field. These SOPs would ensure the implementation of standardised practice by all field staff for all related activities. The MPCT from time to time will decide to develop new SOPs or amend the existing SOPs should the need arises.

Table 20: The Approved Standard Operating Procedures (SOP) for FMU 10

Item	Document No	Activity/Process	Process Owner/Responsibility
1	SFD/FMU 10/SOP-001	Social Assessment.	DFO Keningau, Tambunan and Ranau
2	SFD/FMU 10/SOP-002	Awareness Programme.	Marjah Othman and Clarice Alliun
3	SFD/FMU 10/SOP-003	Tourism Management.	Haji Afifuddin Jadin
4	SFD/FMU 10/SOP-004	Density and abundance of Hornbills within FMU10	Alim Biun
5	SFD/FMU 10/SOP-005	Monitoring	DFO Keningau, Tambunan and Ranau
6	SFD/FMU 10/SOP-006 (*Target has been dropped since 2015 due to the retirement of Resource Person. SOP is no longer In use)*	Guidelines for the Conservation of Rajah Brooke Bird Wing Butterfly in FMU10	Dr Chey Vun Khen
7	SFD/FMU 10/SOP-007	Resource Protection	DFO Keningau, Tambunan and Ranau
8	SFD/FMU 10/SOP-008	Chemical and Fuel	DFO Keningau, Tambunan and Ranau
9	SFD/FMU 10/SOP009	Procedure in Safety and Training	Roslan Lalette
10	SFD/FMU 10/SOP-010	Campsite and Health	DFO Keningau, Tambunan and Ranau

Table 20: The Approved Standard Operating Procedures (SOP) for FMU 10
(continuation)

Item	Document No	Activity/Process	Process Owner/Responsibility
11	SFD/FMU 10/SOP-011	Procedure in Communication and Disputes	DFO Keningau, Tambunan and Ranau
12	SFD/FMU 10/SOP-012	Fauna Inventory	Benedict Jani
13	SFD/FMU 10/SOP-013	Forest Restoration	Jafin Abu Bakar
14	SFD/FMU 10/SOP-014	Controlled Hunting	Benedict Jani
15	SRD/FMU 10/SOP-015	Biodiversity Expedition	Anuar Mohd
16	SFD/FMU10/SOP-016	Managing Spillage (Fuel and Lubricant)	DFO Keningau, Tambunan and Ranau
17	SFD/FMU10/SOP-017	SAR (Search & Rescue)	DFO Keningau, Tambunan and Ranau

3. THE REVISED CONSERVATION TARGETS

Rahim (2009) had described the rationales in selecting the original eight (8) conservation targets. These were reduced to only four (4) Targets during the mid-term review of the original CAMP for FMU10 as documented under the Revised CAMP (Rahim, 2013). The MPCT decided to drop the LMF, the *Rafflesia Keithii* and *Nepenthes* x *trusmadiensis* as well as the Serawi fish. The Conservation Targets retained by the MPCT then were the Upland Mixed Dipterocarp Forest (UMDF) formerly known as Mixed Hill Dipterocarp Forest (MHDF), Summit Scrub (SS), Rajah Brooke's Birdwing Butterfly and the Hornbills. **Table 21** and **Table 22** described the previous targets under the CAMP in 2009 and 2013 respectively.

Table 21: The Initial Eight (8) Conservation Targets and Long Term Goals under the CAMP in 2009

Conservation Targets	Conservation Goals
Mixed Hill Dipterocarp Forest (MHDF)	Restoration of fire degraded and encroached areas with native species
	To ensure zero fire, encroachments, poaching, and illegal timber extraction occurrence in the habitat by 2011
Lower Montane Forest (LMF)	To ensure zero encroachment and poaching occurrence in the habitat by 2011
Summit Scrub (SS)	Restoration of degraded camping area and to achieve zero littering by climbers by 2010
Rafflesia keithii	Total Protection of the species as well as its host plant (*Tetrastigma* spp) by 2012
Nepenthes x trusmadiensis	Total protection of the species at the summit by 2012
Hornbills	Determination of the group's distribution and identification of the dominant species by 2012
Rajah Brooke's Birdwing (*Troides brookiana* brookiana Wallace)	Total protection of the species and its host plant (*Aristolochia* spp) by 2012
Serawi Fish (*Lobocheilus bo*)	Total protection of the species by 2013 in the rivers and streams of FMU 10

Table 22: The Four (4) Conservation Targets and Long Term Goals under the Revised CAMP for FMU10 in 2013

CONSERVATION TARGETS	CONSERVATION GOALS
Mixed Hill Dipterocarp Forest (MHDF)	Restoration of fire degraded and encroached areas with native species
	To ensure zero fire, encroachments, poaching, and illegal timber extraction occurrence in the habitat
Summit Scrub (SS)	Restoration of degraded camping area and to achieve zero littering by climbers by 2018
Hornbills	Determination of the group's distribution and identification of the dominant species by 2018
Rajah Brooke's Birdwing (*Troides brookiana* brookiana Wallace)	Total protection of the species and its host plant (*Aristolochia* spp) by 2018

Under this FMU10 CAMP Ver 2, only three (3) of the initial eight (8) targets are retained. The Rajah Brooke Birdwings was dropped because of the unavailability of an Expert due to the retirement of Dr Chey Vun Khen in 2015. **Table 23** describes the selection and retention of the three (3) conservation targets under FMU10: CAMP Ver. 2. **Fig 12** describes the multiple scale views of the revised conservation targets.

Table 23: Current Conservation Targets and Goals of FMU 10: CAMP Ver. 2

CONSERVATION TARGETS	CONSERVATION GOALS
Upland Mixed Dipterocarp Forest (UMDF)	Restoration of fire degraded and encroached areas with native species
	To ensure zero fire, encroachments, and poaching in the habitat
Summit Scrub (SS)	To ensure minimal Impact from active Eco-Tourism activities at the Summit from the three (3) Climbing Routes
Hornbills*	Determination of the group's distribution and identification of the dominant species

*** Note:** All of the hornbills' species are listed as Protected Fauna in Schedule 2 under Section 25 (2) of the Wildlife Conservation Enactment 1997; however those birds could still be hunted though Licences issued by the Sabah Wildlife Department

Table 24: Justification in selecting the Current Conservation Targets for FMU 10: CAMP Ver. 2

CONSERVATION TARGETS	CONSERVATION GOALS	ACHIEVEMENTS OF GOALS	DECISION BY MPCT
UPLAND MIXED DIPTEROCARP FOREST (UMDF)	Restoration of fire degraded and encroached areas with native species	A total of ten (10) native species were planted in 1,160 ha of restored area by the end of 2012. Due to limited funding, no new planting were done since 2013. Available funding was only adequate to do maintenance of the planted areas. *The work progress is described under Sub-Chapter 7.3.*	**TARGET RETAINED UNDER FMU10: CAMP Ver. 2**
	To ensure zero fire, encroachments, poaching, and illegal timber extraction occurrence in the habitat	One (1) Incidence, each, of fire and encroachment detected and put under control in 2010 in Keningau and Sook. Two incidences of fauna poaching were apprehended and put under control from 2010 to 2011. There was zero occurrence of illegal timber extraction. *The work progress is described in Sub Chapter 7.2.*	
SUMMIT SCRUB (SS)	To ensure minimal Impact from active Eco-Tourism activities at the Summit from the three (3) Climbing Routes	Zero littering was observed by end of 2011 at the summit and the climbing trails. Infrastructure Development became the Focus since 2012. Engagements with local communities in selecting the Malim Gunung (Guides) and Porters done in 2015 for the three (3) wayaan, namely Kaingaran, Mastan and Mannan. *The progress of work since 2009 is described in Sub Chapter 7.4.*	**TARGET RETAINED UNDER FMU10: CAMP Ver. 2**
HORNBILLS	Determination of the group's distribution and identification of the dominant species	The Ten (10) surveys done from 2009 until 2012 indicated the presence of at least four (4) hornbills' species. There was zero incidence of poaching of the species. *Sub Chapter 2.3 describes further on the work progress since 2009.*	**TARGET RETAINED UNDER FMU10: CAMP Ver. 2**

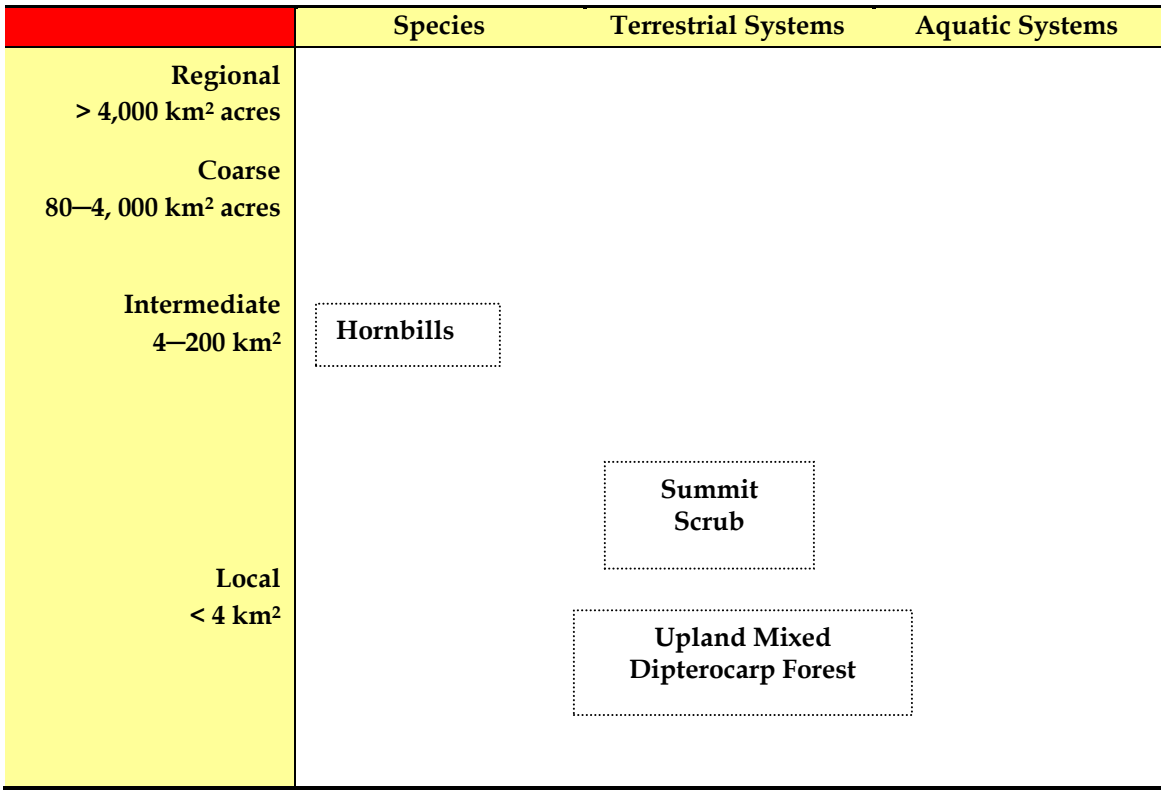

Figure 12: The Revised Conservation Targets of FMU 10 Viewed at Multiple Scales

The three (3) retained targets are described as follows:

3.1 Upland Mixed Dipterocarp Forest (UMDF)

This forest extends from 600 m to 1,500 m ASL. Dipterocarps dominate the crown layers with 16 species mostly from the genus Shorea. Rubiaceae dominates the understorey vegetations with 16 species (**Plate 3**). Another preponderant species includes that from the families of Annonaceae, Leguminosae and Moraceae.

This forest type makes up more than 80 percent of the habitats in FMU 10. By and large, it supports the majority of the flora and fauna populations in FMU 10. Initially, illegal collections of *Rafflesia kethii* by climbers and locals were believed to be the threat to this species. However, this suspicion, through checks done from 2009 until 2012, was not justified from the motivational perspective. The species was not a good trophy for plants collectors and the locals did not use it in their daily life, except for some mythical belief for increasing the male's libido. Moreover, with the implementations of the various strategic actions, the *Rafflesia kethii* in FMU

10 is safe from any poaching danger. As such, this species was dropped as a conservation target in 2013.

Plate 3: The UMDF is dominated by the Dipterocarp and Rubiaceae spp

(Photographed by Jafin A Bakar at Sinua)

Protecting this habitat from destructions from forest fire, illegal poaching of fauna and felling of trees and encroachment however still remain relevant for the next ten (10) years. As such this target was retained by the MPCT in 2013 and 2017.

3.1.1 Previous Goals Achieved

Two (2) goals were initially set for this target previously in 2009 (**Table 28**). The Progress achieved is briefly described as follows:

3.1.1.1 Restoration

Up to the end of 2012 a total of 1,160 ha had been restored with ten (10) native species in ten (10) compartments. Due to budget constraints no new planting were done since 2012. The details of planting and forest restoration maintenance work done are further described in **Sub Chapter 8.3.**

3.1.1.2 Surveillance Work

Surveillance work done through ground patrolling and aerial surveillance in the Nuluhon Trus Madi Forest Reserve had detected three (3) cases of new encroachments and fauna poaching in the habitat. All of these cases were apprehended and put under control by the DFO Keningau. **Sub Chapter 8.2** details the progress of work done to date.

3.2 Summit Scrub (SS)

The Summit Scrub, which extends from 2,500m to 2,640 m ASL. The whole area is only about the size of two (2) football fields. In this habitat where the plants are generally lower than 5 m in canopy height is home to at least six (6) species of Rhododendrons (**Plate 4**). It is the major habitat for the well-known, endemic pitcher plant, and naturally occurring hybrid of *Nepenthes* x *trusmadiensis*. This species is very much admired by climbers to Trusmadi. The MPCT initially believed that it was in danger of being poached by visitors. Thus the species were also chosen as one of the Conservation targets in the initial CAMP in 2009. However, the MPCT soon realised during 2009 until 2013, that poaching of the plant or its plantlets was not likely to occur. Concealing those plants would be difficult without being detected by the accompanying SFD staff during the climb. Even if any individuals do try, one still has to go through the baggage check routine at the exit. This baggage check requirement on all exiting visitors is now a common knowledge to tour guides, climbers and tour operators. Ever since the enforcement of this routine checks, there has not been any report of attempted theft of *Nepenthes* x *trusmadiensis* by climbers from 2009 until 2013. Since the MPCT believed that the species was no longer threatened, it was dropped as a conservation target under the Revised CAMP in 2013.

Plate 4: The Summit Scrub vegetation's are dominated by the Myrtaceae family
(Photographed by Jafin A Bakar)

In the past, the habitat, a tourist spot by virtue of it being the summit of Mt. Trus Madi, was degraded due to uncontrolled cutting of flora including for firewood by visitors and clearing for camping purpose as well as made a place for rampant garbage disposal. Since 2009, with the construction and subsequent upgrading of Sipin Cabin, the mandatory SFD escort during climbing activities through the Wayaan Kaingaran and the erection of eye-catching signage, there was no more indiscriminate clearing for campsite or felling of trees for firewood. The area cleared by Yayasan Sabah has also recovered through natural regeneration, coppicing and also replanting effort by Yayasan Sabah. The MPCT decided to retain the Summit Scrub as a Conservation Target because of the need to ensure minimal damages are impacted upon the site due to expected heavy eco-tourism activities in the next Ten (10) years through the three (3) climbing routes.

3.2.1 Previous Goal Achieved

Two (2) goals were previously set for this target in the initial CAMP FMU10. These were the inventory of *Nepenthes* X *trusmadiensis* and Zero littering at the summit and along the climbing trail at Kaingaran. The two (2) surveys done before the Resource Person, Julius Kulip, resigned in 2010, indicated a healthy population of *Nepenthes* X *trusmadiensis* in the habitat. Since 2010, this target was dropped from the conservation target in FMU10. It was however taken up again by the MPCT as an HCVF 1.3 area in 2014 (**Table A**). Littering was also contained and not a threat anymore by 2013. It was dropped all together from the list of threats. The remaining threats are described under **Table B** in the forwarding chapter and further detailed in **Chapter 4**.

3.2.2 Management of Mountain Climbing Activities

There are three (3) Climbing Routes to the Summit of Mount Trus Madi**.** These are through three (3) Climbing Trails or Wayaan in the Local Dusun Language. The word "Wayaan" would be used in this document to describe those trails. Descriptions of the routes are as follows:

***A) Wayaan Kaingaran**:*

This trail is located some 27 km from Tambunan through the Tambunan – Kaingaran – Mesej – Jalan Batu 8 Kuang (14 Km of mixed gravelled and sealed roads) and Jalan HS Martyn (a 13 km of all weathered gravelled road). The Wayaan is managed by the Tambunan Forestry District through its checking station at the Kaingaran Forestry Check Point. This Wayaan has a total climbing distance of 4.9 km to the summit from the starting point at Kitingan Point (Timpohon Kitingan) **Plate 5**. Since August 2011, the Wayaan was closed for any climbing activities to the public. This was to allow the completion of the current construction of a 3 km Walk way and 20 beds Rest house funded under the Ministry Of Tourism, Malaysia (MOTOUR). It is supposed to be completed by the 8th February 2013. However, delays due to weather and materials procurement as well as variation order approval, the constructions were completed by August 2013.

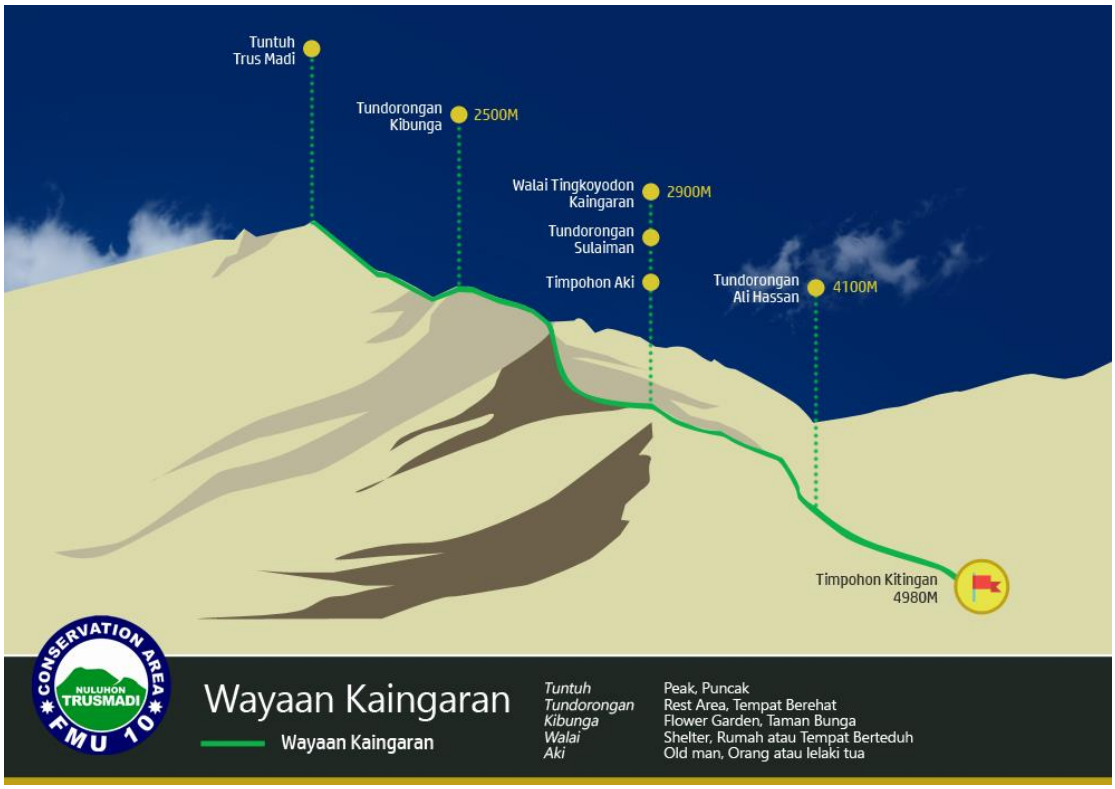

Plate 5: Snap shot of the Wayaan Kaingaran through the Tambunan – Kaingaran Route

B) <u>Wayaan Mastan</u>:

This trail is located around 76 km from Keningau through the Apin-Apin Simpang Ranggom road (a 20 km of sealed road), Jalan Kg Pangas (8 km of gravelled road) and Jalan Ali Hassan (48 km of gravelled and old forest road).The Wayaan is managed by the Keningau Forestry District through the Apin – Apin Forestry Check Point. The Wayaan has a climbing distance of 4.3 km to the summit from the starting point at Rangers Camp (Kem Renjer) **(Plate 6)**. However, due to the Jalan Ali Hassan's atrocious condition, stretching some 42 km, SFD decided to close this climbing route for any climbing activity until funding for its maintenance and upgrading could be procured. To date only 6 km of the Jalan Ali Hassan's road is of good and accessible condition.

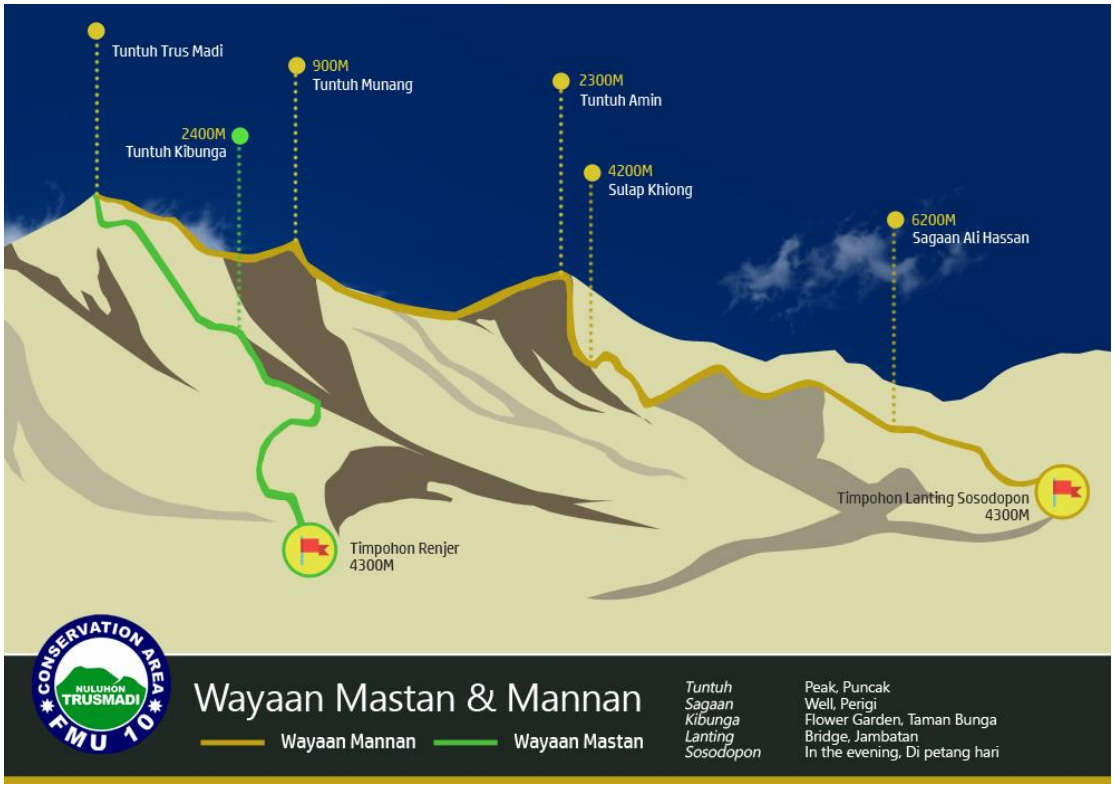

Plate 6: Snap Shot of the Wayaan Mastan (Apin – Apin Keningau) And Wayaan Mannan (Kg. Sinua, Sook, Keningau)

C) <u>Wayaan Mannan</u>:

This trail is located 103 km from Keningau through Sook, Tulid and Kg. Sinua. These road stretches are currently being upgraded into sealed roads. It is expected to be completed by 2014. It will take another 2 km from Kg. Sinua, Sook to reach the Starting Point at Empangan Satu Sinua (Wokok Sinua) through the Jalan Pengaliran dan Saliran road. The Wayaan is managed by the Keningau Forestry District. With a total climbing distance of 11.6 km to the summit from Wokok Sinua, this Wayaan is the longest climbing trail in FMU10 **(Plate 6)**. It remains the only open and active climbing route to scale Mt Trus Madi currently. A Forestry Checking Station has yet to be constructed at the Sinua entrance.

3.3 Hornbills

These birds belong to the Omnivorous avian group, of which eight (8) species could be found in Sabah. Hornbills are among the most flamboyant birds of their habitat. The oversized, slightly decurved bills topped by sometimes outlandish casques shaped as bumps, ridges, or horns make hornbills an unforgettable component of any landscape. Hornbills vary tremendously in size and shape. Males are always larger and stouter than females but the greatest dimorphism often occurs in bill length with males having up to 30% longer bills.

The noise produced by flying hornbills has largely been described as that of an approaching train. This incredible "whooshing," produced in different pitches depending on the species' size, is a result of wing structure. Because horn-bills lack the small feathers that normally cover the shafts of the primary and second flight feathers, each powerful stroke of the wing allows air to pass through and vibrate the large feathers. The casqued on the top of the bill, being the most outstanding feature of the bird, was the main reason for these Hornbills to acquire their common name.

There are key features that must be present in all hornbill habitats—an ample number of large trees for nesting, an adequate year-round supply of food, and enough habitat area to support a viable population. Each species has a particular set of requirements, which may help explain why several species can simultaneously occupy the same habitat.

Hornbills generally wake at dawn, preen their feathers, and then begin their search for food. Normally, hornbills move about in pairs, but some species are found in family groups of three to 20 individuals. Some hornbills gather in large flocks around clumped food resources.

Hornbills are believed to be monogamous and all hornbills are hole-nesters, preferring natural cavities in trees or rock crevices. Unlike any other group of birds, the female hornbill seals the entrance to her nest cavity, leaving only a narrow slit through which she, and later her chicks, receives food from her mate. In most species, the male ferries mud to the female who then works for several days to seal the cavity entrance. Where mud is a rare commodity, the female uses her own faeces as building material.

Nest sealing is believed to have evolved as a form of predator defence, for protection against other intruding hornbills, and to enforce male fidelity. Nest sealing has been described as an example of male chauvinism in which the male cloisters his female, forcing her to depend on him for survival. In reality, the female incarcerates herself and later frees herself, forcing the male to provide for her and their offspring. Because the male is busy provisioning his family, he is incapable of maintaining two nests, and the female can be sure of his complete attention.

The number of eggs, their size, and the length of incubation are all correlated with body size. Clutch size ranges from two to three eggs in large hornbills and up to eight for smaller hornbills. Incubation runs from 23 - 49 days in small and large species, respectively. Eggs hatch in intervals and the emerging chicks are naked and translucent pink with closed eyes. Feather growth begins within a few days and as chicks develop, the skin blackens and begging calls change from feeble cheeps to loud, insistent calls.

The underlying threat to hornbill populations is habitat alteration resulting in forest loss and fragmentation. As forests become smaller and more isolated, hornbill populations decline, resulting in increased vulnerability to extinction from natural disasters such as disease. Protection of hornbill populations and their habitats within conservation areas of adequate size offer some hope for their long-term persistence.

3.3.1 Previous Goal Achieved

A total of ten (10) surveys near Sinua were successfully done by the Research Team headed by Alim Biun of Sabah Parks since 2009 until 2012. A 2 km permanent Research Transect had been established near Sinua to inventorise these birds. A total of 88 km distance was covered by the team in the surveys. A total of 180 hornbills consisting of four (4) species were recorded from 34 direct observations and 64 recognised birds' vocalization from 0 - 800 m of perpendicular distance from the inventory line transect (Alim *et.al*, 2012).

The estimated rate of visual opportunities in an hour is approximately 1.5 birds. Of these, 16.11% (N=29) were Bushy-crested Hornbill (*Anorrhinus galeritus*), 20.56% (N=37) were Helmeted Hornbill (*Rhinoplax vigil*), 33.89% (N=61) were Rhinoceros Hornbill (*Buceros rhinoceros*), and 29.44 % (N=53) were Wreathed Hornbill (*Aceros undulatus*). Overall, Rhinoceros Hornbill recorded the high-density rates of abundance as compared to the other

hornbills. The means estimates abundance of hornbills per/km^2 within the study area is 7.2 birds. This indicates quite healthy populations of the species of horn bills in FMU10, particularly in the Sinua area.

To date, six (6) of these hornbills species have been recorded in the study area in FMU10 (**Table 25 and Plate 7**). These are the Bushy – creasted Hornbill (*Aanorrhinus galeritus*); White – creasted Hornbill (*Berenicornis comatus*); Helmeted Hornbill (*Rhinoplax vigil*); Wreathed Hornbill (*Aceros undulatus*); Black Hornbill (*Anthracoceros malayanus*); and Rhinoceros Hornbill (*Buceros rhinoceros*). Further studies need to be done in the other areas such as Kaingaran and Rompon as well as the Sg Kiluyu Forest Reserve to determine the presence of other species of hornbills in FMU10.

Table 25: Lists of Hornbills Found in FMU10 since 2009

Item	SPECIES	NO OF OBSERVATIONS	NO OF INDIVIDUALS (N)	MEAN / OBSERVATION
1	Bushy Crested Hornbill	7	29	4.14
2	Helmeted hornbill	30	33	1.1
3	Rhinoceros hornbill	23	44	2
4	Wreath Hornbill	25	52	2.04
5	White crowned Hornbill	5	3	1
6	Black Hornbill	1	1	1

Black Hornbill
Enggang Gatal birah
Anthracoceros malayanus

Bushy Creasted hornbill
Enggaang Belukar
(Aanorrhinus galeritus

Wreathed Hornbill
Enggang Gunung
Aceros undulatus

White Crowned Hornbill
Enggang Jambul Putih
Berenicornis comatus

Helmeted Hornbills
Enggang Tebang Mentua
(Rhinoplax vigil)

Rhinoceros Hornbill
Enggang Badak
Buceros rhinoceros

Plate 7: Images of Some of the Recorded Hornbills species in FMU 10

4. THE REVISED THREATS

4.1 Revised Threats

The initial Five (5) threats identified for FMU 10 were poaching for fauna (including illegal collection of flora), fire destruction, littering, encroachment and small scale timber extraction. Mechanisms of identifying these threats had been described earlier in the initial CAMP FMU10 (Rahim, 2009).

Littering along the climbing trails in Tambunan has been put under control largely due to the enforcement of baggage check before and after the mountain climbing activities at the check point. The Bring Your Own Thrash Awareness programme for the climbers and tourist operators contributed to the elimination of this threat as well. The elimination of this activity means that littering is no longer a threat and should be excluded from the revised list. The selections of the Revised Threats were described earlier under **Table B** in the forwarding Chapter. **Table 26** describes the intensity of the revised threats which are as follows:

I. Poaching for flora and fauna is a major threat for the UMDF. It forms a minor threat for the other three (3) Revised Conservation Targets.

II. Fire is a threat for of the Revised Conservation Targets. Some 22,063 ha of the UMDF and LMF areas were burned during the 1997 and 1998 drought.

III. Encroachment occurs largely in Keningau at the UMDF conservation target site, one of the major habitats for FMU 10.

IV. Small – scale timber extraction used to be a major threat that was confined to the Tambunan area, mainly catering for the needs for wood as building materials as well as for commercial use by the local communities. Due to strict enforcement and constant surveillance, this threat has been ably put under control. However, the MPCT felt that it should be included as well as it has the potential to escalate again if the threat is not checked.

Table 26: Intensity of the Revised Threats for FMU 10

THREATS		Upland Mixed Dipterocarp Forest (UMDF)	Summit Scrub (SS)	Hornbills	OVERALL THREAT RANK
1	POACHING OF LARGE AND SMALL FAUNA AND FLORA	**High**	**Low**	**Low**	**Medium**
2	FIRE	**High**	**Low**	**Low**	**Medium**
3	ENCROACHMENT	**High**	**Low**	**Low**	**Medium**
THREAT STATUS FOR TARGETS		**High**	**Low**	**Low**	**Medium**

5. THE REVISED CONSERVATION STRATEGIES

The ultimate objective of the conservation strategies developed under this FMU10: CAMP Ver. 2 is to reduce the stresses and threats that are not only degrading but also lowering the viability of the three (3) selected Conservation Targets. In the original approved CAMP in 2009, a total of eighteen (18) Strategies were selected (**Table 27**). These strategies were subsequently reduced to twelve (12) under the approved Revised CAMP in 2013 (**Table 28**). By focusing on the conservation targets and their sources of threats, the previous twelve (12) strategies were further reduced to ten (10) strategies under this FMU10: Ver. 2 (**Table 29**).

These strategies were further assessed to determine their respective benefits-feasibility-cost rank (high to reasonable) including their respective level of implementation easiness (easy to medium to high). All of the strategies that were identified were ranked as belonging to the highest category and are denoted as 1. These are the strategies that give the highest impact in reducing the threats in the conservation efforts in FMU10.

All of the ten (10) strategies and their relevant strategic actions are further described in **Sub - Chapter 8** under the Annual Work Plan (AWP). The successful implementation of all these strategies is however dependent on the availability of the annually approved budget.

Table 27: The Initial Strategies Implemented under the CAMP for FMU10 from 2009 until 2012

No.	Strategies for Threat Abatement and Restoration
1	Boundaries Demarcation by 2010
2	Upgrade check point facilities and relevant strategic signage
3	Upgrade climbing trails (4.9 km) and construct basic facilities at various rest areas and overnight camping area by 2010
4	Develop and Implement good visitation Protocol/Guidelines
5	Implement good flora and fauna collection Protocol/Guidelines
6	Develop and Implement Social Baseline Surveys by 2010 in the encroached areas
7	Develop and implement controlled hunting plan in Ulu Monsok and Ulu Rompon by 2011
8	Develop and implement Forest Fire Management Plan
9	Establish Community Woodlots in stateland area near Kg. Kaingaran in Tambunan adjoining FMU 10 area by 2011
10	Develop and implement surveillance system
11	Implement the National Ecotourism Guidelines for Ecotourism development at Mt. Trus Madi and BJG's Adventure Tourism site
12	Develop and implement forest restoration for burnt areas
13	Understanding of the target species through: b)Inventory of *N. x trusmadiensis* at the summit by 2010 c) Inventory of hornbills, *R. keithii* and Rajah Brooke and their host plants by 2013
14	Develop and implement relevant conservation awareness programme
15	Collaborate with adjacent landowners to leverage creation of corridors at relevant boundaries of FMU 10
16	Develop ICT capabilities and website for FMU 10
17	Conduct Scientific/Biodiversity Expeditions
18	Conduct Roads maintenance

Table 28: The Previous Strategies under the Revised CAMP for FMU10 from 2013 until 2016

No	Strategies for Threat Abatement and Restoration
1	Boundaries Demarcation and Maintenance
2	Conduct Surveillance Activities
3	Forest Restoration
4	Formulate Suitable Visitation Mechanism and Flora and Fauna Collections Protocol
5	Upgrading and Maintenance of Relevant Infrastructure
6	Implement Relevant Community Forestry Activities
7	Develop and implement controlled hunting plan in Ulu Rompon and Ulu Pangas
8	Establish Community Woodlots in stateland area near Kg. Kaingaran in Tambunan adjoining FMU 10 area
9	Understanding of the target species through: a) Inventory of hornbills by 2018 b) Inventory of Rajah Brooke and their host plants by 2018
10	Implement relevant conservation awareness programmes including Website
11	Scientific/Biodiversity Study
12	Collaborate with adjacent landowners to leverage creation of corridors at relevant boundaries of FMU 10

Table 29: Assessment of the Conservation Strategies under the CAMP for FMU 10 Ver. 2

STRATEGIES FOR THREAT ABATEMENT AND RESTORATION	BENEFITS				FEASIBILITY			COST	OVERALL B & F	RANK
	Threat Abatement Benefit	Restoration Benefit	Leverage (default = Low)	Overall Benefits	Lead Individual/ Institution	Ease of Implementation	Overall Feasibility	Overall Cost *	Overall Strategy Rank	
1. BOUNDARIES DEMARCATION AND MAINTENANCE	VERY HIGH	-	VERY HIGH	VERY HIGH	VERY HIGH	VERY HIGH	VERY HIGH	VERY HIGH	VERY HIGH	1
2. SURVEILLANCE AND MONITORING ACTIVITIES	VERY HIGH	-	VERY HIGH	VERY HIGH	VERY HIGH	VERY HIGH	VERY HIGH	VERY HIGH	VERY HIGH	1
3. FOREST RESTORATION	VERY HIGH	VERY HIGH	VERY HIGH	VERY HIGH	VERY HIGH	VERY HIGH	VERY HIGH	VERY HIGH	VERY HIGH	1
4. MANAGEMENT OF ECO TOURISM ACTIVITIES	VERY HIGH	-	VERY HIGH	VERY HIGH	VERY HIGH	VERY HIGH	VERY HIGH	VERY LOW	VERY HIGH	1
5. UPGRADING AND MAINTAINENANCE OF RELEVANT INFRASTRUCTURES AND WEBSITE	VERY HIGH	-	VERY HIGH	VERY HIGH	VERY HIGH	VERY HIGH	VERY HIGH	VERY HIGH	VERY HIGH	1

Table 29: Assessment of the Revised Conservation Strategies for FMU 10 (continuation)

STRATEGIES FOR THREAT ABATEMENT AND RESTORATION	BENEFITS				FEASIBILITY			COST	OVERALL B & F	RANK
	Threat Abatement Benefit	Restoration Benefit	Leverage (default = Low)	Overall Benefits	Lead Individual/ Institution	Ease of Implementation	Overall Feasibility	Overall Cost *	Overall Strategy Rank	
6. COMMUNITIES ENGAGEMENT	VERY HIGH	-	VERY HIGH	VERY HIGH	VERY HIGH	VERY HIGH	VERY HIGH	VERY HIGH	VERY HIGH	1
7. WILDLIFE MANAGEMENT IN ULU ROMPON AND ULU PANGAS	VERY HIGH	_	VERY HIGH	VERY HIGH	VERY HIGH	HIGH	VERY HIGH	MEDIUM	VERY HIGH	1
8. SURVEY OF HORNBILLS	VERY HIGH	_	VERY HIGH	VERY HIGH	MEDIUM	VERY HIGH	HIGH	MEDIUM	VERY HIGH	1
9. CONSERVATION AWARENESS PROGRAMMES	VERY HIGH	_	VERY HIGH	VERY HIGH	VERY HIGH	VERY HIGH	VERY HIGH	HIGH	VERY HIGH	1
10. MANAGING SCIENTIFIC STUDY	HIGH	-	VERY HIGH	VERY HIGH	MEDIUM	MEDIUM	VERY HIGH	LOW	VERY HIGH	1

6. SUCCESS MEASURES – MONITORING ACTIVITIES

To ensure the success of the ten (10) strategies for the Revised CAMP FMU 10, a number of measurements and monitoring of the conservation targets and the HCVF will need to be done. The summary of the monitoring programmes listed in **Table 30**, describes briefly the seven (7) monitoring activities to be done in measuring the conservation success of the three (3) targets for the next Ten (10) years. All responsible Implementers need to carry out the assessment of the various targets in accordance to their respective indicators, methodologies and frequencies. These monitoring reports and Borang (**Table 31**) would help to advise the MPCT to make the necessary actions and amendments to meet the goals of the Conservation Targets and in managing the HCVF categories and areas.

Table 30: Summary of the Monitoring Activities for the Conservation Targets under FMU10

Item	Target	Indicator	Methodology	Frequency	Responsibility
1	UMDF	Demarcated Forest Boundaries: • No Encroachments • No Illegal Timber Extractions • No Fire Occurrence • No wildlife Poaching • No enlargement of encroached areas by communities **Macro view**	Remote sensing Report: FMU10	Tri Annually	K(FRM) n
2		Demarcated Forest Boundaries: • No Encroachments • No Illegal Timber Extractions • No Fire Occurrence • No wildlife Poaching • No enlargement of encroached areas by communities **Micro view**	BORANG FMU10-1 (Borang Pemantauan/ Rondaan)	Monthly Surveillance	Field Staff
3		Burnt Area Planted and Restored	Laporan Restorasi	Quarterly for Planted Acreage and Area Maintained	Field Staff
4		Growth and Yield Plots	Growth Report on the PSPs	Bi-Annually	FRC Research Team

Table 30: Summary of the Monitoring Activities for the Conservation Targets under FMU10 (continuation)

Item	Target	Indicator	Methodology	Frequency	Responsibility
5	UMDF	Wildlife Surveys, HCV 1.3 and HCV 5 areas monitored	BORANG FMU10 - 3 and BORANG FMU10 - 4	Quarterly	Field Staff
6	Summit Scrub	No Poaching of Flora and Fauna	BORANG FMU10 - 2	All ascents and descents by Tourists: Monthly (Summary)	Field Staff
7	Hornbills	Population density/ Species Distributions of Hornbills	Survey Reports	After each Survey	Sabah Parks Team

Table 31: The Various Monitoring Forms (Borang) and Reports for FMU10

Item	Borang/Reports	Frequency Of Reporting	Information
1	Remote sensing Report: FMU10	Tri-Annually	Overall remote Sensing health of FMU10
2	BORANG FMU10-1	Monthly	Monthly Surveillance status of FMU10 area
3	BORANG FMU10-2	Monthly	Quarterly Status of Baggage Check
4	BORANG FMU10-3	Quarterly	Quarterly status of Wildlife Surveys
5	BORANG FMU10-4	Quarterly	Quarterly status of HCV 1.3 area
6	Growth and Yield Reports on the PSPs	Bi-Annually	Bi-annual status of planted areas
7	Laporan Restorasi	Quarterly	Quarterly status of planted areas
8	Hornbills Reports	Randomly	Status of Hornbills in FMU10
9	Minutes of Meeting	Six Monthly	Status of HCV 5 area

Note**: Appendix 3** describes the various Borang for FMU10.

7. ANNUAL WORK PLAN (AWP)

An Annual Work Plan (AWP) is a must have Document that describes the executions of the various strategic actions including budgeting requirements for all of the ten (10) revised conservation strategies to be done in a particular year by all of the Implementers identified earlier in **Table C** in the forwarding Chapter.

All strategies and the yearly activities would be documented in the early part of the year by the respective implementers for submission to the Chief Planner for the finalisation of the AWP by the MPCT for FMU10. At the end of the year, the work progress will be assessed and reported by all implementers to be included in the SFD's Annual Report.

Table 32 describes the recommended strategic actions to be undertaken by the implementers for their respective AWP's activities. Those actions could be refined further or discarded if necessary depending on the actual implementation environments prevailing at that time. Any changes in the strategic actions would need to be discussed and endorsed by the MPCT prior to its inclusions in the AWP's activities. Beginning 2017, the responsibility of writing up the AWP has been accorded to Awangku Effendy Pg Mahmud.

Table 32: Strategic Actions for Implementation in the AWP for CAMP FMU10

No	Strategy	Strategic actions	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026
1	BOUNDARIES DEMARCATION AND MAINTENANCE	1.Boundary demarcation for part C of Trus Madi Forest Reserve and endorsement by Land and Surveys Department	X									
		2. Boundary demarcation for Extension area and endorsement by Land and Surveys Department										
		3. Boundary maintenance	X	X	X	X	X	X	X	X	X	X
2	SURVEILLANCE AND MONITORING ACTIVITIES	4 Ground Patrol	X	X	X	X	X	X	X	X	X	X
		5. Aerial Surveillance	X	X	X	X	X	X	X	X	X	X
3	FOREST RESTORATION	6. Rehabilitation of Degraded Areas including planting roads maintenance, constructions and Yield Plots reporting and updating	X	X	X	X	X	X	X	X	X	X
4	MANAGEMENT OF ECO TOURISM ACTIVITIES	7.Management of climbing activities (including trainings) to Mt Trus Madi Through Wayaan Kaingaran, Apin-Apin and Sinua	X	X	X	X	X	X	X	X	X	X
		8. Quarterly Reporting and updating of *N X trusmadiensis* plots (HCV1.3) at summit	X	X	X	X	X	X	X	X	X	X
5	UPGRADING AND MAINTAINENANCE OF RELEVANT INFRASTRUCTURE AND WEBSITE	9.Upgrading and Maintenance of Facilities For Wayaan Tambunan, Apin-Apin and Sinua and other Infrastructures	X	X	X	X	X	X	X	X	X	X
		10.Upgrading of ICT Equipments, trainings and Website maintenance	X	X	X	X	X	X	X	X	X	X
6	COMMUNITIES ENGAGEMENT	11.Develop Recommendation in managing Encroachments as Cabinet's directive and Implement decision after stakeholders consultation		X	X	X	X	X	X	X	X	X
		12.Communities Meetings and Monitoring of HCV 5 Area and other activities including trainings	X	X	X	X	X	X	X	X	X	X
7	WILDLIFES SURVEYS IN ULU ROMPON AND ULU PANGAS	13. Camera Trapping Surveys and Report every Quarterly to MPCT and updating on website	X	X	X	X	X	X	X	X	X	X
		14.Develop relevant SOP and trainings	X	X	X	X	X	X	X	X	X	X
8	SURVEY OF HORNBILLS	15. Field Inventory and Analysis and updating on website	X	X	X	X	X	X	X	X	X	X
9	CONSERVATION AWARENESS PROGRAMMES	16.Awareness/ Educating Villagers on Conservation Issues, Reporting and updating on website	X	X	X	X	X	X	X	X	X	X
		17.Develop SOP and report and update on website	X	X	X	X	X	X	X	X	X	X
10	MANAGING SCIENTIFIC STUDY	18. Approved Research by CCF to be monitored by DFO and reported and summarised in website	X	X	X	X	X	X	X	X	X	X
		19. Plan and execute scientific Expeditions in FMU10	X	X	X	X	X	X	X	X	X	X

8. PROGRESS OF THE PREVIOUS STRATEGIES UNDER THE REVISED CAMP (2013 - 2016)

Rahim (2009 and 2013) described the eighteen (18) strategies and the twelve (12) strategies listed under the CAMP for FMU10 and the Revised CAMP for FMU10 respectively. The following Sub – Chapters describe the progress of work for the twelve (12) Strategies of the Revised CAMP for FMU10 from 2009 until the end of 2016. Under this FMU10: CAMP Ver. 2, the twelve (12) strategies have been reduced to ten (10).

8.1. Strategy 1: Boundary Demarcation and Maintenance

The Forest Resource Management (FRM) Division of Headquarters was assigned to carry out the task of boundary demarcation and maintenance for all the three (3) Forest Reserves. Some 124,153 m of the boundaries for Nuluhon Trusmadi had been physically demarcated on the ground by the end of 2012 and maintained by the end of 2016. The whole boundaries for Sg. Kiluyu Forest Reserve stretching some 19,900 m was demarcated by the end of 2013, however has yet to be endorsed and approved by the Land and Survey Department. The newly established Nuluhon Trusmadi (Extension) Forest Reserve boundaries measuring some 68,550 m are not demarcated on the ground yet. **Table 33** describes the brief situation on the demarcation of the forest reserves boundaries in FMU10. The detail progress from 2009 until 2016 is as follows:

8.1.1 Nulohon Trusmadi Forest Reserve

The initial assessment done in 2009 of the outer boundary of the Nuluhon Trusmadi Forest Reserve revealed a total length of 136,400 meters (m) for demarcation survey on the ground. For practical reason, the total length of the boundaries was divided into three (3) parts namely Part A (54,800 m), party B (51,500 m) and finally Part C (35,500 m).

As of December 2009, both Part A (Kg. Tiwag to Kg. Ulu Monsok) and Part B (Kg. Ulu Monsok to Kg. Batu Lunguyan) were successfully surveyed and demarcated on the ground. The total perimeter boundary surveyed was 106,300 m with the total cost of RM 379,491. The usual SFD Plates were also installed at a 20 m interval along these demarcated boundaries. This activity was funded under the 9th Malaysia Plan Project under the FRM Division.

Table 33: Status of Boundary marking for the Forest Reserves in FMU10 as of January 2017

Item	Forest Reserves	Total Boundary Lengths (M)	Status of Boundary Surveyed
1	Nuluhon Trusmadi	136,400	A total of 124,153 m of the length has been surveyed. A balance of 12,247 m to be surveyed
2	Sg Kiluyu	19,900	Demarcation completed but has yet to be verified by the Land and Survey Department
3	Nuluhon Trusmadi (Extension)	68,550	The whole boundaries have yet to be demarcated

Due to the unavailability of fund, survey and demarcation work for the Part C (Kg. Batu Lunguyan to Kg. Sinsuron) of the Nuluhon Trusmadi Forest Reserve's boundaries was not done in 2010 and 2011. Similarly, due to funding constraints in 2010 and 2011, only some portions of the boundaries, namely Part A were maintained and erected with SFD Plates.

A Contract for the survey of Part C of the NuluhonTrusmadi Forest Reserve was finally executed between SFD and Jurukur Swasta, Kota Kinabalu, via Contract NO: ***JP/SN/PPA-FMU10/PSHS/01/2012*** on the 5th of March 2012. The cost of the work totalling RM 169,335 was under the D11 Vote (Pemuliharaan Hutan). The said survey was supposed to be completed over 48 weeks after the signing of the contract. However, due to some unavoidable circumstances, the survey was put on hold until further notice, through the Director's Circular ***JPHTN/PP 100-4/1/KLT.55/105*** dated 10th August 2012. Some 17,803 m was however completed before the stalling of the activity.

Notice to proceed with the survey and demarcations works issued to the contractor since 2013, unfortunately remained unanswered. To ensure the completion of the work, SFD has decided to send its own survey team in 2016.The Team was led by Mr. Colin Benjamin from the Forest Resource Management (FRM) Division, Sandakan. He was assisted by nine (9) forestry staffs from Keningau Region. The survey and demarcation work are expected to be completed at the end of 2017.

8.1.2 Sg Kiluyu Forest Reserve

In May 2012, a tender was called to appoint a registered and reliable surveyor company to survey and demarcate the boundaries of Sg. Kiluyu Forest Reserve, which has been included as part of FMU10. A Contract was duly executed between SFD and Jurukur Swasta of Kota Kinabalu for the survey of 19,900 m of Sg Kiluyu Boundaries on the 6th August 2012, via Contract NO. ***JP/SP/PPA-FMU10/PSHS/02/2012***. The cost of this survey was RM94, 923 to be borne under the Heart of Borneo (HoB) Fund. The work was scheduled to be completed within 48 weeks. However up to the end of 2012, work has yet to begin.

Based on the contract, the survey work of the boundary must be completed within 48 weeks from the date of Registered Survey Paper (RSP) issued by Lands and Surveys Department. The RSP No. 2012149001 for the survey work was issued on 23.10.2012. The survey work was completed before 24.09.2013. As of the end of 2016, the Lands and Surveys Department has yet to approve the survey plan of that forest reserve. A contract amounting to RM66, 446.10 was paid to the contractor (Jurukur Swasta) on 10.07.2013.

8.1.3 Nuluhon Trusmadi (Extension) Forest Reserve

NuluhonTrusmadi Forest Reserve (Extension) is situated on the far south of Ranau Town and lies in N 5^0 37' 00" and E 116^0 36' 00". The landform here ranges from very high hills slopes of 25 degree to mountain with 8000 ft. above sea level and with parent material of sandstone and mudstone. NuluhonTrusmadi Forest Reserve (Extension) with an area of 12,241 Hectares was gazetted as part of Trus Madi Forest Reserve on 01.06.1961 vide Gazette Notification No. 342/1961 and was regazetted and classified as Commercial Forest Reserve Class II on 14.03.1984 vide Gazette Notification No. 4/1984. Presently it has been reclassified as Protection Forest Reserve Class 1 on 08.12.2016 via Gazette Notification No. 13/2016.

The dominant vegetation type for NuluhonTrusmadi Forest Reserve (Extension) comprises of Lower Montane Forest which covered approximately 80 percent of the area and Upland Mixed Dipterocarp Forest covered approximately 20 percent of the area where mostly at the western parts of the reserve. Based on Satellite Image Source (SPOT 6) captured on 31.12.2014, a preliminary forest stratification of NuluhonTrusmadi Forest Reserve (Extension) showed that approximately 171 ha or 1.4 percent of the reserve area was still under the "Good Forest" category. Approximately 4,799 ha or 39.2 percent of the

reserve area was under the “Moderate Forest” and another 6,588 ha or 53.8 percent under the “Poor Forest” category. Apart from that, another 683 ha or 5.6 percent was covered by cloud.

The boundaries of NuluhonTrusmadi Forest Reserve (Extension) are not physically demarcated on the ground yet. Initial investigation showed that the total perimeter of the outer boundaries of the reserve is approximately 68,550 meters. The common boundary with NuluhonTrusmadi (Class I Forest Reserve) is approximately 29,929 meters, while the common boundary with Trusmadi Forest Reserve (Class II Forest Reserve) is approximately 38,621 meters.

8.2 Conduct Surveillance Activities

For management purposes, the FMU 10 is divided into five (5) Mukims under the Tambunan, Keningau and Ranau Forestry Districts. The Mukims are Kirokot, Toboh and Lintuhun in Tambunan; Mukim Apin –Apin in Keningau and Mukim Nuluhon Trusmadi (Extension) in Ranau There are four (4) main access Roads to the Trus Madi Forest Reserve via the Tambunan- Kaingaran (Tambunan) through, Kepayan – Apin - Apin (Keningau), Sinua (Sook, Keningau) and from Ranau. There is no access road yet to Sg Kiluyu Forest Reserve. A 24 hours manned gated entrance and checking stations were erected at both the Kaingaran and Apin-Apin roads. Therefore, strict checking and entrance enforcement is done for both stations.

The Sinua entrance has not been accorded a gated entrance and checking station due to the lack of staff and funding. However, this station is still safe from unwanted trespassers as the Villagers of Kg Sinua acted as the “custodians” on behalf of SFD. This was done through a well organised collaboration with the Kampung folks under the Sinua Ecotourism Management Committee. Constant and active communications between the Sinua representatives (Laimin Dadau and Denis Ikon) and Afifuddin Jadin was done on a monthly basis. Some members of the communities who had been trained by SFD had been appointed as Honorary Rangers in 2013. Apart from being surveillance rangers for SFD, their other main tasks would be as Tourist Guides and Porters for the climbing activities through the Sinua route. The Extension area has not been accorded a checking station. Currently accessibility to the area is not possible even by a Four Wheel Drive Vehicle as the road conditions from Ranau and Sinua are in very bad shape.

Both ground patrolling and aerial surveillance were done since 2009. Six (6) vehicles (4 Wheel Drive) were fully utilised by the field and the CAMP FMU10 Operational Office for the ground patrolling

activities on a weekly basis. Helicopter from Sabah Air Sdn Bhd was rented for the aerial surveillance. A total of eleven (11) aerial surveillances were done from 2009 until 2012. As of the end of 2012, two (2) cases of encroachment and two (2) cases of poaching were apprehended and put under control by the Keningau Forestry District. Infrastructures were demolished at the encroached area, while the poaching cases were duly prosecuted with the help of the SWD, Keningau.

8.2.1 Pooled Patrolling Squad

The MPCT has decided to pool the strength of the field staff for FMU10, Sook Lake Forest Reserve under the DFO of Sook and those from FMU12 under the DFO of Nabawan. This was done to address the problems of inadequate trained staff to police all those areas. The total number of field staff from each Forestry Districts is as described in **Table 17**. Their duties of all those staff would be clearly set out in the respective Annual Work Plans (AWPs) of the respective CAMPs.

8.3 Forest Restoration

The objective of this strategy is to restore some 22,000 ha of burnt and degraded areas with indigenous species only. This area covers about 25 % of the FMU 10 total area. Initially, two (2) sources of funding were secured in 2009. The funds were from the forest rehabilitation funds (Reforestation of Trus Madi Forest Reserve under the Tabung Pemulihan Hutan and from the state government (Reforestation of Burnt Areas for FMU 10: RMK9). DCCF (MGT) Rahim Sulaiman was the implementer for the state funding. The DFO Keningau was the implementer for the rehabilitation funding. Jafin A. Bakar was the field supervisor for both activities.

8.3.1 Early Works

The Ministry of Finance (MOF) Sabah approved the appointment of two (2) planting contractors for the restoration works in early 2009. The two (2) Companies chosen were Green Environmental Consult and Avitrade Plantation Sdn Bhd. The details of their contracts and the locations of the planting compartments are described in **Table 34** and **Fig 13**.

Table 34: Planting Contracts Approved by MOF Sabah for FMU 10 in 2009 until 2013

Name of Company	Contact No and Total Cost	Area Approved by MOF and Funding Source	Validity of Contract	Compartments Allocated for Contract Work
Avitrade Plantation Sdn Bhd	JP/TM-KGU/01/09 **RM2,460,000**	700 ha RFSTATE	13/08/2009 – 12/08/2010	R15, R17, R18, R23, R24A, R24B .R25A and R25B
Green Environmental Consult	JP/TM-KGU/02/09 **RM592,000.00**	160 ha RFTPH	19/09/2009 – 18/09/2011	R16 and R19
Avitrade Plantation Sdn Bhd	JP/TTN/TP(MGT) - D11/01/2011 **RM1,938,000**	300 ha **(Planting)** + 700 ha **(maintenance)** RFSTATE	19/09/2011 – 18/09/2013	R13A, R13B, R19B and R20 **(Planting)** R15, R17, R18, R23, R24A, R24B,R25A and R25B **(Maintenance)**
TOTAL	**RM 4,990,000**	**Area Planted: 1,160 ha**		

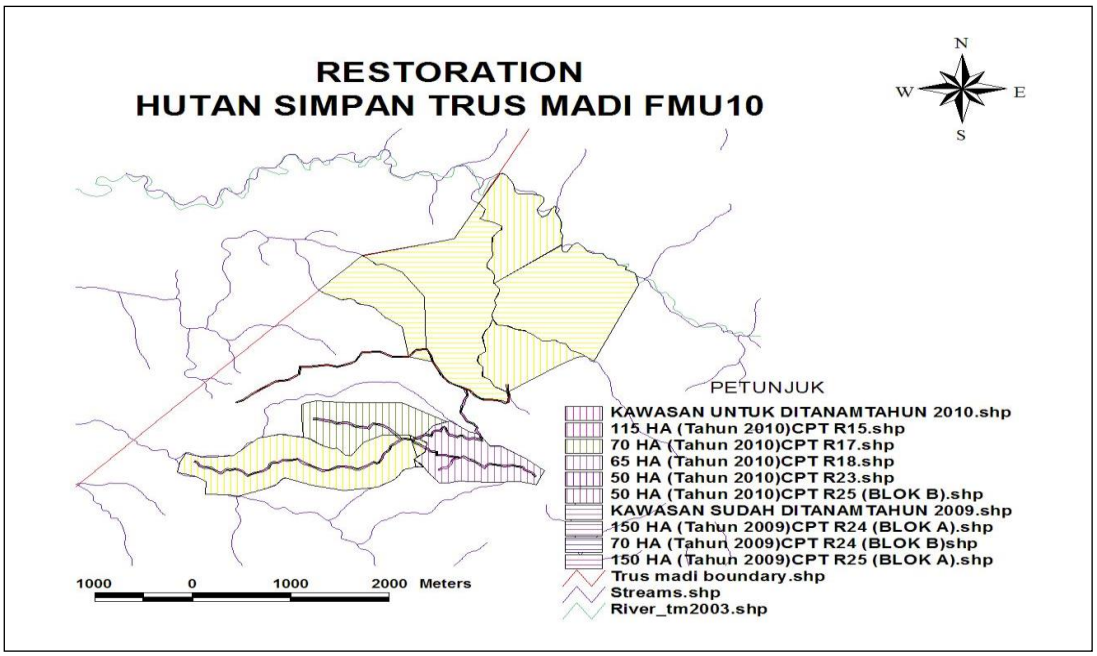

Figure 13: Location of the areas planted in 2009 and 2010 that were maintained annually until 2016

Other important works related to Forest Restorations involved the constructions of planting compartments roads and seedling supplies. These works were either awarded through open tenders or by direct awards. A total of RM 415,710 was spent for the constructions and maintenance of a total 44.31 km of planting roads in the twelve (12) restoration compartments in the early years. A typical costing of planting and maintenance works in FMU10 is detailed in **Table 35.**

A total area of 1,000 ha had been planted and maintained by Avitrade Plantation Sdn Bhd by the end of 2011 until September 2013. The planted areas were located in Compartment R13A, R13B, R15, R17, R18, R19B, R20, R23, R24 and R25 **(Fig 14)**. On the other hand Green Environmental Consult concentrated its 160 ha planting in compartment R16 & R19A until the end of 2011 **(Fig 15)**.

Since 2009, a total area of 1,160 ha had been reforested in FMU10. A total of ten (10) indigenous species were planted (**Table 36**). The species were Bangkal, Binuang Kapur, Kembang Semangkok, Keruing, Laran, Selangan Batu, Seraya Putih, Seraya Bukit and Seraya Spp. A total of 310, 568 trees were planted in the 12 compartments.

Table 35: Costs of Restoration Planting and Maintenance in FMU10

Item	Activity	Contract Unit Price (RM/ha or unit)
1	Site Preparation	900
2	Planting	500
3	**Seedlings Supply**	
	Non – Dipterocarps	3
	Dipterocarps	5
4	Maintenance	180
5	Fertilizer	120
6	Marking of Planting Boundary (m)	1.50

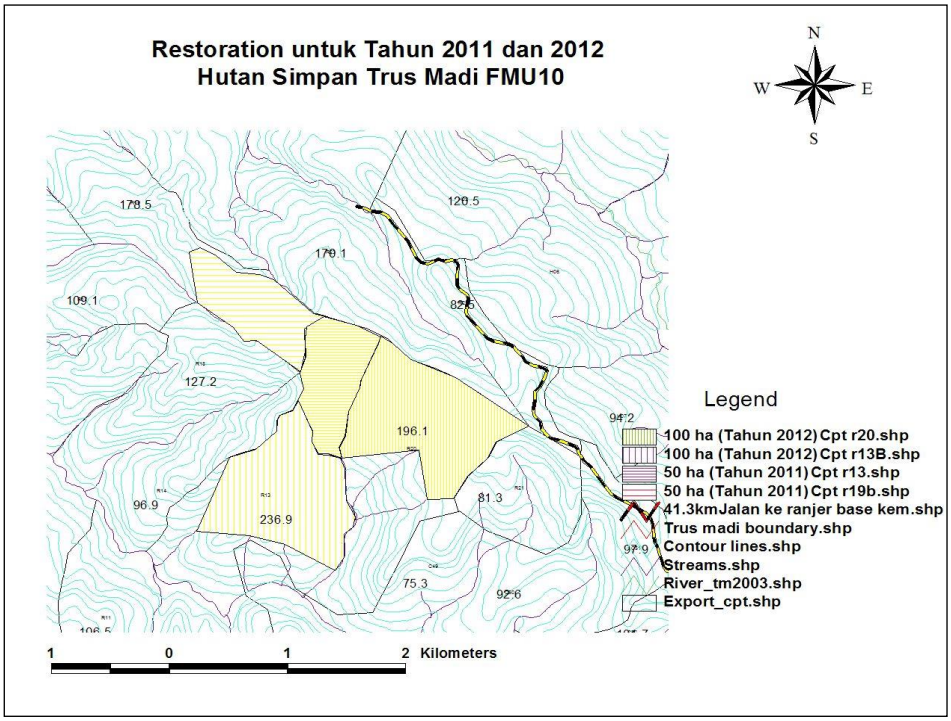

Figure 14: Location of the planted area in 2011 and 2012 by Avitrade Plantation Sdn Bhd that were maintained annually until 2016

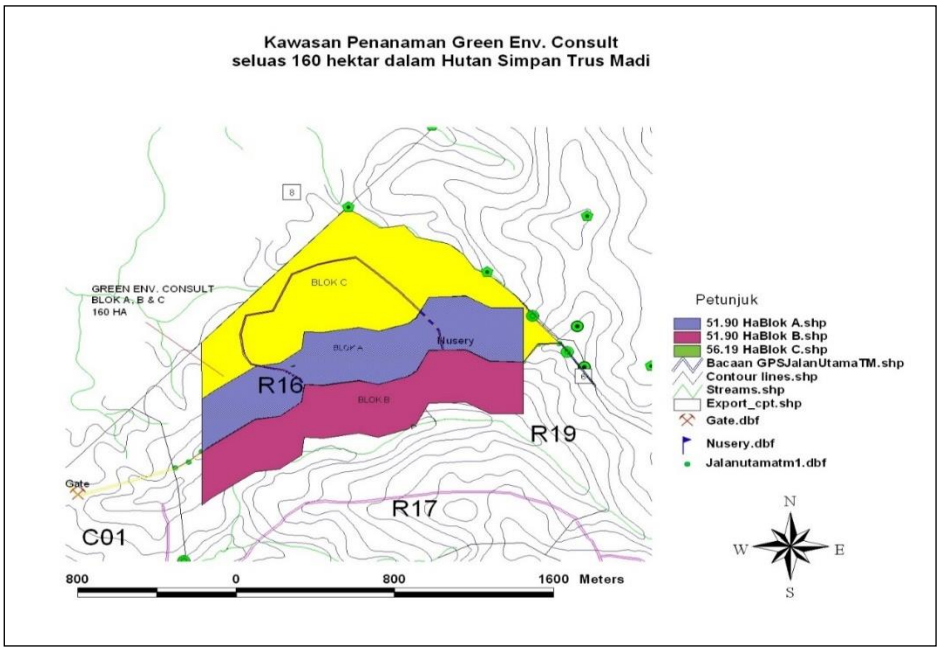

Figure 15: Location of the planted Area by Green Environmental Consult in 2010 and 2011 that were maintained annually until 2016

Table 36: Annual Plantings in Nuluhon Trus Madi Forest Reserve from 2009 until 2011

Compartment Number	Area (Ha)	Number of planted trees	Species Planted (Local names)	Year Planted
Block A (CPT 16 &19)	51.90	14,000	Seraya Putih, Kembang Semangkok, Laran, Binuang, Kapur, Selangan Batu	2009
24A	130	37,180	Keruing, Bangkal, Seraya spp, Kapur, Selangan Batu, Laran, Binuang	2009
24B	70	20,020	Keruing, Bangkal, Seraya spp, Kapur, Selangan Batu, Laran, Binuang	2009
23	50	14,300	Keruing, Bangkal, Seraya Bukit, Kapur, Selangan Batu, Laran, Binuang	2009
25A	150	42,900	Keruing, Bangkal, Seraya Bukit, Kapur, Selangan Batu, Laran, Binuang	2009
Block B (CPT 16 &19)	51.90	14,000	Seraya Putih, Kembang Semangkok, Laran, Binuang, Kapur, Selangan Batu	2010
Block C (CPT 16 &19)	56.19	14,000	Seraya Putih, Kembang Semangkok, Laran, Binuang,	2010
25B	50	14,300	Laran, Binuang, Bangkal	2010
18	65	18,590	Bangkal, Seraya spp, Kapur, Selangan Batu, Laran, Binuang	2010
17	70	20,020	Bangkal, Seraya spp, Kapur, Selangan Batu, Laran, Binuang	2010
15	115	32,890	Bangkal, Seraya spp, Kapur, Selangan Batu, Laran, Binuang	2010
19B	50	13,156	Seraya spp, Kapur, Selangan Batu,	2011
13A	50	14,300	Seraya spp, Kapur, Selangan Batu,	2011
13B	100	28,600	Seraya spp, Kapur, Selangan Batu,	2011
20	100	26,312	Seraya spp, Kapur, Selangan Batu,	2011
	1,160	**310,568**	**(10 Indigenous Species)**	

No new plantings were done since 2013 due to inadequate funding for such activity. Nevertheless maintenance of the planted areas was done annually.

8.3.2 Permanent Sample Plot (PSP)

Three (3) Permanent Sample Plots (PSPs) were set-up randomly in October, 2010 with the objectives to assess the survival rates and performance of the planted seedlings within the restoration areas at Apin-Apin, Nuluhon Trusmadi FR. The areas were rehabilitated a year earlier, in August of 2009. The plots were located as follows;

- Plot 1 in Compartment 24
- Plot 2 in Compartment 18
- Plot 3 in Compartment R15.

Each plot was divided into three (3) sub-plots representing three (3) different slope-ranges as follows:

- Upper slope
- Middle slope
- Bottom slope

Altogether, a total of nine (9) sub-plots were set-up in the three (3) PSPs (**Figure 16**). The MPCT decided to increase the yield plot in 2013. This additional plot, known as Plot number 4, was set up in July 2013 in Compartment R19. It was planted in August 2011.

8.3.2.1 Assessments

Since 2010, six (6) assessments were conducted for Plot 1, 2 and 3 and three (3) assessments for Plot 4. The SOP for growth assessment of the PSP of the restoration plots had been developed accordingly. The latest assessment done in August 2016, revealed an average survival rate of 40.1% for the three (3) PSPs at the age of 84 months after planting (**Figure 17**). The survival rate breakdown by each individual plots were as follows (**Figure 18**):

- 29.8% (PSP 1),
- 46.4% (PSP 2)
- 44.2% (PSP 3).

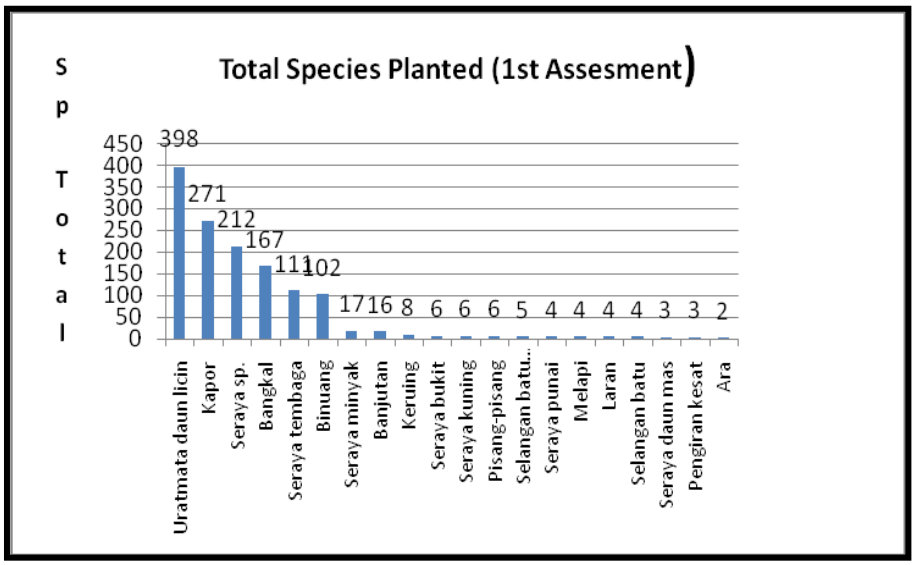

Figure 16: Summary of the Species Planted in Plot 1, 2 and 3.

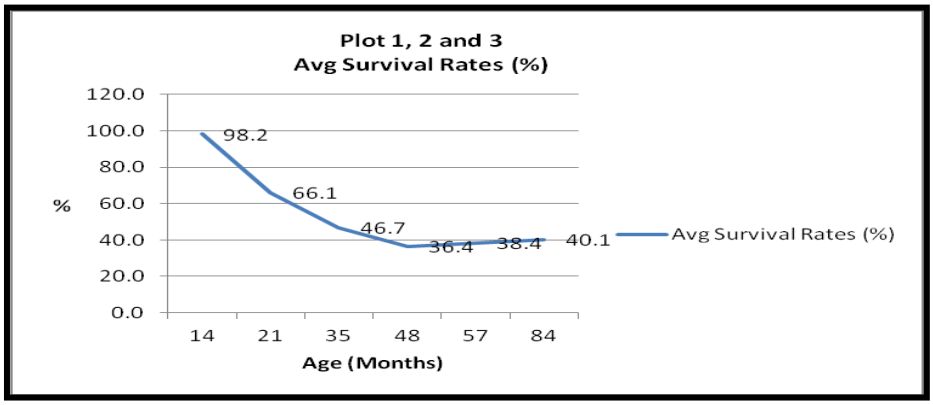

Figure 17: The Average Survival Rates of PSP 1, 2 and 3

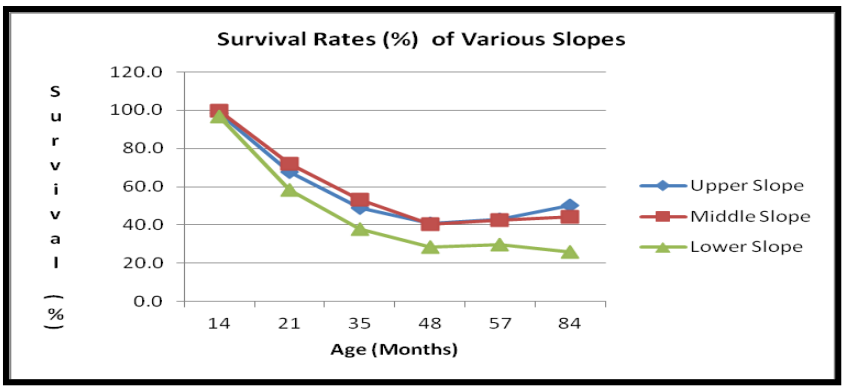

Figure 18: The Individual Survival Rates at various Slopes of PSP 1, 2 and 3

PSP 4 recorded a better survival rate of 74.2% at the age of 60 months after planting. The average survival rate recorded by the four (4) PSPs was 48.6%. **Table 37** describes the average heights of the selected species recorded in the four (4) PSPs. The assessment also revealed to need to continue the maintenance of those plots from climbing creepers and other weeds to enhance the growth of the planted trees.

Table 37: The Mean Height (M) of the Selected Major Species Planted

Item	Species	Age (Months)	Mean Ht (M)	N
PSP1	Bangkal	84	1.34	31
PSP1	Kapur	84	2.17	11
PSP1	Seraya sp	84	2.56	38
PSP1	Uratmata Daun Licin	84	2.99	43
PSP2	Uratmata Daun Licin	84	2.30	23
PSP2	Kapur	84	2.65	98
PSP2	Seraya sp	84	3.46	24
PSP3	Uratmata Daun Licin	84	1.35	134
PSP3	Seraya sp	84	1.38	66
PSP4	Seraya sp	60	1.55	15
PSP4	Uratmata beludu	60	1.83	319

The continiuos assessment for the Restoration Permanent Sample Plot (PSP) had been conducted in July 2018. The general discussion of the assessment showed that

i. The average survival rates of the 4 PSPs covering a total area of about 6.3 ha with age (plot 1,2 and 3 at 108 months old and plot 4 at 84 months old) was 45.1%. Survival rates of Plot 1, 2 and 3 at 108 months old was 36.7%, whilst that for plot 4 at 84 months was 70.4%.
ii. The survival rate of 45.1% translate to about 128 survive seedlings per hectare from an original planting density of about 285 seedlings per hectare regardless of age of the seedlings.
iii. The lower sub-plots suffer highest mortality due to its location at the bottom slope which is exposed to soil erosion and woods debris sliding down the slopes affecting adversely the seedlings planted.
iv. The steep terrain of the rehabilitated sites with mostly at least 20 degrees slope provide the biggest challenge during planting and in the subsequent monitoring and maintenance activities. The steeper the slope the higher occurrences of land slide anticipated and hence the survival of planted seedlings.

v. Seraya Tembaga, Kapur, Uratmata and other Seraya species seems to be adaptable in this environment. Their survival and height growth are acceptable in these harsh conditions. However, Seraya Tembaga performs the best in terms of mean height growth, followed by Kapur and Uratmata species.

vi. It was observed in the last assessment; "broken-top" affected about 50% of the Uratmata species. This problem was not obvious to the other species. This might have affected the height growth measurements of the Uratmata species. The reasons are probably the species young stem are soft and more vulnerable to strong wind which is common in the areas.

vii. It is obvious that pioneer species such as Binuang could not withstand the competition environment of this area due to the canopy cover that still persist in most of this restoration sites.

viii. Generally, the 4 PSPs still needs maintenance particularly eradicating climbing creepers and line weeding annually to ensure the remaining seedlings will continue to survive grow and enrich the areas.

8.4 Formulate Suitable Visitation, Flora and Fauna Collections Procedure

The main objective of this strategy is to recommend to the Chief Conservator Of Forest all appropriate Guidelines and procedures as well as amendments for orderly visitation and fauna and flora collections. This task was earlier managed by a Committee headed by the DCCF (MGT) (**Table 38**). Prior to any implementations on the ground, all eco-tourism related activities including mountain climbing as well as any collections activities and their Guidelines were vetted by the Committee before submission for approval by the Chief Conservator of Forests.

The Non - destructive activities allowed in FMU10 since 2009 were adventure tourism, Insect collection and Mountain climbing. One (1) Occupational Permit (OP) was issued to Borneo Jungle Girl (BJG) to operate its adventure Tourism activities located at KM 18 from the Apin –Apin Forestry Checkpoint.

A fauna collection License is currently issued to Chewy Entomological Services to collect Insects from FMU10. Mountain climbing is managed under both the Tambunan and Keningau Forestry Office.

Table 38: Composition of the Visitations and Collection Committee for FMU10

No	Member	Responsibility
1	DCCF (MGT) Rahim Sulaiman	**Chairman**
2	Haji Afifuddin Jadin	**Secretary**
3	DFO Keningau (Azman Said)	**Member**
4	DFO Tambunan (Salleh Intang)	**Member**
5	ADO Tambunan (Robert Stidi	**Member**
6	ADO Keningau (Mohd Guntur Arif)	**Member**
7	Anuar Mohd	**Member**

The early years from 2009 was largely spent on developing and improving the Wayaan (trail) in the existing Wayaan Kaingaran, access road maintenance and infrastructural development at Camp Mirad Irad, the Kaingaran Check Point and the starting point. **Sub – Chapter 2.4** described some of the infrastructures developed.

Other notable achievements by the Committee and the MPCT since 2009 were as follows:

1) Identification and demarcations of Wayaan Mastan and Mannan

2) The Climbing Guidelines to Mt. Trusmadi which was approved earlier by the Chief Conservator of Forests for implementation via ***JPHTN/TP (FSP) 400-9/1/8/3/KLT.4 (15)*** in November 2012.

3) A group of 52 soldiers from Battalion 15 Briged Sabah had climbed the Mt. Trusmadi via Kaingaran Tambunan as a part of their staffs' high altitude training with a special approval from the Chief Conservator of Forests (Ref: **JPHTN/PP 700-1/3/9/KLT.13(2)** dated 10.10.2013). During this time the Wayaan Kaingaran was closed to the general public.

4) A study tour of Mirad Irad and Kitingan Point by 36 Trainees from the Institut Latihan Perhutanan (IPS) in June 2014.

5) The Mirad Irad Base Camp Tambunan was chosen a venue for the District Action Committee Meeting in May 2014. This meeting was also attended by YB Tan Sri Datuk Seri Panglima Joseph Pairin Kitingan, the Deputy Chief Minister cum Minister of Infrastructure Development.

Briefings on the activities of CAMP FMU 10 and its related development were given by DD (MGT) and the DFO Tambunan to the members of the Tambunan Committee.

6) FMU10 was chosen as the main site for the Annual Borneo Safari International off Road activities, organised by the Sabah Four Wheeled Drive Association. A total of 174 participants and some 65 four wheeled vehicles took part in the week-long event (**27th October – 2nd November 2014**). The Apin-Apin part of FMU10 was used as the main route for various categories of competencies for 4WD adventures.

7) The imposition of relevant forestry charges and the applications for valid permit to all researchers unless exemption is given by the Chief Conservator of Forests in 2014.Throughout the year, a total of 16 students from UMS and 13 students from Institut Kajian Pembangunan were given permission by the Director to conduct their research work in FMU10.

8) Field Visit by the Chief Conservator of Forests and Entourage (50 staff) to Mirad Irad and Kitingan Point in December 2014.

9) The Trusmadi Mountain Guides Association was established in 2015 by the local communities. The MPCT helped to host its Inaugural Meeting.

10) Relevant Trainings for the staff and local communities were also conducted by the MPCT from 2013 until 2016 (**Table 39**).

Table 39: Training Courses Conducted from 2013 until 2016

ITEM	TRAINING COURSE	DATE	VENUE	NUMBER OF PARTICIPANTS
1	Forest Honorary Ranger (RKH)	6-7 November 2013	Sento Hotel Keningau	46
2	Localised Nature Guide (LNG) Level 2	9-29 October 2014	Borneo Tourism Institute	24
3	Basic Occupational First Aid (Siri 1 and 2)	13-14 October 2014	Sento Hotel Keningau	32
4	Forest Honorary Ranger (RKH) & Malim Gunung	19-23 October 2015	Sento Hotel Keningau & Mirad-Irad Base Camp,	54
5	Search And Rescue (SAR) Trusmadi	1-5 August 2016	Bomba Keningau & Mirad-Irad Base Camp	43

8.4.1 Visitations via Wayaan Kaingaran

Prior to its closure in August 2011, the Kaingaran route in Tambunan was the only accessible climbing trail to Mt Trusmadi. In the early years, it recorded a total of 1,639 visitors from 2008 until 2011 **(Table 40)**. Over a four (4) year period, an average of 410 visitors to Mount Trus Madi was recorded annually. This could be translated as 1.14 visitors per day to the area. The local visitors registered an increasing trend while the foreign tourists registered a declining trend of visitation. It could be assumed that since the upgrading of the Jalan HS Martyn and the imposition of orderly visitation by SFD from 2009, climbing mount Trus Madi has become more active. The decline in 2011 was mainly due to the bad road condition from Kaingaran to Jalan Kiang Batu 8. The particular stretch of road under the jurisdictions of the Mallis Daerah Tambunan extending some 3 km in length was not regularly

maintained by Kekal Mewah Sdn Bhd during the year. This route was closed for public in late 2011 until the end of 2014 to allow the constructions of 3 KM Board Walk and a Rest House funded by the Ministry of Tourism Malaysia.

Table 40: Visitors to Trus Madi via Wayaan Kaingaran from 2008 until 2011

Month	Local Visitors				Foreign Visitors				Total Visitors*			
	2008	2009	2010	2011	2008	2009	2010	2011	2008	2009	2010	2011
Jan	16	0	0	0	0	0	1	0	16	0	1	0
Feb	11	13	40	0	1	12	0	1	12	25	40	1
March	10	10	16	37	0	0	0	2	10	10	16	39
April	4	17	60	63	6	0	12	1	10	17	72	64
May	5	39	73	130	2	2	10	0	7	41	83	130
June	28	31	78	82	40	31	7	4	68	62	85	86
July	15	12	90	67	69	13	1	1	84	25	91	68
Aug	51	23	24	37	18	18	5	8	69	41	29	45
Sep	22	12	34	0	0	0	1	0	22	12	35	0
Oct	18	5	100	7	4	0	0	0	22	5	100	7
Nov	9	11	26	0	0	1	0	0	9	12	26	0
Dec	0	26	0	0	0	16	0	0	0	42	0	0
TOTAL	**189**	**199**	**541**	**423**	**140**	**93**	**37**	**17**	**329**	**292**	**578**	**440**

*Note: A total of 1,639 Visitors were recorded for 2008 – 2011.

Since its reopening in January 2015, Wayaan Kaingaran recorded a total of 1,477 visitors through the Wayaan Kaingaran during the two (2) years since its opening **(Table 41**) averaging at 738 visitors annually. The locals were the larger visitors as compared to the foreigners for both 2015 and 2016.

Table 41: Visitors to Trus Madi via Wayaan Kaingaran in 2013 until 2016

Month	Local Visitors				Foreign Visitors				Total Visitors*			
	2013	2014	2015	2016	2013	2014	2015	2016	2013	2014	2015	2016
Jan	0	0	0	36	0	0	0	0	0	0	0	36
Feb	0	0	2	25	0	0	0	6	0	0	2	31
March	0	0	92	75	0	0	3	31	0	0	95	106
April	0	0	30	13	0	0	1	2	0	0	31	15
May	0	0	55	24	0	0	0	9	0	0	55	33
June	0	0	32	18	0	0	6	6	0	0	38	24
July	0	0	35	41	0	0	94	18	0	0	129	59
Aug	0	0	90	69	0	0	79	3	0	0	169	72
Sep	0	0	56	139	0	0	40	16	0	0	96	155
Oct	0	0	43	70	0	0	39	0	0	0	82	70
Nov	0	0	60	33	0	0	10	2	0	0	70	35
Dec	0	0	15	51	0	0	3	5	0	0	18	56
TOTAL	**0**	**0**	**510**	**594**	**0**	**0**	**275**	**98**	**0**	**0**	**785**	**692**

*Note: A total of 1,477 Visitors were recorded from 2015 – 2016.

8.4.2 Visitation via Wayaan Mannan

This route has the longest distance among the three (3) Wayaans. Since the closure of the Kaingaran route in late 2011, Wayaan Mannan, through the Sinua route, became the only active climbing point that was opened to the public. Prior to that this route was not ready to receive any visitors as SFD has yet to identify and demarcate the climbing trails. The lack of trained local tourist guide was also a factor in its inactivity. Since October 2011 to January 2013, a total of 325 visitors ascended through the route to the Summit of Mt Trus Madi **(Table 42)**. The activity was possible due to the diligence of a local guy, Denis Ikon, who had previous experience as a Tourist Guide elsewhere. The route witnessed an increased visitation from 2013 until 2016 with a total of 1,400 visitors **(Table 43)**. Similarly to the trend at Wayaan Kaingaran, the locals were the larger visitors here compared to the foreigners.

Table 42: Visitors to Trus Madi via Wayaan Mannan from 2010 until 2013

Month	Local Visitors				Foreign Visitors				Total Visitors *			
	2010	2011	2012	2013	2010	2011	2012	2013	2010	2011	2012	2013
Jan	0	0	0	19	0	0	0	0	0	0	0	19
Feb	0	0	0	1	0	0	0	10	0	0	0	11
March	0	0	11	8	0	0	3	2	0	0	14	10
April	0	0	0	2	0	0	0	6	0	0	0	8
May	0	0	0	7	0	0	0	4	0	0	0	11
June	0	0	13	0	0	0	2	5	0	0	15	5
July	0	0	7	0	0	0	6	0	0	0	13	0
Aug	0	0	13	13	0	0	3	4	0	0	16	17
Sep	0	0	4	1	0	0	8	3	0	0	12	4
Oct	0	9	1	0	0	1	1	1	0	10	2	1
Nov	0	36	11	20	0	1	2	0	0	37	13	20
Dec	0	45	10	12	0	2	11	7	0	47	21	19
TOTAL	**0**	**90**	**70**	**83**	**0**	**4**	**36**	**42**	**0**	**94**	**106**	**125**

*: A total of 325 Visitors were recorded from 2010 - 2013

Table 43: Visitors to Trus Madi via Wayaan Mannan from 2013 until 2016

Month	Local Visitors				Foreign Visitors				Total Visitors*			
	2013	2014	2015	2016	2013	2014	2015	2016	2013	2014	2015	2016
Jan	19	32	10	7	0	0	0	0	19	32	10	7
Feb	1	0	28	64	10	0	0	11	11	0	28	75
March	8	72	29	27	2	5	2	1	10	77	31	28
April	2	13	18	50	6	2	0	1	8	15	18	51
May	7	55	32	46	4	4	2	6	11	59	34	52
June	0	0	30	0	5		5	0	5	0	35	0
July	0	19	9	16	0	11	14	26	0	30	23	42
Aug	13	0	50	30	4	6	12	0	17	6	62	30
Sep	1	53	32	44	3	12	31	0	4	53	63	44
Oct	0	22	47	119	1	3	5	0	1	25	52	119
Nov	20	6	29	58	0	16	4	11	20	22	33	69
Dec	12	0	7	32	7	0	0	11	19	0	7	43
TOTAL	**83**	**272**	**321**	**493**	**42**	**47**	**75**	**67**	**125**	**319**	**396**	**560**

*Note: A total of 1,400 visitors were recorded for 2013 - 2016

8.4.3 Visitation via Wayaan Mastan

The access road to this Wayaan is approximately 75 kilometers from the town of Keningau. Except for a length beginning at the Checking station of less than 10 km, the Jalan Hj Ali Hasan remained largely unmaintained since 2009. Efforts by the MPCT to upgrade and maintain the 43 KM stretches of gravelled road (Jalan Hj Ali Hasan) in this route were always hampered by the lack of maintenance funds. The Wayaan Mastan, a route passing through Apin Apin Keningau, was nevertheless opened to the public in May 2015 and some months in 2016. Due to its treacherous road conditions, this alternative route could only attracted a total of 52 Visitors from 2015 until 2016 (**Table 44**).

Table 44: Visitors to Trus Madi via Wayaan Mastan from 2013 until 2016

Month	Local Visitors				Foreign Visitors				Total Visitors*			
	2013	2014	2015	2016	2013	2014	2015	2016	2013	2014	2015	2016
Jan	0	0	0	0	0	0	0	0	0	0	0	0
Feb	0	0	0	0	0	0	0	0	0	0	0	0
March	0	0	0	0	0	0	0	0	0	0	0	0
April	0	0	0	0	0	0	0	0	0	0	0	0
May	0	0	13	0	0	0	0	0	0	0	13	0
June	0	0	0	0	0	0	1	0	0	0	0	0
July	0	0	4	0	0	0	13	0	0	0	5	0
Aug	0	0	0	3	0	0	0	0	0	0	13	3
Sep	0	0	0	0	0	0	0	0	0	0	0	0
Oct	0	0	0	0	0	0	0	0	0	0	0	0
Nov	0	0	0	0	0	0	0	0	0	0	0	0
Dec	0	0		8	0	0	10	0	0	0	0	8
TOTAL	**0**	**0**	**17**	**11**	**0**	**0**	**24**	**0**	**0**	**0**	**41**	**11**

*Note: A total of 52 Visitors were recorded from 2015 – 2016.

8.4.4 Visitation via Borneo Jungle Girl (BJG) Camp Site

Borneo Jungle Girl (BJG is a private operator with a valid Occupation Permit (OP) for its Camp Site since 2006. The site is located some 33 KM from Keningau. Its main activity was on Nature Tourism focusing on Entomological Experience and Fauna Jungle Trekking. The early years was mainly spent on developing its Camp site and Jungle Treks. Due to its niche market focus, its markets were mainly catering for foreigners. Tourists to the Camp site finally came in 2013. For the three (3) years from 2013

until 2016, a total of 229 visitors stayed at the BJG Camp **(Table 45)**. In 2016 most of the visitors are from China. The number of tourists from China is expected *to* increase every year

Table 45: Visitors to Borneo Jungle Girl (BJG) from 2013 until 2016

Month	Local Visitors				Foreign Visitors				Total Visitors*			
	2013	2014	2015	2016	2013	2014	2015	2016	2013	2014	2015	2016
Jan	0	0	0	0	0	0	0	0	0	0	0	0
Feb	0	0	0	0	0	3	0	33	0	3	0	33
March	0	0	0	0	0	14	9	0	0	14	9	0
April	0	0	6	0	0	0	10	33	0	0	16	33
May	0	0	0	0	0	2	0	11	0	2	0	11
June	0	0	0	0	0	0	0	0	0	0	0	0
July	0	0	0	0	0	0	0	0	0	0	0	0
Aug	0	0	0	0	0	0	5	35	0	0	5	35
Sep	0	0	1	10	0	0	7	0	0	0	8	10
Oct	0	0	0	5	0	0	35	1	0	0	35	6
Nov	0	0	0	0	0	9	0	0	0	9	0	0
Dec	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	**0**	**0**	**7**	**15**	**0**	**28**	**66**	**113**	**0**	**28**	**73**	**128**

*****Note: A total of 229 Visitors were recorded from 2013 – 2016.

8.5 Upgrading And Maintenance of Relevant Infrastructures

Providing good accessibility and on ground presence in the Trus Madi Forest Reserve was the major focus under this strategy when the Initial CAMP for FMU 10 was approved in 2009. Implementation of this strategy was shared by ADFO Tambunan, Julius P. Indu, SFMO Jafin A. Bakar and SFC, Haji Afiffudin Jadin. The various Infrastructures that were constructed, upgraded and maintained in FMU 10 up to the end of 2012 are previously described in **Sub – Chapter 2.4.**

Throughout the years relevant infrastructures were maintained as and when funds were available. These maintenance works would be continued and clearly spell out in the AWPs. It is perhaps worth mentioning that there was a proposal by the Jabatan Kerja Raya Sabah to upgrade and seal the existing 4.6 KM of access road (Jalan H S Martyn) under a Project Upgrading of Jalan Trusmadi (Phase 2), Tambunan Sabah. The primary objective is to provide a better road system for the tourists to climb

Mt. Trus Madi. The road includes a sealed single carriageway (two lanes) in accordance with JKR standard. The MPCT has not been informed of any progress of the project.

8.6 Implement Relevant Social Forestry Activities

The final recommendation on the action to be taken by the MPCT is described in the previous **Sub – Chapter 1.5.2.1.**

8.7 Develop and Implement Controlled Hunting Plan in Ulu Rompon and Ulu Pangas

This strategy was headed by the Keningau SWD. The site for this activity was located at KM 18 Jalan Ali Hasan, Ulu Pangas, Keningau. Since 2009 a number of activities were carried out to decide on the next course of actions under the Controlled Hunting Strategy in FMU 10 Trus Madi Forest Reserve. The following activities were carried out under this strategy from 2009 until 2012:

8.7.1 Construction of Basic Infrastructures and Hunting Trails

The facilities constructed in 2009 were a two room guard post, 12 person hunters lodge and a 10 vehicle car park. The facility was also equipped with electricity and gravity water supply. Apart from that some signboards were also erected. In 2010, general regulations signage and sketch map of the location of the hunting trails was erected.

Identification of areas for the development of hunting trail was carried out on 15-21/7/2010. Eventually five (5) trails within the control hunting area were successfully developed. The trails were named as Pelanduk Trail, Landak Trail, Keluang Trail, Kijang Trail and Payau Trail. These activities were implemented with the collaboration between Keningau Wildlife Office staff and staff from other Wildlife Stations.

8.7.2 Wildlife Inventory

As mentioned earlier, a total of five (5) Wildlife inventories were done in the area since 2009 by SWD. The objective was to determine the population and density of wildlife species especially of game animal (species) as listed in Schedule 3 of the Wildlife Conservation Enactment 1997. SWD staff from the other districts including headquarters, West Coast, Lok Kawi Wildlife Park, Lahad Datu, Sandakan and Tawau was recruited for this general inventory on wildlife. The wildlife inventories carried out so far indicated the presence of several species of game animals in the controlled hunting areas. However, its

density is still low to justify the opening of the area for controlled hunting activity yet. Further inventories need to be done to monitor the densities of the wild lifes in the area.

8.8 Establish Community Woodlots in Stateland Area in Tambunan Adjoining FMU 10

The objective of this strategy is to provide necessary wood resources for the Tambunan local communities in a stateland area outside FMU 10 near kampong Kaingaran. This objective is also expected to abate or reduce the threats of communities engaging in illegal timber extraction in FMU 10 by providing alternative timber resources for their domestic usages and managed them sustainably by the communities themselves. The task to proceed and to implement this strategy was entrusted to DFO Tambunan assisted by ADFO Julius Peter Indu. Resource Person Hj Mohd Nooh Jiran would also be assisting in this strategy.

A quick survey of the villages situated along the fringes of FMU10 in the early days of the planning stage indicated that the houses in those villages are primarily built using chainsaw-cut timber. As for now, those villagers got their timber from their own lots of forest but these privately owned forests are being converted to agriculture land. It is envisaged that in a not too distant future, wood will be in a very short supply around the Tambunan area, thus putting FMU10 increasingly threatened from illegal wood harvesting.

To abate that threat, it was decided that a community woodlot outside the Trus Madi Forest Reserve should be established. After some deliberation, the area formally issued with logging TOL to Ipang Ganggal, Anthony Dubis, Regina Rundi and Jimmy Jipulis, Intra Bayangan and Alam Semesta which is situated at the headwaters of Namadan and Kaingaran rivers and has a combined area of approximately 3,700 ha was selected. The reasons for selecting this area are, firstly because it could act as a buffer zone for FMU10 and secondly because the soils of the area falls within the Trus Madi soil series, which is best left forested due of its fragile characteristics and therefore not suitable for agriculture development.

The woodlot will be administered and managed by a committee which will be headed by the DFO Tambunan. Members of the committee would include the District Officer of Tambunan, the District Chief of Tambunan and relevant Heads of Department in Tambunan. Through such mechanism, each relevant Department will have a role to play in supporting the management of the Woodlots Strategy. Forestry Department through FMU10 will be entrusted in forest inventory, data analysis and preparations of Comprehensive Harvesting Plan and in seedlings supply.

A sub-committee, to be headed by the Native Chief, will also be formed. He will be assisted by all the village headmen and the Village Development and Security Committee (JKKK) chairpersons from participating villages. Its function will be as a communal work coordinating body. During the days of Forest Guard Peter Lupang Tingkalus way back in 1935, he and a local charismatic Native Chief by the name of OKK (Orang Kaya Kaya) Taliban, gather together all bamboo extraction permit holder on an appointed date to carry out communal work to plant bamboo in an area designated to be a bamboo reserve. In this sub-committee, the Native Chief OKK Taliban would keep tab of all permit holders and to gather and mobilise them to participate in communal work at the woodlot.

8.8.1 Work Progress

A briefing related to the concept and implementation of the community woodlot, the beneficiaries and mechanisms was done at length by Rahim Sulaiman, the DCCF (MGT) in a special meeting with the District Officer and PPHT personals of Tambunan District in the middle of 2009. The Woodlot matter was also highlighted during the Stakeholder workshop in Hotel Perkasa Keningau and was endorsed by all except by delegates form Kaingaran, Pononoburan and Nandal. Overall the responses were positive especially from The District Officer of Tambunan as Chairman of the committee. However, SFD was advised to apply for the area to the Assistant Collector of Land Revenue (ACLR) Office not only for the purpose of the Creation of the Woodlot but also for gazette purpose. The advice given was supposed to be following the standard procedure for any normal land application. Mapping and documentation was duly done by the DFO Tambunan as per advised.

In 2010, not much progress was achieved. The Land Application was submitted to PPHT Tambunan and given the reference PT NO. 20-10140023 but unfortunately, the land application was not tabled at any of the LUC meeting in 2010. It was later understood that a working paper was needed. A working paper was submitted to PPHT as requested but still the application was not tabled at the LUC meeting despite all the reminders.

Despite various reminders by DFO Tambunan, hearing of the application was not acceded by the Land Utilisation Committee until the end of 2011. The main reason cited this time around was that the Land and Survey Department was directed by the government to expedite the processing of outstanding land applications from the public yet to be tabled in the Committee Meeting.

Finally the SFD Land Application was brought up and tabled in the Land Utilisation Committee Meeting on 12 Mac 2012 with comments from the District Surveyor from Keningau as follows:

- The area applied by Sabah Forestry Department also fall within the water catchment area of Sag Kaingaran being applied by Jabatan Pengairan Sabah under Land Application No.PT 2009140029.

- The area applied was also overlapping with a land application under T.O.L.95142010 P 141226953.

The Committee was not able to come up with any recommendation yet with regards to SFD's application. Instead, the SFD was advised to present its case with detail justification in the next Committee Meeting. ADFO Julius Peter Indu duly did the presentation to the Committee Meeting in June 2012. The said meeting of June 2012 again advised SFD to submit a detailed working paper for presentation in the next meeting envisaged to be held in March 2013. The MPCT finally got tired of waiting and the non – cooperative attitudes of the district administrators and decided to drop this strategy all together under the FMU10; CAMP Ver. 2.

8.9 Understanding of the Target Species by 2018:

There were two Target Species selected under this strategy, namely the Hornbills and the Rajah Brooke Birdwing. The MPCT decided to drop the Rajah Brooke Birdwings from the target as not much progressed was achieved under the previous CAMP since 2009. Progress on the hornbills was described earlier under **Sub Chapter 3.3**.

8.10 Implement Relevant Conservation Awareness Programmes and Website Maintenance

The conservation awareness Programmes strategy was initially headed by the late Haji Abdul Rahman Tuah in 2013. Upon his demise in 2014, the task was given to Marjjah Othman. Claire Alliun was also given the task in 2015 upon joining in the FMU10 Operational Team. The objective was to provide information and to educate the general public of Tambunan and Keningau on the importance of conserving forested areas and general biodiversity. The task of managing the FMU10 Conservation Area (FMU10CA) website was initially handled by the JPKN Keningau from 2009 until 2013.

8.10.1 Work Progress for the Awareness Programmes

A total of thirty two (12) Awareness programmes were implemented since 2009 (**Table 46**). Through this effort a total of visitors or participants were educated and made aware of the conservation efforts in FMU10 during these programmes.

Table 46: Awareness Programmes Implemented Since 2009

No	Activity	Date Implemented	No of Visitors/Participants
1	Awareness Programme at Tambunan District Harvest Festival	23/5/2009	127
2	Awareness Programme at State Harvest Festival ,Keningau	23/05/2009	520
3	Awareness Programme at Pesta Keningau	1-2/5/2010	200
4	Awareness Programme at Tambunan District Harvest Festival	15/5/2010	139
5	Awareness Programme at Public Compliant Day (Biro Pengaduan Awam)	23/07/2010	20
6	Awareness Programme at Rain Forest Carnival	9 & 10/12/2010	130
7	Awareness Programme at Client's Day (Road Transport Department)	24/03/2011	201
8	Awareness Programme at Tambunan District Harvest Festival	21/05/ 2011	184
9	Awareness Programme at Tambunan Homestead Road Show	30/11/2011	67
10	Awareness Programme at Tambunan District Harvest Festival	19/05/ 2012	135
11	Awareness Programme at SMK,Tambunan	18/01/2012	1,603
12	Awareness Programme at SMK Nambayan	11/4/,2013	1,236

Table 46: Awareness Programmes Implemented Since 2009 (continuation)

No	Activity	Date Implemented	No of Visitors/Participants
13	Awareness Programme at SMK Gunsanad II	19/6/2013	1, 603
14	Awareness Programme at SMK Keningau II	13/2/2014	1,200
15	Awareness Programme at SMK Bingkor	12/6/2014	1,500
16	Awareness Programme at Pameran Sempena Program NBOS6 (Karnival Kesihatan)	20 & 21/.03/2015	120
17	Awareness Programme at Pameran Sempena Hari Kerjaya SMK Nambayan	15/04/2015	500
18	Pameran Sempena Hari Kementerian Perdagangan Dalam Negeri Koperasi & Kepenggunaan(KPDNKK)Sabah Dan Perasmian Kedai Borneomart Apin Apin , Keningau	25/04/2015	120
19	Pameran Sempena Pelancaran Pesta Kaamatan Peringkat Negeri Sabah	30 & 31/05/2015	550
20	Awarenes Programme at Kg. Nandagan + Kg. Mempisas	08/08/2015	155
21	Awareness Programme at Kg. Kepayan Baru	15/08/2015	109
22	Awareness Programme at Kg. Sinua	22/08/2015	213
23	Awareness Programme at Kg. Kaimadang and Kg. Merapok	29/08/2015	96
24	Pameran Sempena Program Community Policing (Ibu Pejabat Polis Daerah Keningau)	23/11/2015	100
25	Pameran & Taklimat Program Kerjaya SMK Nambayan	14/04/2016	1,200

Table 46: Awareness Programmes Implemented Since 2009 (continuation)

No	Activity	Date Implemented	No of Visitors/Participants
26	Pesta Kaamatan Peringkat Daerah Tambunan	13 & 14/05/2016	250
27	Taklimat FMU10 di SK. St. David	16/06/2016	200
28	Awareness Programme at Batu Lunguyan	10/8/2016	50
29	Awareness Programme at Mansiat	29/8/2016	50
30	Awareness Programme at Luanti Baru and Linsudan	10/9/2016	118
31	Pameran Pelancaran Tahun Melawat Tambunan 2017	02/11/2016	500
32	Awareness Programme at Monsok Tengah	19/11/2016	90
	TOTAL VISITORS/	**PARTICIPANTS**	

8.10.2 Website Maintenance

In 2013, Mr. Afendy bin Suraip was appointed as the resource person for the development of the FMU10 website, which was previously handled by a staff from the Sabah State Computer Service Department (JPKN). The development of the website was started on that year using a brand-new open-source content management system (CMS), Joomla! This platform was chosen due to various factors such as low operating cost, efficiency and suitability to the purpose and operation of the website. The development of the website consisted of five (5) stages viz Interface Design, Content-Filling, Testing & Troubleshooting I, Web Launch, and lastly, Testing & Troubleshooting II. The new FMU10 website was officially launched and accessible for public in the third quarter of 2014 (**Plate 8**)

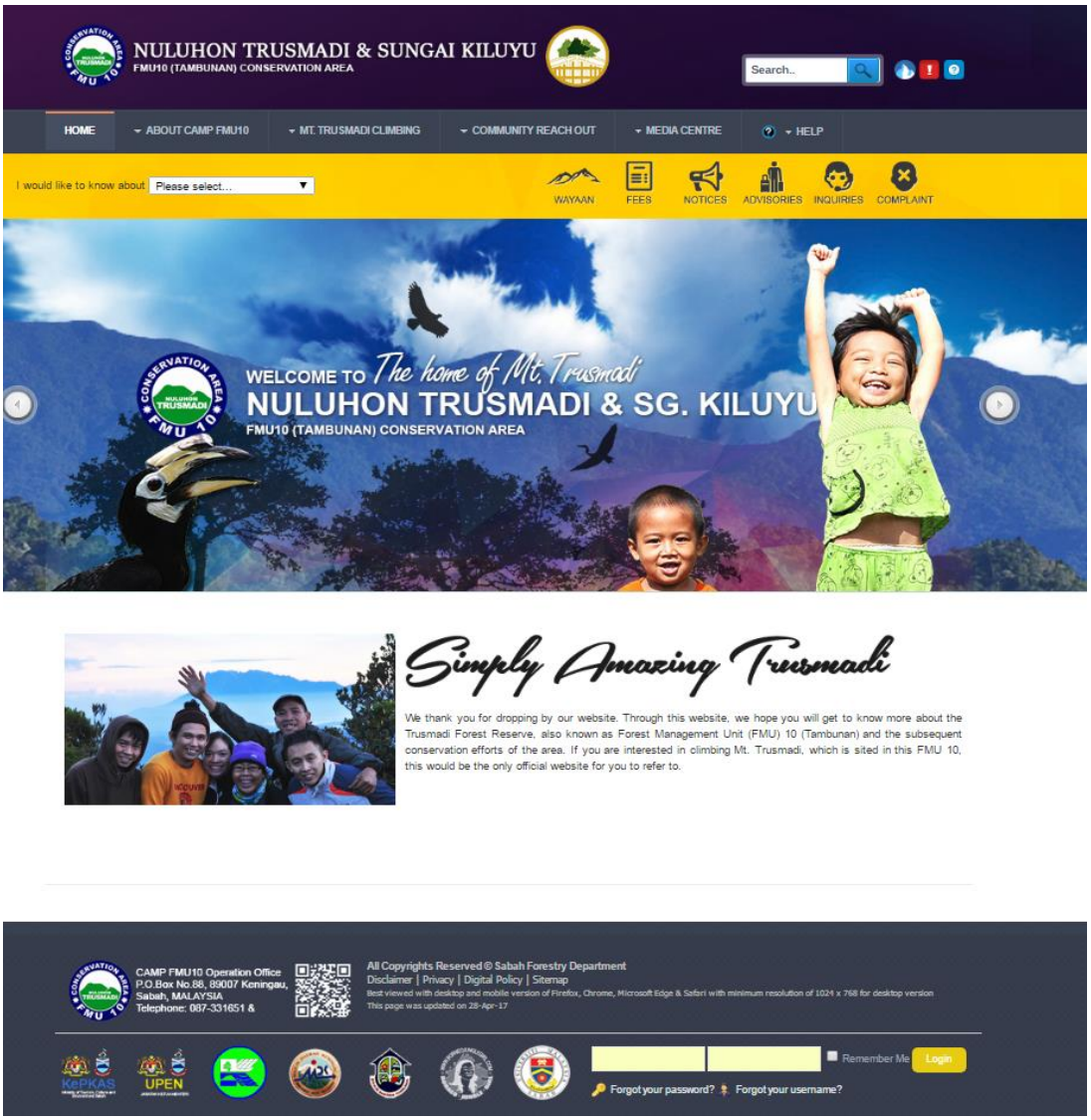

Plate 8: Homepage of the FMU10 Conservation Area Website

The website was managed and updated according to the latest changes and necessary amendments to cater for the certification, eco-tourism and public awareness topics. It served as a gateway for the public to get the latest information on the ascent to Mt. Trusmadi, as well as updates on the eco-tourism activities held within the conservation area and the forest certifications activities. The website performance, content suitability and rate of service can be translated by monitoring these crucial indicators provided by specific digital patterns as follows:

a) Number of Online Visitors

This information provides us with the insight of website popularity based on the number of online visitors. The website recorded 13,291 visitors in 2014 and the numbers increased exponentially by 41.71 percent or 5,544 in 2015. The trend continued to grow steadily with 18,621 online visitors recorded as of November 2016 (**Figure 19**)

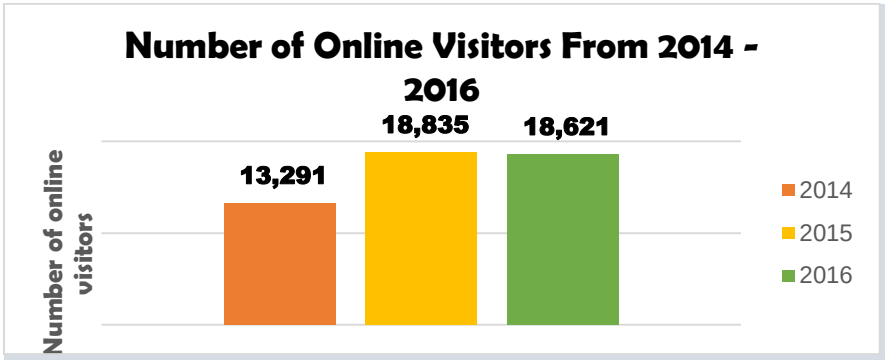

Figure 19: The Numbers of online visitors to FMU10 Website in 2014 until 2016

b) Nationalities of the Online Visitors'

This information provided the MPCT with the insight of the website's online visitors' nationalities. In total, visitors from 17 countries were recorded by the website for the past three years (**Figure 20**).
In 2014, citizens from Malaysia, Japan, Taiwan, United Kingdom and Turkey were the top five (5) on line visitors to the FMU10 website. This ranking continued to be dominated by Malaysians as the top visitors while the Indians was the lowest among the visitors (**Table 47**). In 2016, visitors from the United Kingdom were almost at par with those from Malaysia (**Figure 21).** This trend indicated to the MPCT regarding the need to maintain English as the Website's language and the need to improve on the standards of English, either written or oral, among the implementers of FMU10 strategies.

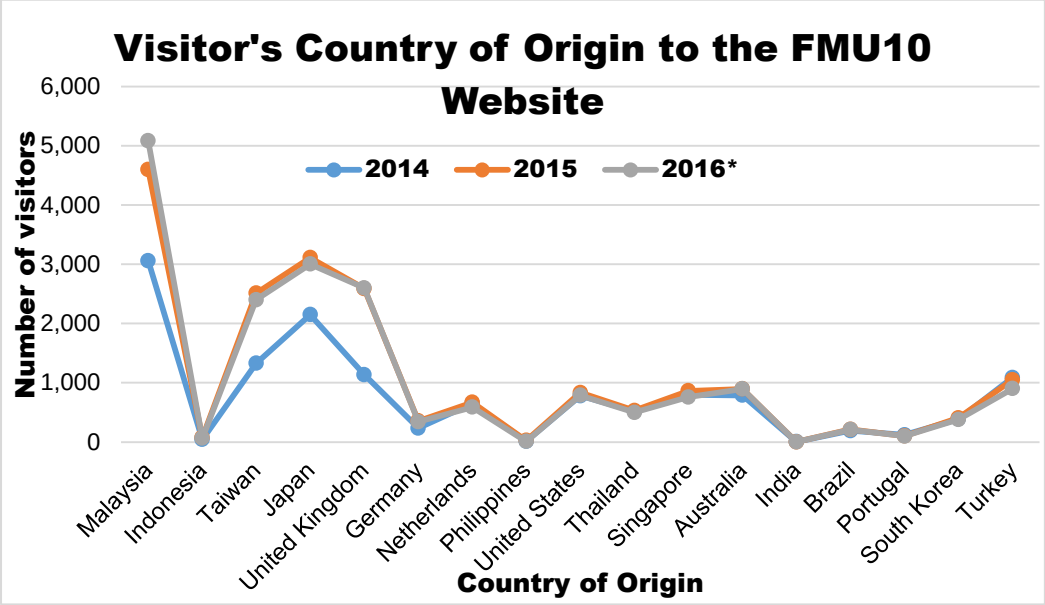

Figure 20: Nationalities of the online Visitors to FMU10 Website in 2014 until 2016

Table 47: Nationalities of the online Visitors to the FMU10 Website from 2014 until 2016

National	2014	2015	2016*
Malaysia	3,059	4596	5081
Indonesia	42	75	65
Taiwan	1,329	2511	2401
Japan	2,150	3111	3001
United Kingdom	1,136	2589	2601
Germany	235	356	342
Netherlands	654	668	589
Philippines	13	27	10
United States	779	834	789
Thailand	521	532	498
Singapore	795	864	759
Australia	787	897	895
India	6	3	2
Brazil	190	213	210
Portugal	121	101	98
South Korea	387	408	380
Turkey	1,087	1050	900

*As of November 2016

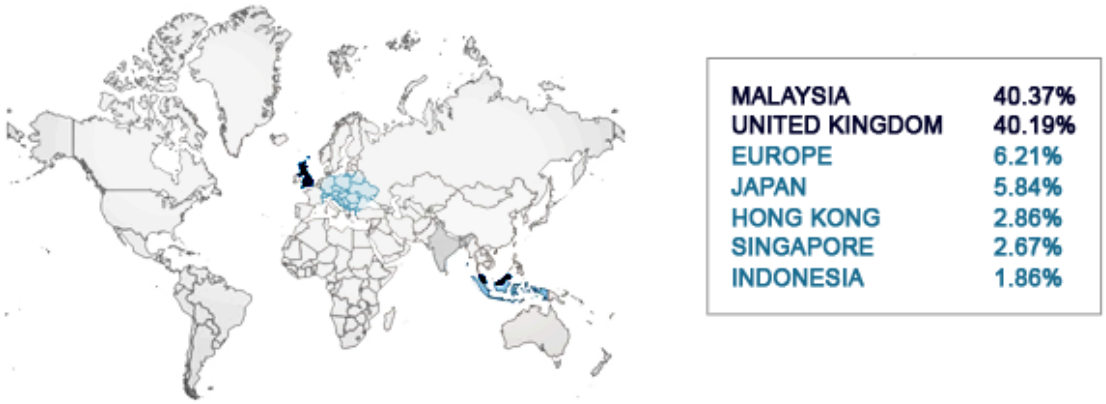

Figure 21: The Nationalities of the on line Visitor's to the FMU10 Website in 2016

a) Website Click Hot Topic

The website administrator monitored on the most clicked, popular and the mostly inquired information in the website (**Figure 22**) Thus; the content in the website can always be frequently monitored and updated when needed according to the priority of importance based on this information.

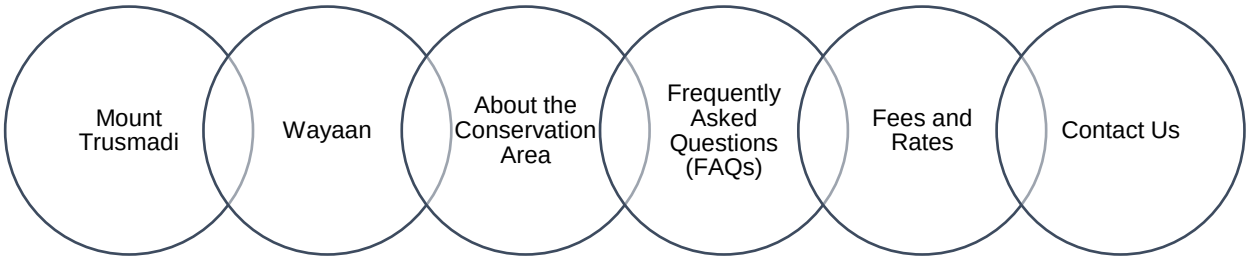

Figure 22: The main Components of the FMU10 Contents

There were no major updates done for the FMU10 website until the third quarter (Q3) of 2016. However, during the fourth quarter (Q4) of 2016, some contents and layout of the website were amended to comply with the forest certification requirements. These changes were made to assist the nature conservationist, the general public including the forest certification's auditor to obtain related summaries of the conservations activities such as surveillance, wildlifes, growth and yields as well as the monitoring of the HCVF areas.

8.11 Scientific/Biodiversity Study

The main aim of this strategy is assemble a team headed by FRC to conduct a scientific expedition to explore and study the biodiversity that thrive in the Nuluhon Trusmadi and Sg Kiluyu Forest Reserves. This was managed by Resource Person, Anuar Mohd of FRC, Sepilok. In the past, some expeditions and various studies have been conducted in the area especially at the summit and rivers by various institutions and individuals. Under this strategy, the unexplored areas within the Trus Madi Forest Reserve, namely the Mirad – Irad Base Camp area and the Sinua Base Camp area were selected. During the expeditions, the participations of outside institutions and individuals were invited to compliments the existing expertise available within the SFD. Two (2) expeditions, one (1) botanical field survey, one (1) workshop and a Roundtable Discussion have been held since the inception of the CAMP FMU10 from 2009 until 2016. These are as follows:

a) Kaingaran Trus Madi Biodiversity Expedition in 2009

This Kaingaran Trus Madi Biodiversity Expedition was held on the 4th - 12th August, 2009. The base camp of the expedition was sited at the north-western part of FMU 10 beside the Mirad-Irad River at an altitude of about 900 m asl. The objective of the expedition was to survey the biodiversity richness in the adjacent area and its vicinity leading to Mount Trus Madi. Some 70 researchers/scientists and supporting staffs from the FRC, the School of International Tropical Forestry (SITF) of Universiti Malaysia Sabah (UMS), Universiti Teknologi Mara (UITM) and a private company took part in the expedition. A total of about RM45, 000 was utilized under the Unit Biodiversity Hub's (UBC) budget of FRC. The results of this expedition were later reported in the Trusmadi Workshop the following year.

b) Trus Madi Workshop in 2010

This workshop was held on the 23-24th, March 2010 at Perkasa Hotel, Keningau. It was officiated by Datuk Sam Mannan, the Chief Conservator of Forests Sabah. The workshop was held to disseminate research findings based on the expedition done in 2009. The Workshop also served as a platform for information sharing and discussion among the MPCT members, experts and the relevant stakeholders, both inside and outside of the SFD. A total of 15 papers were presented and 3 information papers were disseminated and shared among the 150 workshop participants. An exhibition showcasing all the activities undertaken and facilities available within the Trus Madi FR was also held at the Lobby of the hotel. Field excursion to climb Mt Trus Madi and visiting the restoration sites the following day for interested participants of the workshop. A total of about RM3, 000 was utilized using the budget of the

UBH of FRC during the workshop. However, most of the costs in holding the Workshop were absorbed under the CAMP FMU 10 Fund, estimated at RM100, 000. A Proceeding of this workshop was also published in 2011.A total sum of RM 30,000 was utilised from the budget of UBH of FRC for this publication.

c) Trus Madi Sinua Expedition in 2011

This Expedition was a continuous effort by the MPCT and FRC to better understand the Nuluhon Trusmadi's vast biodiversities. It was held on Oct 24th – Nov 2nd, 2011. A Total of about 50 individuals consisting of researchers and supporting staffs took part in the expedition. An estimated sum of RM80, 000 was utilised from the CAMP FMU 10 fund for this activities. The findings of this expedition and reports of other programme and activities conducted were presented at a Roundtable Discussion Forum the following year in 2012.

d) Trus Madi – Sinua Roundtable Discussion in 2012

This Discussion to disseminate and share the findings and information based on the Trus Madi Sinua expedition was held in September, 2012. A publication on the record of discussion was published by the MPCT in 2013.

e) Sg Kiluyu Field Excursion in 2013

A small group of FRC's staff, particularly the botany and insect groups have managed to enter and conduct preliminary flora and insect surveys within the Kiluyu FR in mid - 2013 during the execution of the Trusmadi FR's EIA assessment. Some flora specimens were collected from the area.

f) Botanical Field Survey in 2015

This survey was conducted at the Sg Kiluyu Forest Reserve. The main aim of this strategy is to conduct a scientific expedition to explore and study the biodiversity that thrive in this Trusmadi Forest Reserves landscape. This was managed by Resource Person, Anuar Mohd of FRC, Sepilok. **Sub – Chapter 1.4.4** detailed the major findings of the survey.

8.12 Collaborate With Adjacent Landowners at Relevant Boundaries of FMU10

Due to the heavy workload of Jafin Abu Bakar, this strategy which was accorded a lower priority, limited attention was focused in its implementation. This strategy was subsequently assigned to Haji Afifuddin Jadin. The progress done in 2012 has been limited to identifying the major and big landowners around the vicinity of FMU10. So far, a number of big land owners such as Sabindo Plantation, which was also given an OP on an access road in the Pangas area, Sook Oil Palm Plantation (Ladang Sungala), Sabah Forestry Development Authority (SAFODA) and Lembaga Industri Getah Sabah (LIGS) near Nandagan had been identified and consulted with regards to this Revised CAMP's implementation.

Land data would be collected from the Land and Surveys, Keningau and Tambunan. In November 2012, a letter to acquire land titles' information surrounding Trusmadi Forest Reserve (Ref **JPHTN/KGU700-1/3/2/KLT.2/43** dated **29hb. November 2012**) was sent to the Land and Survey Department. This activity will be followed up vigorously by SFC Haji Afiffudin Jadin as well as through consultations with the various Land owners especially the big companies. The progress done in 2014 had been limited to identifying the major and big land owners around the vicinity of FMU 10. A number of big land owners such as Sabindo Plantation Sdn Bhd, Sook Oil Palm Plantation (Ladang Sungala), Sabah Forestry Development Authority (SAFODA), Lembaga Industri Getah Sabah (LIGS) had been identified and consulted with regard to the revised CAMP's implementation. One of the land owners was given OP (Occupation Permit) for road access in the Nuluhon Trusmadi Forest Reserve. To date, four hundred and fifty six (456) Land Titles within a two (2) km radius along the FMU 10 Forest Reserve Boundaries' were obtained from the Land and Survey Department. Application by Denis ikon for an Occupation Permit (OP) over an area of 0.2 ha for camping site at the KS Khiong Point in Sinua was approved by the Chief Conservator of Forests in 2014.

9. MID – TERM REVIEW OF THE CAMP

A review of this **FMU10: CAMP Ver. 2** will be done by the MPCT for FMU10 towards the end of the fourth (4) year of implementation, namely on 2020. This revision is known as the mid -term Review or the third mid-term review for FMU10. A Third Revised CAMP for FMU10, to be referred to as **FMU10: CAMP Ver. 3** will be produced by the MPCT for FMU10 before January 2021.

The **FMU10: CAMP Ver. 3** to be approved by the Chief Conservator of Forest Sabah will be valid for a period of ten (10) years. The mid - term review will bring on board all the necessary changes for the conservation targets, threats, all relevant changes in the operating environments of FMU10, physically or financially or socially, all relevant new things, technologies, information and the new strategies or even man power and other related planning capacities and capabilities.

10. FOREST CERTIFICATION ANNUAL SURVEILLANCE

FMU10, one of the areas that are managed wholly by SFD was selected for certification by 2014 under the Forest Stewardship Council's (FSC) Principle of Forest Certification. Two (2) Forest Certification Resource Persons had been recruited and included into the MPCT in the first quarter of 2012. They were ACF Subari Suparlan and DFO Ulu Segama- Malua, Indra Sunjoto. Their main tasks were to train the various Implementers of the CAMP and the MPCT for FMU10 regarding Forest Certification.

The relevant documents and guidelines for the Forest Certification were distributed and appended for further references by all field staff and implementers of the CAMP for FMU10. Another important document that details the gaps to be acted upon, resulting from an earlier Baseline Assessment done in June 2012 by a third party Assessor from the Global Forest and Trade Network (GFTN) was also distributed and appended to all staff and implementers of CAMP for FMU10. All implementers for the Revised CAMP FMU10 were made aware of their respective roles and responsibilities in acting upon the relevant gaps.

The FMU10 was subjected to rigorous auditing for Forest Certification by the Scientific Certification System (SCS) Global Services in 2015 under the Principles and Criteria of the Forest Stewardship Council (FSC), which were fully subscribed by the MPCT for FMU10 and the Sabah Forestry Department (SFD). A Forest Certification ***(SCS-FM/COC-005062; FSC-C122511: SCS-FCP Interim Standard for Forest Management Certification in Malaysia Version 6.1)*** was subsequently awarded to FMU10. **This Forest Certificate is valid from 11.5.2015 until 10.5.2020**. Surveillance auditing by SCS Global Services to assess the compliance of the FMU10's activities to the FSC Certification's requirements will be done annually.

11. BUDGET

Rahim (2013) described the sources of funding and the total received in implementing the FMU10: CAMP strategies since 2009 until 2013. The first source of funding is the non-developmental fund or Internal Funding through the Tabung Perhutanan Sabah (Pemulihan Hutan and Perhutanan Masyarakat). This Tabung is administered by SFD, through the collection of certain approved rates endorsed by the MOF, Sabah from the harvesting of logs. Approval for funding, which is restricted to SFD only, is managed by a Committee comprising of the Chief Conservator of Forests, Setiausaha Hasil Bumi and the Permanent Secretary of the Ministry of Finance. The second source of funding is the Developmental Funding through the Five (5) Year Development Plans (Rancangan Malaysia Lima (5) Tahun), either from the State or the Federal level.

Since the start of the Rancangan Malaysia Ke sepuluh (RMK10) that began in 2009, SFD has been blessed with additional funding from both the State and Federal level. At the Federal level, additional funding from the Ministry of Tourism of Malaysia (MOTAC) was made available to SFD apart from the usual funding under the Ministry of Natural Resources (NRE). At the state level, apart from the usual funding under the Jabatan Ketua Menteri (JKM), additional funding through KPKAS, also a tourism component was made available too for SFD. A new planning mechanism however was implemented by both the state and federal level. Under the Rolling Plan, agencies are to submit their budgetary requirement on a two (2) year timeline plan, unlike the previous routine of five (5) years' timeline and an annual additional submission.

As mentioned earlier, a total budget of RM 41,000,000 was estimated by the MPCT to implement the ten (10) conservation strategies for the next ten (10) years (**Table E**). A major chunk of this budget, at RM 23,000,000, was estimated for the forest rehabilitation strategy alone. The remaining nine (9) strategies were estimated to incur a cost of RM 18,000,000 over the ten (10) year period. A budget requirement of RM 4,100,000 is therefore estimated annually in implementing this FMU10: CAMP Ver. 2.

12. UPDATES

Any important or pertinent updates or changes such as manpower and other planning capacities or capabilities or even changes in Forest policies or other relevant policies, which are needed for mass dissemination to the public, if so required, will be taken on board in the ***Annual Work Plan (AWP)*** or in the ***Public Summary on the FMU10 Website***. Those updates will either be regularly done or otherwise will be taken as additional notes to this Document. The relevant Chapters in this document will be quoted with regards to those required updates.

NOTE:

To ensure continuity and to avoid confusions, the tasks of monitoring and developing the subsequent changes or updates are assigned to ***Jafin Abu Bakar and Haji Afifuddin Jadin***. A Chapter on Updates is added in this **FMU10: CAMP Ver. 2** and left vacant, with just these brief notes, to cater for their subsequent write-ups by the two (2) assigned officers previously mentioned. In the event of any transfers of these two (2) officers, able replacements must be assigned to continue these tasks.

13. ADDENDUM

If those updates are found to be totally new and not detailed in this document, new chapters will be added accordingly and they should be taken as addendum to this Document. The MPCT for FMU10 will produce an Addendum document for approval by the Chief Conservator of Forest Sabah accordingly, if that write up has not coincided with the mid – term review period.

NOTE:

To ensure continuity and to avoid confusions, the tasks of monitoring and developing the subsequent addendum is assigned to ***Jafin Abu Bakar and Haji Afifuddin Jadin***. A Chapter on the Addendum is added in this **FMU10: CAMP Ver. 2** and left vacant, with just these brief notes, to cater for their subsequent write-ups by the two (2) assigned officers previously mentioned. In the event of any transfers of these two (2) officers, able replacements must be assigned to continue these tasks.

APPENDIX 1: LISTS OF FMU 10 PLANNING TEAMS MEMBERS IN DEVELOPING THE FMU10: CAMP Ver. 2

(a) MEMBERS OF THE MANAGEMENT PLANNING CORE TEAM (MPCT)

Name and Designation	Organisation	Responsibility	Contact Address
Rahim Sulaiman Deputy Chief Conservator of Forests Sabah (Management)	SFD, Sandakan	FMU 10 CAMP Chairman & Editor	Locked Bag 68, Jabatan Perhutanan Sabah. 90009. Sandakan
Abtah Deri (Forest Resource Management Officer)	SFD, Sandakan	Management Planner	Locked Bag 68, Jabatan Perhutanan Sabah. 90009. Sandakan
Salleh Intang (District Forest Officer Tambunan)	District Forestry Office, Tambunan	Field Planner and Implementer (Tambunan)	Forestry Office Tambunan. P.O.Box 64.89657.Tambunan
Azman Said District Forest Officer Keningau	District Forestry Office, Keningau	Field Planner and Implementer (Keningau)	Forestry Office Keningau P.O.Box 88, 89007.Keningau
Harry Ikok District Forest Officer Ranau	District Forest Office Ranau	Field Planner and Implementer (Ranau)	Forestry Office Ranau Ranau
Jafin Abu Bakar (FMU10 Planning Officer)	FMU10 Operational Office, Keningau	Restoration Planner and Implementer (Keningau)	FMU10 Office @ Forestry Office Keningau. P.O.Box 88, 89007.Keningau
Awangku Effendy Pg Mahmud (FMU10 Planning Officer)	Pejabat TP(MGT) Sandakan	FMU 10 Planning Officer and Implementer	Locked Bag 68, Jabatan Perhutanan Sabah. 90009. Sandakan
Haji Afifuddin Jadin (FMU10 Planning Officer)	FMU10 Operational Office, Keningau	FMU 10 Planning Officer and Implementer	FMU10 Office @ Forestry Office Keningau. P.O.Box 88, 89007.Keningau
Clarice Alliun (FMU10 Planning Officer)	FMU10 Operational Office, Keningau	FMU 10 Planning Officer and Implementer	FMU10 Office @ Forestry Office Keningau. P.O.Box 88, 89007.Keningau
Ricky Yolok (FMU10 Planning Officer)	FMU10 Operational Office, Keningau	FMU 10 Planning Officer and Implementer	FMU10 Office @ Forestry Office Keningau. P.O.Box 88, 89007.Keningau

(a) MEMBERS OF THE MANAGEMENT PLANNING CORE TEAM (MPCT) Continuation

Name and Designation	Organisation	Responsibility	Contact Address
Bonaventure Yampai (Assistant District Forest Officer Tambunan)	District Forestry Office Tambunan	Field Planner and Implementer (Tambunan)	Forestry Office Tambunan. P.O.Box 64.89657.Tambunan
Marjjah Othman Assistant District Forest Officer Tambunan)	District Forestry Office Tambunan	Awareness Program Planner and Implementer (Tambunan)	Forestry Office Tambunan. P.O.Box 64.89657.Tambunan
Muhd Asri Muhd Shitin (Assistant District Forest Officer Ranau)	District Forest Office Ranau	Field Planner and Implementer (Ranau)	Forestry Office Ranau Ranau
Mohd Guntor Arif (Assistant District Officer Keningau) District Office Keningau	District Office Keningau	District Planner	Keningau District Office

(b)MEMBERS OF THE RESOURCE PERSON GROUP (RPG) IN DEVELOPING FMU10: CAMP VER. 2 (MEMBERS OF THE MPCT)

Name and Designation	Organisation	Responsibility	Contact Address
Anuar Mohamad (Forest Plantation Head)	FRC Sepilok	Forest Plantation Planner and Implementer	FRC, Sepilok
Amelia Cynthia Bosi	TP(FSP) Office	Forest Certification	SFD, HQ Sandakan
Alim Biun	Sabah Parks	Hornbills Planner and Implementer	Sabah Parks Crocker Range Office Kundasang
Joseph Sipaut Wildlife Officer	Sabah Wildlife Department Keningau	Wildlife Planner and Implementer	Sabah Wildlife Department Keningau
Subari Suparlan Pegawai MCEE Kota Kinabalu	Pegawai MCEE Kota Kinabalu	Forest Certification	Pejabat Perhutanan Kota Kinabalu Kimanis
Afendy Suraip (Website Master)	Staff of KAI	Website Maintenance	SFD, HQ Sandakan

APPENDIX 2: FSC CERTIFICATE FOR FMU10

APPENDIX 3: THE MONITORING FORMS OF FMU10 (BORANG FMU10)

A) BORANG FMU10 -01

BORANG FMU 10-01 (EDITED 2017)
HUTAN SIMPAN NULUHON TRUS MADI, SG. KILUYU& NULUHON TRUS MADI (TAMBAHAN)
RONDAAN / PEMANTAUAN (DARAT / UDARA)

(1)TARIKH RONDAAN:		**(2)**MASA BERTOLAK:		**(3)** MASA KEMBALI:	

(4)SENARAI LOKASI RONDAAN DARAT

A1. Jalan OP Sabindo	A9. Jalan Sungkoi	A18. Kawasan Sinua
A2. Sg. Rompon	A10. Jalan Merapok	A19. Kawasan Restorasi
A3. Kem BJG	A11. Jalan Batu Lunguyan	A20. Jalan Sinungkalangan
A4. Jalan Kundasang Baru	A12. Sunggala Plantation	A21. Jalan Namadan
A5. Jalan Kepayan Baru	A13. Sungai Atug	A22. Jalan Nandal
A6. Jalan Linsudan	A14. Kawasan Mempisas	A23. H.S. Sg. Kiluyu
A7.Jalan Kaimadang	A15. Kawasan Nandagan	A24. Nuluhon (tambahan)
A8. Jalan Marasak	A16. Kawasan Mansiat	
	A17. Kawasan Tuawon	

(5) BUTIRAN RONDAAN / PEMANTAUAN

BIL	LOKASI	MASA	BACAAN GPS
1			
2			
3			
4			
5			

(6) HASIL RONDAAN / PEMANTAUAN

Insiden Dikesan Ada ☐ Tidak Ada ☐

(7) JENIS KESALAHAN / KES (NYATAKAN JIKA ADA)	**(8)**LOKASI KESALAHAN / KES (CERAPAN GPS)

(9) TINDAKAN DIAMBIL

TANGKAP OYDS 1 ☐
RAMPASAN BARANGAN BUKTI ☐
LAPORAN POLIS ☐
PENYERAHAN BARANG KES ☐

1.NO. LAPORAN POLIS:_____

2.BUTIRAN BARANGAN DIRAMPAS
2.1 :_____
2.2 :_____

(10) CATATAN*(sila tulis dalam lampiran lain jika perlu)* Muka Surat 2

(11) AHLI ROMBONGAN

BIL	NAMA	JAWATAN	JABATAN/AGENSI
1			
2			
3			
4			
5			
6			
7			
8			
9			
10			
11			
12			

(12) PENGANGKUTAN YANG TERLIBAT

BIL	NO PENDAFTRAN KENDERAAN / HELIKOPTER	STESEN / AGENSI / JABATAN
1		
2		
3		
4		
5		
6		

TANDATANGAN KETUA ROMBONGAN

…….
NAMA :
JAWATAN :

Cop Agensi / Jabatan

B) BORANG FMU10 -02

BORANG FMU 10-02 (EDITED 2017)
HUTAN SIMPAN NULUHON TRUS MADI, SG. KILUYU & NULUHON TRUS MADI (EXTENSION)
BORANG PEMERIKSAAN BARANG DAN BEG

(1) TARIKH		**(2)** MASA		**(3)** LOKASI	

(4) NAMA PELANCONG

BIL	NAMA	FLORA		FAUNA		TANDATANGAN PENAMA
		YA	TIADA	YA	TIADA	
1						
2						
3						
4						
5						
6						
7						
8						
9						
10						

TANDATANGAN PEMERIKSA

…….
NAMA :
JAWATAN :

Cop Jabatan

CATATAN:

C) BORANG FMU10 – 03

BORANG FMU 10-03
Hutan Simpan Nuluhon Trus Madi,
Sg. Kiluyu & Nuluhon Trus Madi
(Tambahan

WILDLIFE SURVEYS

Starting Time: Weather Before:
Ending Time: After:
Ending Point [GPS]:
Distance Covered (m):
Survey Route:

No	Dist on the Road (m)	Time (12hrs)	Topo*	Habitat Type*	GPS Location		Alt (m)	Area /Cpt	Type of Sign*	Wildlife Species	No. of Object	Note (age, sex, food plants, tree species, etc)
					X_coor	Y_coor						

Note *:

Habitat Type*: 1- Lowland (< 500m), **2**- Upland (>500m), **3**- Dry Lowland, **4**- Open Area, **5**- Semi Inundated, **6**- Swamp, **7**- River, **8**- Riparian

Slope: 1: Flat, **2**: 0-10°, **3**: 10°-45°, **4**: >45°, **5**: Top Ridge , **6**: Undulating
Type of Sign*: 1- Direct Sighting, **2**- footprint, **3**- dung, **4**- Calling, **5**- Feeding Sign, **7**- Claw Mark, **8**- Mud Rubbing, **9**- Urine, **10**- Wallow, **11**- Twisted, **12**- Nest

D) BORANG FMU10 – 04

BORANG FMU 10-03
HUTAN SIMPAN NULUHON TRUS MADI, SG. KILUYU & NULUHON TRUS MADI (TAMBAHAN)
PEMANTAUAN HCV 1.3 (PLOT NEPENTHES)

(1) TARIKH RONDAAN:		**(2)** MASA BERTOLAK:		**(3)** MASA KEMBALI:	

4) BUTIRAN PEMANTAUAN

GPS POINT	PEMERHATIAN BIL. POKOK		KOMEN
	ASAL	SEKARANG	

5) CATATAN *(SILA TULIS DALAM LAMPIRAN LAIN JIKA PERLU)*

(6) AHLI ROMBONGAN

BIL	NAMA	JAWATAN
1		
2		
3		
4		
5		
6		
7		
8		

TANDATANGAN KETUA ROMBONGAN

…….
NAMA :
JAWATAN :

Cop Jabatan

NOTA:
SERTAKAN GAMBAR-GAMBAR BERKAITAN

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