CONVENTION ON INTERNATIONAL TRADE IN ENDANGERED SPECIES
OF WILD FAUNA AND FLORA

Seventeenth meeting of the Plants Committee
Geneva (Switzerland), 15-19 April 2008

Non-detriment findings

Timber species and medicinal plants

SUMMARY REPORT ON THE NON-DETRIMENT FINDINGS FOR RAMIN (*GONYSTYLUS* SPP.) FOR MALAYSIA IN 2008

1. This attached document has been submitted by the Management Authority of Malaysia.

NON-DETRIMENTAL FINDINGS ON RAMIN
FOR MALAYSIA YEAR 2008

1. This NDF on ramin is prepared based on the CITES document Inf. 11.3 "CITES Scientific Authorities: Checklist To Assist In Making Non-Detrimental Findings For Appendix II Exports" [the full version of the NDF is available as an Inf. doc at PC17]. The NDF on ramin contained three parts namely Table 1 and Table 2 of the CITES document Inf. 11.3, Table 1B and Table 2B of the CITES document Inf. 11.3 and explanatory notes entitled 'Explanatory Notes: Non-Detrimental Findings For Malaysia Year 2007'. Table 1 and Table 2 is for all ramin species (*Gonystylus* species) [see Annex to this document]. The determination of the cautious harvest quota was based the current scientific information and stocking data, such as silvicultural characteristics, growth data, inventory data, forest acreage, forest type and stand density. Precautionary principles are also applied to ensure the harvest level is not detrimental to the survival of the species.

2. *Gonystylus* (Ramin) is one of three genera of plants in the Gonystyloidae sub-family of Thymelaeaceae family. At present, the genus *Gonystylus* consisting of about 30 species of tall trees and some shrubs, is distributed throughout the Malaysian area (Indonesia, Malaysia, the Philippines, Papua New Guinea, Singapore and Brunei Darussalam) with the majority of species found in Borneo (Soerianegara & Lemmens, 1994). They also reported there are twenty seven (27) species found in the Borneo island especially in Sarawak and only seven (7) species so far being reported occurring in Peninsular Malaysia. Cockburn (1976) described eight (8) ramin species that are found in Sabah. Ramin is found in peat swamp forest up to the hill areas. Whitmore (1973) and Yunus (2000) described the silvicultural characteristics and distribution of five (5) of the species as shown in **Table 1**. Browne (1955), Cockburn (1976) and Soerianegara & Lemmens (1994) described the silvicultural characteristics and distribution of thirteen (13) of the species as shown in **Table 2**.

Table 1: Silvicultural characteristics and distribution *of Gonystylus* spp. in Peninsular Malaysia.

Species	Silvicultural Characteristics (Average max. tree height and diameter size)	Distribution
Gonystylus affinis	Medium size tree up to 33m tall and bole up to 76cm diameter.	Dryland forest and undulating area.
G. brunnescens	Big size tree up to 36m tall and bole up to 95cm diameter.	Dryland forests and low lying area.
G. confuses	Medium to big size tree up to 30m tall and 70cm diameter.	Dryland forests and lowland area.
G. maingayi	Small to big size tree up to 40m tall and 76cm diameter.	Dryland forests and foothills of mountains up to 600m altitude.
G. bancanus	Medium size tree up to 27m tall and bole up to 67cm diameter. (Record shows that the tree could grow up to 45m tall and bole up to 80cm diameter).	Found in Peat swamp forest.

Source: Whitmore (1973), Wyatt-Smith (1979) and Yunus (2000)

Table 2: Silvicultural characteristics and distribution *of Gonystylus* spp. in Sabah and Sawarak.

Species	Silvicultural Characteristics (Average max. tree height and diameter size)	Distribution
Gonystylus affinis	Small to medium size tree up to 33m tall and bole up to 90cm diameter.	Plains, hillsides and ridges up to 330 m altitude.
G. brunnescens	Medium to big size tree up to 36 (-45) m tall and bole up to 95cm diameter.	Low-lying land and hill, up to 350 (-1500) m altitude.
G. consanguineus	Medium to big size tree up to 40m tall and bole up to 80cm diameter.	Lowland on loamy or clayey soil or even limestone rock, up to 400 m altitude.
G. maingayi	Medium to big size tree up to 40m tall and bole up to 76cm diameter.	Peat swamp forest and lowland, up to 150 (-200) m altitude.
G. bancanus	Medium to big size tree up to 40 (-45) m tall and bole up to 120cm diameter.	Lowland freshwater swamp or peat swamp forest. It occurs up to 100 m altitude.
G. forbesii	Medium to big size tree up to 40 m tall, up to 85 cm diameter.	Swamp and dryland, up to 400 m altitude.
G. keithii	Shrub or small to medium size tree up 26 m tall and bole up to 90cm diameter.	Mostly on sandy soils, up to 400 m altitude.
G. lucidulus	Medium to fairly big size tree up to 36m tall and bole up to 40cm diameter.	Low undulating hill, on yellow sandy soil, up to 300m altitude.
G. macrophyllus	Medium to big size tree up to 45m tall and bole up to 100cm diameter.	Low and medium altitude, ascending 1500 m.
G. velutinus	Medium to large size tree up to 35m tall and bole up to 70cm diameter.	Sandy soil and clayey swampy soil, very low altitude.
G. xytocarpus	Medium to big size tree up to 36 m tall and bole up to 75cm diameter.	Heath and lowland forest, up to 100 m altitude.
G. stenosepalus	Small size tree up to 15m tall.	Lowland and hill, up to 1350m altitude.
G. bornensis	Small to medium size tree.	Lowland and hill, up to 1350m altitude.

Source: Browne (1955), Cockburn (1976) and Soerianegara & Lemmens (1994)

3. Yunus (2000) had reported the growth rates for all tree species for dryland / inland forests as in **Table 3**. He also noted in general the diameter increment is higher for light heavy hardwood (LHW), followed by medium heavy hardwood (MHW) then heavy hardwood (HHW), and ramin is belongs to the LHW.

4. Although some of tropical rain forest trees in flower and fruit all the time, most species bear flower and fruit only periodically, and many of them annually. As a whole showed a single distinct and marked annual peak of flowering between March and July then fruiting from about July to October (Whitmore, 1984). Dipterocarps species in general fruit heavily every 2 – 3 years with occasional intervals of up to 5 years. *G. bancanus* is reported no difficulty to produce flowers and it fruits regularly. Four to five years were observed to be the interval for gregarious flowering and fruiting at the Pekan Peat Swamp Forest.

Table 3: General growth rates for all species for dryland forests.

Stem Size	Diameter Growth (cm/year)	Mortality (%/year)	Ingrowth (%/year)
Small pole (≥5-15cm diameter)	0.30	3.0	-
Big pole (≥15-30cm diameter)	0.42	3.6	2.1
Small tree (≥30-45cm diameter)	0.48	1.1	2.2
Big tree (≥45cm diameter)	0.53	1.9	2.6

Source: *Yunus (2000)*

Table 4: Distribution and extent of major forest types in Malaysia, 2005 (million hectares).

Region	Land area	Natural forest			Plantation forest	Total forested land	Percentage total of forested land
		Dry inland forest	Swamp forest	Mangrove forest			
Peninsular Malaysia	13.16	5.40	0.31	0.10	0.09	5.90	44.8
Sabah	7.37	3.83	0.12	0.34	0.11	4.40	59.7
Sarawak	12.30	7.92	1.12	0.14	0.06	9.24	75.1
Malaysia	**32.83**	**17.15**	**1.55**	**0.58**	**0.26**	**19.54**	**59.5**

5. Analysis of Ramin growth in logged over peat swamp forest had shown a mean annual diameter increment of 0.57cm dbh with a standard deviation of 0.36cm (Anon, 2004). The analysis also showed highest diameter increment of 0.79cm was observed for the 30 - 39cm diameter classes and 0.64cm for 20 - 29cm diameter classes. However, in larger diameter classes, annual diameter increment declined to 0.49cm and smaller diameter classes to 0.40cm. Sia (2004) noted mean annual diameter increment for ramin in mixed swamp forest of Sarawak is 29cm for trees ≥30 cm dbh, highest diameter increment in the 30-40 cm class (achieving a mean of 0.45 cm) but slowed down slightly to 0.34 cm in the next diameter class of 40-50 cm and the increment in the intermediate size class (10-20 cm) averages 0.16 cm. The seedling in the enrichment planting in Kalimantan, Indonesia was reported to have an average growth in height of 12.5cm/year and an expected mean annual diameter increment of 0.5 - 0.7cm among the young trees, attaining 1 cm under optimal conditions (Soerianegara & Lemmens, 1994). Seedling planted at Forest Research Institute Malaysia (FRIM) after ten years planting have an average annual height increment of 100 cm and 0.79 cm diameter increment per year (Shamsudin and Ismail, 1994).

6. Based on the final National Forest Inventory Four (NFI 4) result that was carried out by the Forestry Department Peninsular Malaysia (FDPM) between 2002 and 2004, there are estimated 5.76 million trees of *Ramin* [15cm diameter at breast height (dbh) or more] in Peninsular Malaysia, with an estimated volume of 5.49 million $m^{3,}$, refer to **Table 5**. Referring to **Table 5,** it can be seen that 70.2% of the total number of trees is between 15-30cm diameter sizes, 17.5% is 30 - 45cm diameter size and 12.3% is >45cm diameter size. The timber volume for the >45cm diameter size trees is 2,717,102 m^3 or 49.5% the timber volume for trees diameter size +15cm.

Table 5: Summary of *Gonystylus* species stocking in Peninsular Malaysia by forest classes.

Forest* Classes	Diameter Class 15-30 cm		Diameter Class 30-45 cm		Diameter Class > 45 cm		Total	
	Stem	Volume (M^3)	Stem	Volume (M^3)	Stem	Volume (M^3)	Stem	Volume (M^3)
1	12,837	9,024	121,678	90,567	26,517	161,205	161,032	260,796
2	773,629	339,883	163,242	166,285	15,499	85,460	952,370	591,628
3	320,314	130,019	58,971	54,708	13,436	26,526	392,721	211,253
4	0.0	0.0	101,823	135842	6032	57,911	104,855	193,753
5	789,552	269,804	77,280	72,431	108,876	348,347	975,708	690,582
6	284,527	124,279	24,461	32,607	17,923	65,162	326,910	222,048
7	211,029	111,994	284,893	330,692	369,520	1,515,645	865442	1,958,331
8	405,205	136,849	178,921	150,079	70,095	214,886	654,220	501,814
9	433,891	168,912	0.0	0.0	64,467	168,291	498,358	337,203
10	5,699	3,487	0.0	0.0	1,467	4,744	7,166	8,231
11	814,154	447,351	0.0	0.0	15,317	68,925	829,471	516,276
Total	**4,050,837**	**1,741,602**	**1,011,269**	**1,033,211**	**709,149**	**2,717,102**	**5,768,253**	**5,491,915**

* Deliberation on the Forest Classes is in Table 10 [of the full version of the NDF].

7. The Malaysia/UNDP/GEF project (2001-2006) in Pahang has shown that the Pekan Peat Swamp Forest in Pahnag Peninsular Malaysia, the volume of ramin trees 50 cm dbh and above is about 14 m3 per hectare which is equivalent to 3.5 trees per hectare. The estimated number of ramin trees according to diameter classes >15 cm dbh, >30 cm dbh and >45 cm dbh is in **Table 6**.

Table 6: Ramin density by diameter classes of Pekan Peat Swamp Forest, Pahang.

Diameter Classes	> 15 cm	> 30 cm	> 45 cm
No. of Trees / Ha	9.7	8.0	5.2

8. The Malaysia/DANCED project (1997-1999) conducted a pre-felling inventory study in the North Selangor Peat Swamp Forest and found that the number of ramin trees per hectare by diameter classes >15 cm dbh, >30 cm dbh and >45 cm dbh is in **Table 7**.

Table 7: Ramin density by diameter classes of North Selangor Peat Swamp Forest, Selangor.

Diameter Classes	> 15 cm	> 30 cm	> 45 cm
No. of Trees / Ha	9.3	5.4	2.9

9. Lee (2004) stated that the stocking of ramin in the old growth stand in the peat swamp forests of Sarawak could be gauged based on a series of inventories carried out in the past. Among studies that had been done on ramin stocking were reported by Wood and Johnson (1964), Wood (1971) and Chai (1989).

10. Sixty-four (64) yield plots were established in Sarawak between 1971 and 1987, each consisting of 100 x 10 x 10 m quadrats, have been established at a sampling intensity of 0.25 % in the logged and silviculturally treated mixed swamp foerest. Yield plots were designed to monitor forest recovery through providing information on recruitment, growth and mortality of ramin and predict timing of the next harvesting. Sia (2004) reported that the volume of ramin from the yield plots ranged from < 1m3 to 30 m3 ha-1 (**Table 8**).

11. Lee (2004) also described inventories that had been carried out by the Forest Department of Sarawak in a few peat swamp forest which had been logged for ramin ≥48cm diameter ten years after exploitation, with a view to assessing present stocking and regeneration. Two type of inventory were completed, namely forest inventory and diagnostic sampling. Forest inventory sampled the

upper limit growing stock while the diagnostic sampling sampled the growing stock of desirable species < 20 cm dbh. See **Table 9**.

12. Anon (2004b) noted that the *Gonystylus* spp. density for trees >15cm dbh in Peninsular Malaysia on average 1 - 3 stems per hectare in all forest types and also noted that for dryland forest the tree density is <1stem per hectare. Soerianegara & Lemmens (1994) noted in Sarawak the number of ramin trees over 20 cm in diameter is estimated at 2-20 trees/ha in mixed swamp forest and the standing stock of ramin may be as high as 35 m3/ha. Mixed swamp forest is the most extensive of the five peat swamp forest types in Sarawak (Lee and Chai, 1995).

Table 8: Ramin density, volume mean annual increment (VMAI) and volume content.

Site	VMAI (m3/ha/yr)	Stem/ha	Volume (m3/ha)
Pulau Bruit PF		21	28.4
Naman FR	1.15	24	27.1
Simunjan FR		16	30.1
Triso PF		2	5.8
Sebuyau PF	0.42	14	27.0
Saribas FR		3	6.4
Daro FR	0.05	6	8.2
Tatau PF		19	5.5
Batang Lassa PF(YPs 30-36)		4	1.7
Loba Kabang PF	0.03	2	2.7
Bawan FR (YPs 43-48)	0.86	8	6.6
Bawan FR (YPs 65-72)	0.11	4	3.8
Batang Lassa PF(YPs 73-79)	0.04	7	2.9
Retus PF	0.01	1	0.9

Source: Sia (2004)

Table 9: Tree density and volume of ramin in forest logged ten years previously.

Site	Stem ha-¹	Volume[m³ ha -¹]
Daro Forest Reserve	4.2	2.27
Loba Karang (North) Protected Forests	3.4	2.63
Loba Karang (South) Protected Forests	6.5	4.58

13. The production of ramin round log has fluctuated around 30,000 m^3 for the last few years. It should be noted while ramin log can be obtained from the inland forests the production of the ramin log per unit area in the peat swamp forest is much higher. In year 2005, ramin log production was about 32546 m^3 and **Table 10** shows the ramin log production by year.

Table 10: Ramin log production by year (m^3).

Year	Peninsular Malaysia	Sarawak	Total
2000	70,337	67,042	137379
2001	45,076	57,334	102410
2002	51,033	32,045	83078
2003	49,499	25,095	74594
2004	29,203	21,372	50575
2005	23,892	8,654	32546
2006	15933	4964*	20897*

* January – November 2006

Cautious harvest quota determination

14. The approach applied to determine the cautious harvest quota of *Ramin* is based on volume, tree size, area, and species group control. The tree silviculture parameters taken into account in the approach, *inter alia* tree growth rate, species distribution and population, and forest recovery capacity.

15. In order to ensure a conservative cautious harvest quota for Ramin, precautionary principle has also been applied by taking into the calculation the following parameters, among others:

    a) The trees of the Protection Forests are excluded in the calculation as the function of the forests is for conservation.

    b) General tree growth rate used in SMS for natural forest, that is 0.8 – 1cm per year. However, for the determination of the harvest quota, the tree diameter growth rate used is 0.3 – 0.6cm per year.

    c) The forest harvesting rotation used for dryland and peat swamp forest in Peninsular Malaysia are 30 – 55 years and 40 – 60 years respectively. In the case of Ramin production, the rotation period used in determining the harvest quota is 50 years. In Sarawak, the rotation period practice for peat swamp forest is 45 years and the lowest cutting limit for Ramin is not less than 40 cm diameter.

    d) Using a lower growth rates and long rotation period in the growth projection, it will not only lower the harvest quota but would further ensure that the crop trees for the next harvest will grow to the targeted size of >45cm diameter and it is likely to be >50cm diameter. It is projected that the next harvest crop will be 60cm diameter and above.

    e) In accordance to SMS practiced in Peninsular Malaysia, trees allowed to be harvested are not less than 45cm diameter and in Sarawak is not less than 40cm diameter. These minimum allowable cut are higher or at least equal to the allowable cut recommended by SGS Qualifier Programme for PT Diamond Raya Timber Indonesia (Anon, 2000 and Anon, 2003).

    f) Most of the forested areas (dryland forests) in Sarawak and all forested areas in Sabah were not taken into calculation to determine the cautious harvest quota for Malaysia.

16. The calculation method used to calculate the cautious harvest quota for Peninsular Malaysia for *Gonystylus* species are as follows:

    a) The timber volume of ramin (dryland and peat swamp forest) is approximately **2,648,177m^3**. [Exclude trees from the Protection Forests areas (**Table 5**)]

    b) The harvesting rotation period used is 50 years. [Refer to **paragraph 16 (c)** above]

    c) Annual production of round log = (2,648,177 ÷ 50) = **52,963m^3** per year

    d) Estimated sawn timber production based on 70% recovery = (52,963 x 0.70) = **37,074** m^3. For 2008, the cautious harvest quota for Ramin (*Gonystylus* species) for Peninsular Malaysia is proposed as for year 2007, which **43,000m^3**.

17. The calculation method used to calculate the cautious harvest quota for *G. banccanus* (peat swamp forest species) for Sarawak is as follows:

    a) Production peat swamp forest area is approximately = 880,000 – 53880 = **826,120 hectares**. [Peat swamp forest is about 880,000 hectares and out of it 53,880 hectares is National Park. (Refer to **Table 4**)].

    b) Harvesting rotation practice in Sarawak is 45 years (Cutting limit is ≥40 cm diameter).

    c) Annual harvesting coupe = 826,120 / 45 = **18,358.2 hectares** (Assuming that the current extent of peat swamp forest will remain stable for the next five years).

d) From **Table 8**, it is calculated that the average mean annual volume increment is 0.33 m³/ha.

e) Annual production of round log = (18,358.2 * 0.33) = **6,058**m^3 per year.

f) Estimated sawn timber production based on 70% recovery = (6,058.2 x 0.70) = **4240**m^3. Therefore, the proposed 2008 cautious harvest quota for *G. banccanus* for Sarawak peat swamp forest is **6000m³**.

18. Ramin (*Gonystylus* species) cautious harvest quota for year 2008 for Malaysia is proposed as for year 2007, **50,000 m³**. This quota has taken into account the derived quotas of paragraph 17 and 18 above. Also taken into account significant acreage of forested areas were not taken into account in calculating the cautious harvest quota for the country. Based on 70% recovery rate it is estimated the sawn timber production is **35,000 m³**.

19. Without applying the precautionary approach, the harvest quota for Malaysia can be more than 50% perhaps up to 100% because the proposed quota (**50,000 m³** for all *Gonystylus* species) is mostly based on the Peninsular Malaysia forested areas. **Table 5** showed that the forested areas in Sabah and Sarawak make up about 70% of Malaysia's forested land and with the remaining 30% in Peninsular Malaysia. In addition, Sabah and Sarawak have more ramin species compared to Peninsular Malaysia, refer **Table 1** and **Table 2**. On this basis, ramin production capacity in Sarawak and Sabah is much higher but due to no stocking data available a precautionary approach is applied with a lower harvest quota.

Table 1 – Plants. Summary of harvest regime for plant species

Species: Gonystylus species Country (if applicable State or Province): Malaysia
Date (of making Non-detriment Finding): December 2008 Period to be covered by finding: 1 year
Name: _____ Position in Scientific Authority: _____
Is the species endemic, found in a few countries only, or widespread? Malesia area (Malaysia, Indonesia, The Philippines, Papua New Guinea and Brunei)
Conservation status of the species (if known): IUCN Global status: _____ National status: _____ Other: _____

Type of) harvest	Main product	Degree of control	Demographic segment of population harvested			Relative level of off-take (include number or quantity if known)				Reason for off-take and percentage (if known)			Commercial destination and percentage (if known)		
			Immature	Mature	Sex	Low <30	Medium 30-50%	High >50%	Unknown	Sub sistence	Com mercial	Others	Local	National	Inter national
1.1 Artificial propagation		a) Regulated													
		b) Illegal or unmanaged													
1.2 Non-lethal harvesting of fruits/flowers/ seeds/leaves		a) Regulated													
		b) Illegal or unmanaged													
1.3 Non-lethal harvesting of bark/roots/ wood		a) Regulated													
		b) Illegal or unmanaged													
1.4 Removal of whole plant		a) Regulated													
		b) Illegal or unmanaged													
1.5 Removal of whole		a) Regulated													
		b) Illegal or unmanaged													
1.6 Killing of individual by removal of seeds, leaves, bark, roots, wood	WOOD	a) Regulated		X		X					X			X	X
		b) Illegal or unmanaged													

Table 2: Factors affecting management of the harvesting regime

Biological characteristics: Animals only		
2.1. Life history: What is the species' life history?	High reproductive rate, long-lived	
	High reproductive rate, short-lived	
	Low reproductive rate, long-lived	
	Low reproductive rate, short-lived	
	Uncertain	
2.2. Ecological adaptability: To what extent Is the species adaptable (habitat, diet, environmental tolerance etc)?	Extreme generalist	
	Generalist	
	Specialist	
	Extreme specialist	
	Uncertain	
2.3 Dispersal efficiency: How efficient is the species' dispersal mechanism at key life stages?	Very Good	
	Good	
	Medium	
	Poor	
	Uncertain	
2.4. Interaction with humans: Is the species tolerant to human activity other than harvest?	No interaction	
	Pest /Commensal	
	Tolerant	
	Sensitive	
	Uncertain	
Biological characteristics: Plants only		
2.1. Life form: What is the life form of the species?	Annual	
	Biennial	
	Perennials (herbs)	
	Shrub and small trees (max. 12 m.)	
	Trees	**X**
2.2. Regeneration potential: What is the regenerative potential of the species concerned?	Fast vegetatively	
	Slow vegetatively	
	Fast from seeds	
	Slow or irregular from seeds or pores	**X**
	Uncertain	
2.3. Dispersal efficiency: How efficient is the species' dispersal mechanism?	Very Good	
	Good	
	Medium	**X**
	Poor	
	Uncertain	
2.4. Habitat: What is the habitat preference of the species?	Disturbed open	
	Undisturbed open	
	Pioneer	
	Disturbed forest	**X**
	Climax	

National status: Animals and plants		
2.5. National distribution: How is the species distributed nationally?	Widespread, contiguous in country	
	Widespread, fragmented in country	**X**
	Restricted and fragmented	
	Localised	
	Uncertain	
2.6. National abundance: What is the abundance nationally?	Very abundant	
	Common (where it occurs)	**X**
	Uncommon	
	Rare	
	Uncertain	
2.7. National population trend: What is the recent national population trend?	Increasing	
	Stable	
	Reduced, but stable	**X**
	Reduced and still decreasing	
	Uncertain	
2.8. Quality of information: What type of information is available to describe abundance and trend in the national population?	Quantitative data, recent	**X**
	Good local knowledge	
	Quantitative data, outdated	
	Anecdotal information	
	None	
2.9 Major threats: What major threat is the species facing (underline following: overuse/ habitat loss and alteration/ invasive species/ other: and how severe is it?	None	
	Limited/Reversible/Irreversible	**X**
	Substantial	
	Severe/Irreversible	
	Uncertain	
Harvest management: Animals and plants		
2.10. Illegal off-take or trade: How significant is the national problem of illegal or unmanaged off-take or trade?	None	
	Small	**X**
	Medium	
	Large	
	Uncertain	
2.11. Management history: What is the history of harvest?	Managed harvest: ongoing with adaptive framework	**X**
	Managed harvest: ongoing but informal	
	Managed harvest: new	
	Unmanaged harvest: ongoing or ew	
	Uncertain	
2.12. Management plan or equivalent: Is there a management plan related to the harvest of the species?	Approved and co-ordinated local and national management plans	**X**
	Approved national/state/provincial management plan(s)	**X**
	Approved local management plan	**x**
	No approved plan: informal unplanned management	
	Uncertain	

2.13. Aim of harvest regime in management planning: What is harvest aiming to achieve?	Generate conservation benefit	
	Population management/control	**X**
	Maximise economic yield	**X**
	Opportunistic, unselective harvest, or none	
	Uncertain	
2.14 Quotas: Is the harvest based on a system of quotas?	Ongoing national quota:	**X**
	based on biologically derived local quotas	**X**
	Ongoing quotas: "cautious" national or local	
	Untried quota: recent and based on biologically derived local quotas	
	Market-driven quota(s), arbitrary quota(s), or no quotas	
	Uncertain	
Control of harvest: Animals and plants		
2.15. Harvesting in Protected Areas: What percentage of the legal national harvest, occurs in State-controlled Protected areas?	High	
	Medium	
	Low	
	None	**X**
	Uncertain	
2.16. Harvesting in areas with strong resource tenure or ownership: What percentage of the legal national harvest occurs outside Protected Areas, in areas with strong local control over resource use?	High	**X**
	Medium	
	Low	
	None	
	Uncertain	
2.17. Harvesting in areas with open None **access:** What percentage of the legal national harvest occurs in areas where there is no strong local control, giving *de facto* or actual open access? drw15	None	**X**
	Low	
	Medium	
	High	
	Uncertain	
2.18. Confidence in harvest management: Do budgetary and other factors allow effective implementation of management plan(s) and harvest controls?	High confidence	**X**
	Medium confidence	
	Low confidence	
	No confidence	
	Uncertain	
Monitoring of harvest: Animals and plants		
2.19. Methods used to monitor the harvest: What is the principal method used to monitor the effects of the harvest?	Direct population estimates	**X**
	Quantitative indices	
	Qualitative indices	
	National monitoring of exports	
	No monitoring or uncertain	
2.20. Confidence in harvest monitoring: Do budgetary and other factors allow effective harvest monitoring?	High confidence	**X**
	Medium confidence	
	Low confidence	
	No confidence	
	Uncertain	

Incentives and benefits from harvesting: Animals and plants		
2.21. Utilisation compared to other threats: What is the effect of the harvest when taken together with the major threat that has been identified for this species?	Beneficial	
	Neutral	
	Harmful	
	Highly negative	**X**
	Uncertain	
2.22. Incentives for species conservation: At the national level, how much conservation benefit to this species accrues from harvesting?	High	
	Medium	
	Low	**X**
	None	
	Uncertain	
2.23. Incentives for habitat conservation: At the national level, how much habitat conservation benefit is derived from harvesting?	High	**X**
	Medium	
	Low	
	None	
	Uncertain	
Protection from harvest: Animals and plants		
2.24. Proportion strictly protected: What percentage of the species' natural range or population is legally excluded from harvest?	>15%	**X**
	5-15%	
	<5%	
	None	
	Uncertain	
2.25. Effectiveness of strict protection measures: Do budgetary and other factors give confidence in the effectiveness of measures taken to afford strict protection?	High confidence	**X**
	Medium confidence	
	Low confidence	
	No confidence	
	Uncertain	
2.26. Regulation of harvest effort: How effective are any restrictions on harvesting (such as age or size, season or equipment) for preventing overuse)?	Very effective	**X**
	Effective	
	Ineffective	
	None	
	Uncertain	