

**KUMPULAN PENGURUSAN KAYU KAYAN TERENGGANU SDN BHD
(KPKKT)**

PUBLIC SUMMARY

ON

**THE SUSTAINABLE FOREST MANAGEMENT (SFM)
OF DUNGUN TIMBER COMPLEX (DTC),
TERENGGANU, MALAYSIA**

Updated on: November 2nd 2016

By

**SUHAIRI SULONG, WAN M. SUHAIMI W. Aziz, BORHAN Mohd
& MOHD HAKIMI Abu Hassan**

Bukit Besi, Malaysia

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1.0 INTRODUCTION

KPKKT continues to manage the timber concession area of Dungun Timber Complex (DTC) following the tenets of Sustainable Forest Management (SFM) principles as laid out in KPKKT's Forest Management Plan (FMP) which covers a 30-year period, from 2008 – 2037. The latter represents the second cycle of KPKKT's management of DTC under the Malaysian Selective Management System (SMS). All of the prescriptions contained in the FMP were drawn in such a way as to accommodate as much as possible the current as well as anticipated future changes in global attitudes and trends in the approaches towards forest resource management, biodiversity conservation, climate amelioration and environmental protection.

1.1 EIA-Compatibility and Compliance

The management of DTC continues to comply with the environmental management standards as laid out by the relevant authorities, namely the Department of Forestry as well as Department of Environment, Terengganu State. The Malaysian National Policy on the Environment aims at continued economic, social, and cultural progress of the country and enhancement of the quality of life of its people, through environmentally sound and sustainable development. In this context, appropriate environmentally-benign forest management standards and practices have been and will continue to be duly observed by KPKKT in all of its forest management activities and field operations, in order to minimise potential negative impacts of such operations.

1.2 Compliance with Existing Laws and Legislations as well as FSC P&C

KPKKT continues to comply with (1) the National Forestry Policy 1997; (2) National Forestry Act 1984 (NFP & NFA), (3) the "Forest Concession Agreement of Dungun Timber Complex (DTC)" (SFD TERENGGANU 1982), and (4) other relevant legislation as well as standards prescribed by local and international certification bodies such as the Forest Stewardship Council (FSC). The State Government of Terengganu first signed the concession agreement with KPKKT for the long term management and development of the FMU, covering a period of 25 years, from 1983 to 2007, which had been renewed and extended to cover the present cycle of management, from 2008 to 2037.

DTC was recognised and certified by FSC as a "Well-Managed Forest" in April 2008. This certification was subsequently renewed for a further five years as from 2012.

1.3 Manpower Position

As of the date of this Public Summary (November 2nd 2016), KPKKT employs a total of ___ staff. Of these, about ___% work at the management level (General Manager, Deputy GM, Senior Forest Manager, Forest Manager, Assistant Managers and Forest Officers), and ___% at the technical level (Forest Rangers, Foresters and Machine Operators) (see Table 1 for staffing position and Fig. 1 for Organisational Chart). The high proportion of technical staff reflects the importance attached by KPKKT on field and R & D operations. For road construction, tree felling and timber extraction, KPKKT engages a total of _____ contractors.

Table 1. Staffing Position at KPKKT as of November 2015

Section	Category				Total
	A	B	C	D	
Management	2	6			8
Supervisor			25		25
Technical			9		9
Support staff			19	1	20
Clerk & support staff			12		12
Contract staff			6	1	7
TOTAL					81



Fig. 1. Organisational Chart of KPKKT (Nov. 2016)

2. TIMBER RESOURCE BASE AND MANAGEMENT STRATEGY

2.1 Management Strategy

There had been no major change in Project details, including information with regard to species biodiversity over those mentioned in the FMP. The 6 Permanent Reserved Forests (PRFs) that make up DTC remain as follows: (1) Jengai PRF (51,640 ha), (2) Besul PRF (6,190 ha), (3) Jerangau PRF (9,710 ha), (4) Pasir Raja Barat PRF (6,463 ha), (5) Pasir Raja Selatan PRF (31,512 ha), and (6) Besul Tambahan PRF (3,360 ha).

These forests are still rich in various tropical timber species including:

(1) Balau, (2) Balau laut merah, (3) Balau membatu, (4) Chengal, (5) Keruing, (6) Kempas, (7) Merbau, (8) Meranti nemesu, (9) Meranti bukit, (10) Meranti seraya, (11) Meranti sengkawang merah, (12) Meranti rambai daun, (13) Meranti kepong, (14) Meranti kepong, (15) Meranti tembaga, (16) Resak, (17) Damar hitam, (18) Damar minyak, (19) Kapur, (20) Keladan, (21) Mersawa, (22) Meranti sarang punai, (23) Meranti melantai, (24) Meranti langgong, (25) Gerutu, (26) Meranti paang, (27) Nyatoh, (28) Sepetir, (29) Bintangor, (30) Durian, (31) Jelutong, (32) Kedondong, (33) Kembang semangkok, (34) Giam, (35) Kulim, (36) Merawan, (37) Melunak, (38) Merpauh, (39) Medang, (40) Simpoh, (41) Mengkulang, (42) Kelat, as well as a host of “miscellaneous species”.

Based on past 5-year (2011 – 2015) production data, these forests still managed to produce an average of 15.15 nett hoppus ton of round timber per ha from the species mentioned above. This is equivalent to approx. 28 m³/ha.

In terms of its long term management strategy, KPKKT continues to embrace and practise the Malaysian Selective Management System (SMS) to manage the mixed dipterocarp forest within DTC. The company’s commitment to remain viable while at the same time maintain its FSC-certified status, remains unchanged. These can be summarised as follows:

1. Strict adherence to and proper implementation of the prescriptions laid out in the Forest Management Plan and guided by the Terengganu State Forestry Department.
2. Commitment to reducing the impact of logging on the natural environment by protecting residual Potential Crop Trees (PCTs), regeneration, biodiversity, soil, water resources, habitats and high conservation value forest (HCVF) and the human environment
3. Maintenance of ecology and the ratio of dipterocarp vs non-dipterocarp species in the residual stands as in the original forest composition
4. Commitment towards maximum utilisation of timbers and minimisation of wastes
5. Continued investment in developing Reduced/Low Impact Logging (RIL) methodologies in all types of timber production areas,
6. Provision of necessary training and mentoring programmes to staff and contractors along with supervision on the ground on regular basis.
7. Management of the Concession Area as a self-sustaining, multiple-use FMU.
8. A full subscription to all FSC’s Principles and Criteria for SFM.

2.2 Forest Function Mapping and Forest Zoning

The natural forests within DTC have been generally and conveniently classified into functional classifications as defined in the National Forestry Act of 1993.

Table 2. Forest Functions in DTC in relation to the Functions Defined in the NFA1993.

National Forest Policy 1992		National Forestry Act 1993	Forest Zonation in Dungun Timber Complex (DTC)	% DTC Area
Production Forest		Sustainable timber production	Timber Production (TP)	67%
Protection Forest	Soil protection	Soil protection	Soil Protection (SP)	14%
			Soil Conservation (SC)	37%
		Soil reclamation	-	-
	Flood control	Flood control	Flood Control Conservation (WFC)	-
	Safeguarding of water resources	Water catchment	Water Catchment Conservation (WCC)	37%
			Riparian Buffer Protection (WBP/ HCVF)	18%
Preservation of biodiversity	Wildlife Sanctuary	Rare Ecosystem Protection (HCVF)	-	
	Virgin Jungle Reserve	Protected Area Buffer (HCVF)	1%	
	Climate amelioration	-	-	
Amenity Forest	Recreation	Amenity	e.g. Chemerong Waterfall	<1%
	Ecotourism	-	e.g. Chemerong Waterfall	<1%
	Public awareness	-	-	-
Research and Education Forests (added in Rev. 1992)		Research	e.g Compts. 51 & 54 of Jengai FR.	<1%
		Education	e.g. Compartment 52 of Jengai FR.	<1%
		Forest for federal purposes	-	-

Table 3.
Mammal Species Identified in Jengai Permanent Reserved Forest (PRF) During 2011 Survey

Common name	Scientific Name	Protection Status	Status	
			IUCN	CITES
Large Indian civet	<i>Viverra zibetha</i>	TP	NT	III
Malay civet	<i>Viverra zangalunga</i>	TP	LC	NL
Malayan porcupine	<i>Hystrix brachyura</i>	P	LC	III
Pig-tailed macaque	<i>Macaca nemestrina</i>	P	VU	II
Long-tailed macaque	<i>Macaca fascicularis</i>	P	LC	II
Banded langur	<i>Presbytis femoralis</i>	P	NT	II
White handed gibbon	<i>Hylobates lar</i>	TP	EN	II
Common barking deer	<i>Muntiacus muntjak</i>	P	LC	NL
Lesser Mouse deer	<i>Tragulus javanicus</i>	P	DD	NL
Wild pig	<i>Sus scrofa</i>	P	LC	NL
Malayan tapir	<i>Tapirus indicus</i>	TP	EN	I
Asian elephant	<i>Elephas maximus</i>	P	EN	I
Smooth otter	<i>Lutra perspicillata</i>	TP	VU	NL
Malayan sun bear	<i>Helarctos malayanus</i>	P	VU	I
Asiatic wild dog	<i>Cuon alpinus</i>	TP	EN	I
Leopard cat	<i>Prionailurus bengalensis</i>	TP	LC	I
Leopard	<i>Panthera pardus</i>	TP	NT	I
Asiatic Golden cat	<i>Catopuma temminckii</i>	TP	NT	II
Malayan tiger	<i>Panthera tigris jacksoni</i>	TP	EN	I

Key:

EN – Endangered	VU- Vulnerable	TP- Totally Protected
VU – Vulnerable	LC – Least Concern	P- Protected
NT - Near threatened	DD - Data deficient	NL- Not listed

Table 4. Avifauna species, their protection & conservation status, location and relative density.

[Key: Besul (T) = Besul (Tambahan) forest reserve, P = protected, IUCN = IUCN Red List of Threatened Species 2010, VU = vulnerable species, NT = Near Threatened species. Appx. 1 = Appendix 1 (CITES). Refer to Appendix 1 for scientific name and species number. Relative density: 40-50 = fairly high, 20 - 30 = medium, 10-20 = fairly low, 5-10 = low, 1-5 = extremely low. Note: density estimate given as a general guide]

NO.	Species common Name/Family	P	IUCN	CITES	Forest reserve	Relative density
Phasianidae						
1	FERRUGINOUS PARTRIDGE	TP	NT		Jengai	1
2	Malaysian Peacock Pheasant	TP	VU		Jengai, Besul	3
3	Great Argus	TP	NT		Jengai	2
Accipitridae						
4	Lesser Fish Eagle	TP	NT		Jengai, Besul	7
5	Grey-headed Fish Eagle	TP	NT		Jengai	1
Psittacidae						
6	Blue-rumped Parrot	TP	NT		Jengai, Besul	27
Cuculidae						
7	Short-toed Coucal	TP	VU		Besul	1
8	Chestnut-bellied Malkoha	TP	NT		Jengai	3
9	Black-bellied Malkoha	TP	NT		Besul	1
Trogonidae						
10	Scarlet-rumped Trogon	TP	NT		Jengai	2
Alcedinidae						
11	Rufous-collared Kingfisher	TP	NT		Jengai	1
Bucerotidae						
12	Black Hornbill	TP	NT		Jengai, Besul, near Cp. J37/B3? (Sg. Jengai)	18
13	Great Hornbill	TP	NT	Appx. 1	Jengai	2
14	Rhinoceros Hornbill	TP	NT		Jengai	17
15	Helmeted Hornbill	TP	NT	Appx. 1	Jengai	2
16	White-crowned Hornbill	TP	NT		Jengai, Besul	5
17	Wrinkled Hornbill	TP	NT		Jengai	4
Megalaimidae						
18	Red-crowned Barbet	TP	NT		Jengai	5
19	Red-throated Barbet	TP	NT		Jengai	3
20	Yellow-crowned Barbet	TP	NT		Jengai, Besul	2
Picidae						
21	White-bellied Woodpecker			Appx.1	Jengai, Besul	5
22	Olive-backed Woodpecker	TP	NT		Near border of Cp. J37/B3?	1
23	Great Slaty Woodpecker	TP	VU		Jengai, Besul	7
Eurylaimidae						
24	Green Broadbill	TP	NT		Jengai, Besul	7
25	Black-and-yellow Broadbill	TP	NT		Jengai, Besul, Besul (T)	16
Pittidae						
26	Garnet Pitta	TP	NT		Jengai	2
Aegithinidae						
27	Green Iora	TP	NT		Jengai, Besul	32
Campephagidae						
28	Fiery Minivet	TP	NT		Jengai, Besul, Besul (T)	8
Corvidae						
29	Crested Jay	TP	NT		Jengai	1
30	Black Magpie	TP	NT		Jengai, Besul	14
Pycnonotidae						
31	Black-and-White Bulbul	TP	NT		Jengai	1
32	Grey-bellied Bulbul	TP	NT		Jengai, Besul, Besul (T)	7
33	Puff-backed Bulbul	TP	NT		Jengai, Besul	17
34	Buff-vented Bulbul	TP	NT		Jengai, Besul, Besul (T)	25
35	Streaked Bulbul	TP	NT		Jengai, Besul	10
Timaliidae						
36	Brown Fulvetta	TP	NT		Jengai, Besul	5
37	Black-throated Babbler	TP	NT		Jengai	2
38	Chestnut-rumped Babbler	TP	NT		Jengai, Besul	6
39	Fluffy-backed Tit-Babbler	TP	NT		Jengai, Besul, Besul (T)	27
40	Sooty-capped Babbler	TP	NT		Besul	2
41	White-chested Babbler	TP	NT		Jengai, near border of Cp. J37/B3 (Sg. Jengai)	3
42	Striped Wren-babbler/ Kenopia	TP	NT		Jengai	2
Chloropsidae						
43	Lesser Green Leafbird	TP	NT		Jengai, Besul	8

Table 5. Endemic Plant Species in Jengai PRF.

Key: PM = Peninsular Malaysia; Trg = Terengganu; * = New finding in Terengganu;

A = Cpt 76,78,79 (11 years after logging); B = Cpt 63 (24 years after logging); C = Cpt 6 (27 years after logging).

No.	Species	Vernacular name	Family	Endemic to:	Locality
1	<i>Eugeissona verticillaris</i>	Rotan Sabong	Palmae	PM	B, C
2	<i>Pinanga scortechinii</i>	Pinang Hutan	Palmae	PM	B,C
3	<i>Scaphochlamys breviscarpa</i>	-	Zingiberaceae	PM, Trg	C
4	<i>Scaphochlamys laxa</i>	-	Zingiberaceae	PM	A,C
5	<i>Anisophyllea reticulata</i>	Delex	Anisophylleaceae	PM*	A, B
6	<i>Cyathocalyx pruniferus</i>	Antoi	Annonaceae	PM	A,C
7	<i>Enicosanthum fuscum</i>	Mempisang	Annonaceae	PM	A
8	<i>Vatica scortechinii</i>	Resak Langgong	Dipterocarpaceae	PM	A,B,C
9	<i>Diospyros argentea</i>	Kayu Arang	Ebenaceae	PM	C
10	<i>Diospyros nutans</i>	Kayu Arang	Ebenaceae	PM	B
11	<i>Diospyros penangiana</i>	Kayu Arang	Ebenaceae	PM*	B, C
12	<i>Ptychopyxis caput-medusae</i>	Rambai Hutan	Euphobiaceae	PM	B
13	<i>Ptychopyxis costata var. oblanceolata</i>	Mendaroh	Euphobiaceae*	PM*	A,B,C
14	<i>Lithocarpus curtisii</i>	Mempening	Fagaceae	PM	A
15	<i>Hydnocarpus filipes</i>	Setumpol	Flacourtiaceae	PM	A,B,C
16	<i>Hydnocarpus kunstleri var. tomentosa</i>	Setumpol	Flacourtiaceae	PM	C
17	<i>Henckelia miniata</i>	-	Gentianaceae	PM, Trg	A,B,C
18	<i>Henckelia puncticulata</i>	-	Gentianaceae	PM	A,B,C
19	<i>Kayea elegans</i>	Penaga	Guttiferae	PM*	B,C
20	<i>Callicarpa maingayi</i>	-	Labiatae	PM	A,C
21	<i>Bauhinia bidentata subsp. bidentata</i>	-	Leguminosae	PM	A,B,C
22	<i>Oxyspora bullata</i>	Senduduk	Melastomataceae	PM*	A,B,C
23	<i>Ficus deltoidea var. trengganuensis</i>	Mas Cotek	Moraceae	PM	C
24	<i>Ficus mollisima</i>	Ara	MoOraceae	PM*	A,B
25	<i>Ardisia kunstleri</i>	-	Myrsinaceae	PM*	A,B
26	<i>Embelia canescens var. canescens</i>	-	Myrsinaceae	PM*	C
27	<i>Syzygium politum</i>	Kelat	Myrtaceae	PM*	C
28	<i>Aporosa globifera</i>	Sebasah	Phyllanthaceae	PM*	A,C
29	<i>Diplospora lasiantha</i>	-	Rosaceae	PM	B
30	<i>Hypobathrum venulosum</i>	-	Rubiaceae	PM	A,B
31	<i>Psychotria griffithii</i>	-	Rubiaceae	PM	A,B
32	<i>Saprosma glomerulata</i>	Sekentut	Rubiaceae	PM	C
33	<i>Tarenna maingayi</i>	-	Rubiaceae	PM*	A,B
34	<i>Timonius wrayi</i>	-	Rubiaceae	PM	A,B
35	<i>Pentace grandefolia</i>	Melunak	Tiliaceae	PM, Trg	C
36	<i>Pentace strychnoidea</i>	Melunak	Tiliaceae	PM	B

2.3 Human Resource Development

Training and capacity building involving both KPKKT's personnel and those of KPKKT's contractors, are of utmost importance in order to achieve SFM in the Concession Area and maintain our FSC-certified status. As for the contractors and their staff, KPKKT provides the necessary support and incentives for training initiatives by, for instance, roping-in the contractors concerned into our training programmes aimed at enhancing knowledge and skills in field techniques. Table ___ below summarises the trainings, workshops and courses which are participated by KPKKT in order to avail the workers to the latest thinking and development in areas related to their jobs. Apart from that, training for staff in the following areas are also being considered and will be arranged from time to time:

1. Training of machine operators in environmentally benign and damage-limiting techniques
2. Training in silviculturally significant tree marking procedures
3. Training in silviculturally relevant stand treatment techniques
4. Training on nursery technology and planting stock production.

Table 6.
Short Courses, Seminars and In-Service Field Visits Organised for KPKKT Staff in 2016

No	Date & Duration	Course Title	Venue	Participation
1	27 – 28 Jan 2016 (2 days)	Seminar on Ecology & Genetics of Dipterocarp Forests	Genting Highlands, Pahang	Asst Manager (Operation), Asst tanager (Compliance)
2	20 – 21 Jan 2016 (2 days)	Kursus Pemantapan Profesionalisma Kumpulan GPB	Duyong Marina & Resort, Terengganu	Management Staff
3	15 – 16 Feb 2016 (2 days)	Kursus Bancian Hutan Pre F & Post F	HSK Telemong/ Pusat Latihan Perhutanan (PLPT) Chalok	Selected Contractors
4	22 – 24 Feb 2016 (3 days)	Garis Panduan Jalan Hutan	HSK Rasau Kertih	Selected Staff
5	1 – 3 March 2016 (3 days)	Pemantapan Budaya Inovasi & Motivasi Diri	Kompleks TTITC, K. Berang	Selected Staff
6	27 – 31 March 2016 (5 days)	Kejurulatihan Pengusahasilan Hutan Berimpak Rendah (RIL) Menggunakan Kaedah Logfishing, 2016	KPKKT	Selected Staff & Contractors
7	31/5 – 3/6/2016 (4 days)	Penandaan Pokok	PLPT Chalok & Comp. 26 HSK Telemong	Selected Contractors
8	15 – 18 Aug 2016 (4 days)	Pengedalian Gergaji Berantai dan Teknik Tebangan Berarah	PLPT Chalok	Selected Staff
9	5 – 9 Sept 2016 (5 days)	Pemahaman Persijilan Pengurusan Hutan (MC&I) Hutan Asli	Pejabat Agama Kemaman	Selected Staff & Contractors

2.4 Silviculture

KPKKT adopts a pragmatic policy with regard to the silviculture of the managed TRF stands, in line with the dictates of SMS and contemporary thinking on TRF resource management. Residual stands are regenerated through natural means as well as controlled artificial regeneration in the form of Open Area Planting (*Tanaman Kawasan Lapang* - TKL) while selective harvesting takes care of the larger sized regeneration and pole-sized trees.

2.4.1 Selective Harvesting as a Form of Silvicultural Treatment

KPKKT subscribes to the view that selective harvesting of trees combined with RIL and directional felling, judiciously planned and carried out in an environmentally-benign manner could pass as being equivalent to a silvicultural treatment. This is by virtue of the fact that such operation incorporates the following:

- (i) a network of well-constructed and uncompacted network of skid trails which forms a convenient and well-distributed network of fertile germination beds for wildings ideal for enrichment planting and open-area planting (TKL);
- (ii) the use of appropriate RIL methods and machines which would lead to controlled and minimal amount of damage and compaction to the soil and disturbance to the forest ecology,
- (iii) the practice of directional felling; and
- (iv) use of a well-trained and motivated workforce who ensures that harvesting activities are done professionally and to the desired specifications and standards.

2.4.2 Forest Regeneration and Mother Trees

The SMS considers a forest as being regenerated, if there was a sufficient number of individuals above the prescribed SMS stocking standards in all size classes up to 45cm DBH. Our observation and surveys have shown that this requirement was well met and there were sufficient young regeneration (up to the size 45.00cm DBH), as well as mother trees in residual stands of all ages.

2.4.3 Open/ Disturbed Area Planting (*Tanaman Kawasan Lapang* (TKL))

Our records of the *Tanaman Kawasan Lapang* (TKL) activities conducted within DTC over the period from 2008 up till 2015 (i.e. 8 years), can be summarised in the following points:

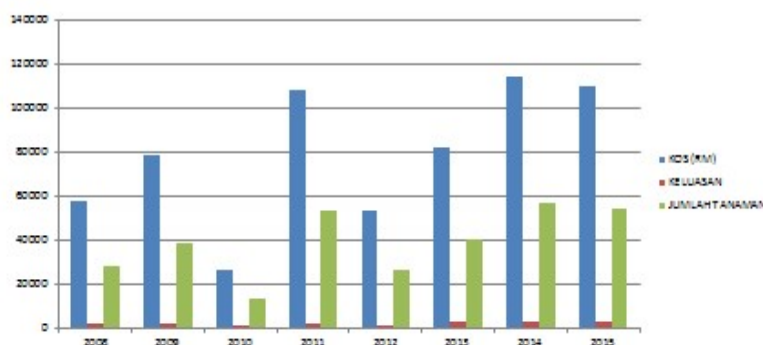
- Total area subjected to TKL activities was spread over a total Felling Coupe of 15,516.2 ha.
- Total number of seedlings planted as of Dec. 2015 stood at 310,720 seedlings, or 20 seedlings/ha
- Total expenditure for planting was **RM630,761.60 or RM2.03 / seedling.**
- Species planted comprises the following:
(1) Chengal, (2) Giam, (3) Kembang semangkok, (4) Kapur, (5) Meranti rambai daun, (6) Meranti tembaga, (7) Balau, (8) Meranti seraya, (9) Meranti sarang punai, (10) Sepetir, (11) Balau pasir, (12) Karas, (13) Bintangor, (14) Damar hitam, (15) Keruing, (16) Balau bukit, (17) Keladan, (18) Gerutu, (19) Meranti langgung, (20) Penaga, (21) Meranti kepong, (22) Merawan, (23) Meranti melantai, (24) Damar minyak, (25) Meranti nemesu, (26) Merawan bunga, (27) Meranti singkawang air, and (28) Nyatoh.

The above statistics can be compared with a total of 282,350 seedlings planted during the whole of the first FMP period of 1983 – 2007. The different species were planted at different spacings depending on the degree of openness of the site and hardness of the soil; as well as the slope condition. Sentang for instance, was used for planting up open spaces such as log landings, along roadsides, skid trails, abandoned road, abandoned camp sites, *etc.* In the case of Kapur, open areas were planted up immediately. The seedlings were either produced in KPKKT's nursery located in Compartment 52 of Jengai PRF, or procured through contract suppliers which complement those seedlings supplied by the TSFD. KPKKT keeps records on the

areas planted as well as the tending treatments conducted up to 4 years after planting. Attempts will be made to update the records and monitor the growth performance of the plantings.

Table 7.

	Y E A R								GRAND TOTAL	8-YR AVERAGE
	2008	2009	2010	2011	2012	2013	2014	2015		
TOTAL COST OF PLANTING (RM)	57,572.30	78,814.80	26,455.00	108,339.00	53,352.50	82,275.90	114,293.00	109,559.00	630,761.60	78,845.19
TOTAL AREA PLANTED (Ha)	1,831.0	1,918.0	626.6	2,235.5	1,173.0	2,299.0	2,616.0	2,797.0	15,516.2	1,939.5
NUMBER OF SEEDLINGS PLANTED	28,410	38,825	13,032	53,369	26,282	40,330	56,302	53,970	310,720	38,840



2.5 Yield Regulation

The yield regulation for DTC is determined based on:

- ★ The present stocking and site conditions of the second growth timber stand
- ★ Data from Pre-Felling Inventory
- ★ Deductions according to the extent of logging damages on the remaining stand
- ★ Deductions for unproductive areas within production forest (e.g. infrastructure, buffer zones, etc).

For the period 2011 – 2015, the gross total area of forest stands within DTC that were subjected to selective logging stood at **8,750ha or an average of 1,750ha** per year which is well below the annual allowable harvesting quota of 2,000ha/yr allocated by the Terengganu State Forest Department.

The volume of round timber produced during the 5-year period ranged from as high as 33,013.722 hoppus tonnes (ht) in 2013 to as low as 19,805.292ht in 2015 giving an average of 26,505.846ht/year.

2.6 Growth and Yields

2.6.1 Permanent Sample Plots (PSPs)

A total of 70 PSPs each with a size of 1.0 ha were established in various parts of DTC area during September 1997. In 2011 a total of 18 of these plots were shortlisted to be re-measured after a lapse of about 14 years, and a report on the growth and yield of these plots was prepared. Recently (in 2015) it was decided that another round of re-measurement should be done on these 18 PSPs which would, in theory, provide a total of 18 years' data which would in turn place KPKKT in the league of very rare private forestry firms that had successfully accomplished such a difficult feat.

However, as of early November 2016, it was discovered only four (4) of the said 18 plots were managed to be traced and re-measured for the third time (i.e. over a space of 18 years).

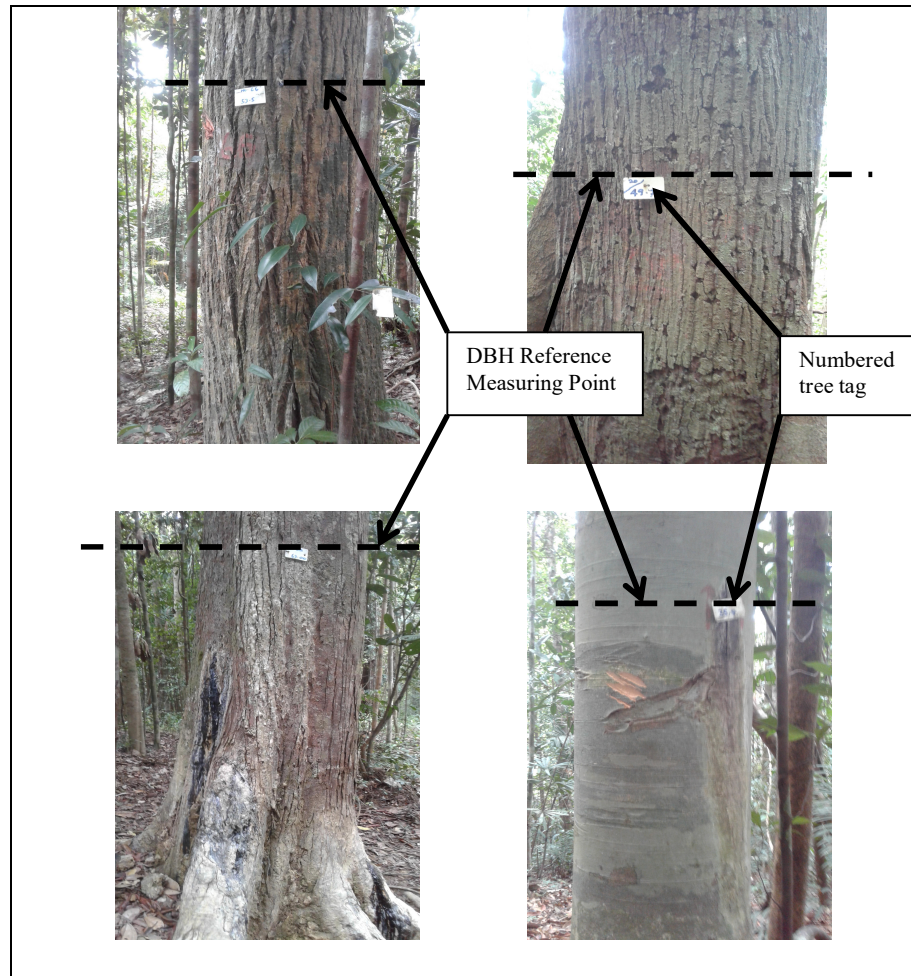
Efforts are continuing to trace more of the remaining PSPs, as well as the others, which would mean more expenses would be required. Among the reasons for the difficulty to re-locate the PSPs were:

- The long lapse in time
- Difficulty to access due to damaged/ collapsed roads and bridges
- Improper recording of plot locations
- Change and/or retirement of staff directly involved in plot establishment
- Lack of maintenance over the years, resulting in severe damages to plots, loss of tree tags as well as defacement of paints and numbers on trees.
- High costs to revisit/re-measure/ maintain the plots.

Under the circumstance, the following line of actions are recommended:

- (1) Continue maintaining those PSPs that were managed to be identified so far
- (2) Close/ terminate those PSPs that are found to be untraceable and/or severely damaged.
- (3) Establish new set of PSPs but using a design which is simpler and more efficient than the existing one.
- (4) Focus on re-measuring trees planted in the *Tanaman Kawasan Lapang* (TKL) project.

Fig. 2
Tagged and re-
measured trees
within PSP No.
88, Besul PRF





Figs. 3
Views of PSP88 showing tagged trees and
successfully established wildings of dipterocarps
species.

2.7 Conservation of Biodiversity and Genetic Resources

Biological diversity or biodiversity is the variety and variability among living organisms and the ecological complexes, in which they occur. The overall objective is to reduce the impact of forestry operations on biodiversity in general, and wildlife in particular.

Prescriptions/ Actions Taken by KPKKT:

1. Map and protect (no logging): (i) Soil Protection areas; (ii) Riparian Buffers; (iii) Swamps (Flood Control and Conservation); (iv) Any other areas identified as having a special value (e.g., an area where a rare species occurs or is known to be especially abundant)
2. Employ RIL techniques, incl. directional felling, appropriate laying and construction of skid trails
3. Minimise soil erosion and loss from road construction.
4. Retain pockets of unlogged forest stand in the larger matrix of logged forest. Such patches of unlogged forest act as reservoirs of biological diversity.
5. Disrupt the tree canopy as little as possible to minimise fragmentation of wildlife habitats (e.g. during road construction).
 - Maintain crossing points over roads, where tree crowns on the two sides of the road maintain close contact. This is easier on level ground than on hill slopes, and easier on straight

stretches than on curved parts. WWF Malaysia recommends a crossing point every 100m of road.

- Maintain down- and up-stream access for aquatic fauna by using bridges or open-bottom culverts to cross streams.

6. Map and protect saltlicks.

7. Protect trees important for biodiversity:

- Over-mature trees (for birds; e.g. hornbills and woodpeckers)
- Fruiting trees such as fig trees
- Rare tree species
- When replanting, include a small proportion of tree species that are important for wildlife, such as Petai (*Parkia speciosa*), Kerayong (*Parkia javanica*), Tampoi (*Baccaurea spp.*), Pulasan (*Nephelium spp.*), Figs (*Ficus spp.*), Macang (*Mangifera spp.*), Kerdas and Jering (*Pithecellobium spp.*), Durian (*Durio zibethinus*), Asam jawa (*Tamarindus javanica*) and Sesenduk (*Scaphium malaccensis*).

2.8 Recreation and Eco-tourism

The use of the forest concession for recreation and eco-tourism is set to increase in the future. The Chemerong Waterfall in the 418-ha Compt. 26 of Pasir Raja Selatan PRF, and located some 155 km from the airport in Kuala Terengganu and 77km from Dungun, the nearest major town; has attracted an estimated 1,000 tourists per year. This suggests a high potential for tourism development. In 1995 and early 1996 KPKKT spent RM110,000.00 to build access road and parking space. For further improvement, the Tourism Committee of Terengganu has endorsed a RM1 million contribution from government funds to develop the waterfall area into an attractive eco-tourism spot.

2.9 Demarcation and Control of Boundaries

KPKKT continues to assist, to the extent possible, and facilitate the work done by the Terengganu SFD to mark and clean forest boundaries within the Project Area. The work on forest boundaries follow the guidelines as specified in the Malaysian Forestry Manual and MC & I on cutting of boundary lines, marking of boundary trees, sequence of boundary inspection, replacement of missing beacons, etc.

2.10 Road Construction and Maintenance

Road construction continues to be undertaken by contractors with close supervision and control by KPKKT.

2.11 Forest Nursery

KPKKT's nursery is located within compartment 52 Jengai PRF covering an area of about 0.56 ha. The location is near the main road entrance to Jengai PRF. This nursery is able to accommodate a total of 40,000 tree seedlings at any one time. Species that are raised in this nursery include dipterocarp species such as *Neobalanocarpus heimii* (Chengal), *Shorea atrinervosa* (Balau), *Shorea multiflora* (Damar Hitam), *Parashorea* (Gerutu), *Hopea nutans* (Giam), *Dryobalanops aromatic* (Kapur), *Dipterocarpus spp* (Keruing), *Hopea pubescens* (Merawan bunga), *Hopea griffithii* (Merawan Siput Jantan), *Shorea platycaldos* (Meranti Bukit), *Shorea pauciflora* (Meranti Nemesu), *Shorea Acuminata* (Meranti Rambai Daun), *Shorea parvifolia* (Meranti Sarang Punai), *Shorea curtisii* (Meranti Seraya), *Shorea leprosula* (Meranti Tembaga) and Non Dipterocarp species such as *Callophylum biflorum* (Bintangor), *Agathis borneensis* (Damar Minyak), *Aquilaria malaccensis* (Karas), and *Scophium macropodum* (Kembang Semangkok). The seedlings were used in our "open area planting programme" in Dungun Timber Complex (DTC) and Cherul Forest Concession (CFC) upon the seedlings concerned reaching a height of about 2 feet (60 cm)..

3.0 RESOURCE CONSERVATION AND MANAGEMENT OF BIODIVERSITY

3.1 Biodiversity Management Strategies and Activities in DTC

Dungun Timber Complex (DTC) plays a very crucial role in safeguarding the high biodiversity values as it shares the boundary with Taman Negara National Park in the western flank of Pasir Raja PRF (HCV 1). A total of four endangered dipterocarp species were identified during the survey on flora (HCV 1.2). A total of thirty five new species were recorded for Terengganu, 11 of which are endemic to Malaysia (HCV 1.3).

The area is rich in bird diversity with 176 near threatened, threatened and endangered (IUCN Redlist) bird species recorded (HCV 1.2). Nineteen threatened and endangered (HCV 1.2) mammal species recorded with the iconic Malayan Tiger, Asian Elephant, Malayan Tapir, Dhole and White-handed gibbon listed as Endangered (IUCN Redlist). A further enhancement in wildlife protection, stricter enforcement and anti-poaching measures are the best management options to reduce threats to the HCV species. Critical temporal use of areas for birds were identified (HCV 1.4) and sustainable forest management practices will be important to ensure that these areas are not degraded during logging operations.

DTC plays an important role as part of a larger forest landscape (HCV 2) being part of the *Banjaran Taman Negara - Banjaran Timur* forest complex; its close proximity to Taman Negara National Park and because it shares boundary with Gunung Aais and Sg. Nipah FRs in the south. One potentially threatened and endangered ecosystem (HCV 3) was identified in the PRFs assessed namely Pandan Swamp. DTC is listed as an important water stress area in Peninsular with five catchments legally gazette as *Hutan Tadahan Air* (HCV 4).

The social survey when looking at all the communities surrounding DTC on a whole suggested that, more than 80% do not depend on the DTC forest for subsistence or to supplement their income. For families that do depend on the forest they rely on the forest for 3 main products i.e. NTFP, medicinal plants and fish with fish being the most critical resource of the three (HCV 5).

Forest Management practice strictly adhering to Reduced Impact Logging (RIL) guidelines is the single most important action being undertaken by KPKKT in order to safeguard the HCVs identified in DTC. Retaining healthy, logging-free riparian buffers are also crucial for biodiversity, to protect rivers and avoid erosion.

3.2 General Recommendations for Biodiversity Management

4.2.1 Avifauna conservation

Regular patrols along the roads near the borders of the forest reserves could deter hunting activities at the DTC and mitigate the loss of threatened birds. Patrols could ideally be carried out with cooperation of the Forestry Department and Department of Wildlife and National Parks (PERHILITAN). A community outreach programme including socio-economic improvement to educate surrounding communities on the importance biodiversity, could play a meaningful role in mitigating hunting activities and inculcate a sense of belonging for the forest and its wildlife.

3.2.2 Large mammal conservation

The survey indicates that Jengai FR still harbours iconic wildlife species such as the Malayan tiger, Asian elephant and Malayan Tapir. However, these HCVs are in serious threat and their survival in under pressure.

In order to ensure the survival of these species, appropriate strategies will be developed aimed at reducing encroachment into KPKKT's concession area. Effective enforcement to stop poaching and encroachment should be immediately implemented through increased patrolling and security as well as community engagement and awareness campaigns with assistance from Perhilitan, TSFD, FDPM and WWF-Malaysia. The presence of browse vegetation along the roadsides; serves as important food source for deers and other

herbivores. In term of primates and other frugivores, KPKKT will help by replanting fruit trees (e.g. *Ficus sp.*) as part of the company's silviculture treatment.

3.2.3 HCVF/ GRA within the Project Area

The following sites have been identified and marked as potential HCVFs within the Forest Concession.

1. The area around the *Neobalanocarpus heimii* (Chengal) tree which has been listed in the Malaysia Book of Records as the largest Chengal tree in the world.
2. The strip of forest that forms a corridor and buffer between the concession forest and Taman Negara. It is proposed that the width of this buffer/ corridor strip be set at 100 metres.
3. The area around Gunung Mandi Angin which has been the subject of many scientific and botanical expeditions and supports unique flora and fauna.
4. The Keruing Sarawak and Resak stands in Jerangau PRF

As of present, the following two areas have been chosen as HCVFs within DTC to be maintained and managed by KPKKT:

1. The Keruing Sarawak plot within Compt 31 Jerangau PRF, and
2. The community watershed forest within Compt 52 Jengai PRF.

Detailed descriptions on these two HCVFs are embodied in a separate **HCVF Management Plan** document prepared by KPKKT, which also covers Future Activities & Plan of Actions to be undertaken within the HCVFs concerned.

4.0 FOREST PROTECTION, MONITORING AND CONTROL

4.1 Forest Protection

Main aspects of protection include: (1) Protection from encroachment; (2) Protection from pest and disease outbreak; (3) Protection from fire; and (4) Protection from pollution.

4.1.1 Protection from Encroachment

KPKKT has taken appropriate steps to protect strategic parts of DTC by installing gates or berms that would reduce the potential for encroachment and wildlife harassment. These measures will be strengthened through regular patrol with the help of the enforcement division of the SFD and the relevant authorities concerned such as the police, army personnel, PERHILITAN, etc.

4.1.2 Protection from Pests and Diseases

In KPKKT the line of action that was followed in this respect during the planning period focuses on the following:

- (1) Improvement in Nursery Practice
- (2) Improvement in Forest Hygiene

4.1.3 Protection from Fire

The control and protection of the concession forest from fire require several important steps that need to be clearly understood and followed by the management. These are:

- 1) demarcation of clear and well-defined boundaries;
- 2) establishment of permanent firebreaks;
- 3) provision of standing instructions to staff and workers;

- 4) establishment of communications channel;
- 5) provision of training in fire fighting skill for staff and workers.

4.2 Monitoring and Control

Periodic reviews of the Forest Management Plan will be undertaken to reassess the initially calculated AAC and, if necessary, adjusted. The periodic reviews will also take into consideration any over- or under-logging during the preceding 5 years, forest conversions, and transitions from untreated/ unsustainable to sustainably managed forest, costing, protection status of the forest etc.

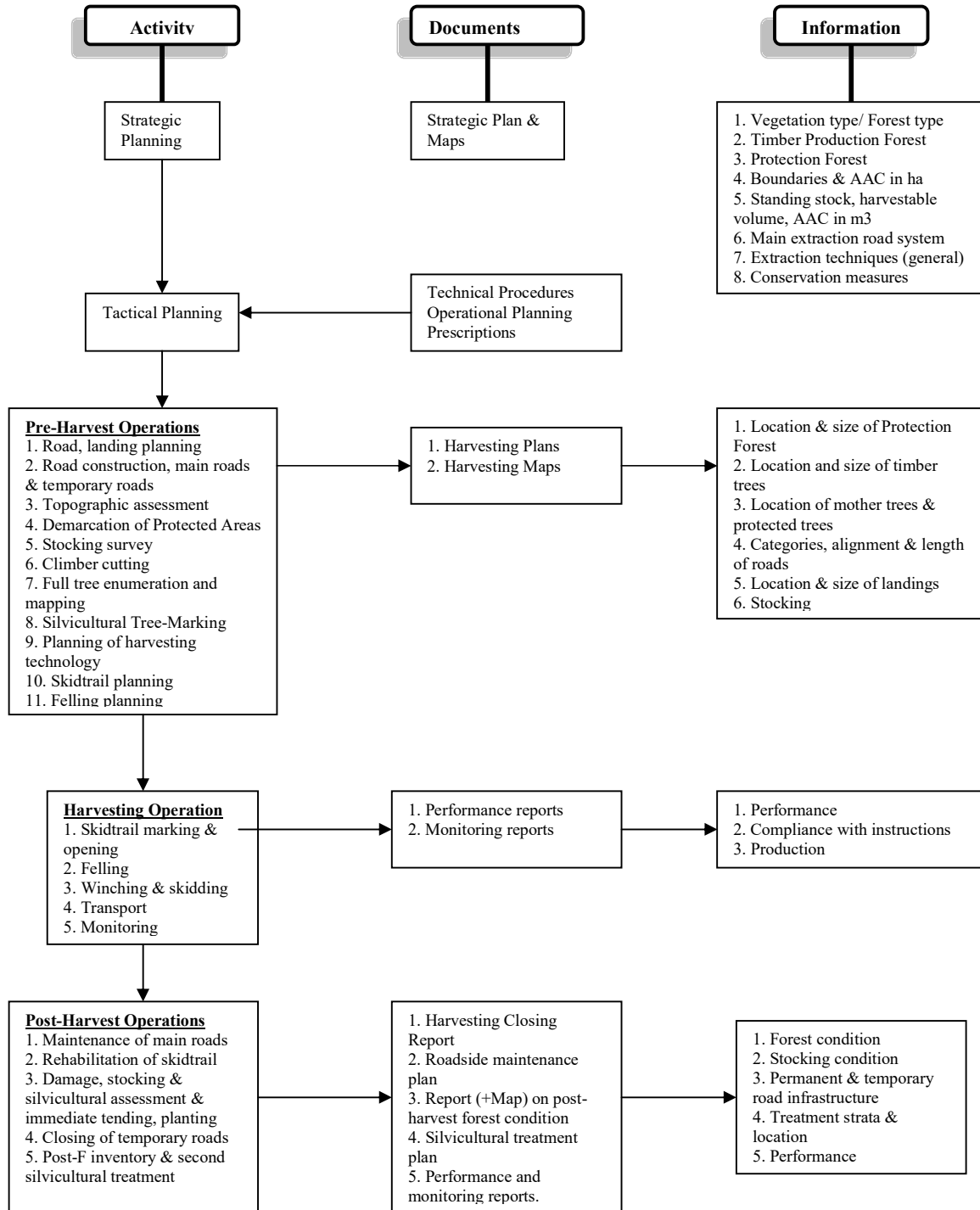
An indispensable part of any professional monitoring, evaluation and control is the existence of proper documentation and records keeping. A good records management provides a recipe for what to do, how to do it, and where to begin. It has the following major components: (i) records creation management, (ii) records retention development, (iii) vital records security, (iv) filing systems management, (v) records centres management, (vi) development of organising schemes, indexing, and knowledge of how and when to dispose of quality records.

5.0 TRAINING NEEDS

Among the skills that need to be acquired include, but not necessarily limited to the following:

- (1) The business of natural tropical forest management, including planning for sustainability;
- (2) Aspects on forest certification and chain-of-custody;
- (3) Environmental aspects and impacts of forest operations and RIL concept and practice;
- (4) Management of forest for NTFP and forest services;
- (5) Economic aspects of SFM in tropical rain forest,
- (6) Conservation and management of biodiversity.
- (7) Aspects of forest road engineering and RIL;
- (8) Directional felling;
- (9) Skills in operating logging machines/ tools,
- (10) Skill in forest inventory, basic survey, tree marking and tree & seedling identification,
- (11) Basic ecology and environmental impacts.
- (12) The application of biotechnology in nursery management and planting stock production.

Figure 4. Planning, implementation and monitoring of reduced-impact logging (RIL).



6.0 SOCIO-ECONOMICS

Besides the obvious services and environmental benefits of the natural forest, some of its produce are traditionally known to have high consumption and income values to certain segments of the communities living in its vicinity. While areas of DTC containing these resources may not be designated as HCVF, KPKKT is nonetheless, obliged to institute appropriate management prescriptions with the view to enhance the values of these resources and coordinate their utilisation. KPKKT continues to ensure that all its activities, particularly harvesting operations, do not severely damage, and thereby reducing the values of these resources. At the same time, KPKKT will attempt, to the extent possible, to implement the necessary measures to enhance the quantity and quality of these resources.

On the other hand, the local communities on their part, should shoulder some of the responsibilities to safeguard the resources from being over-exploited while trying to gain economic benefits and services from them. In this respect, KPKKT will continue with the initiative to create and instil awareness about the relevant laws and regulations which govern the collection, keeping and utilisation of these resources. This will be done in cooperation with the relevant authorities which, in turn have their respective areas of responsibility and jurisdictions.

There will be regular consultations between KPKKT, the relevant households and the authorities concerned (incl. TSFD) to discuss on issues related to the collection and use of forest produce. The non-timber forest products, medicinal plants and wildlife are very important for the future not only for the communities but also to the State and the society at large. Efforts in whatever forms, initiated and implemented by any parties will always be given the necessary support for the benefit of all.

7.0 SUMMARY OF ENVIRONMENTAL MANAGEMENT AND MITIGATION MEASURES UNDERTAKEN WITHIN DTC

Table 8. provides a summary of the mitigation measures undertaken within DTC..

Table 8. Summary of Management and Mitigation Measures in the Project Area

No.	Significant Aspect & Impacts	Mitigation Measures & Compliance
1	<u>Project Concept</u>	<ul style="list-style-type: none"> ➤ Selective Logging conducted in Logging Blocks (LBs) of 100- 150 ha. ➤ Tree felling and removal based on “RIL” and Directional Felling with the long term objective of achieving SFM.
2	<u>Project Design</u> <u>Soils</u> a) Erosion of soil surface b) Landslip c) Slope stability	<ul style="list-style-type: none"> ➤ Appropriate engineering practices by installing culverts, side ditches, cross drains, diversion ditches, sediment basins, rip rap, silt traps or other facilities. Minimisation of total length of roads and area of disturbance along with and proper maintenance. Forest roads and forest tracks follow the specifications laid out by the Forestry Department. ➤ All forest roads are closed when not in active use. ➤ Benching of slopes, diversion, dykes, retention of buffer strips, seeding of grass or cover vegetation. Minimisation of cutting and filling. ➤ Use and movement of heavy machinery are strictly controlled.
	2.2 <u>Hydrology and Water Quality Control and Supervision</u> a) Water yield, dry season flow and flood response Sediment load and turbidity b) Physical, chemical and	<ul style="list-style-type: none"> ➤ Conservation of catchment areas; density of roads and tracks are kept to a minimum ➤ Proper engineering practices by dumping loose material at designated area; adequate compaction of permanent roads and provision of culverts, cross-drains; silt traps; buffer zones; revegetate slopes with fast growing indigenous species and bamboo. ➤ Efforts made to ensure that the total suspended solid (TSS) in surface

	c)	biological qualities	<ul style="list-style-type: none"> ➤ water run-off from the project site is kept below 150 mg/l. ➤ Proper storage of gasoline or engine oil; proper waste disposal site. ➤ Prohibition to the use of poison. ➤ Control of the use of fire for open burning ➤ Appropriate and environmentally safe toilet facilities built for the forest workers at or near their kongsis. ➤ All sewage and kitchen sullage from the workers' kongsis are appropriately handled before being released to any water courses.
	2.3	<u>Drainage</u>	<ul style="list-style-type: none"> ➤ Utilisation of natural drainage patterns to reduce sedimentation; maintain riparian vegetation. Facilitation of water flow by clearing streams and culverts from rubbish, waste timbers and silt. ➤ All river crossings only constructed upon the approval from TSFD. ➤ All natural water courses, rivers and their tributaries are not used as silt trap or sediment trap. ➤ No activity whatsoever is conducted within river reserve and buffer strips
	2.4	<u>Groundwater</u>	
	a)	Recharge, quality and aquifer characteristics	<ul style="list-style-type: none"> ➤ Conservation and maintenance of catchment areas; minimum disturbance to aquifer.
	b)	Existing uses	<ul style="list-style-type: none"> ➤ Avoidance of spillage/ seepage of fuels, engine oil or other similar pollutants on soil. Proper disposal of unused fuels, engine oil, rubbish and sewage. Proper storage of fuel and engine oil. ➤ Disposal of Scheduled Wastes is undertaken in accordance with the Environmental Quality Regulations (Scheduled Wastes) 1989.
	2.5	<u>Atmospheric Quality Control</u>	
	a)	Climate	<ul style="list-style-type: none"> ➤ Logging operation conducted according to proper Forest Harvesting Plan and special care taken during rainy seasons. Usage of less polluting machines (bulldozers, excavators, trucks, 4-wheeled drives, chainsaws). These machines are regularly checked and maintained. ➤ Open burning is strictly controlled and supervised at all times
	b)	Air pollution	<ul style="list-style-type: none"> ➤ Mechanisms instituted to slow down the speed of running vehicles going downhill by building bunds etc. Surface grade of main roads improved. ➤ Similar to air pollution – noise tends to be localized and temporary in nature. Sources of noise come from chainsaws, heavy machines (bulldozers, excavators, trucks, generators, pumps, etc) particularly those old machines which are not only extremely noisy and producing a lot of smoke but also a safe hazard and dangerous to use. Continued exposures to noises such as old generators, bulldozers and excavators may seriously impair hearing ability of workers and disturb hibernating animals. ➤ Workers should wear safety gears such as ear plugs and machines and engines should not be allowed to run when not in use. New and well-serviced machines should be preferred whenever possible. ➤ No open burning was done on any combustible material or rubbish except those allowed under the Environmental Quality Order (Prescribed Activities) (Open Burning) 2000.
	c)	Noise	
	2.6	<u>Land Use</u>	<ul style="list-style-type: none"> ➤ All boundaries for forest compartment and the whole logging block were clearly marked to the specification of TSFD. ➤ Erosion control measures were implemented.
	2.7	<u>Habitats, Species and Population</u>	
	a)	Terrestrial/ Aquatic Habitat	<ul style="list-style-type: none"> ➤ A comprehensive survey was conducted with help from WWF-Malaysia and PERHILITAN to document the fauna in the forest area including those animal species which are thought be threatened, rare and endemic to the site.
	b)	Endangered, endemic or protected plant species	<ul style="list-style-type: none"> ➤ Proper sustainable forest management practice; protection of catchment areas; proper erosion control measures. ➤ Avoidance of logging in areas identified as containing high conservation value (HCV) species.
	c)	Birds	<ul style="list-style-type: none"> ➤ Avoidance of felling of nesting trees or felling of timber trees on nesting trees. Avoidance of felling fruiting trees whose fruits are useful to birds and other wildlife.
	d)	Mammals, reptiles and amphibians	<ul style="list-style-type: none"> ➤ Construction and logging activities are done in stages (start from fringes of forest) to allow animals to move and migrate to other safer, forested areas.
	e)	Fish and other aquatic life	<ul style="list-style-type: none"> ➤ Erosion control measures implemented; catchment areas preserved. Never use poison and explosive to catch fish.
		Fruit trees	

	f)		➤ Prohibition to workers from cutting down fruit trees and trees known to support animals and birdlife.
	2.8	<i>Human and Socio-Economic</i>	<ul style="list-style-type: none"> ➤ Proper erosion control measures; preservation of water catchment areas. Prohibition of use of poison. ➤ Enforcement of safety rules for all workers; safety of logging and transportation; maintenance of machines. ➤ Employment local residents as far as possible ➤ Avoidance from disturbing these areas; report findings to Museum Department or relevant agencies. ➤ Avoidance from operating near local kampung settlements. ➤ Prohibition to workers from hunting and poaching of wild animals as well as destroying nesting sites. ➤ Measures taken to prohibit/ limit access of public into forest area as this may only complicates safety arrangement: their own safety from falling trees and branches, running machines and passing vehicles; protection of the forest against fire, theft of forest produce, etc.
	a)	Domestic water supply	
	b)	Physical safety	
	c)	Employment	
	d)	Cultural/ Historical site	
	e)	Local communities	
	f)	Hunting and poaching	
	g)	Public access	
3	a)	Forest Protection	<ul style="list-style-type: none"> ➤ Protection against Pests and Diseases. ➤ Minimisation of use of chemicals but encouragement to use of biological means to control pests and diseases.

8.0 CONCLUDING REMARKS

8.1 Compliance

KPKKT's compliance with FSC's set of P & C during the period subsequent to certification in 2008 up till now, can be summarised as follows:

Principle 1: Compliance with Laws and FSC Principles (6 criteria)

- ✿ KPKKT has a track record of compliance and its business relationship with state and federal regulatory agencies appear to be in harmony.
- ✿ No incidence of illegal harvesting or poaching of wildlife so far.

Principle 2: Tenure and Land Use Rights and Responsibilities (3 criteria)

- ✿ KPKKT is a member of the Joint Consultative Committee (*Jawatankuasa Pembangunan and Tindakan Daerah*) at the district level to resolve any forestland ownership disputes, if any. There had never been any forestland dispute in KPKKT forest concession.
- ✿ Law establishes legal ownership and right to use the defined forest area.

Principle 3: Indigenous Peoples' Right (4 criteria)

- ✿ There is no indigenous community living inside the Project Area and no indigenous people working for KPKKT or any of KPKKT's contractors.
- ✿ However KPKKT is sensitive to the needs of these people and render appropriate assistance in the event they trespass through DTC area. Staff and Contractors of KPKKT have been accordingly regularly briefed to this effect.

Principle 4: Community Relations and Workers' Rights (5 criteria)

- ✿ KPKKT's presence in the district is well received, and the company has been considered in a favourable sense by the local community. Local residents are given priority for services and labour contract.
- ✿ KPKKT has contributed positively to the economy of the state and the district of Dungun.
- ✿ A joint committee between employer and employee exists and operating.
- ✿ KPKKT has been a good paymaster and employer as well as a responsible neighbour.

Principle 5: Benefits from the Forest (6 criteria)

- ☛ As a member of Golden Pharos Berhad (GPB), KPKKT is financially strong and contributes to add value to its timber through various downstream processing under GPB: sawmilling and solid door manufacturing, etc.
- ☛ Favourable rate of growth of second growth forest ensures sustainability of operation into second rotation under SMS.

Principle 6: Environmental Impact (10 criteria)

- ☛ A landscape-level EIA on the Forest Concession has been conducted and the relevant EIS had been prepared.
- ☛ No usage of fire or open burning in all of KPKKT's forestry operations.
- ☛ Management of reserved and protected areas is addressed in the FMP
- ☛ Guidelines on measures to mitigate negative impacts of forest operations are being followed in earnest.
- ☛ Disposal of chemicals, containers, waste oils, etc is being done properly.

Principle 7: Management Plan (4 criteria)

- ☛ KPKKT management consists of well qualified and experienced team of professionals.
- ☛ Resource management is conducted in accordance with SFM which balances up the different needs of economic, social and environment sustainability and protection.

Principle 8: Monitoring and Assessment (5 criteria)

- ☛ Collaborative research projects have taken place with FRIM, JPSM, UPM, etc.
- ☛ Research and monitoring plots have been established and remeasured at specified intervals.
- ☛ R & D capability is being expanded.
- ☛ Appropriate training and exposure provided to relevant staff.

Principle 9: Maintenance of High Conservation Value Forests (HCVFs) (4 criteria)

- ☛ HCVF area have been identified and surveyed the ground with assistance from WWF-Malaysia
- ☛ Appropriate plans of action for the management of HCVFs are in place.

8.2 Moving Forward

In what follows, some basic issues are presented for KPKKT to critically address as part of the enabling conditions and critical success factors for the future:

- ☼ KPKKT to continue to build up standing timber inventory to levels associated with optimal stocking, rather than being depleted over time.
- ☼ KPKKT to ensure financial stability of the organisation and anticipate the likelihood that financial exigencies may influence the stability of the timber harvesting regime and exceed the allocated AAC.
- ☼ KPKKT to embark into serious program to educate its staff at all levels as well as the contractors.
- ☼ KPKKT to continue to forge ahead and expand its capability in the fields of R & D and to continuous monitor of the forest conditions through in-house as well as collaborative research initiatives and to build up its own data bank for future planning and execution.
- ☼ KPKKT to make effort to move ahead and take pride in being a truly professional forest management company that subscribes to MC & I and FSC P & C both in spirit and action by adopting a more responsible image as a forest management firm which places due and balanced emphasis on all tangible and intangible aspects of SFM.

----- end of Public Summary -----
November 04th 2016