Executive summary of the status of the bullet tuna resource

(As adopted by the IOTC Scientific Committee 10 November 2006)

Marked changes are factual changes, mainly related to the inclusion of the latest fisheries statistics are shown for the consideration of the SC in Nov07
Note also, the Working Party on Neritic Tunas is due to meeting 26 Nov07 and further changes may be recommended

BIOLOGY

Bullet tuna (*Auxis rochei*) is an oceanic species found in the equatorial areas of the major oceans. It is a highly migratory species with a strong schooling behaviour. Adults are principally caught in coastal waters and around islands that have oceanic salinities.

Adults can grow to 50 cm fork length. Bullet tuna mature at around two years old — about 35 cm (FL). It is a multiple spawner with fecundity ranging between 31,000 and 103,000 eggs per spawning (according to the size of the fish). Larval studies indicate that bullet tuna spawn throughout its range.

Bullet tuna feed on small fishes, particularly anchovies, crustaceans (commonly crab and stomatopod larvae) and squid. Cannibalism is common. Because of their high abundance, bullet tuna are considered to be an important prey for a range of species, especially the commercial tunas.

No information is available on the stock structure of bullet tuna in Indian Ocean.

FISHERIES

Bullet tuna is caught mainly by gillnet and line across the broader Indian Ocean area (Figure 1). This species is also an important catch for artisanal purse seiners. The catch estimates for bullet tuna were derived from very small amounts of information and are therefore highly uncertain[1] (Figure 2). The catches provided in Table 1 are based on the information available at the Secretariat and the following observations on the catches cannot currently be verified. Estimated catches of bullet tuna reached around 1,000 t in the early 1990's and peaked at 2,700 t in 2005. The average annual catch estimated for the period 2002 to 2006 is 2,200 t. In recent years, the countries attributed with the highest catches of bullet tuna are India, Indonesia and Sri Lanka (Table 1, Figure 3).

The fisheries in the Indian Ocean mainly catch bullet tuna ranging between 15 and 25 cm.

AVAILABILITY OF INFORMATION FOR STOCK ASSESSMENT

There is no information on the stock structure of bullet tuna in the Indian Ocean.

There is some age and the growth information available for bullet tuna in the Indian Ocean.

Possible fishery indicators:

1. **Trends in catches**: The catch estimates for bullet tuna are highly uncertain. Catches fluctuate from year to year but have been steadily increasing since the early 1980's.
2. **Nominal CPUE Trends:** data not available to the Secretariat.
3. **Average weight in the catch by fisheries:** data not available to the Secretariat.
4. **Number of squares fished:** data not available to the Secretariat.

STOCK ASSESSMENT

While some localised, sub-regional assessments may have been undertaken, no quantitative stock assessment has been undertaken by the IOTC Working Party on Neritics.

[1] The uncertainty in the catch estimates has been assessed by the Secretariat and is based on the amount of processing required to account for the presence of conflicting catch reports, the level of aggregation of the catches by species and or gear, and the occurrence of unreporting fisheries for which catches had to be estimated.

MANAGEMENT ADVICE

No quantitative stock assessment is currently available for bullet tuna in the Indian Ocean, therefore the stock status is uncertain.

The SC notes the catches of bullet tuna are typically variable but relatively low compared to the other neritic species. The reasons for this are not clear: it may be problem related to reporting, or it may be a normal fluctuation in the fishery. Bullet tuna is a relatively productive species with high fecundity and rapid growth and this makes it relatively resilient and less prone to overfishing. Nevertheless, bullet tuna appears to be an important prey species for other pelagic species including the commercial tunas, therefore it should be reviewed at the first meeting of the IOTC Working Party on NeriticTunas.

BULLET TUNA SUMMARY

Maximum Sustainable Yield:	-
Preliminary catch in 2006 *(data as of October 2007)*	3,500 t
Catch in 2005	2,700 t
Mean catch over the last 5 years (2002-06)	2,200 t
Current Replacement Yield:	-
Relative Biomass ($B_{current}/B_{MSY}$):	-
Relative Fishing Mortality ($F_{current}/F_{MSY}$):	-

Table 1. *Best scientific estimates of the catches of bullet tuna (as adopted by the IOTC Scientific Committee) by gear and main fleets for the period 1957-2006 (in thousands of tonnes).*
Data as of October 2007

Gear	Fleet	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83
Gillnet	India	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1
Gillnet	Indonesia															0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Gillnet	Other Fleets	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Gillnet	Total	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.1	0.1	0.0	0.1	0.1	0.1	0.1	0.1
Line	India	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.1	0.0	0.1	0.1	0.1	0.1	0.1	0.1
Line	Other Fleets	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Line	Total	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Other gears	India	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Other gears	Other Fleets							0.0	0.0	0.0					0.0		0.0		0.0	0.0								
Other gears	Total	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
All	Total	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.1	0.1	0.2	0.1	0.1	0.2	0.2	0.1	0.2	0.2

Gear	Fleet	Av02/06	Av57/06	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	00	01	02	03	04	05	06
Gillnet	India	0.4	0.1	0.0	0.1	0.2	0.1	0.1	0.2	0.2	0.1	0.2	0.1	0.2	0.1	0.3	0.2	0.2	0.2	0.2	0.3	0.3	0.4		1.1	0.4
Gillnet	Sri Lanka	0.3	0.2			0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.5	0.5	0.8	1.2	1.1	0.3	1.5	0.4	0.4	0.3	0.3	0.2	0.4
Gillnet	Indonesia	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Gillnet	Other Fleets	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Gillnet	Total	0.9	0.3	0.0	0.1	0.2	0.1	0.2	0.2	0.2	0.3	0.3	0.3	0.8	0.7	1.2	1.5	1.5	0.7	1.9	0.8	0.8	0.8	0.4	1.4	1.0
Line	India	1.0	0.2	0.1	0.1	0.4	0.2	0.3	0.3	0.3	0.3	0.4	0.2	0.5	0.3	0.5	0.4	0.5	0.4	0.5	0.5	0.5	0.8	0.5	1.2	1.7
Line	Other Fleets	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Line	Total	1.0	0.2	0.1	0.1	0.4	0.2	0.3	0.3	0.3	0.3	0.4	0.3	0.5	0.3	0.5	0.5	0.5	0.4	0.5	0.5	0.5	0.8	0.5	1.2	1.7
Other gears	India	0.2	0.1	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.1	0.1	0.1	0.1	0.2	0.2	0.3	0.2	0.1	0.3
Other gears	Sri Lanka	0.1	0.0																							0.4
Other gears	Total	0.3	0.1	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.1	0.1	0.1	0.1	0.2	0.2	0.3	0.2	0.1	0.8
All	Total	2.2	0.6	0.2	0.3	0.7	0.4	0.5	0.7	0.6	0.7	0.9	0.6	1.4	1.1	1.8	2.1	2.1	1.2	2.5	1.4	1.6	1.9	1.1	2.7	3.5

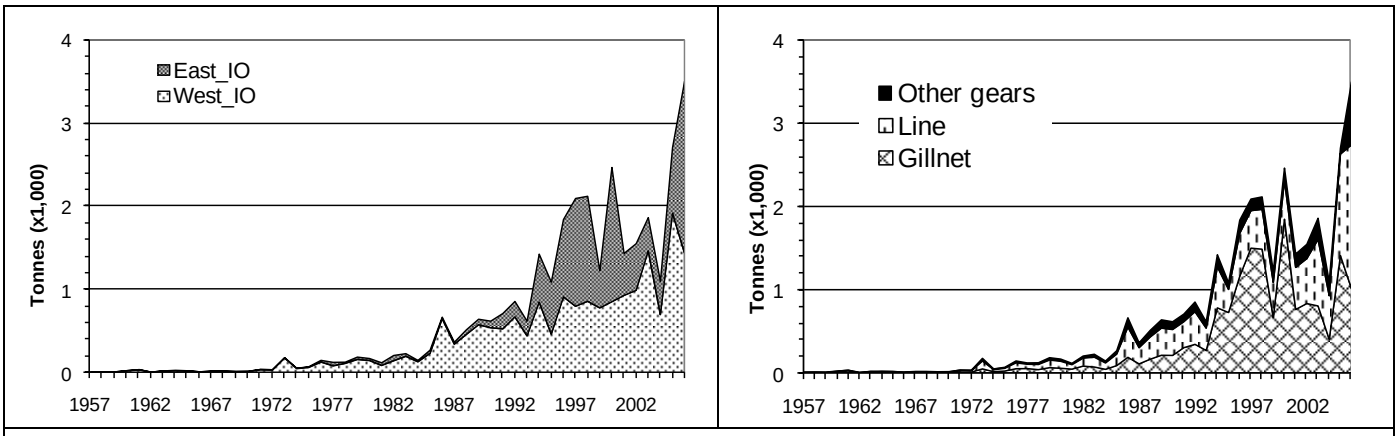


***Figure 1**. Bullet tuna: annual catches from 1957 to 2006 by area (left) and gear (right).* *Data as per October 2007*

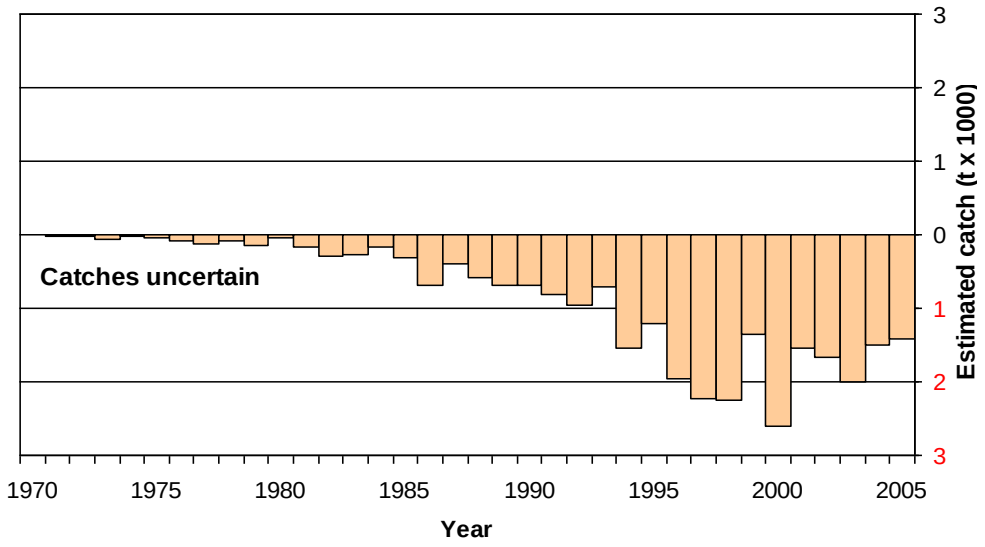


***Figure 2**. Bullet tuna: uncertainty of annual catch estimates. The amount of the catch below the zero-line has been categorised as uncertain according to the criteria given in the text.* *Data as of October 2006 – yet to be updated*

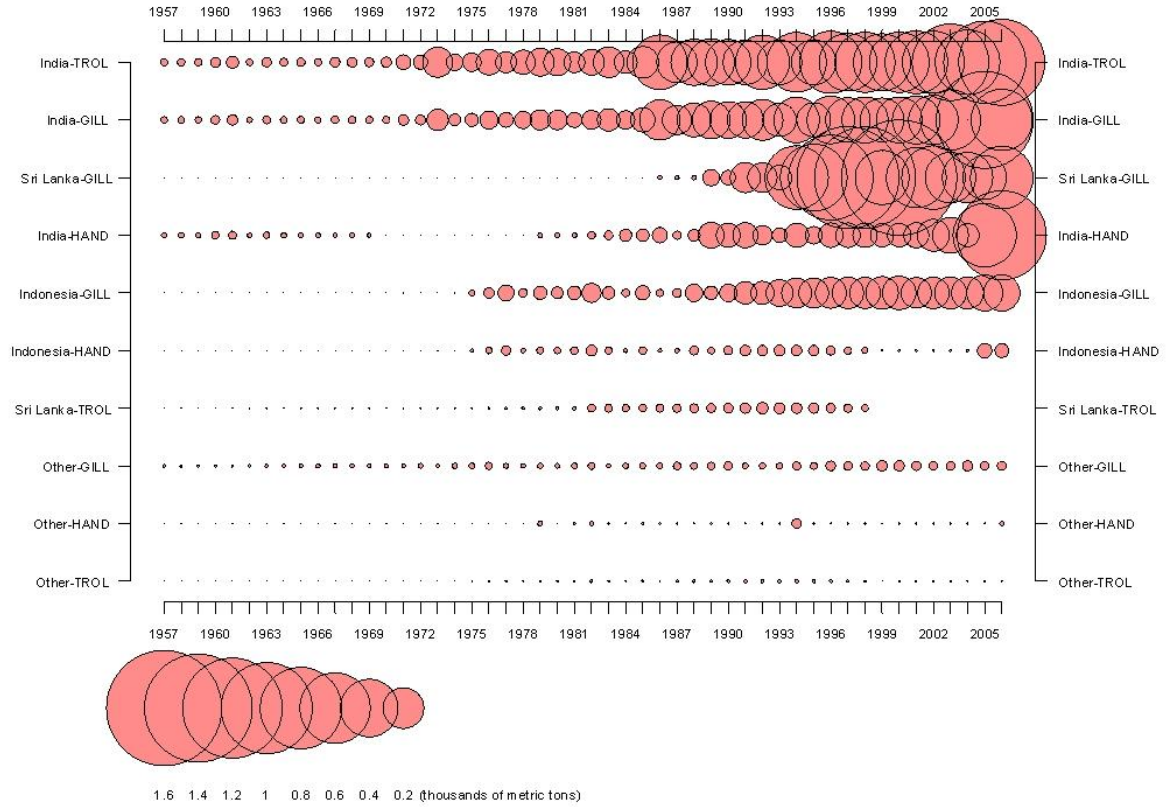


Figure 3. *Bullet tuna: catches by gear and main fleets for the period 1957-2006 (in thousands of tonnes).* *Data as of October 2007*

Executive summary of the status of the frigate tuna resource

(As adopted by the IOTC Scientific Committee 10 November 2006)

Marked changes are factual changes, mainly related to the inclusion of the latest fisheries statistics are shown for the consideration of the SC in Nov07
Note also, the Working Party on Neritic Tunas is due to meetin 26 Nov07 and further changes may be recommended

BIOLOGY

Frigate tuna (*Auxis thazard*) is a highly migratory species found in both coastal and oceanic waters. It is highly gregarious and often schools with other Scombrids.

In other oceans, frigate tuna grows to around 65 cm fork length but the largest size reported for the Indian Ocean is 58 cm (off Sri Lanka).

Size at first maturity is between 29 cm and 35 cm fork length depending on location. In the southern Indian Ocean, the spawning season extends from August to April whereas north of the equator it is from January to April. Fecundity ranges between 200,000 and 1.06 million eggs per spawning (depending on size).

Frigate tuna feeds on small fish, squids and planktonic crustaceans (e.g. decapods and stomatopods). Because of their high abundance, frigate tuna are considered to be an important prey for a range of species, especially the commercial tunas.

No information is available on the stock structure of frigate tuna in Indian Ocean.

FISHERIES

Frigate tuna is taken from across the Indian Ocean area using gillnets, bait boats and lines (Figure 1). This species is also an important catch for Industrial purse seiners. The catch estimates for frigate tuna were derived from very small amounts of information and are therefore highly uncertain[2] (Figure 2). The catches provided in Table 1 are based on the information available at the Secretariat and the following observations on the catches cannot currently be verified. Estimated catches have increased steadily since the late 1970's, reaching around 10,000 t in the early 1980's and over 30,000 t by the mid-1990's. The average annual catch estimated for the period 2002 to 2006 is 32,100 t. In recent years, the countries attributed with the highest catches are India , Indonesia , Maldives and Iran and Sri Lanka (Table 1, Figure 3).

The size frigate tuna taken by the Indian Ocean fisheries typically ranges between 25 and 40 cm depending on the type of gear used, season and location.

AVAILABILITY OF INFORMATION FOR STOCK ASSESSMENT

There is no information on the stock structure of frigate tuna in the Indian Ocean.

Age and growth, fecundity estimates and size at first maturity information is available for frigate tuna in the Indian Ocean.

Possible fishery indicators:

1. **Trends in catches**: The catch estimates for frigate tuna are highly uncertain. Catches fluctuate from year to year but have been steadily increasing since the mid 1950's.
2. **Nominal CPUE Trends:** data not available to the Secretariat.
3. **Average weight in the catch by fisheries:** data not available to the Secretariat.
4. **Number of squares fished:** data not available to the Secretariat.

[2] The uncertainty in the catch estimates has been assessed by the Secretariat and is based on the amount of processing required to account for the presence of conflicting catch reports, the level of aggregation of the catches by species and or gear, and the occurrence of unreporting fisheries for which catches had to be estimated.

STOCK ASSESSMENT

While some localised, sub-regional assessments have been undertaken by national scientists, no quantitative stock assessment has been undertaken by the IOTC Working Party on Neritics.

MANAGEMENT ADVICE

No quantitative stock assessment is currently available for the frigate tuna in the Indian Ocean, therefore the stock status is uncertain. This species is a relatively productive species with high fecundity and rapid growth and this makes it relatively resilient and not prone to overfishing. Nevertheless, frigate tuna appears to be an important prey species for other pelagic species including the commercial tunas, therefore it should be reviewed at the first meeting of the IOTC Working Party on Neritic Tunas.

FRIGATE TUNA SUMMARY

Maximum Sustainable Yield:	-
Preliminary catch in 2006 *(data as of October 2007)*	37,000 t
Catch in 2005	25,800 t
Mean catch over the last 5 years (2002-06)	32,100 t
Current Replacement Yield:	-
Relative Biomass ($B_{current}/B_{MSY}$):	-
Relative Fishing Mortality ($F_{current}/F_{MSY}$):	-

Table 1. *Best scientific estimates of the catches of frigate tuna (as adopted by the IOTC Scientific Committee) by gear and main fleets for the period 1957-2006 (in thousands of tonnes).*
(Data as of October 2007)

Gear	Fleet	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83
Baitboat	Maldives	0.9	0.9	0.9	0.9	1.4	1.4	1.4	1.4	2.3	2.8	2.8	2.8	2.8	1.7	1.7	1.8	3.9	3.5	2.3	1.5	1.8	0.9	0.9	0.8	0.8	1.2	2.0
Baitboat	Other Fleets														0.0		0.0		0.0	0.0							0.1	0.1
Baitboat	Total	0.9	0.9	0.9	0.9	1.4	1.4	1.4	1.4	2.3	2.8	2.8	2.8	2.8	1.7	1.7	1.8	3.9	3.5	2.4	1.5	1.8	0.9	0.9	0.8	0.8	1.2	2.0
Gillnet	Indonesia															0.0	0.0	0.0	0.0	0.3	1.0	2.2	0.6	1.5	1.2	1.6	3.1	1.3
Gillnet	India	0.2	0.2	0.2	0.3	0.5	0.1	0.3	0.4	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.3	1.6	0.4	0.6	0.9	0.6	0.9	1.2	1.1	0.7	1.1	1.5
Gillnet	United Arab Emirates																		0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	1.0	0.4
Gillnet	Oman	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.1
Gillnet	Other Fleets	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.1	0.1	0.1	0.1	0.2	0.1	0.1	0.1	0.1	0.3	0.2	0.1
Gillnet	Total	0.2	0.2	0.2	0.4	0.5	0.2	0.3	0.4	0.3	0.3	0.3	0.3	0.3	0.2	0.4	0.4	1.7	0.8	1.3	2.4	3.2	2.0	3.1	2.7	2.8	5.5	3.4
Line	India	0.1	0.1	0.1	0.2	0.3	0.1	0.2	0.3	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.9	0.2	0.3	0.5	0.3	0.5	0.6	0.6	0.3	0.5	0.8
Line	Indonesia															0.0	0.0	0.0	0.0	0.0	0.1	0.3	0.1	0.2	0.2	0.2	0.5	0.2
Line	Maldives	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.1	0.2	0.2	0.2	0.1	0.2
Line	Sri Lanka	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.2	0.7	0.7
Line	Other Fleets																							0.0		0.0	0.0	0.1
Line	Total	0.2	0.2	0.2	0.3	0.4	0.2	0.3	0.4	0.4	0.4	0.4	0.4	0.4	0.2	0.3	0.3	1.0	0.4	0.5	0.8	0.9	0.8	1.1	1.1	0.9	1.8	1.9
Other gears	Thailand														0.2	0.5	0.4	0.7	0.5	1.2	0.8	0.7	0.9	0.1	0.0	0.1	1.3	0.5
Other gears	India	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2
Other gears	Other Fleets							0.0	0.1	0.0					0.2	0.1	0.1	0.1	0.1	0.2	0.1	0.1	0.2	0.1	0.3	0.1	0.1	0.2
Other gears	Total	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.0	0.0	0.0	0.0	0.4	0.6	0.6	0.9	0.7	1.4	1.0	0.8	1.2	0.4	0.5	0.3	1.5	0.9
All	Total	1.4	1.4	1.4	1.6	2.4	1.8	2.1	2.3	3.0	3.4	3.5	3.4	3.4	2.5	3.0	3.2	7.5	5.3	5.5	5.7	6.7	4.8	5.4	5.1	4.8	10.1	8.2

Gear	Fleet	Av02/06	Av57/06	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	00	01	02	03	04	05	06
Baitboat	Other Fleets		0.0	0.0	0.1	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1													
Baitboat	Total	3.8	2.4	1.8	1.3	0.9	1.0	1.5	2.0	3.1	2.4	3.2	5.1	3.8	3.7	6.1	2.3	3.8	3.1	3.7	3.7	3.9	4.1	3.3	4.6	3.2
Gillnet	Indonesia	9.5	3.0	0.5	1.7	0.4	0.7	2.6	1.5	2.6	4.3	4.5	6.0	7.5	7.4	8.0	8.4	8.1	9.0	9.5	7.8	8.4	8.6	8.6	11.0	11.1
Gillnet	India	7.4	2.6	1.0	1.7	4.8	2.5	3.4	4.2	4.0	3.9	4.9	3.3	6.1	3.4	6.6	5.8	6.3	5.7	6.2	6.8	7.2	10.1	8.0	2.7	9.1
Gillnet	Sri Lanka	1.5	0.6			0.0	0.0	0.0	0.3	0.3	0.2	0.4	1.2	1.7	1.7	2.7	3.9	3.8	1.8	1.4	1.5	1.7	1.9	1.9	1.4	0.6
Gillnet	Iran, Islamic Republic	1.5	0.4			0.3	0.4	0.3	0.2	0.1	0.5	0.3	0.4	0.2	4.4	0.7	0.6	0.5	0.6	0.8	0.6	0.6	1.1	1.5	1.6	2.4
Gillnet	United Arab Emirates	0.2	0.2	0.4	0.4	0.5	0.5	0.5	0.5	0.6	0.5	0.6	0.6	0.6	0.5	0.5	0.5	0.5	0.5	0.3	0.3	0.3	0.3	0.2	0.2	0.2
Gillnet	Oman	0.2	0.2	0.2	0.1	0.1	0.3	0.5	0.9	0.6	0.1	0.2	0.4	0.5	0.8	0.6	0.9	0.6	0.6	0.5	0.6	0.2	0.1	0.3	0.2	0.2
Gillnet	Other Fleets	0.3	0.1	0.3	0.2	0.1	0.2	0.3	0.2	0.2	0.2	0.2	0.1	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.2	0.2	0.2	0.2	0.3	0.3
Gillnet	Total	20.6	7.2	2.4	4.2	6.3	4.7	7.7	7.9	8.2	9.6	11.1	12.0	16.8	18.5	19.4	20.2	20.1	18.5	19.0	17.9	18.6	22.4	20.7	17.4	23.9
Line	India	4.1	1.4	0.5	0.9	2.4	1.3	1.7	2.1	2.0	2.0	2.5	1.7	3.1	1.7	3.4	3.0	3.2	2.9	3.1	3.4	3.7	4.9	4.4	0.8	6.9
Line	Indonesia	0.3	0.2	0.1	0.3	0.1	0.2	0.4	0.2	0.4	0.5	0.5	0.6	0.6	0.5	0.4	0.3	0.2	0.0	0.0	0.0	0.0	0.0	0.1	0.7	0.6
Line	Maldives	0.3	0.2	0.2	0.3	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.5	0.3	0.3	0.4	0.2	0.4	0.3	0.3	0.3	0.3	0.2	0.3	0.4	0.3
Line	Sri Lanka	0.0	0.3	0.5	0.6	0.6	0.7	0.7	0.8	0.9	1.0	1.2	1.1	1.1	1.0	0.8	0.7	0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Line	Other Fleets	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0
Line	Total	4.8	2.1	1.4	2.1	3.4	2.4	3.1	3.4	3.7	3.9	4.6	3.9	5.1	3.6	5.1	4.1	4.3	3.3	3.5	3.8	4.0	5.2	4.8	1.9	7.8
Other gears	Thailand	1.0	0.8	0.6	1.7	0.8	7.5	1.4	1.1	0.9	0.9	1.2	1.2	0.9	1.4	0.9	0.9	0.6	0.4	1.0	1.0	0.8	1.1	1.1	1.1	1.1
Other gears	India	0.7	0.3	0.1	0.2	0.6	0.3	0.4	0.5	0.5	0.5	0.6	0.4	0.7	0.4	0.8	0.7	0.8	0.7	0.8	0.8	0.9	1.3	0.8	0.1	0.2
Other gears	Sri Lanka	0.6	0.2				0.0	0.1	0.1	0.2	0.2	0.3	0.4	0.4	0.6	0.6	0.7	0.8	1.0	1.0	0.9	1.0	0.9	0.9	0.2	0.1
Other gears	Other Fleets	0.6	0.2	0.3	0.4	0.4	0.3	0.0	0.3	0.0	0.1	0.0	0.0	0.0	0.0	1.2	0.2	0.0	0.0	0.9	0.5	1.1	0.4	0.4	0.6	0.7
Other gears	Total	2.9	1.5	1.0	2.3	1.8	8.1	1.9	2.0	1.6	1.7	2.2	1.9	2.1	2.4	3.6	2.5	2.2	2.1	3.7	3.3	3.7	3.7	3.3	1.9	2.0
All	Total	32.1	13.2	6.6	10.0	12.4	16.2	14.2	15.3	16.6	17.6	21.1	22.9	27.8	28.1	34.2	29.2	30.4	27.0	29.9	28.7	30.3	35.5	32.0	25.8	37.0

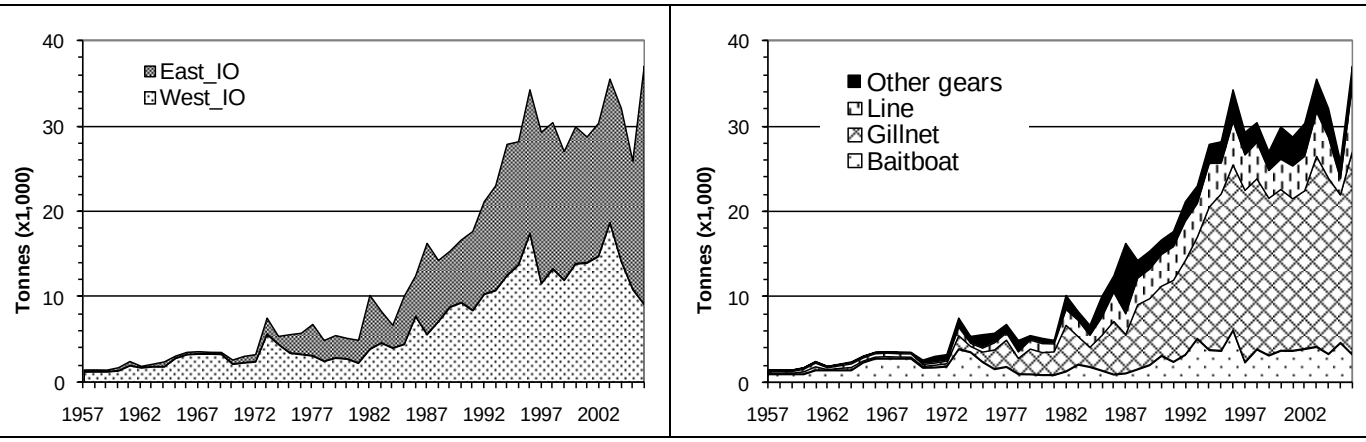


***Figure 1**. Frigate tuna: annual catches from 1957 to 2006 by area (left) and gear (right). Data as per October 2007*

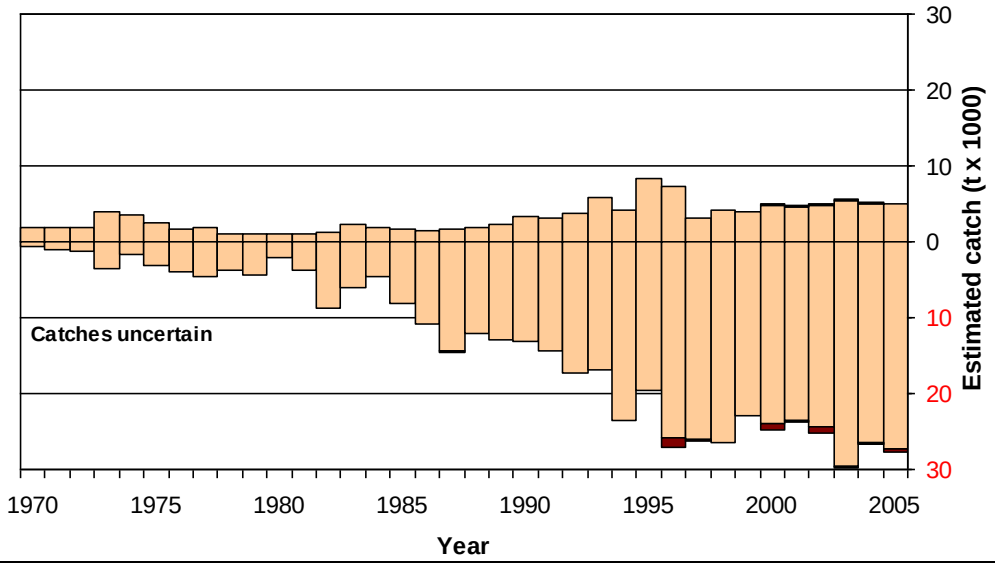


***Figure 2**. Frigate tuna: uncertainty of annual catch estimates. The amount of the catch below the zero-line has been categorised as uncertain according to the criteria given in the text. Dark sections represent estimates of catches by industrial fleets. Data as of October 2006 yet to be updated*

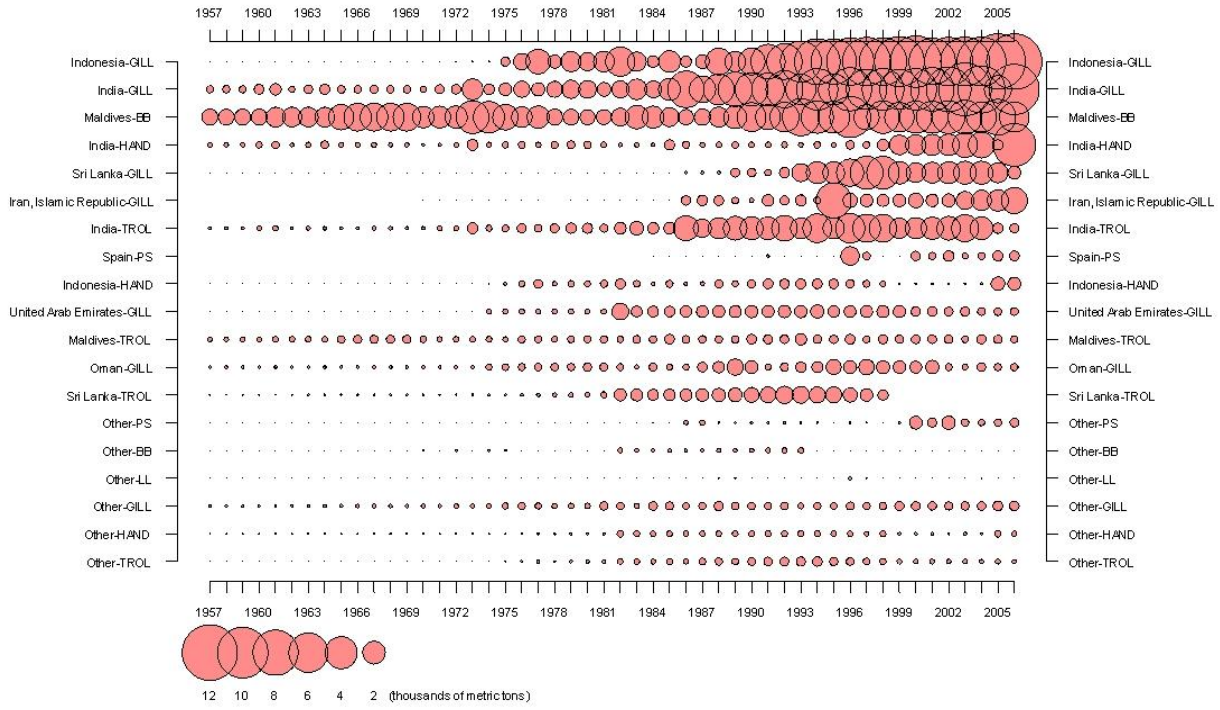


Figure 3. *Frigate tuna: **c**atches by gear and main fleets for the period 1957-2006.(Data as per October 2007)*

Executive summary of the status of the Indo-Pacific king mackerel resource

As adopted by the IOTC Scientific Committee 10 November 2006

Marked changes are factual changes, mainly related to the inclusion of the latest fisheries statistics are shown for the consideration of the SC in Nov07
Note also, the Working Party on Neritic Tunas is due to meeting 26 Nov07 and further changes may be recommended

BIOLOGY

The Indo-Pacific king mackerel (*Scomberomorus guttatus*) is a migratory species that forms small schools and inhabits coastal waters, sometimes entering estuarine areas. It is found in waters from the Persian Gulf, India and Sri Lanka, Southeast Asia, as far north as the Sea of Japan.

Adults can reach a maximum length of 76 cm fork length. Maturity is reached at around 48-52 cm total length (TL) or 1-2 years old in southern India, and about 40 cm (TL) in Thailand. Based on the occurrence of ripe females and the size of maturing eggs, spawning probably occurs from April to July in southern India and in May in Thailand waters. Fecundity increases with age in the Indian waters, ranging from around 400,000 eggs at age 2 years to over one million eggs at age 4 years.

The Indo-Pacific king mackerel feeds mainly on small schooling fishes (e.g. sardines and anchovies), squids and crustaceans.

No information is available on the stock structure of Indo-Pacific king mackerel stock structure in Indian Ocean.

FISHERIES

The Indo-Pacific king mackerel is mostly caught by gillnet fisheries in the Indian Ocean (Figure 1), in particular artisanal fleets from India and more recently Indonesia (Table 1). The catch estimates for Indo-Pacific king mackerel were derived from very small amounts of information and are therefore highly uncertain[3] (Figure 2). The catches provided in Table 1 are based on the information available at the Secretariat and the following observations on the catches cannot currently be verified. Estimated catches have increased steadily since the mid 1960's, reaching around 10,000 t in the early 1970's and over 30,000 t by 1989. The average annual catch estimated for the period 2002 to 2006 is 33,100 t. In recent years, the countries attributed with the highest catches are Indonesia, India and Iran (Table 1, Figure 3).

AVAILABILITY OF INFORMATION FOR STOCK ASSESSMENT

There is no information on the stock structure of Indo-Pacific king mackerel in the Indian Ocean.

Age and growth, fecundity estimates and size at first maturity information is available for Indo-Pacific king mackerel in the Indian Ocean.

Possible fishery indicators:

1. **Trends in catches**: The catch estimates for Indo-Pacific king mackerel are highly uncertain. Catches fluctuate from year to year but have been steadily increasing since the mid 1960's.
2. **Nominal CPUE Trends:** data not available to the Secretariat.
3. **Average weight in the catch by fisheries:** data not available to the Secretariat.
4. **Number of squares fished:** data not available to the Secretariat.

STOCK ASSESSMENT

No quantitative stock assessment has been undertaken by the IOTC Working Party on Neritics.

[3] The uncertainty in the catch estimates has been assessed by the Secretariat and is based on the amount of processing required to account for the presence of conflicting catch reports, the level of aggregation of the catches by species and or gear, and the occurrence of unreporting fisheries for which catches had to be estimated.

MANAGEMENT ADVICE

No quantitative stock assessment is currently available for the Indo-Pacific king mackerel in the Indian Ocean, therefore the stock status is uncertain. This species is a relatively productive species with high fecundity and rapid growth and this makes it relatively resilient and not prone to overfishing.

The SC recommends Indo-Pacific king mackerel be reviewed at the first meeting of the IOTC Working Party on Neritic Tunas.

INDO-PACIFIC KING MACKEREL SUMMARY

Maximum Sustainable Yield:	-
Preliminary catch in 2006 *(data as of October 2007)*	29,100 t
Catch in 2005	29,500 t
Mean catch over the last 5 years (2002-06)	33,100 t
Current Replacement Yield:	-
Relative Biomass ($B_{current}/B_{MSY}$):	-
Relative Fishing Mortality ($F_{current}/F_{MSY}$):	-

Table 1. *Best scientific estimates of the catches of Indo-Pacific king mackerel (as adopted by the IOTC Scientific Committee) by gear and main fleets for the period 1957-2006 (in thousands of tonnes).* *Data as of October 2007*

Gear	Fleet	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83
Gillnet	Indonesia	0.3	0.3	0.3	0.3	0.3	0.4	0.4	0.4	0.4	0.5	0.5	0.5	0.5	0.4	0.5	0.6	0.6	0.8	1.1	0.5	0.4	0.4	0.5	0.5	0.6	1.1	1.0
Gillnet	India	2.4	2.1	1.8	2.3	3.1	2.9	2.4	3.2	2.7	2.9	2.9	3.5	3.2	3.8	4.8	6.0	3.9	7.0	6.2	6.9	5.3	4.9	7.6	8.2	7.7	7.8	7.8
Gillnet	Iran, Islamic Republic																										1.4	1.6
Gillnet	Malaysia	0.2	0.2	0.2	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1								1.4	1.5	1.7	1.4	1.6	1.9	1.7
Gillnet	Saudi Arabia																									0.0	0.0	0.0
Gillnet	Thailand														0.1		0.0	0.2	0.1	0.1	0.3	0.6	0.4	0.7	0.5	0.7	0.2	0.1
Gillnet	Yemen	0.1	0.1	0.2	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.2	0.1	0.2	0.2	0.2	0.5	0.5	0.6	0.6	0.7	0.6	0.7	0.6	0.5	0.1
Gillnet	Pakistan	0.1	0.0	0.0	0.1	0.1	0.1	0.1	0.2	0.2	0.3	0.2	0.2	0.2	0.2	0.2	0.3	0.2	0.2	0.2	0.2	0.2	0.3	0.4	0.1	0.3	0.3	0.3
Gillnet	Other Fleets														0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1
Gillnet	Total	3.1	2.8	2.5	2.8	3.6	3.6	3.1	4.0	3.5	4.0	3.9	4.6	4.2	4.6	5.7	7.2	5.1	8.5	8.0	8.4	8.6	8.1	11.5	11.4	11.5	13.3	12.8
Line	India	0.3	0.3	0.3	0.3	0.5	0.4	0.4	0.5	0.4	0.4	0.4	0.5	0.5	0.5	0.7	0.9	0.6	1.0	0.9	1.0	0.8	0.7	1.1	1.2	1.1	1.1	1.1
Line	Other Fleets	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.2	0.1	0.1	0.1
Line	Total	0.4	0.3	0.3	0.4	0.5	0.4	0.4	0.5	0.4	0.5	0.4	0.6	0.5	0.6	0.7	0.9	0.6	1.0	0.9	1.0	0.8	0.8	1.1	1.4	1.2	1.2	1.2
Other gears	India	1.5	1.3	1.1	1.4	1.9	1.8	1.5	2.0	1.6	1.8	1.7	2.2	1.9	2.3	3.0	3.7	2.4	4.3	3.8	4.2	3.2	3.0	4.6	5.0	4.7	4.8	4.8
Other gears	Thailand														0.1	0.3	0.2	0.0	0.0	0.0	0.4	0.1	0.1	0.0	0.2	0.2	0.7	0.7
Other gears	Malaysia	0.0	0.0	0.0	0.2	0.3	0.3	0.3	0.6	0.8	0.9	0.7	0.8	0.8									0.0	0.1	0.0		0.3	0.0
Other gears	Other Fleets	0.0	0.0	0.0				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1
Other gears	Total	1.5	1.3	1.1	1.6	2.2	2.1	1.8	2.6	2.5	2.7	2.5	3.0	2.7	2.4	3.2	3.9	2.4	4.3	3.8	4.5	3.3	3.1	4.8	5.3	4.9	5.7	5.6
All	Total	5.0	4.4	3.9	4.8	6.3	6.2	5.3	7.1	6.4	7.1	6.8	8.1	7.4	7.5	9.6	11.9	8.1	13.8	12.8	14.0	12.7	12.0	17.4	18.0	17.6	20.3	19.5

Gear	Fleet	Av02/06	Av57/06	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	00	01	02	03	04	05	06
Gillnet	Indonesia	10.4	4.1	0.9	1.4	1.4	1.6	9.3	11.6	5.4	4.7	1.9	8.9	5.7	10.6	13.8	11.9	11.8	11.2	11.7	13.2	9.5	10.5	14.3	8.9	8.9
Gillnet	India	7.4	6.5	11.2	9.8	5.5	7.1	8.6	10.3	7.5	11.4	9.9	12.1	9.3	9.8	7.2	8.2	12.8	7.9	7.8	8.5	9.3	8.7	7.0	6.1	5.9
Gillnet	Iran, Islamic Republic	3.8	1.3	0.9	0.5	0.5	0.7	0.7	1.7	2.3	2.5	2.2	1.6	1.6	5.4	4.3	2.3	3.9	3.5	4.1	2.5	4.0	3.7	4.3	3.1	4.0
Gillnet	Malaysia	0.6	0.8	1.0	1.3	1.7	1.9	1.6	1.2	1.3	1.4	1.7	1.4	1.4	0.9	1.0	1.1	1.5	0.3	0.4	0.5	0.9	0.8	0.7	0.4	0.5
Gillnet	Saudi Arabia	0.5	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.3	0.3	0.3	0.3	0.4	0.3	0.3	0.7	0.7
Gillnet	Thailand	0.4	0.3	0.2	0.3	0.3	0.5	0.4	0.3	0.4	0.3	0.5	0.6	0.4	0.6	0.5	0.5	0.7	0.9	0.3	0.4	0.5	0.5	0.2	0.4	0.3
Gillnet	Yemen	0.3	0.4	0.8	0.6	0.7	0.6	0.5	0.4	0.5	0.5	0.5	0.5	0.5	0.5	0.4	0.4	0.4	0.4	0.3	0.3	0.3	0.3	0.3	0.3	0.3
Gillnet	Pakistan	0.2	0.2	0.3	0.3	0.5	0.5	0.6	0.0	0.1	0.8	0.0					0.1	0.1	0.3	0.3	0.2	0.2	0.2	0.1	0.2	0.2
Gillnet	Other Fleets	0.1	0.1	0.0	0.1	0.1	0.1	0.1	0.1	0.2	0.0	0.1	0.2	0.1	0.2	0.2	0.3	0.2	0.3	0.3	0.2	0.2	0.1	0.2	0.1	0.1
Gillnet	Total	23.8	13.6	15.3	14.3	10.6	13.0	21.7	25.7	17.6	21.6	16.9	25.3	19.0	28.1	27.5	25.0	31.7	25.0	25.5	26.1	25.3	25.1	27.4	20.2	21.1
Line	India	1.1	1.0	1.6	1.4	0.8	1.0	1.3	1.5	1.1	1.7	1.4	1.8	1.4	1.4	1.1	1.2	1.9	1.1	1.1	1.2	1.4	1.3	1.0	1.2	0.9
Line	Other Fleets	0.1	0.1	0.0	0.0	0.1	0.3	0.0	0.1	0.1	0.1	0.0	0.0	0.1	0.0	0.0	0.1	0.0	0.1	0.1	0.0	0.0	0.0	0.1	0.1	0.1
Line	Total	1.2	1.0	1.7	1.5	0.9	1.3	1.3	1.6	1.2	1.7	1.5	1.8	1.5	1.4	1.1	1.2	1.9	1.2	1.2	1.3	1.4	1.3	1.1	1.3	1.0
Other gears	India	4.9	4.0	6.9	6.0	3.4	4.4	5.3	6.3	4.6	7.0	6.1	7.4	5.7	6.0	4.4	5.0	7.9	4.8	4.8	5.2	5.7	5.3	4.6	4.9	3.8
Other gears	Thailand	2.4	0.7	0.4	0.4	0.7	0.7	0.3	0.8	0.9	0.9	1.2	1.2	0.9	1.4	2.5	2.5	2.4	1.1	1.6	1.7	2.2	2.2	2.7	2.4	2.4
Other gears	Malaysia	0.8	0.3	0.0		0.2	0.3	0.1	0.1	0.1	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	1.1	1.3	0.8	0.7	0.8	0.7	0.7	0.8
Other gears	Other Fleets	0.1	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.0	0.0
Other gears	Total	8.1	5.1	7.3	6.4	4.3	5.3	5.7	7.2	5.6	8.1	7.4	8.7	6.7	7.5	7.0	7.6	10.4	7.1	7.7	7.7	8.8	8.5	8.0	8.0	7.0
All	Total	33.1	19.6	24.3	22.2	15.7	19.7	28.7	34.4	24.3	31.4	25.8	35.7	27.2	37.0	35.6	33.8	44.0	33.2	34.4	35.1	35.5	34.9	36.5	29.5	29.1

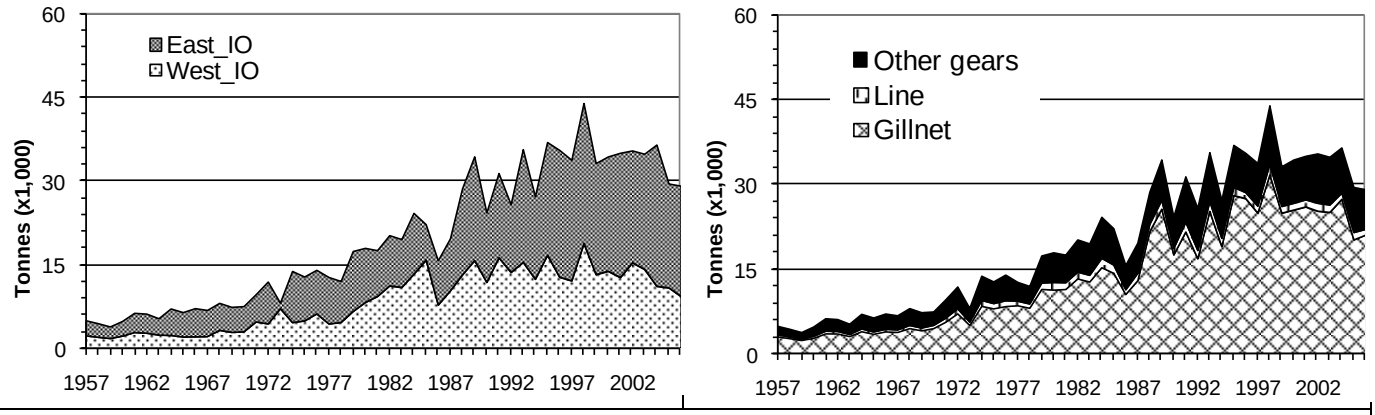


***Figure 1**. Indo-Pacific king mackerel: annual catches from 1957 to 2006 by area (left) and gear (right).* *Data as of October 2007*

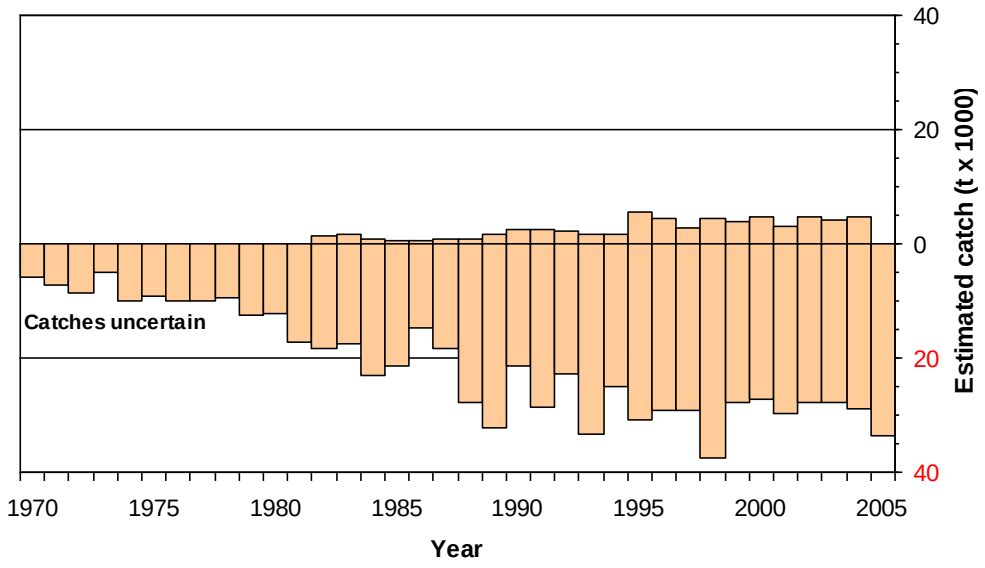


***Figure 2**. Indo-Pacific king mackerel: uncertainty of annual catch estimates. The amount of the catch below the zero-line has been categorised as uncertain according to the criteria given in the text.* *Data as of October 2006- yet to be updated*

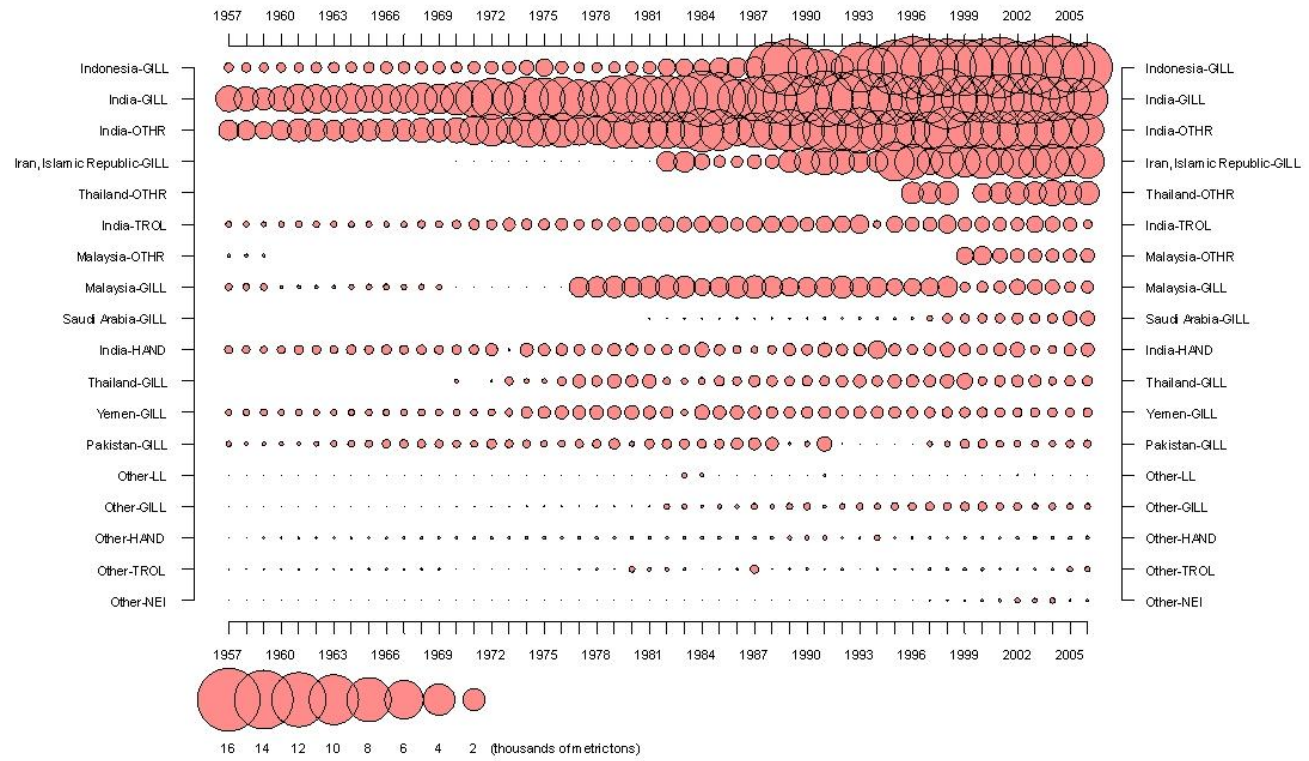


Figure 3. *Indo-Pacific king mackerel: estimated catches by gear and main fleets for the period 1957-2006 (in thousands of tonnes).* *Data as of October 2007*

Executive summary of the status of the kawakawa resource

(As adopted by the IOTC Scientific Committee 10 November 2006)

Marked changes are factual changes, mainly related to the inclusion of the latest fisheries statistics are shown for the consideration of the SC in Nov07
Note also, the Working Party on Neritic Tunas is due to meeting 26 Nov07 and further changes may be recommended

BIOLOGY

Kawakawa (*Euthynnus affinis*) lives in open waters close to the shoreline and prefers waters temperatures ranging from 18° to 29°C. Kawakawa form schools by size with other species sometimes containing over 5,000 individuals. Kawakawa are often found with yellowfin, skipjack and frigate tunas. Kawakawa are typically found in surface waters, however, they may range to depths of over 400 m (they have been reported under a fish-aggregating device employed in 400 m), possibly to feed.

Kawakawa grow a length of 100 cm FL and can weigh up to 14 kg but the more common size is around 60 cm. Juveniles grow rapidly reaching lengths between 50 and 65 cm by three years of age.

On the Natal coast in South Africa, sexual maturity is attained at 45-50 cm and spawning occurs mostly during summer. A 1.4 kg female (48 cm FL) may spawn approximately 0.21 million eggs per batch (corresponding to about 0.79 million eggs per season).

Kawakawa larvae are patchy but widely distributed and can generally be found close to land masses. Large changes in apparent abundance are linked to changes in ocean conditions. This species is a highly opportunistic predator feeding on small fishes, especially on clupeoids and atherinids; also squid, crustaceans and zooplankton.

No information is available on stock structure of kawakawa in Indian Ocean.

FISHERIES

Kawakawa is caught mainly by gillnets and purse seiners (Table 1 and Figure 1) and may be an important by-catch of the industrial purse seiners. The catch estimates for kawakawa were derived from very small amounts of information and are therefore highly uncertain[4] (Figure 2). The catches provided in Table 1 are based on the information available at the Secretariat and the following observations on the catches cannot currently be verified. Annual estimates of catch kawakawa increased markedly from around 10,000 t in the late 1970's to reach the 50,000 t mark in the mid-1980's. Since 1997, catches have been around 100,000 t. The average annual catch estimated for the period 2002 to 2006 is 109.6 t. In recent years, the countries attributed with the highest catches are Indonesia, India and Iran (Table 1, Figure 3).

A high percentage of the kawakawa captured by Thai purse seiners in the Andaman sea is comprised of fish 8 to 42 cm long.

AVAILABILITY OF INFORMATION FOR STOCK ASSESSMENT

There is no information on the stock structure of kawakawa in the Indian Ocean.

Numerous studies have been undertaken to investigate the age and the growth of kawakawa. These include various studies based on age and length distributions using various body parts (e.g. vertebrae, dorsal spines, and otoliths). Fecundity of kawakawa has also been studied in Indian Ocean.

Possible fishery indicators:

1. **Trends in catches**: The catch estimates for kawakawa are highly uncertain. The trend in catches indicates a large and continuous increase in the catches from the mid-1980's to 2002 (Figure 1). The estimated catches decreased over the period 2002-2005.

[4] The uncertainty in the catch estimates has been assessed by the Secretariat and is based on the amount of processing required to account for the presence of conflicting catch reports, the level of aggregation of the catches by species and or gear, and the occurrence of unreporting fisheries for which catches had to be estimated.

2. **Nominal CPUE Trends:** data not available to the Secretariat.
3. **Average weight in the catch by fisheries:** data not available to the Secretariat.
4. **Number of squares fished:** data not available to the Secretariat.

STOCK ASSESSMENT

While some localised, sub-regional assessments may have been undertaken, no quantitative stock assessment has been undertaken by the IOTC Working Party on Neritics.

MANAGEMENT ADVICE

No quantitative stock assessment is currently available for kawakawa in the Indian Ocean, therefore the stock status is uncertain.

The SC notes the catches have been relatively stable for the past 10 years.. Nevertheless, the SC recommends that this species be reviewed at the first meeting of the IOTC Working Party on Neritic Tunas.

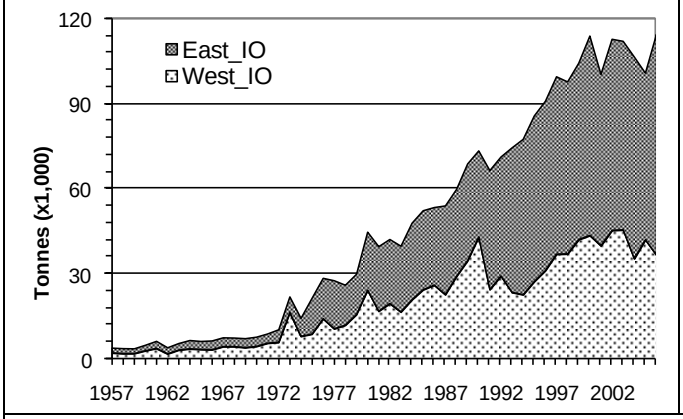
KAWAKAWA SUMMARY

Maximum Sustainable Yield:	-
Preliminary catch in 2006 *(data as of October 2007)*	114,800 t
Catch in 2005	101,100 t
Mean catch over the last 5 years (2002-06)	109,600 t
Current Replacement Yield:	-
Relative Biomass ($B_{current}/B_{MSY}$):	-
Relative Fishing Mortality ($F_{current}/F_{MSY}$):	-

Table 1. *Best scientific estimates of the catches of kawakawa (as adopted by the IOTC Scientific Committee) by gear and main fleets for the period 1957-2006 (in thousands of tonnes).* *Data as of October 2007.*

Gear	Fleet	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83
Purse seine	Malaysia	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.3	0.4	0.5	0.4	0.3	1.2	0.8	0.9	0.5	0.7	1.2	0.8	0.9	1.7	1.0	2.5	1.0	0.8	1.4
Purse seine	Thailand														0.1	0.4	0.4	0.6	0.5	1.1	0.7	0.6	0.8	0.1	0.0	0.0	1.2	0.4
Purse seine	India	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.0	0.0	0.1	0.1	0.1	0.1	0.2	0.1	0.1	0.1
Purse seine	Other Fleets							0.2	0.8	0.3					0.0		0.0		0.0	0.0							0.0	0.0
Purse seine	Total	0.1	0.1	0.1	0.2	0.2	0.1	0.3	1.0	0.6	0.4	0.5	0.4	0.3	1.3	1.3	1.4	1.3	1.2	2.4	1.6	1.6	2.6	1.3	2.7	1.2	2.1	1.9
Gillnet	Indonesia	1.2	1.2	1.1	1.2	1.5	1.5	1.6	1.7	1.9	2.0	1.9	2.0	2.2	1.7	1.7	2.7	2.9	4.7	9.6	12.0	14.8	10.8	12.1	17.2	20.8	2.8	0.5
Gillnet	India	0.9	1.0	0.9	1.7	2.4	0.7	1.4	1.3	1.0	0.9	1.3	1.2	1.0	1.0	2.1	2.0	9.9	2.8	3.5	6.4	4.4	6.0	8.1	12.8	7.5	7.9	6.1
Gillnet	Iran, Islamic Republic														0.1	0.1	0.1	0.2	0.2	0.2	0.3	0.3		0.2	0.2	0.4	0.7	2.5
Gillnet	Yemen	0.4	0.4	0.5	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.5	0.5	0.5	0.4	0.4	0.5	0.5	0.4	0.5	0.6	0.6	0.7	0.6	1.8	1.0	0.9	0.8
Gillnet	Oman	0.1	0.1	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.7	0.8	0.9	1.0	1.1	1.0	1.2	1.1	0.8	0.4
Gillnet	Pakistan	0.7	0.4	0.4	0.4	0.4	0.6	0.9	1.3	1.4	1.8	1.8	1.8	1.6	1.4	1.2	1.4	1.1	1.5	1.7	1.6	1.4	0.8	1.4	0.7	1.0	1.3	0.4
Gillnet	United Arab Emirates														0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	2.0	0.9
Gillnet	Other Fleets	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.0	0.2	0.1	0.2	0.1	0.2	0.3	0.5	0.3	0.1	0.2	0.2	0.6	0.5	0.2
Gillnet	Total	3.3	3.0	3.0	3.8	4.8	3.4	4.4	4.8	4.9	5.3	5.7	5.7	5.5	5.0	5.8	7.1	15.1	10.5	16.7	22.5	22.8	19.6	23.7	34.3	32.7	17.0	11.8
Line	Maldives											0.3	0.3	0.4	0.4	0.3	0.4	0.6	0.5	0.3	0.9	0.9	0.7	0.6	0.9	1.0	1.2	1.3
Line	Indonesia	0.1	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.3	0.3	0.4	0.4													15.6	19.0
Line	Other Fleets	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.2	0.3	0.3	0.4	0.3	0.3	0.2	0.3	0.4	0.5	0.5	1.0	1.0
Line	Total	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.3	0.4	0.7	0.7	0.8	0.7	0.5	0.6	0.9	0.9	0.6	1.2	1.1	1.0	1.0	1.4	1.5	17.8	21.2
Other gears	Maldives											0.2	0.2	0.2	0.3	0.2	0.3	0.6	0.4	0.2	0.2	0.2	0.2	0.2	0.3	0.5	1.0	1.1
Other gears	India	0.5	0.5	0.5	0.9	1.2	0.4	0.7	0.7	0.6	0.5	0.7	0.7	0.6	0.6	1.2	1.1	4.3	1.5	1.9	3.2	2.2	2.9	3.9	6.3	4.0	4.0	3.3
Other gears	Other Fleets	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.4	0.7
Other gears	Total	0.5	0.5	0.5	0.9	1.2	0.4	0.7	0.7	0.6	0.5	0.9	0.9	0.8	0.8	1.4	1.4	4.9	1.9	2.0	3.5	2.4	3.0	4.1	6.6	4.5	5.5	5.0
All	Total	4.0	3.9	3.8	5.1	6.4	4.2	5.7	6.7	6.4	6.6	7.7	7.6	7.4	7.9	9.0	10.5	22.1	14.5	21.6	28.7	27.8	26.2	30.1	45.0	39.9	42.4	40.0

Gear	Fleet	Av02/06	Av57/06	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	00	01	02	03	04	05	06
Purse seine	Malaysia	9.3	2.6	1.6	2.5	2.1	1.3	1.9	2.0	3.1	3.4	5.5	3.4	1.9	2.4	4.0	4.2	6.1	5.4	6.9	6.0	10.1	8.7	8.5	7.8	11.4
Purse seine	Thailand	6.4	2.5	0.6	1.5	0.7	4.5	2.2	2.2	4.5	7.0	7.7	7.2	5.7	8.6	6.4	5.9	4.3	2.6	6.3	6.2	4.9	7.0	7.0	6.5	6.5
Purse seine	India	1.1	0.5	0.1	0.2	0.4	0.2	0.2	0.5	0.7	1.2	1.5	1.2	0.9	1.1	1.0	1.3	1.2	1.6	1.6	1.4	1.6	1.7	1.0	0.4	1.0
Purse seine	Other Fleets	0.3	0.1	0.0			0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.2
Purse seine	Total	17.1	5.6	2.3	4.2	3.2	6.0	4.3	4.7	8.2	11.6	14.7	11.8	8.5	12.1	11.4	11.5	11.7	9.6	14.9	13.6	16.7	17.5	16.6	14.7	20.1
Gillnet	Indonesia	42.7	15.7	6.5	0.9	2.2	2.3	12.4	12.1	9.6	20.9	17.6	27.6	34.5	34.9	37.8	41.0	40.4	46.3	48.9	40.3	43.2	44.5	48.7	39.1	38.1
Gillnet	India	17.4	8.6	7.6	11.2	12.0	9.3	10.1	17.5	22.4	13.8	17.4	13.8	9.7	12.1	11.1	15.3	14.1	17.8	18.5	15.8	18.3	18.0	12.4	17.4	20.8
Gillnet	Iran, Islamic Republic	13.3	3.0	3.9	1.7	1.9	0.6	2.2	0.8	0.7	0.7	0.7	0.5	2.1	3.9	5.7	7.8	7.9	10.9	13.5	12.5	16.4	14.1	11.6	11.8	12.6
Gillnet	Yemen	2.6	1.2	1.2	2.1	1.5	1.4	1.7	1.3	1.6	1.7	1.7	0.6	1.3	1.3	1.5	1.7	1.9	2.1	2.3	2.5	2.7	1.6	3.1	3.0	2.6
Gillnet	Oman	2.3	1.1	1.1	1.0	1.1	2.6	3.5	2.0	2.2	1.1	1.6	0.9	1.5	2.2	2.4	2.5	1.8	1.5	1.7	2.0	1.5	2.9	2.5	2.2	2.5
Gillnet	Pakistan	2.1	1.6	0.5	0.8	1.6	2.0	4.1	1.4	2.1	1.9	1.5	1.5	1.7	1.4	2.9	2.8	3.0	3.5	3.1	2.3	1.6	1.8	2.1	2.5	2.5
Gillnet	United Arab Emirates	0.6	0.8	0.9	0.8	1.2	1.8	1.9	2.0	2.1	2.0	2.1	1.2	2.3	2.1	2.1	2.2	2.2	2.2	0.7	0.9	0.7	0.7	0.6	0.6	0.6
Gillnet	Other Fleets	2.2	0.9	0.4	0.3	0.3	0.5	0.7	0.7	0.9	1.0	1.2	0.8	1.8	2.1	2.3	3.4	3.6	2.3	2.2	3.0	3.4	2.4	1.8	1.5	1.6
Gillnet	Total	83.2	32.8	22.1	18.9	21.9	20.6	36.6	37.9	41.5	43.1	43.8	46.9	54.9	60.0	65.7	76.7	74.8	86.7	90.9	79.2	87.8	86.1	82.9	78.0	81.3
Line	India	5.7	1.6								4.3	5.5	4.3	3.0	3.8	3.5	4.8	4.4	5.6	5.8	4.9	5.7	5.4	4.2	4.5	8.8
Line	Maldives	0.5	0.6	0.7	1.4	0.7	0.9	0.6	0.8	1.0	0.8	1.2	1.9	0.9	1.0	1.2	0.6	1.4	0.5	0.5	0.4	0.4	0.5	0.5	0.6	0.3
Line	Indonesia	0.3	3.8	16.3	20.4	20.1	18.7	11.5	15.2	10.7	4.4	3.4	6.6	7.1	6.0	5.5	3.4	2.4	0.1	0.1	0.1	0.1	0.1	0.2	0.0	1.0
Line	Other Fleets	0.9	0.7	1.1	0.9	1.0	2.6	1.2	1.2	1.2	1.5	1.6	1.3	1.5	1.4	1.3	1.3	1.1	0.9	0.5	0.7	0.5	0.7	0.6	1.1	1.7
Line	Total	7.4	6.7	18.2	22.7	21.8	22.3	13.3	17.2	13.0	11.1	11.6	14.2	12.6	12.1	11.5	10.1	9.3	7.0	6.9	6.1	6.8	6.7	5.4	6.1	11.8
Other gears	Maldives	1.8	0.8	0.8	1.0	0.6	0.5	0.6	0.6	1.0	0.8	1.3	1.7	1.7	1.7	2.6	1.5	2.2	1.2	1.4	1.7	1.8	1.9	1.8	2.1	1.3
Other gears	India	0.0	1.8	4.1	5.2	5.7	4.3	4.9	8.3	9.7											0.0		0.0			
Other gears	Other Fleets	0.1	0.1	0.7	0.5	0.5	0.5	0.3	0.4	0.3	0.1	0.1	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.1	0.1	0.2	0.3
Other gears	Total	1.9	2.7	5.6	6.7	6.8	5.3	5.8	9.3	10.9	0.9	1.4	1.8	1.7	1.7	2.6	1.5	2.2	1.3	1.4	1.8	1.9	2.0	1.9	2.3	1.6
All	Total	109.6	47.7	48.1	52.5	53.7	54.2	60.0	69.0	73.6	66.7	71.5	74.7	77.7	86.0	91.2	99.8	98.0	104.6	114.2	100.7	113.0	112.3	106.8	101.1	114.8



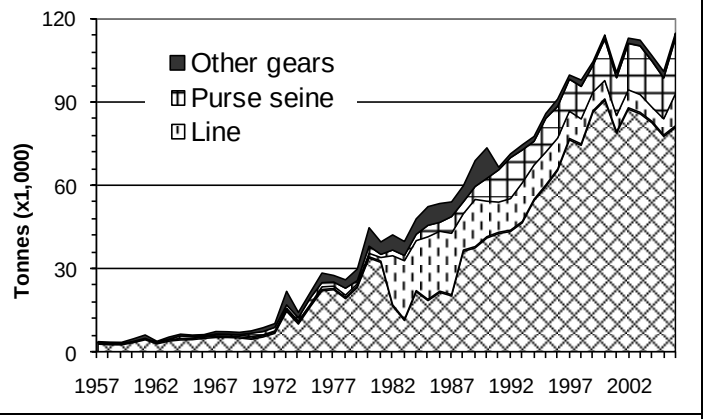


***Figure 1**. Kawakawa: (a) annual catches from 1957 to 2006 by (on the left) area i.e. Eastern and Western Indian Ocean and (on the right) gear. Data as of October 2007*

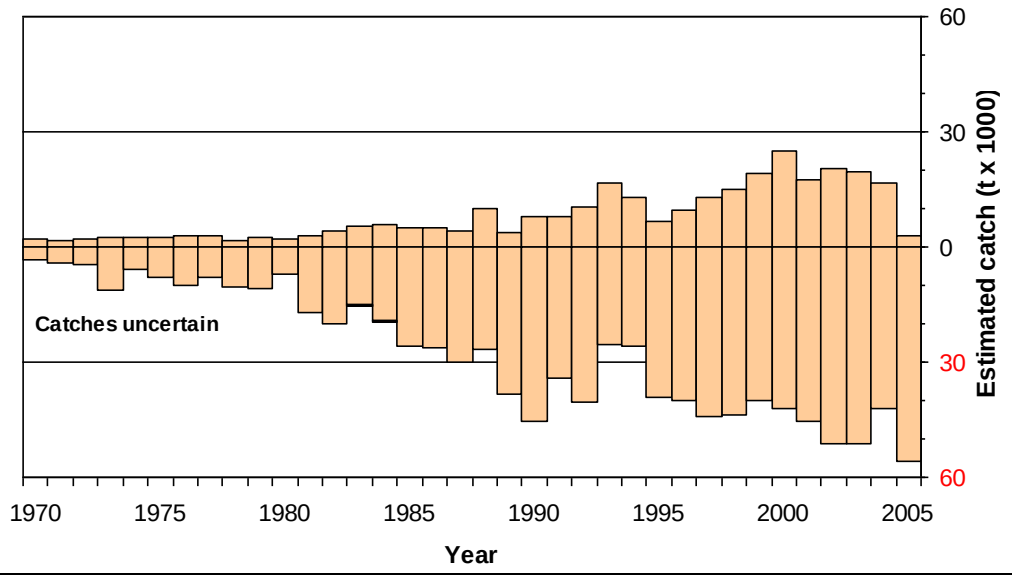


***Figure 2**. Kawakawa: uncertainty of annual catch estimates. The amount of the catch below the zero-line has been categorised as uncertain according to the criteria given in the text. Data as of October 2006- yet to be updated*

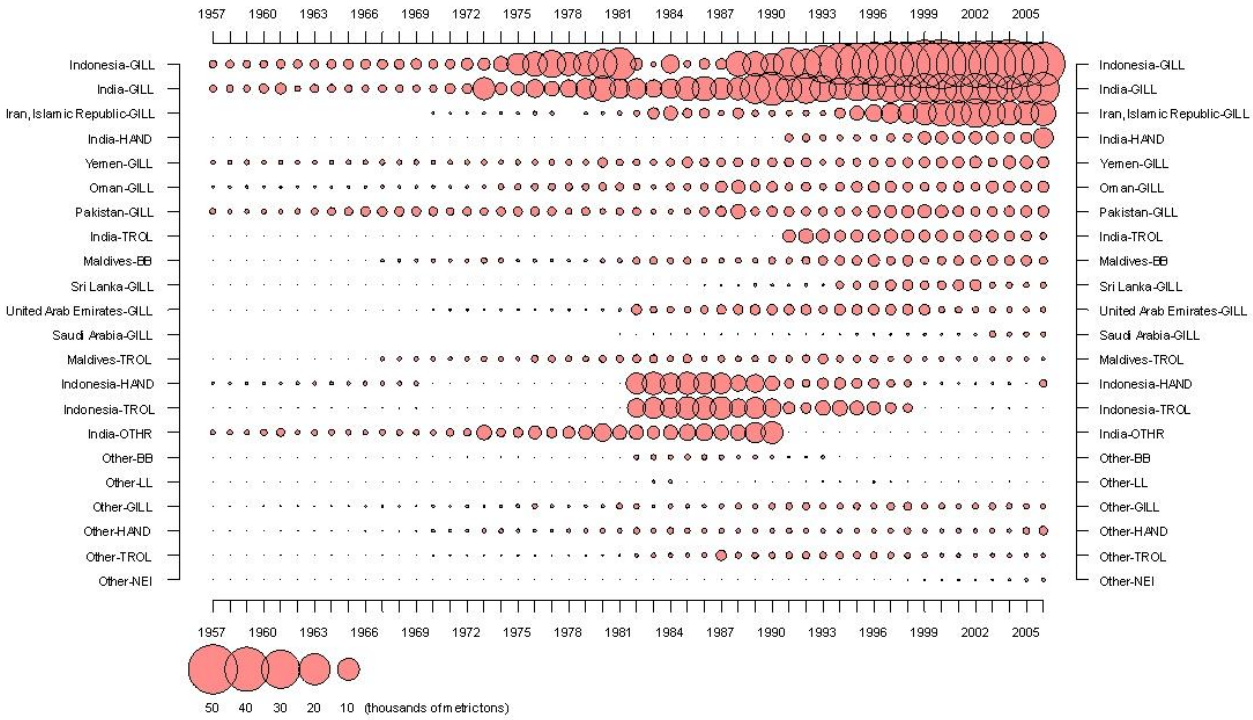


Figure 3. *Catches of kawakawa by gear and main fleets for the period 1957-2006 (in thousands of tonnes).*
Data as of October 2007

Executive summary of the status of the longtail tuna resource

(As adopted by the IOTC Scientific Committee 10 November 2006)

Marked changes are factual changes, mainly related to the inclusion of the latest fisheries statistics are shown for the consideration of the SC in Nov07
Note also, the Working Party on Neritic Tunas is due to meeting 26 Nov07 and further changes may be recommended

BIOLOGY

Longtail tuna *(Thunnus tonggol)* is an oceanic species that forms schools of varying sizes. It is most abundant over areas of broad continental shelf.

Longtail tuna grows to around 145 cm FL or 35.9 kg, but the most common size in Indian Ocean ranges from 40 to 70 cm. Longtail tuna grows rapidly to reach 40 to 46 cm in FL in one year.

The spawning season varies according to location. Off the west coast of Thailand there are two distinct spawning seasons: January-April and August-September.

Longtail tuna feeds on a variety of fish, cephalopods, and crustaceans, particularly stomatopod larvae and prawns.

No information is available on the stock structure of longtail tuna in the Indian Ocean.

FISHERIES

Longtail tuna is caught mainly by gillnet and in a lesser extent by artisanal purse seiners and most of the catch is taken in the western Indian Ocean area (Figure 1). The catch estimates for longtail tuna were derived from very small amounts of information and are therefore highly uncertain[5] (Figure 2). The catches provided in Table 1 are based on the information available at the Secretariat and the following observations on the catches cannot currently be verified. Estimated catches of longtail tuna increased steadily from the mid 1950's, reaching around 9,000 t in the early 1970's and over 50,000 t by the mid-1980's and peaking at 97,700 t in 2002. The average annual catch estimated for the period 2002 to 2006 is 90,800 t . In recent years, the countries attributed with the highest catches of longtail tuna are Indonesia, Iran, Oman, Yemen and Pakistan (Table 1, Figure 3).

AVAILABILITY OF INFORMATION FOR STOCK ASSESSMENT

There is no information on the stock structure of longtail tuna in the Indian Ocean.

Age and the growth are available for Longtail tuna in other oceans.

Possible fishery indicators:

1. **Trends in catches**: The catch estimates for longtail tuna are highly uncertain. There has been a variable but steady increase in the catches from the mid-1950's (Figure 1). .
2. **Nominal CPUE Trends:** data not available to the Secretariat.
3. **Average weight in the catch by fisheries:** data not available to the Secretariat.
4. **Number of squares fished:** data not available to the Secretariat.

STOCK ASSESSMENT

While some localised, sub-regional assessments may have been undertaken, no quantitative stock assessment has been undertaken by the IOTC Working Party on Neritics.

[5] The uncertainty in the catch estimates has been assessed by the Secretariat and is based on the amount of processing required to account for the presence of conflicting catch reports, the level of aggregation of the catches by species and or gear, and the occurrence of unreporting fisheries for which catches had to be estimated.

MANAGEMENT ADVICE

No quantitative stock assessment is currently available for longtail tuna in the Indian Ocean, therefore the stock status is uncertain.

The SC notes the catches of longtail tuna are increasing and recommended that this species be reviewed at the first meeting of the IOTC Working Party on Neritic Tunas.

LONGTAIL TUNA SUMMARY

Maximum Sustainable Yield:	-
Preliminary catch in 25006 *(data as of October 2007)*	92,400 t
Catch in 2005	81,000 t
Mean catch over the last 5 years (2002-06)	90,800 t
Current Replacement Yield:	-
Relative Biomass ($B_{current}/B_{MSY}$):	-
Relative Fishing Mortality ($F_{current}/F_{MSY}$):	-

Table 1. *Best scientific estimates of the catches of longtail tuna (as adopted by the IOTC Scientific Committee) by gear and main fleets for the period 1957-2006 (in thousands of tonnes).*
Data as of October 2007

Gear	Fleet	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83
Purse seine	Malaysia	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.1	0.1	0.2	0.2	0.2	0.1	0.7	0.5	0.5	0.3	0.4	0.7	0.5	0.5	0.9	0.6	1.4	0.6	0.5	0.8
Purse seine	Thailand														0.0	0.2	0.2	0.3	0.2	0.5	0.3	0.3	0.4	1.8	0.6	1.1	6.9	6.8
Purse seine	Other Fleets							0.0	0.0	0.0					0.0		0.0		0.0	0.0					0.0	0.0	0.0	0.0
Purse seine	Total	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.1	0.1	0.2	0.2	0.2	0.1	0.7	0.7	0.7	0.6	0.6	1.2	0.8	0.8	1.3	2.4	2.0	1.7	7.4	7.6
Gillnet	Indonesia	1.0	1.0	1.0	1.0	1.3	1.3	1.4	1.5	1.6	1.8	1.7	1.8	1.9	1.2	1.3	2.0	2.2	3.5	7.2	9.1	11.1	8.1	9.1	13.0	15.6	14.2	14.8
Gillnet	Iran, Islamic Republic														0.6	0.1	0.7	0.9	0.9	0.9	1.4	1.6		0.8	1.0	2.2	2.9	5.6
Gillnet	Oman	0.7	0.7	0.9	0.7	0.7	0.7	0.7	0.7	0.8	0.8	1.0	1.0	1.0	0.9	1.0	1.1	1.2	3.8	4.4	5.0	5.3	5.8	5.4	6.6	6.3	4.6	2.1
Gillnet	Yemen	0.3	0.3	0.4	0.3	0.3	0.3	0.3	0.3	0.4	0.4	0.4	0.4	0.4	0.3	0.4	0.4	0.5	1.1	1.3	1.4	1.5	1.7	1.5	1.7	1.4	1.2	0.4
Gillnet	Pakistan	2.0	1.0	1.0	1.2	1.1	1.7	2.5	3.5	3.8	5.1	4.9	4.9	4.5	4.1	3.3	3.9	3.1	4.3	4.7	4.4	3.9	2.3	4.0	1.8	2.8	3.5	1.2
Gillnet	India	0.4	0.4	0.4	0.8	1.1	0.3	0.6	1.1	0.5	0.5	0.5	0.4	0.4	0.3	0.5	0.6	3.0	0.8	1.0	1.5	1.0	1.6	2.0	2.9	1.7	2.6	1.2
Gillnet	United Arab Emirates	0.9	0.9	1.3	1.3	1.3	1.6	1.6	1.6	1.6	1.6	1.7	1.7	1.7	0.9	0.9	0.9	0.9	1.5	1.5	1.4	1.4	1.4	1.4	1.4	0.4	4.0	2.6
Gillnet	Other Fleets	0.0	0.0	0.0	0.1	0.1	0.1	0.0	0.1	0.1	0.2	0.2	0.2	0.1	0.4	0.2	0.4	0.1	0.3	0.5	0.9	0.6	0.3	0.4	0.6	1.4	1.0	0.4
Gillnet	Total	5.3	4.4	5.0	5.4	5.9	6.0	7.1	8.7	8.9	10.3	10.5	10.4	10.1	8.7	7.6	10.0	11.8	16.1	21.6	25.1	26.5	21.2	24.7	28.9	31.8	34.1	28.2
Other gears	India	0.0	0.1	0.0	0.1	0.1	0.0	0.1	0.1	0.1	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.5	0.2	0.2	0.4	0.3	0.3	0.5	0.7	0.4	0.6	0.3
Other gears	Other Fleets	0.1	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.3	0.3	0.1	0.0	0.0	0.0	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.1	0.0	1.0
Other gears	Total	0.2	0.2	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.1	0.2	0.2	0.6	0.2	0.3	0.4	0.3	0.4	0.5	0.7	0.5	0.6	1.3
All	Total	5.6	4.6	5.3	5.7	6.2	6.4	7.5	9.1	9.3	10.8	11.0	10.9	10.5	9.5	8.5	10.9	12.9	16.9	23.1	26.3	27.6	22.8	27.6	31.7	33.9	42.1	37.1

Gear	Fleet	Av02/06	Av57/06	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	00	01	02	03	04	05	06
Purse seine	Malaysia	4.0	1.2	1.0	1.5	1.3	0.8	0.8	1.1	1.3	1.5	2.4	1.5	0.8	1.0	1.7	1.8	2.6	2.3	3.0	2.6	4.3	3.7	3.6	3.4	4.9
Purse seine	Thailand	2.9	1.9	5.9	2.2	1.5	1.4	1.2	1.4	1.0	5.3	2.0	3.2	2.0	3.4	4.0	3.7	9.9	5.1	4.4	1.0	2.7	3.2	2.8	2.9	2.9
Purse seine	Iran, Islamic Republic	2.9	0.5													0.7	0.8	1.5	2.1	2.7	3.0	5.8	3.6	1.5	1.2	2.3
Purse seine	Other Fleets	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.2	0.0	0.0	0.3	0.1	0.0	0.0
Purse seine	Total	9.9	3.6	6.9	3.7	2.8	2.2	2.0	2.6	2.3	6.7	4.4	4.7	2.8	4.5	6.4	6.3	14.0	9.6	11.2	6.6	12.9	10.8	8.1	7.5	10.1
Gillnet	Indonesia	31.9	14.5	15.4	15.5	15.4	16.0	17.8	20.6	15.0	18.8	15.4	25.8	31.1	30.6	32.5	33.4	32.1	34.9	36.8	29.5	32.4	33.1	35.5	29.1	29.4
Gillnet	Iran, Islamic Republic	21.8	8.7	6.1	11.8	11.7	12.1	16.9	19.4	14.9	14.6	9.8	8.2	11.5	27.2	16.5	17.9	18.2	21.3	38.7	31.9	24.1	26.7	18.0	17.3	22.8
Gillnet	Oman	7.7	4.6	6.1	6.6	7.5	17.3	15.8	8.8	7.0	4.3	5.2	6.9	5.6	4.2	5.4	5.1	4.4	4.8	5.5	6.1	6.9	8.0	8.2	7.5	7.9
Gillnet	Yemen	5.6	1.7	1.0	1.1	0.5	0.6	0.7	0.6	1.4	0.7	1.4	1.8	2.4	2.3	2.6	3.0	3.3	3.7	4.0	4.4	4.7	3.7	5.4	6.3	7.6
Gillnet	Pakistan	5.2	4.0	1.3	2.1	4.4	6.0	6.3	4.9	6.3	6.1	5.8	4.5	5.8	5.0	4.7	5.6	5.5	6.4	6.1	5.2	4.9	5.9	5.1	4.9	4.9
Gillnet	India	3.7	2.2	1.8	4.5	1.6	3.3	2.4	2.8	3.6	2.9	1.9	2.9	3.0	4.2	3.1	3.3	3.7	6.6	7.3	6.5	4.6	3.0	1.4	3.4	6.1
Gillnet	United Arab Emirates	2.2	2.2	2.6	2.4	3.4	3.1	3.4	3.4	3.4	3.3	3.4	3.4	3.8	4.9	5.0	3.2	3.2	3.2	1.5	1.5	1.9	2.9	2.0	2.0	2.0
Gillnet	Other Fleets	0.9	0.7	0.5	0.8	0.9	1.5	1.3	0.7	0.7	0.8	0.7	1.0	0.7	0.8	1.9	1.8	1.5	1.4	1.2	1.0	1.4	1.1	0.4	0.9	0.7
Gillnet	Total	78.9	38.6	34.7	44.9	45.4	60.0	64.4	61.2	52.1	51.4	43.6	54.5	63.9	79.3	71.7	73.3	71.9	82.5	101.0	86.1	80.9	84.5	76.1	71.5	81.6
Other gears	India	1.0	0.7	0.4	1.2	0.4	0.8	0.7	0.7	0.9	1.2	0.8	1.2	1.2	1.7	1.3	1.3	1.5	2.7	3.0	2.6	1.9	1.3	0.5	1.1	0.0
Other gears	Other Fleets	1.0	0.6	2.9	1.5	2.4	2.2	1.0	0.9	1.1	0.9	1.1	0.6	1.4	1.1	0.9	0.7	0.8	0.7	0.5	1.3	0.6	1.1	1.7	0.9	0.7
Other gears	Total	2.0	1.3	3.4	2.6	2.8	3.0	1.7	1.6	2.0	2.1	1.9	1.8	2.6	2.8	2.2	2.0	2.3	3.4	3.4	4.0	2.5	2.4	2.3	2.0	0.8
All	Total	90.8	43.5	45.0	51.2	51.0	65.3	68.1	65.3	56.5	60.3	49.9	61.0	69.4	86.6	80.2	81.6	88.2	95.4	115.7	96.7	96.3	97.7	86.5	81.0	92.4

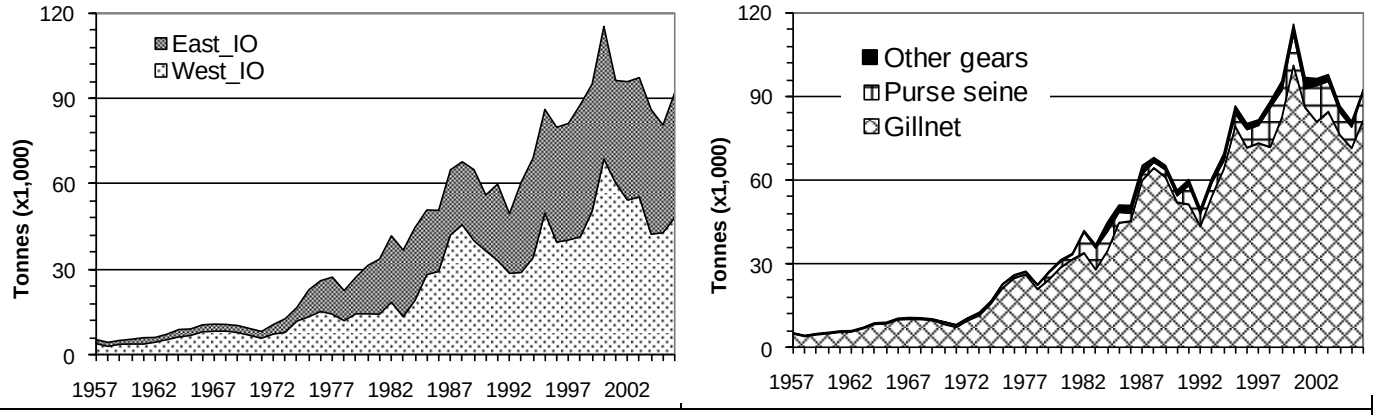


***Figure 1**. Longtail tuna: annual catches from 1957 to 2006 by area (left) and gear (right).* *Data as per October 2007*

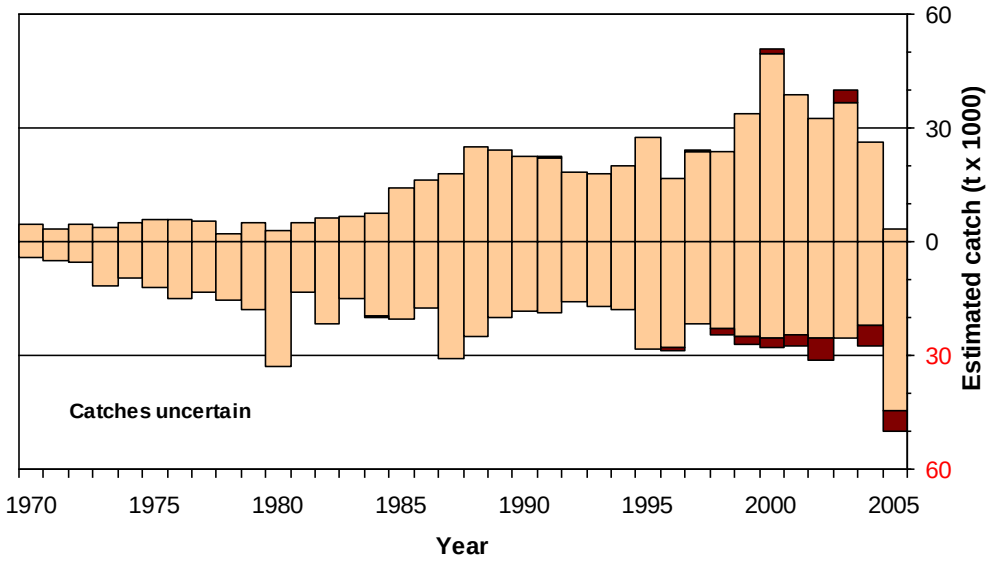


***Figure 2**. Longtail tuna: uncertainty of annual catch estimates. The amount of the catch below the zero-line has been categorised as uncertain according to the criteria given in the text. Dark sections represent estimates of catches by industrial fleets.* *Data as of October 2006 –yet to be updated*

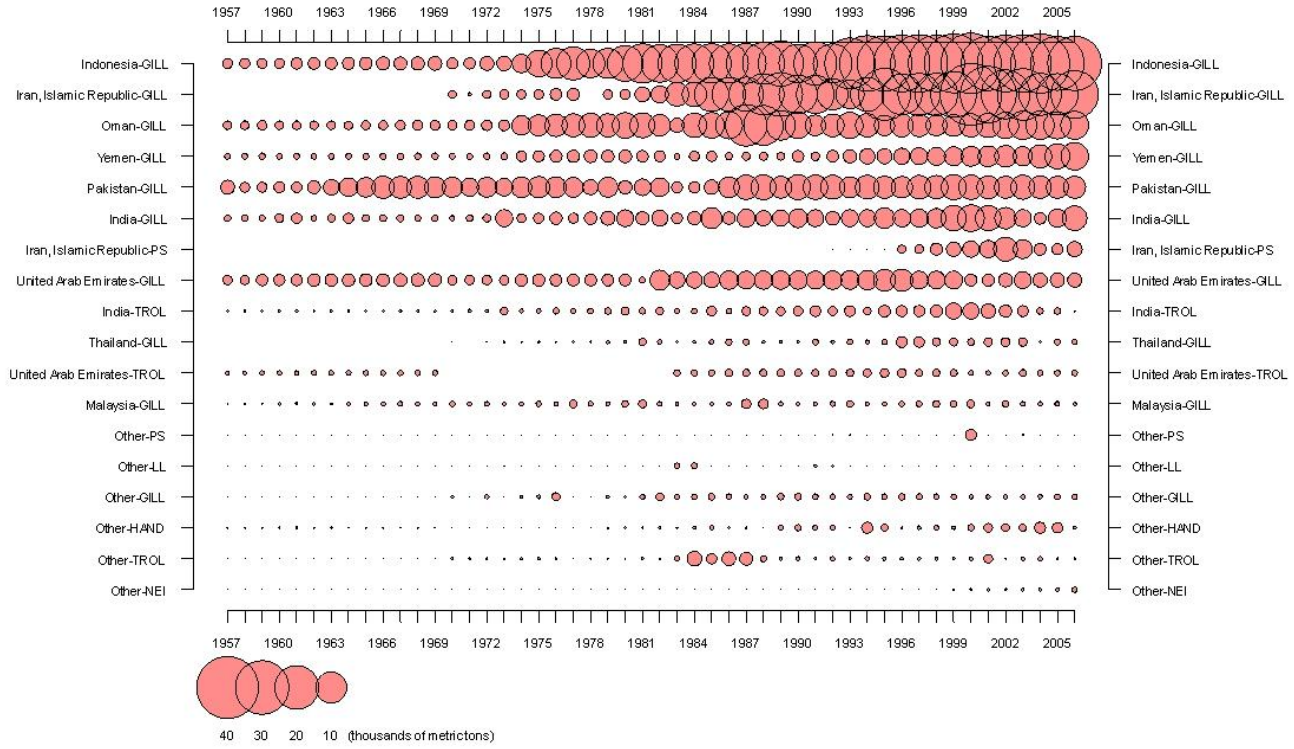


Figure 3. *Longtail tuna: **c**atches by gear and main fleets for the period 1957-2006 (in thousands of tonnes).*

Data as of October 2007

Executive summary of the status of the narrow-barred Spanish mackerel resource

(As adopted by the IOTC Scientific Committee 10 November 2006)

Marked changes are factual changes, mainly related to the inclusion of the latest fisheries statistics are shown for the consideration of the SC in Nov07
Note also, the Working Party on Neritic Tunas is due to meeting 26 Nov07 and further changes may be recommended

BIOLOGY

The narrow-barred Spanish mackerel or king seer *(Scomberomorus commerson*) is a pelagic, top level predator found throughout tropical marine waters of the Indo-West Pacific. Juveniles inhabit shallow inshore areas whereas adults are found in coastal waters out to the continental shelf. Adults are usually found in small schools but often aggregate at particular locations on reefs and shoals to feed and spawn. Spanish mackerel appear to undertake lengthy migrations. Spanish mackerel feed primarily on small fishes such as anchovies, clupeids, carangids, also squids and shrimps.

Spanish mackerel may live for up to 15 years, and grow to 240 cm fork length or 70 kg. Females are multiple spawners. Year-round spawning has been observed in east African waters, with peaks during late spring to summer (April-July) and autumn (September-November) coinciding with the two seasonal monsoons which generate high abundances of plankton and small pelagic fish. Size at first maturity is estimated to be around 52 cm for males and 81 cm for females.

Genetic studies carried out on *S. commerson* from Djibouti, Oman and U.A.E. showed there were small genetic differences among stocks in these three places.

FISHERIES

Spanish mackerel is targeted throughout the Indian Ocean by artisanal and recreational fishers. The main method of capture is gill net, but significant numbers of are also caught using trolling lines.

The catch estimates for Spanish mackerel were derived from very small amounts of information and are therefore highly uncertain[6] (Figure 2). The catches provided in Table 1 are based on the information available at the Secretariat and the following observations on the catches cannot currently be verified. The catches of Spanish mackerel increased from around 50,000 t the mid-1970's to 100,000 t by the mid-1990's. The current average annual catch is around 112,200 t (for the period 2002 to 2006), with most of the catch obtained taken from the west Indian Ocean area. (Figures 1, 3 and Table 1). In recent years, the countries attributed with the highest catches of Spanish mackerel are Indonesia, Madagascar, Pakistan, Iran and Saudi Arabia.

The size of Spanish mackerel taken varies by location with 32-119 cm fish taken in the Eastern Peninsular Malaysia area, 17-139 cm fish taken in the East Malaysia area and 50-90 cm fish taken in the Gulf of Thailand. Similarly, Spanish mackerel caught in the Oman Sea are typically larger than those caught in the Persian Gulf.

AVAILABILITY OF INFORMATION FOR STOCK ASSESSMENT

Numerous studies have been completed in Indian Ocean to determine the fecundity, the size at first maturity and age and growth parameters.

Genetic studies carried out on *S. commerson* from Djibouti, Oman and U.A.E. showed there were small genetic differences among stocks in these three places, therefore, stock assessment purposes, the use of sub-stocks may be appropriate.

Possible fishery indicators:

[6] The uncertainty in the catch estimates has been assessed by the Secretariat and is based on the amount of processing required to account for the presence of conflicting catch reports, the level of aggregation of the catches by species and or gear, and the occurrence of unreporting fisheries for which catches had to be estimated.

1. **Trends in catches**: The catch estimates for narrow-barred Spanish mackerel are highly uncertain. The trend in catches indicate a large and continuous increase in the catches from the 1970's to 2000, followed by a period of relatively stable catches at around 120,000 t (Figure 1).
2. **Nominal CPUE Trends:** data not available to the Secretariat.
3. **Average weight in the catch by fisheries:** data not available to the Secretariat.
4. **Number of squares fished:** data not available to the Secretariat.

STOCK ASSESSMENT

While some localised, sub-regional assessments have been undertaken, typically by national scientists, no quantitative stock assessment has been undertaken by the IOTC Working Party on Neritics.

MANAGEMENT ADVICE

No quantitative stock assessment is currently available for narrow-barred Spanish mackerel tuna in the Indian Ocean, therefore the stock status is uncertain. The SC notes that Spanish mackerel is a relatively productive species with high fecundity and this makes it relatively resilient and less prone to overfishing; however, it recommends that this important species be reviewed at the first meeting of the IOTC Working Party on Neritic Tunas.

NARROW-BARRED SPANISH MACKEREL SUMMARY

Maximum Sustainable Yield:	-
Preliminary catch in 2006 *(data as of October 2007)*	117,900 t
Catch in 2005	103,000 t
Mean catch over the last 5 years (2002-065)	112,200 t
Current Replacement Yield:	-
Relative Biomass ($B_{current}/B_{MSY}$):	-
Relative Fishing Mortality ($F_{current}/F_{MSY}$):	-

Table 1. *Best scientific estimates of the catches of narrow-barred Spanish mackerel (as adopted by the IOTC Scientific Committee) by gear and main fleets for the period 1957-2006 (in thousands of tonnes).* *Data as of October 2007*

Gear	Fleet	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83
Gillnet	Indonesia	0.5	0.6	0.5	0.6	0.7	0.8	0.8	0.8	1.0	1.0	0.9	0.9	1.0	1.1	1.2	1.4	1.2	1.1	5.6	3.7	5.0	4.3	3.9	6.1	4.4	6.1	7.7
Gillnet	India	2.6	2.3	2.0	2.6	3.4	3.2	2.7	3.1	2.6	2.8	2.7	3.8	3.3	3.8	5.5	6.0	6.1	6.6	6.3	7.3	5.3	5.1	7.9	9.3	7.8	11.0	10.0
Gillnet	Pakistan	2.1	1.1	1.1	1.3	1.2	1.8	2.7	3.8	4.1	5.5	5.3	5.3	4.8	4.4	3.5	7.5	4.9	4.4	3.1	3.7	5.4	5.8	9.2	2.0	7.3	7.4	8.0
Gillnet	Iran, Islamic Republic																										0.1	1.4
Gillnet	United Arab Emirates	1.0	1.0	1.6	1.6	1.6	1.8	1.8	1.8	2.0	2.0	2.1	2.1	2.1	2.2	2.4	2.4	2.4	3.7	3.7	3.6	3.6	3.6	3.6	3.6	3.5	6.5	5.4
Gillnet	Sri Lanka	0.9	1.0	1.2	1.2	1.3	2.1	3.0	2.6	2.2	3.8	5.4	5.3	5.2	3.9	2.6	2.9	3.3	3.2	3.1	3.9	3.8	3.9	4.5	6.1	5.0	4.5	4.0
Gillnet	Saudi Arabia																									0.6	0.5	0.7
Gillnet	Oman	1.3	1.3	1.6	1.3	1.3	1.3	1.3	1.3	1.4	1.4	1.7	1.7	1.7	1.6	1.7	1.9	2.1	6.7	7.8	8.9	9.4	10.3	9.5	11.7	11.1	8.2	3.6
Gillnet	Yemen	0.8	0.8	1.0	0.8	0.8	0.8	0.8	0.8	0.9	0.9	1.0	1.0	1.0	0.8	0.9	1.0	1.1	2.6	3.1	3.5	3.7	4.0	3.7	4.1	3.3	2.9	0.9
Gillnet	Qatar																										0.2	0.2
Gillnet	Malaysia	0.3	0.3	0.3	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.2	0.2								2.9	3.1	3.4	2.7	3.2	3.9	3.4
Gillnet	Other Fleets	0.0	0.0	0.0				0.0	0.0	0.5	0.2	0.1	0.0	0.0	0.7	0.7	0.8	0.8	0.8	0.9	1.6	2.6	1.8	2.2	1.7	3.2	2.8	2.7
Gillnet	Total	9.6	8.5	9.2	9.4	10.3	11.9	13.2	14.4	14.9	17.7	19.5	20.4	19.4	18.5	18.4	24.0	21.8	29.1	33.6	36.2	41.7	41.9	47.8	47.3	49.6	54.1	47.8
Line	India	0.4	0.3	0.3	0.4	0.5	0.5	0.4	0.5	0.4	0.4	0.4	0.5	0.5	0.6	0.8	0.9	0.9	1.0	0.9	1.1	0.8	0.7	1.1	1.4	1.1	1.6	1.5
Line	Saudi Arabia																									0.2	0.2	0.3
Line	Other Fleets	0.5	0.6	0.9	0.7	0.7	1.0	1.3	1.2	1.2	1.6	1.9	2.0	2.0	1.3	1.0	1.0	1.2	1.1	1.6	1.6	1.9	1.9	1.9	3.3	2.7	1.8	2.8
Line	Total	0.9	0.9	1.2	1.1	1.2	1.4	1.7	1.6	1.5	2.0	2.3	2.5	2.4	1.8	1.8	1.8	2.1	2.1	2.5	2.7	2.6	2.6	3.1	4.6	4.0	3.6	4.6
Other gears	India	1.6	1.4	1.2	1.6	2.1	2.0	1.7	1.9	1.6	1.7	1.7	2.3	2.0	2.3	3.4	3.6	3.7	4.0	3.8	4.5	3.2	3.1	4.8	5.7	4.8	6.7	6.1
Other gears	Thailand														0.1	0.3	0.2	0.0	0.0	0.0	0.4	0.1	0.1	0.0	0.3	0.2	0.7	0.7
Other gears	Other Fleets	0.1	0.1	0.1	0.2	0.3	0.3	0.3	0.7	0.9	0.9	0.8	0.9	0.8	0.7	0.9	0.6	0.3	0.5	0.5	0.7	0.9	0.8	0.5	0.5	0.0	0.3	0.1
Other gears	Total	1.7	1.5	1.3	1.8	2.4	2.3	2.0	2.6	2.5	2.6	2.5	3.2	2.9	3.1	4.5	4.4	4.1	4.6	4.4	5.6	4.2	4.0	5.4	6.4	5.0	7.7	7.0
All	Total	12.2	10.9	11.6	12.3	13.9	15.7	16.8	18.6	18.9	22.3	24.2	26.0	24.7	23.4	24.7	30.2	28.0	35.8	40.5	44.4	48.5	48.5	56.3	58.3	58.6	65.4	59.4

Gear	Fleet	Av02/06	Av57/06	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	00	01	02	03	04	05	06
Gillnet	Indonesia	19.8	7.7	6.5	6.2	7.6	8.6	10.2	9.7	8.5	10.0	10.8	13.5	12.4	13.7	15.9	14.9	16.8	16.2	18.4	20.8	17.2	18.0	22.6	20.3	21.1
Gillnet	India	18.2	9.4	10.6	9.3	13.3	10.3	11.7	12.3	9.1	9.8	13.9	11.8	14.0	16.3	14.0	14.5	18.3	17.7	20.8	15.7	20.6	19.4	15.7	13.7	21.4
Gillnet	Pakistan	8.8	6.5	6.9	7.4	7.6	7.8	10.2	6.8	6.3	10.2	8.4	8.4	7.2	8.6	10.1	12.5	12.7	13.2	10.7	9.3	8.7	9.3	9.5	8.2	8.2
Gillnet	Iran, Islamic Republic	7.6	2.1	0.6	0.7	0.7	1.1	1.0	2.5	3.4	3.7	3.3	2.9	3.1	11.1	3.6	3.9	4.0	4.6	7.1	6.1	8.6	8.1	7.1	5.9	8.3
Gillnet	United Arab Emirates	4.3	4.3	5.4	4.2	6.7	5.7	6.1	6.4	6.3	6.0	6.2	6.2	6.9	6.8	7.1	8.3	8.6	9.0	8.2	9.0	3.3	4.9	4.4	4.4	4.4
Gillnet	Sri Lanka	3.2	3.7	3.7	3.8	4.0	4.1	4.3	4.3	4.3	4.2	4.1	4.1	4.1	4.8	4.0	4.2	4.6	5.0	5.0	4.9	5.1	4.5	4.5	0.7	0.9
Gillnet	Saudi Arabia	3.2	2.5	0.8	7.1	7.7	7.0	7.1	6.7	7.6	7.8	7.9	8.3	8.5	6.0	5.0	3.7	4.7	3.8	3.5	4.8	4.0	3.1	2.9	2.9	2.9
Gillnet	Oman	2.7	5.7	10.7	20.3	14.3	25.3	27.8	11.1	7.8	3.6	3.6	3.1	3.8	6.1	5.2	5.9	3.1	3.4	2.6	2.8	2.1	2.8	3.2	2.7	2.9
Gillnet	Yemen	1.8	2.2	4.5	3.5	3.8	3.3	2.6	2.3	3.1	3.2	2.6	3.1	3.3	3.0	2.4	2.3	2.2	2.2	2.1	2.0	1.9	1.8	1.8	1.8	1.8
Gillnet	Qatar	1.6	0.3	0.3	0.3	0.1	0.1	0.1	0.2	0.6	0.7	0.8	0.6	0.4	0.3	0.3	0.4	0.6	0.5	0.8	1.0	1.0	1.9	1.5	1.9	1.9
Gillnet	Malaysia	1.3	1.5	2.1	2.6	3.5	3.8	3.2	2.4	2.7	2.8	3.5	2.8	2.7	1.9	2.1	2.3	3.0	0.7	0.9	1.0	1.7	1.5	1.4	0.8	1.0
Gillnet	Other Fleets	3.2	1.9	1.8	2.5	2.8	2.9	2.6	2.6	3.4	3.0	3.5	3.0	2.6	3.2	3.4	3.3	3.7	3.9	2.8	3.3	3.3	3.3	2.8	3.3	3.3
Gillnet	Total	75.7	47.8	53.9	68.0	72.1	80.0	87.2	67.3	63.1	65.2	68.5	67.9	69.1	81.8	73.2	76.1	82.6	80.1	82.8	80.8	77.5	78.7	77.4	66.6	78.1
Line	Madagascar	12.0	4.1			3.8	7.9	0.4	8.5	10.0	8.0	8.0	10.0	10.0	10.0	10.0	10.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0
Line	India	2.8	1.4	1.5	1.4	1.9	1.5	1.7	1.8	1.3	1.4	2.0	1.7	2.0	2.4	2.0	2.1	2.7	2.6	3.0	2.3	3.0	2.8	2.3	2.8	3.2
Line	Saudi Arabia	2.4	0.9	0.3	1.2	1.4	2.0	2.3	2.5	1.3	1.4	2.2	2.6	2.9	0.9	1.0	2.3	2.4	2.7	2.4	2.3	2.3	2.7	2.2	2.4	2.4
Line	Other Fleets	2.8	2.2	2.4	2.1	2.7	3.6	2.7	3.2	3.5	3.7	3.1	3.6	3.8	2.7	2.9	3.1	2.9	2.3	2.7	3.7	2.4	3.0	2.9	3.1	2.5
Line	Total	20.0	8.6	4.3	4.7	9.8	14.9	7.1	16.0	16.1	14.6	15.4	17.9	18.8	16.0	15.9	17.5	19.9	19.5	20.1	20.3	19.7	20.5	19.5	20.4	20.2
Other gears	India	12.0	5.8	6.5	5.7	8.1	6.3	7.2	7.5	5.5	6.0	8.5	7.2	8.6	9.9	8.6	8.9	11.2	10.8	12.7	9.6	12.6	11.9	10.2	11.7	13.7
Other gears	Thailand	2.7	0.8	0.4	0.5	0.8	0.7	0.4	0.8	1.0	0.9	1.3	1.2	1.0	1.4	2.8	2.7	2.7	1.1	1.8	1.9	2.5	2.5	3.0	2.7	2.7
Other gears	Other Fleets	1.8	0.6	0.1	0.0	0.2	0.4	0.2	0.3	0.1	0.2	0.3	0.3	0.4	0.1	0.1	0.4	0.5	1.6	1.7	1.2	1.8	1.3	1.1	1.7	3.2
Other gears	Total	16.5	7.2	6.9	6.2	9.1	7.4	7.8	8.6	6.6	7.1	10.1	8.7	9.9	11.5	11.4	12.0	14.4	13.6	16.3	12.8	16.9	15.7	14.3	16.1	19.6
All	Total	112.2	63.6	65.1	78.9	91.0	102.3	102.1	91.9	85.8	86.9	93.9	94.5	97.9	109.3	100.5	105.7	116.8	113.2	119.2	113.9	114.1	114.9	111.2	103.0	117.9

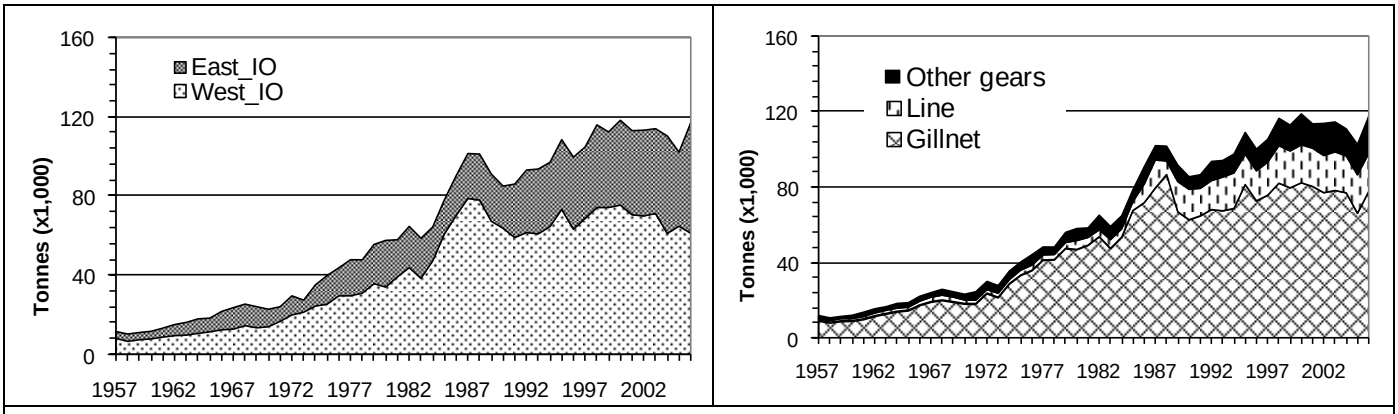


Figure 1. *Narrow-barred Spanish mackerel: (a) annual catches from 1957 to 2006 by (on the left) area i.e. Eastern and Western Indian Ocean and (on the right) gear.* *Data as of October 2007*

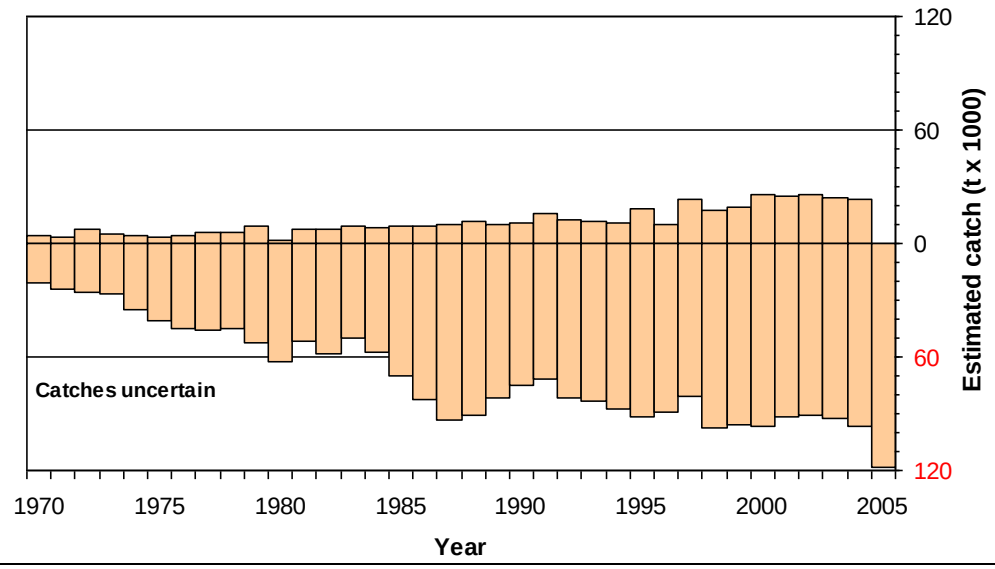


Figure 2*. Narrow-barred Spanish mackerel: uncertainty of annual catch estimates. The amount of the catch below the zero-line has been categorised as uncertain according to the criteria given in the text.* *Data as of October 2006- yet to be updated*

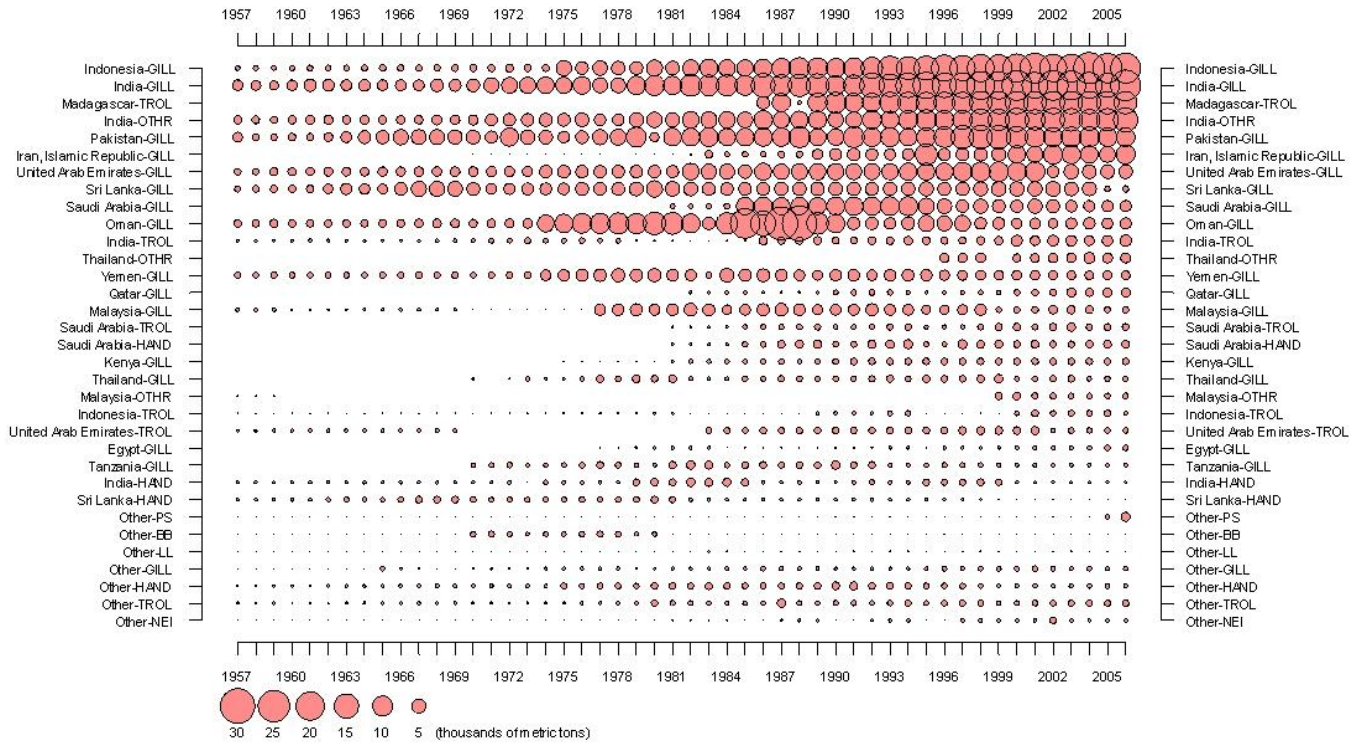


Figure 3. *Narrow barred Spanish mackerel: catches of by gear and main fleets for the period 1957-2006 (in thousands of tonnes).* *Data as of October 2007*

Executive summary of the status of the wahoo resource

(As adopted by the IOTC Scientific Committee 10 November 2006)

Marked changes are factual changes, mainly related to the inclusion of the latest fisheries statistics are shown for the consideration of the SC in Nov07
Note also, the Working Party on Neritic Tunas is due to meeting 26 Nov07 and further changes may be recommended

BIOLOGY

Wahoo (*Acanthocybium solandri*) occurs widely in the tropical and sub-tropical waters of the major oceans. Larger individuals are solitary but may also be found in small, loose aggregations. Like other oceanic scombrids, wahoo are often found in association with current lines, near seamounts and around floating objects and debris. Little is known of their early life history; however wahoo larvae are pelagic and prefer shallow water less than 100 m in depth. The distribution of juveniles is unknown.

As a top-level predator, wahoo feeds on a range of open-water prey including other scombrids (e.g. skipjack tuna, frigate tuna), scads, flying fish, squid and occasionally fishes of the mixed scattering layer (e.g. lantern fish).

Wahoo live for over six years, grow rapidly and can reach a size of 210 cm fork length and around 83 kg. Size changes with latitude, with average weight increasing with distance from the equator; this is apparently correlated to cooler temperatures.

Sexual maturity occurs at around of 90 cm but some wahoo may commence spawning after one year. Spawning occurs year-round in the tropics and during the summer months in subtropical waters. Wahoo are probably multiple spawners, with spawning occurring over a protracted period when favourable conditions (temperature, food) are encountered. Fecundity is relatively high (e.g. six million eggs per spawning for a 131 cm fish). Males appear to predominate at sizes greater than 140 cm.

Little information is available on wahoo movement, although seasonal changes in availability and the latitudinal variation in average size suggest that some seasonal migration may occur.

No information is available on the stock structure of wahoo in Indian Ocean.

FISHERIES

Wahoo is mainly taken with hand line and gillnet combined with drifting long line, it is also a bycatch of longline fisheries. Trolling is a common method to catch wahoo in Maldives. It is caught in similar quantities in both western and eastern areas of the Indian Ocean (Figure 1). Wahoo is also a bycatch of longline fisheries. The catch estimates for wahoo were derived from very small amounts of information and are therefore underestimated and highly uncertain[7] (Figure 2). The catches provided in Table 1 are based on the information available at the Secretariat and the following observations on the catches cannot currently be verified. Estimated catches of wahoo jumped from negligible levels to just below 300 t in the 1980's. Catches peaked in 1991 at 900 t and thereafter fluctuated between 300 and 500 t. The current average annual catch is around 500 t (for the period 2002 to 2006). In recent years, the countries attributed with the highest catches of wahoo are Indonesia, Sri Lanka, Tanzania, Indonesia, France and Kenya.

AVAILABILITY OF INFORMATION FOR STOCK ASSESSMENT

There is no information on the stock structure of wahoo in the Indian Ocean.

Information is available on fecundity, the size at first maturity, age and growth of wahoo in other oceans.

Possible fishery indicators:

[7] The uncertainty in the catch estimates has been assessed by the Secretariat and is based on the amount of processing required to account for the presence of conflicting catch reports, the level of aggregation of the catches by species and or gear, and the occurrence of unreporting fisheries for which catches had to be estimated.

1. **Trends in catches**: The catch estimates for wahoo are highly uncertain. Catches have been variable but around the 300-500 t mark since early 1990's (Figure 1).
2. **Nominal CPUE Trends:** data not available to the Secretariat.
3. **Average weight in the catch by fisheries:** data not available to the Secretariat.
4. **Number of squares fished:** data not available to the Secretariat.

STOCK ASSESSMENT

While some localised, sub-regional assessments may have been undertaken, no quantitative stock assessment has been undertaken by the IOTC Working Party on Neritics.

MANAGEMENT ADVICE

No quantitative stock assessment is currently available for wahoo in the Indian Ocean, therefore the stock status is uncertain. However, wahoo is a relatively productive species with high fecundity and rapid growth and these attributes make it relatively resilient and not prone to overfishing.

The SC recommends that this species be reviewed at the first meeting of the IOTC Working Party on Neritic Tunas.

WAHOO SUMMARY

Maximum Sustainable Yield:	-
Preliminary catch in 2006 *(data as of October 2007)*	300 t
Catch in 2005	500 t
Mean catch over the last 5 years (2002-06)	500 t
Current Replacement Yield:	-
Relative Biomass ($B_{current}/B_{MSY}$):	-
Relative Fishing Mortality ($F_{current}/F_{MSY}$):	-

Table 1. *Best scientific estimates of the catches of wahoo (as adopted by the IOTC Scientific Committee) by gear and main fleets for the period 1957-2006 (in thousands of tonnes).* *Data as of October 2007*

Gear	Fleet	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83
Gillnet	India	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0
Gillnet	Other Fleets	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Gillnet	Total	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Line	Tanzania														0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0			
Line	India	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0
Line	Sri Lanka	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.2
Line	Total	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.0	0.2	0.2
Other gears	Indonesia																						0.0	0.0	0.0	0.0	0.0	0.0
Other gears	India	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0
Other gears	Other Fleets									0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Other gears	Total	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
All	Total	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.2	0.3

Gear	Fleet	Av02/06	Av57/06	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	00	01	02	03	04	05	06
Gillnet	Sri Lanka	0.1	0.0			0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.2	0.1	0.0	0.1	0.1	0.2	0.2	0.2	0.2	0.1	0.1	0.1	0.1
Gillnet	India	0.0	0.0	0.0	0.0	0.0			0.1	0.0	0.3	0.0	0.0		0.0	0.0	0.0					0.0	0.0	0.0	0.1	0.0
Gillnet	Other Fleets	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0					0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Gillnet	Total	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.3	0.0	0.2	0.2	0.1	0.0	0.1	0.1	0.2	0.2	0.2	0.2	0.1	0.1	0.2	0.1
Line	France-Territories	0.1	0.0												0.0	0.0	0.0	0.0	0.1	0.0	0.1	0.1	0.1	0.1		
Line	France-Reunion	0.1	0.0										0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.1	0.1	0.1	0.0	0.0	0.0
Line	Tanzania	0.0	0.0	0.1	0.1	0.1	0.1	0.2	0.1	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Line	Kenya	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Line	India	0.0	0.0	0.0	0.0	0.0			0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0					0.0	0.0	0.0	0.0	0.0
Line	Sri Lanka	0.0	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Line	Other Fleets	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Line	Total	0.2	0.1	0.2	0.3	0.3	0.3	0.4	0.3	0.4	0.4	0.4	0.3	0.3	0.3	0.3	0.3	0.2	0.2	0.2	0.2	0.2	0.3	0.2	0.1	0.1
Other gears	Indonesia	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1
Other gears	India	0.0	0.0	0.0	0.0	0.0			0.1	0.0	0.2	0.0	0.0		0.0	0.0	0.0			0.0		0.0	0.0	0.0	0.1	0.0
Other gears	Other Fleets	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Other gears	Total	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1
All	Total	0.5	0.2	0.3	0.3	0.3	0.3	0.4	0.6	0.4	0.9	0.4	0.5	0.5	0.4	0.4	0.4	0.3	0.5	0.4	0.4	0.5	0.5	0.4	0.5	0.3

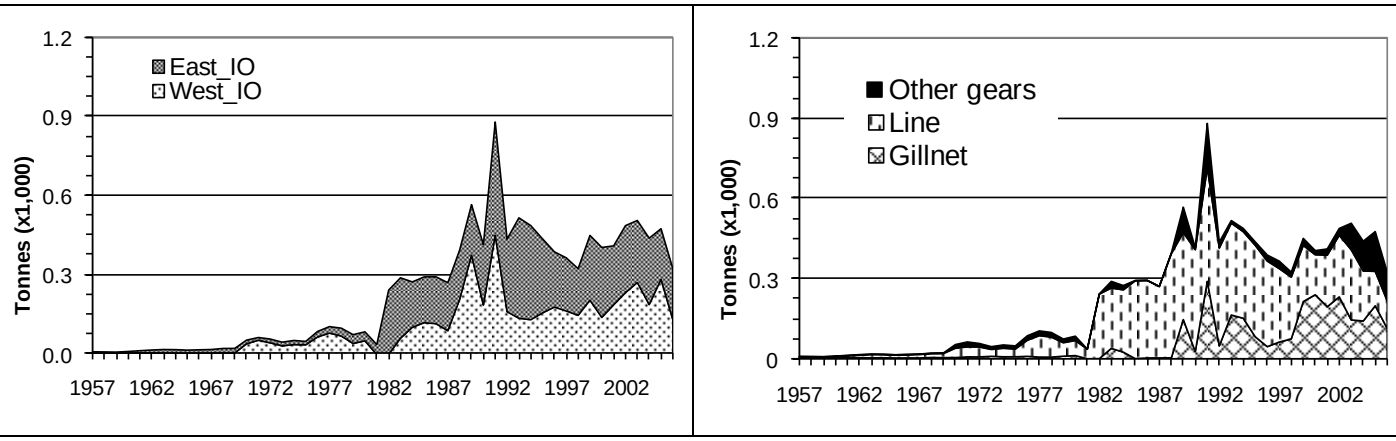


***Figure 1**. Wahoo: annual catches (thousand of metric tonnes) by area (left) and gear (right) from 1957 to 2006). Data as of October 2007*

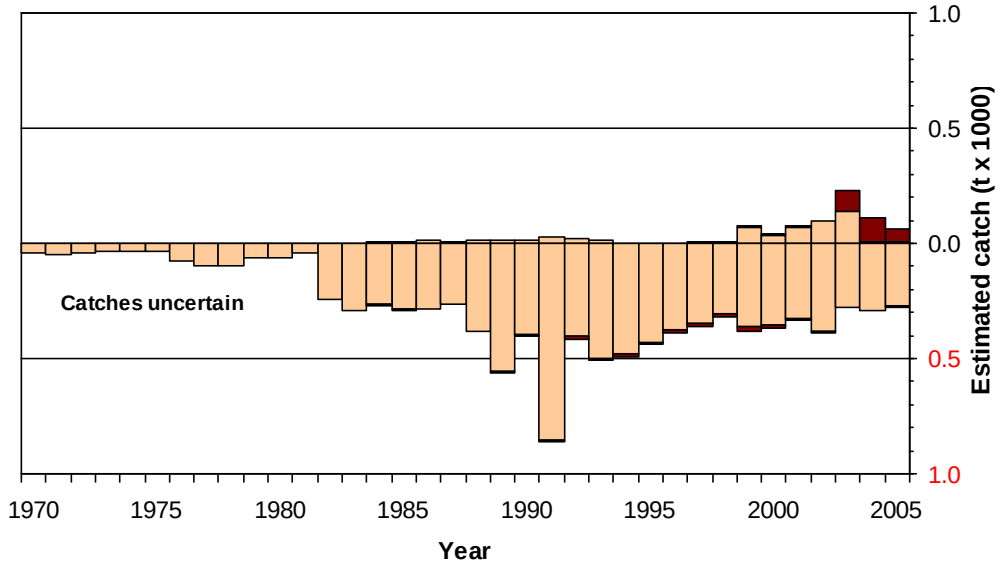


***Figure 2**. Wahoo: uncertainty of annual catch estimates. The amount of the catch below the zero-line has been categorised as uncertain according to the criteria given in the text. Dark sections represent estimates of catches by industrial fleets.*

Data as of October 2006 – yet to be updated

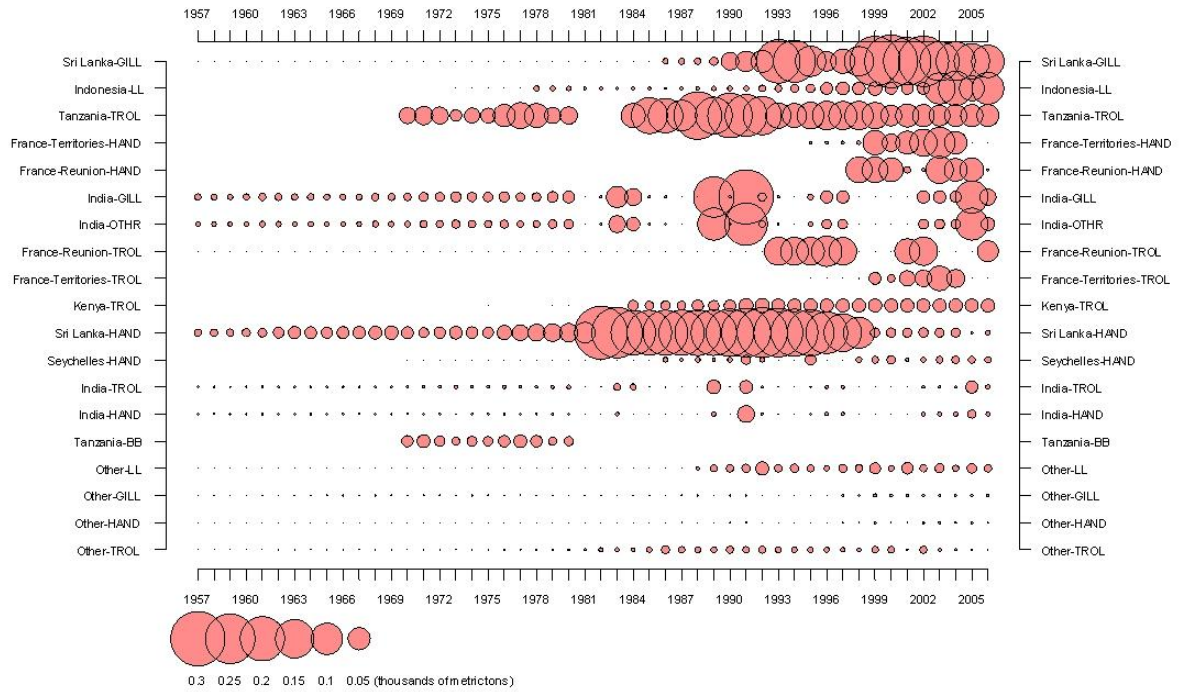


Figure 3. *Wahoo: catches by gear and main fleets for the period 1957-2006 (in thousands of tonnes).* *Data as of October 2007*