

## Executive Summary of the Status Of The Narrow-barred Spanish Mackerel Resource

New document to be submitted for consideration by the SC in Nov06

### 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<sup>1</sup> (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 117,500 t (for the period 2001 to 2005), with most of the catch obtained taken from the west Indian Ocean area. (Figures 1, 3 and Tables 1).

Nineteen countries reported catches of Spanish mackerel in the IOTC region in 2005 (Figure 2). The highest catches were reported by India (29,081 t or 24% of the total catch), followed by Indonesia (22,793 t, 19 %), Madagascar (12,000 t, 10%), Pakistan (9,493 t, 8 %), Iran (7,079 t, 6 %) and Saudi Arabia (5,516 t, 5 %).

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.

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<sup>1</sup> 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.

## 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:

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
3. **Average weight in the catch by fisheries:**
4. **Number of squares fished:** CE data not available

## 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 rapid growth and this makes it relatively resilient and less prone to overfishing; however, it recommends that this important species be reviewed every 2 to 3 years by the IOTC Working Party on Neritics.

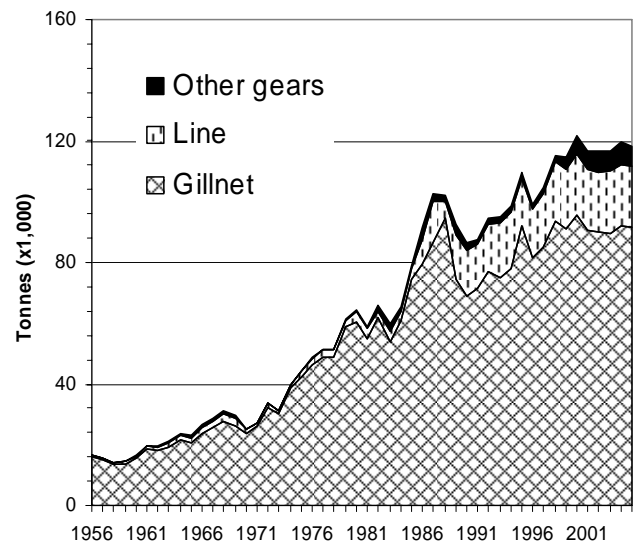
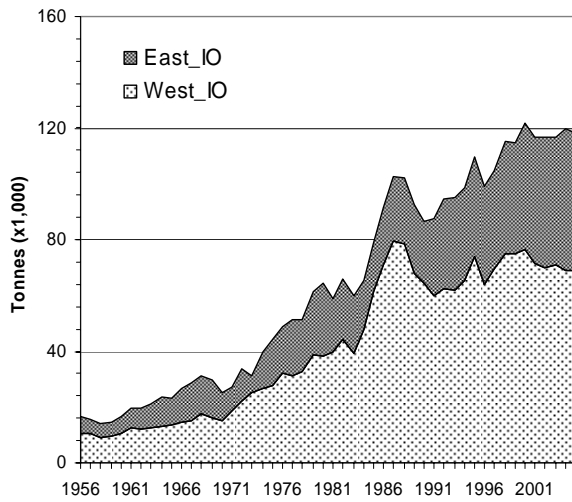
## NARROW-BARRED SPANISH MACKEREL SUMMARY

Maximum Sustainable Yield :	-
Current (2005) Catch:	118,240 tonnes
Mean catch over the last 5 years (2001-05)	117,726 tones
Current Replacement Yield :	-
Relative Biomass ( $B_{\text{current}}/B_{\text{MSY}}$ ) :	-
Relative Fishing Mortality ( $F_{\text{current}}/F_{\text{MSY}}$ ):	-

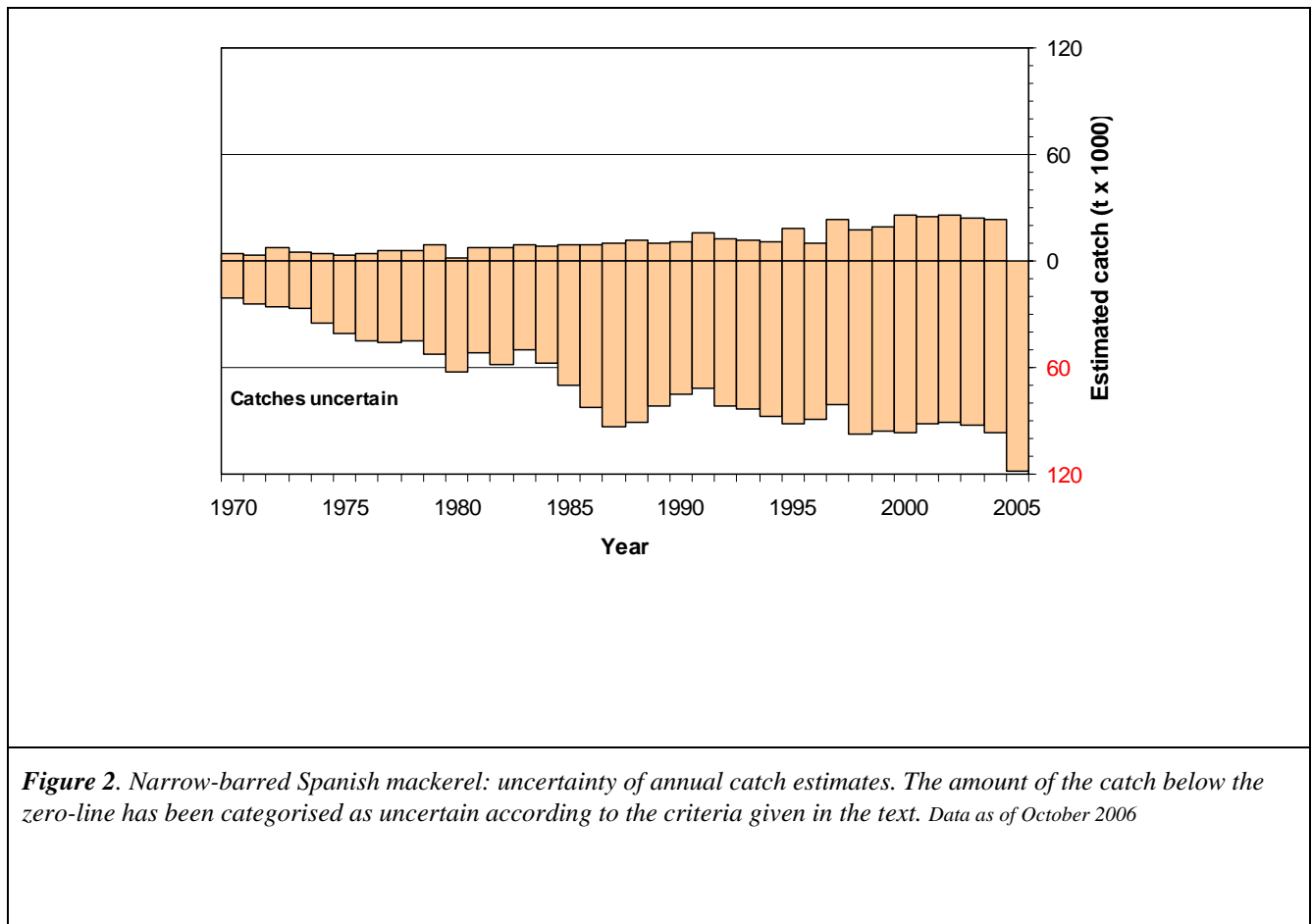
**Table 1.** Narrow barred Spanish mackerel: catches of by gear and main fleets for the period 1956-2005 (in thousands of tonnes). Data as of 12 October 2006.

Gear	Fleet	56	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	
Gillnet	India	10.0	7.4	6.8	5.8	8.2	11.0	8.6	8.1	9.6	7.7	7.9	8.2	10.4	9.3	9.3	13.2	14.6	14.3	16.2	15.3	17.6	12.7	12.3	18.8	22.3	13.2	18.5	
	Indonesia	1.1	1.0	1.1	1.0	1.1	1.3	1.4	1.4	1.5	1.7	1.8	1.7	1.8	2.0	1.1	1.1	1.3	1.2	1.0	5.1	3.4	4.6	4.0	3.6	5.8	4.2	5.9	
	Pakistan	0.8	2.1	1.1	1.1	1.3	1.2	1.8	2.7	3.8	4.1	5.4	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	1.9	7.3	7.3	
	Iran, Islamic Republic																											0.1	
	United Arab Emirates	0.8	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	
	Sri Lanka	0.8	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	
	Saudi Arabia																											0.6	0.5
	Oman	1.3	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	
	Egypt																							0.0	0.0	0.2	0.2	0.3	0.3
	Yemen	0.8	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	
	Malaysia	0.3	0.3	0.3	0.3	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.3	0.2	0.2	0.2								3.0	3.3	3.6	2.9	3.5	4.1
	Other Fleets	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.6	0.2	0.1	0.0	0.0	0.7	0.6	0.8	0.8	0.7	0.9	1.5	2.6	1.8	2.1	1.6	3.1	2.8
	<b>Total</b>		<b>16.0</b>	<b>14.8</b>	<b>13.4</b>	<b>13.5</b>	<b>15.4</b>	<b>18.4</b>	<b>17.9</b>	<b>19.2</b>	<b>21.5</b>	<b>20.8</b>	<b>23.7</b>	<b>25.7</b>	<b>27.9</b>	<b>26.3</b>	<b>23.9</b>	<b>26.0</b>	<b>32.4</b>	<b>29.9</b>	<b>38.6</b>	<b>42.1</b>	<b>46.2</b>	<b>49.0</b>	<b>48.9</b>	<b>58.8</b>	<b>60.3</b>	<b>55.0</b>	<b>61.7</b>
Line	Saudi Arabia																											0.2	0.2
	Other Fleets	0.7	0.7	0.8	1.1	0.9	1.0	1.2	1.5	1.4	1.5	1.9	2.2	2.2	2.3	1.3	1.1	1.1	1.2	1.2	2.1	1.9	2.2	2.2	2.2	3.7	2.9	2.0	
	<b>Total</b>	<b>0.7</b>	<b>0.7</b>	<b>0.8</b>	<b>1.1</b>	<b>0.9</b>	<b>1.0</b>	<b>1.2</b>	<b>1.5</b>	<b>1.4</b>	<b>1.5</b>	<b>1.9</b>	<b>2.2</b>	<b>2.2</b>	<b>2.3</b>	<b>1.3</b>	<b>1.1</b>	<b>1.1</b>	<b>1.2</b>	<b>1.2</b>	<b>2.1</b>	<b>1.9</b>	<b>2.2</b>	<b>2.2</b>	<b>2.2</b>	<b>3.7</b>	<b>3.1</b>	<b>2.2</b>	
Other gears	Thailand															0.1	0.3	0.2	0.1	0.0	0.1	0.5	0.1	0.1	0.0	0.3	0.3	0.8	
	Malaysia	0.1	0.1	0.1	0.1	0.3	0.4	0.4	0.4	0.8	1.1	1.2	1.0	1.1	1.0										0.0	0.2	0.0	0.4	
	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	0.1	0.1	0.1	0.3	0.0	0.6	0.9	
	<b>Total</b>	<b>0.1</b>	<b>0.1</b>	<b>0.1</b>	<b>0.1</b>	<b>0.3</b>	<b>0.4</b>	<b>0.4</b>	<b>0.4</b>	<b>0.8</b>	<b>1.1</b>	<b>1.2</b>	<b>1.0</b>	<b>1.1</b>	<b>1.0</b>	<b>0.1</b>	<b>0.3</b>	<b>0.2</b>	<b>0.1</b>	<b>0.0</b>	<b>0.1</b>	<b>0.5</b>	<b>0.2</b>	<b>0.3</b>	<b>0.5</b>	<b>0.3</b>	<b>0.9</b>	<b>2.1</b>	
<b>All</b>	<b>Total</b>	<b>16.7</b>	<b>15.6</b>	<b>14.3</b>	<b>14.7</b>	<b>16.6</b>	<b>19.8</b>	<b>19.6</b>	<b>21.1</b>	<b>23.7</b>	<b>23.4</b>	<b>26.8</b>	<b>28.9</b>	<b>31.2</b>	<b>29.6</b>	<b>25.3</b>	<b>27.4</b>	<b>33.7</b>	<b>31.2</b>	<b>39.8</b>	<b>44.3</b>	<b>48.6</b>	<b>51.4</b>	<b>51.4</b>	<b>61.5</b>	<b>64.3</b>	<b>59.1</b>	<b>66.0</b>	

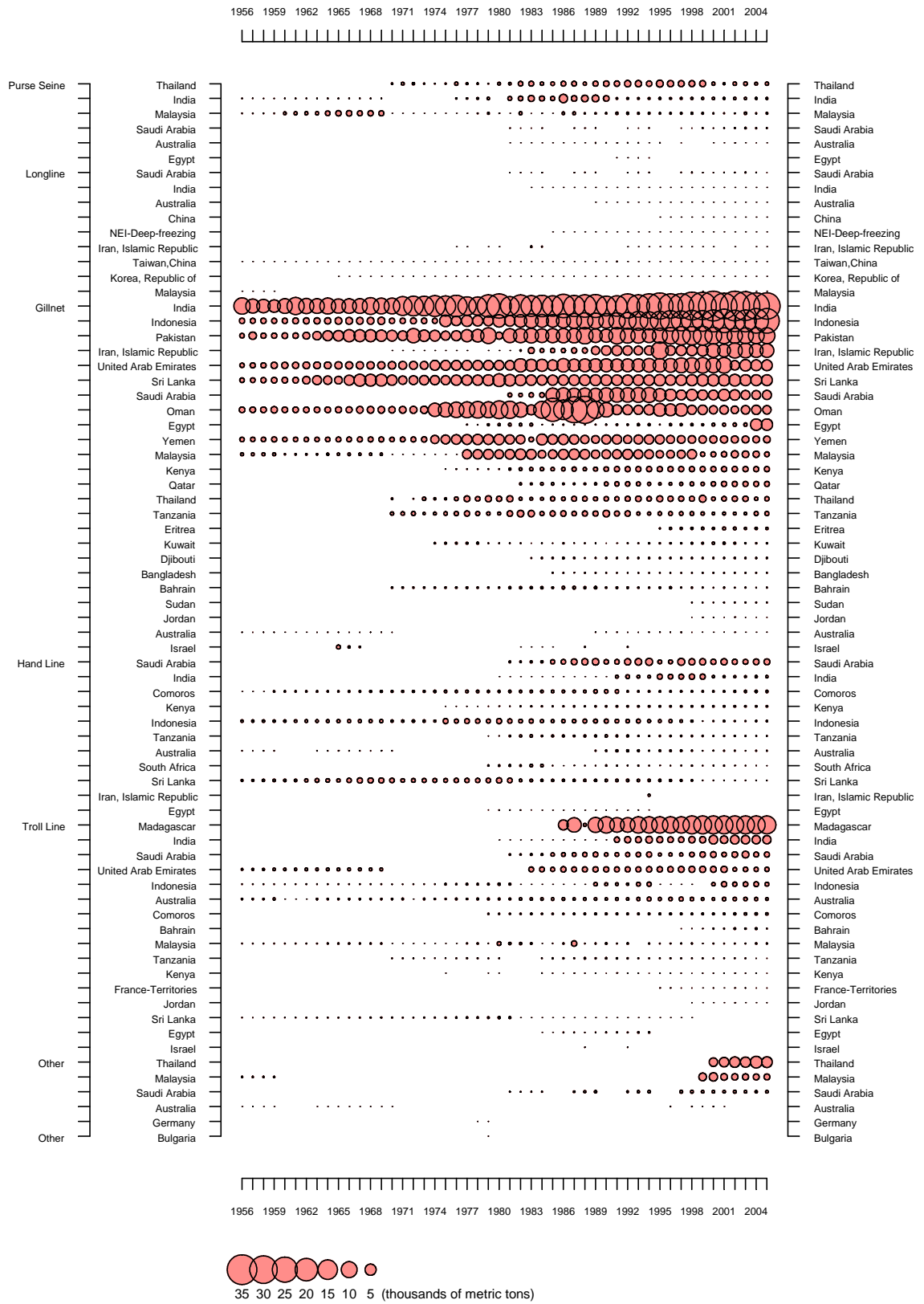
Gear	Fleet	Av01/05	Av56/05	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	00	01	02	03	04	05
Gillnet	India	28.4	16.8	16.2	17.6	15.7	20.7	16.8	19.0	19.8	14.7	15.8	22.3	18.8	22.4	26.0	22.4	23.2	29.3	28.3	33.3	25.2	33.0	31.1	26.2	26.2
	Indonesia	20.2	7.4	7.4	6.3	6.1	7.5	8.4	10.0	9.2	8.2	10.0	10.8	13.5	12.4	13.7	16.0	14.9	16.8	16.2	18.5	20.8	17.2	18.0	22.5	22.8
	Pakistan	9.3	6.4	7.9	6.9	7.3	7.6	7.8	10.2	6.8	6.3	10.1	8.4	8.4	7.2	8.6	10.1	12.5	12.8	13.3	10.8	9.4	8.8	9.4	9.5	9.5
	Iran, Islamic Republic	7.4	1.9	1.4	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	7.1
	United Arab Emirates	5.2	4.3	5.4	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
	Sri Lanka	4.7	3.7	4.0	3.7	3.8	4.0	4.1	4.2	4.3	4.3	4.2	4.1	4.1	4.1	4.8	4.0	4.2	4.6	5.0	4.9	4.9	5.1	4.5	4.5	4.5
	Saudi Arabia	3.6	2.5	0.7	0.8	7.1	7.7	7.0	7.1	6.7	7.6	7.8	7.9	8.3	8.5	6.1	5.0	3.7	4.7	3.8	3.5	4.9	4.0	3.1	2.9	3.2
	Oman	2.7	5.7	3.6	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
	Egypt	2.2	0.3	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.2	0.2	0.0	0.2	0.2	0.2	0.2	0.3	0.4	0.4	0.4	4.9	4.9
	Yemen	1.9	2.1	0.9	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
	Malaysia	1.4	1.6	3.6	2.2	2.8	3.7	4.0	3.4	2.6	2.8	3.0	3.7	3.0	2.9	2.0	2.2	2.4	3.2	0.7	0.9	1.1	1.8	1.6	1.5	0.9
	Other Fleets	3.9	2.0	2.6	2.1	2.9	2.9	3.1	2.8	2.8	4.0	3.7	4.2	3.6	2.9	3.5	3.5	3.5	3.7	4.4	3.3	4.0	4.0	3.9	3.6	3.9
	Total	90.8	54.7	54.0	##	74.5	79.6	86.7	94.4	74.7	68.7	71.3	77.2	75.2	77.8	91.8	81.7	85.0	93.5	91.0	95.4	90.5	90.1	89.6	92.2	91.8
	Line	Madagascar	12.0	3.9				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
India		2.8	0.7									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	2.8	2.8
Saudi Arabia		2.4	0.9	0.3	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
Other Fleets		2.9	2.3	3.0	2.6	2.3	2.8	3.7	2.9	3.6	3.8	3.7	3.1	3.6	3.9	2.7	2.9	3.1	2.8	2.3	2.7	3.7	2.4	3.0	3.0	2.5
Total		20.0	7.7	3.3	2.9	3.5	8.0	13.5	5.6	14.6	15.1	14.6	15.4	17.9	18.8	16.0	15.9	17.5	19.8	19.5	20.1	20.3	19.7	20.5	20.1	19.7
Other gears	Thailand	4.6	1.0	0.9	0.5	0.6	0.9	0.9	0.4	1.0	1.2	1.1	1.6	1.5	1.2	1.8	1.5	1.4	1.4	1.4	3.2	3.6	4.5	4.5	5.6	4.8
	Malaysia	1.5	0.5	0.0	0.0		0.3	0.3	0.1	0.1	0.1	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.2	2.4	2.7	1.7	1.5	1.6	1.4	1.5
	Other Fleets	0.5	0.4	1.5	1.1	0.7	2.7	1.3	1.9	2.0	1.2	0.1	0.3	0.4	0.4	0.2	0.2	0.5	0.6	0.5	0.5	0.5	0.6	0.6	0.5	0.5
	Total	6.7	1.8	2.5	1.5	1.3	3.9	2.6	2.4	3.1	2.5	1.5	2.1	2.0	1.8	2.1	1.7	2.0	2.1	4.3	6.4	5.7	6.6	6.7	7.4	6.8
All	Total	117.5	64.3	59.8	65.3	79.2	91.5	102.8	102.4	92.3	86.3	87.3	94.6	95.1	98.4	###	99.3	104.5	115.4	114.8	121.9	116.5	116.5	116.8	119.7	118.2



**Figure 1.** Narrow-barred Spanish mackerel: (a) annual catches from 1956 to 2005 by (on the left) area i.e. Eastern and Western Indian Ocean and (on the right) gear. Data as of October 2006



**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



**Figure 3.** Narrow barred Spanish mackerel: catches of by gear and main fleets for the period 1956-2005 (in thousands of tonnes). Data as of October 2006