

Review of king mackerel sampling data provided by The Fisheries Research in the Gulf of Mexico and Caribbean Sea at the Instituto Nacional de Pesca in Mexico

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Summary

Catch, effort and size data for Mexican king mackerel fisheries operating in the Gulf of Mexico were provided by scientists of the Fisheries Research in the Gulf of Mexico and Caribbean Sea, at the Instituto Nacional de Pesca in Mexico for assessment purposes. The information on fishing effort covers the years 1986 – 1989 and 1993- 1994, and the size frequency samples cover 1984, 1986-1989, 1991, 1993-1994. This paper provides a preliminary review of this information.

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Introduction

The king mackerel from the Gulf of Mexico are harvested not only by US fisheries, but also by Mexican Fisheries. Tagging data suggest that the Gulf migratory group migrates southward during the winter months along the Florida west coast and from Texas into Mexican waters. Moreover, fish tagged and released in Mexico have been recovered in the northern US waters (Ortiz 2008, SEDAR16-DW-10). In the past, Mexican scientists had participated and provided data for stock assessment of king mackerel (1988?) as part of a cooperative scientific program. Unfortunately, this cooperation was interrupted since 1990?, although fisheries in both countries continue and their need for a cooperative management of this straddling resource is recognized by both parties.

Summary Mexican Data

Scientists from the Fisheries Research in the Gulf of Mexico and Caribbean Sea, a branch of the Instituto Nacional de Pesca in Mexico, provided 2 databases of data available at the Direccion General de Pesca on king mackerel fisheries of the Gulf of Mexico. The first dataset included fishing effort for the 1986-1989 and 1993-1994. The file included records of 664 surveys conducted by the Institute. Each survey recorded the following information: number of vessels, fishing gear type, number of lines if applicable to fishing gear, number of hours (fishing hours), number of fish caught, and weight of catch, year, month and day of record. It is unclear what fraction of the total effort was covered by each survey.

Table 1 shows the distribution of catch in numbers and weight by year and month from the surveys records. Total number of fish sampled during the 6 years covered was 6,769. Sampling was conducted mainly in April, May and June. In 1986 the sampling dates included February and March, while in 1994 samples were also collected in October. In weight units, a total of 645 (t ? whole weight?) were sampled for all years. Table 2 shows the distribution of catch-effort sampling by fishing gear. Over 90% of the king mackerel catch is made by trolling, with the rest being caught with gillnets (Fig 1, Table 4). Coincidentally, the number of vessels that operate trolling gear was the largest every year, up to 3,500 units were recorded. However, the number of fishing hours is only greater for trolling in 1986 (Table 3), other years show comparable fishing effort as gillnets (Fig 3). It is unclear if the units of fishing effort are the same for all gear types. Fisheries using the trolling gear reported between 2 and 6 lines, with 3 and 4 the most common gear setting operation (Table 5, Fig 4).

Size samples from the Mexican king mackerel fisheries were available for 1984, 1986-1989, 1991, and 1993- 1994. A total of 10,975 fish were measured (Fork length cm) mainly during April and May (75%) (Table 6). Most of size samples were from the trolling gear (5,736), although the size samples were not distinguished by gear type in all years (Table 7). The mean size of king mackerel sampled was 70 cm (FL), with 50 % quartiles of samples between 63 and 77 FL cm (Fig 5). The range of

size reported was from 35 and 106 cm. The size distribution by year is shown in Fig 6, mean size sample per year was above the overall average in 1989, 1991 and 1993. However, the number of size samples varied between years, with fewer samples collected in 1984, 1986 and 1993.

This summary is provisional and requires further review and validation by Mexican scientists. Additional information on total reported catch of king mackerel by Mexican fisheries is available at the ICCAT database ([ICCAT - INTERNATIONAL COMMISSION FOR THE CONSERVATION OF ATLANTIC TUNAS](#)) (Table 8, Fig 7) and published report available through the internet <http://www.inp.sagarpa.gob.mx/Publicaciones/sustentabilidad/Golfo/sierragolfo.pdf>.

Table 1. Summary of catch and effort sampling from the Mexican king mackerel fisheries. Data provided by the Fisheries Research in the Gulf of Mexico and Caribbean Sea.

Number of fish		Month							Grand Total
Year	2	3	4	5	6	9	10		
1986	50	336	373	1870				2629	
1987			422	542				964	
1988			142	758		12		912	
1989			136	764		12		912	
1993			136	764		12		912	
1994							440	440	
Grand Total	50	336	1209	4698	36		440	6769	

Weight of catch		Month							Grand Total
Year	2	3	4	5	6	9	10		
1986	3	35	27	121				186	
1987			50	38				88	
1988			18	89		2		109	
1989			12	89				101	
1993			12	89				101	
1994			37				9	14	
Grand Total	3	35	156	426	2	9	14	645	

Table 2. Summary of fishing vessels sampled from the Mexican king mackerel fisheries by year, month and gear type.

Number of Canoes		Month							Grand Total
Year	Gear Type	2	3	4	5	6	9	10	
1986	AGALLERA (Gillnet)	1	3						4
	CURRICAN (Trolling)	2	88	122	415				627
1987	AGALLERA (Gillnet)			879	513				1392
	CURRICAN (Trolling)			499	2204				2703
1988	CHINCHORRO (Round Gillnet)			1					1
	CURRICAN (Trolling)			76	3192	109			3377
	DESCONOCIDA (Unknown)			18					18
	RED (Gillnet)			76	2415	108			2599
1989	CHINCHORRO			15					15
	CURRICAN (Trolling)			62	3192	109			3363
	DESCONOCIDA (Unknown)				18				18
	RED (Gillnet)			76	2415	108			2599
1993	CHINCHORRO			1					1
	CURRICAN (Trolling)			76	3192	109			3377
	DESCONOCIDA (Unknown)				18				18
	RED (Gillnet)			76	2415	108			2599
1994	CURRICAN (Trolling)			703			378	810	1891
Grand Total		3	91	2680	19989	651	378	810	24602

Table 3. Summary of fishing effort (hours fishing) by year, month and gear type from the Mexican king mackerel fisheries sampled.

Number of Hours fishing (sum)								
Year	Gear Type	2	3	4	5	6	9	10 Grand Total
1986	AGALLERA (Gillnet)	12	38					50
	CURRICAN (Trolling)	12	199	147	881.5			1239.5
1987	AGALLERA (Gillnet)			279	108			387
	CURRICAN (Trolling)			130.5	182			312.5
1988	CHINCHORRO (Round Gillnet)			5				5
	CURRICAN (Trolling)			29	279	0		308
	DESCONOCIDA (Unknown)			6				6
	RED (Gillnet)			74	413	12		499
1989	CHINCHORRO			11				11
	CURRICAN (Trolling)			23	279			302
	DESCONOCIDA (Unknown)				6			6
	RED (Gillnet)			74	413	12		499
1993	CHINCHORRO			5				5
	CURRICAN (Trolling)			29	279			308
	DESCONOCIDA (Unknown)				6			6
	RED (Gillnet)			74	413	12		499
1994	CURRICAN (Trolling)			222			42	99.5
Grand Total		24	237	1108.5	3259.5	36	42	99.5
								4806.5

Table 4. Catch in weight by year and gear type from the Mexican king mackerel fisheries.

Year	Weight Catch		Gear type			Grand Total
	AGALLERA (Gillnet)	CHINCHORRO (Round Gillnet)	CURRICAN (trolling)	Unknown	RED (Gillnet)	
1986	103		11614.5			11717.5
1987	475.2		2062.5			2537.7
1988		0	1686.5	11	431.5	2129
1989		50.5	1636	11	431.5	2129
1993			1686.5	11	431.5	2129
1994			3290			3290
Total	578.2	50.5	21976	33	1294.5	23932.2

Table 5. Number of lines reported for the trolling gear by year from the Mexican king mackerel fisheries.

Number of fish					
Year	CURRICAN (trolling) Number of lines				
	2	3	4	5	6
1986	35	89	341		
1987	64	291	274	3	
1988	25	200	289	22	7
1989	25	200	276	22	7
1993	25	200	289	22	7
1994	40	295	105		

Table 6. Summary of the size frequency samples from the king mackerel Mexican fisheries.

Year	Month									
	May	Apr	Oct	Jul	Jun	Sep	Mar	Feb	Jan	Nov
1987	969	1200	0	0	0	0	0	0	0	0
1988	1116	394	0	0	345	0	0	0	0	0
1991	1333	608	0	0	0	0	73	66	105	0
1994	0	814	844	0	0	389	0	0	0	7
1989	869	315	0	0	0	0	0	0	0	0
1986	0	0	0	336	27	0	0	0	0	0
1984	0	103	126	0	0	0	59	34	0	0
1993	663	0	0	0	0	0	0	0	0	0

Table 7. Distribution of size samples by gear type from the king mackerel Mexican fisheries.

Gear	N
Unknown	106
AGALLERA (Gillnet)	516
AGALLERA/CURRICAN (Gillnet/trolling)	9
ALMA (Fixed gillnet)	466
ALMADRABA (Fixed gillnet)	7
CHINCHORRO (Round gillnet)	384
CURRICAN (Trolling)	5736
DESCONOCIDA	1189
GNT (Gillnet ?)	16
LINEA (Hand line ?)	631
NO IDENTIFICADO	196
RED (Gillnet)	248

Table 8. Reported catch of king mackerel by the Mexican fleet available at the ICCAT database.

Year	Catch_t	Fleet	Area	Gear
1960	1000	Mex	West Tropical Atlantic	Unclassified
1961	1000	Mex	West Tropical Atlantic	Unclassified
1962	1000	Mex	West Tropical Atlantic	Unclassified
1963	1000	Mex	West Tropical Atlantic	Unclassified
1964	900	Mex	West Tropical Atlantic	Unclassified
1965	1000	Mex	West Tropical Atlantic	Unclassified
1966	900	Mex	West Tropical Atlantic	Unclassified
1967	1000	Mex	West Tropical Atlantic	Unclassified
1968	700	Mex	West Tropical Atlantic	Unclassified
1969	1100	Mex	West Tropical Atlantic	Unclassified
1970	907	Mex	West Tropical Atlantic	Unclassified
1971	1300	Mex	West Tropical Atlantic	Unclassified
1972	1520	Mex	West Tropical Atlantic	Unclassified
1973	2189	Mex	West Tropical Atlantic	Unclassified
1974	1531	Mex	West Tropical Atlantic	Unclassified
1975	1354	Mex	West Tropical Atlantic	Unclassified
1976	1497	Mex	West Tropical Atlantic	Unclassified
1977	1331	Mex	West Tropical Atlantic	Unclassified
1978	1535	Mex	West Tropical Atlantic	Unclassified
1979	2249	Mex	West Tropical Atlantic	Unclassified
1980	1946	Mex	West Tropical Atlantic	Unclassified
1981	2740	Mex	West Tropical Atlantic	Unclassified
1982	4409	Mex	West Tropical Atlantic	Unclassified
1983	2874	Mex	West Tropical Atlantic	Unclassified
1984	2164	Mex	West Tropical Atlantic	Unclassified
1985	2303	Mex	West Tropical Atlantic	Unclassified
1986	2643	Mex	West Tropical Atlantic	Unclassified
1987	3067	Mex	West Tropical Atlantic	Unclassified
1988	3100	Mex	West Tropical Atlantic	Unclassified
1989	2300	Mex	West Tropical Atlantic	Unclassified
1990	2689	Mex	West Tropical Atlantic	Unclassified
1991	2147	Mex	West Tropical Atlantic	Unclassified
1992	3014	Mex	West Tropical Atlantic	Unclassified
1993	3289	Mex	West Tropical Atlantic	Unclassified
1994	3097	Mex	West Tropical Atlantic	Unclassified
1995	3214	Mex	West Tropical Atlantic	Unclassified
1996	4661	Mex	West Tropical Atlantic	Unclassified
1997	4661	Mex	West Tropical Atlantic	Unclassified
1998	3583	Mex	West Tropical Atlantic	Unclassified
1999	4121	Mex	West Tropical Atlantic	Unclassified
2000	3688	Mex	West Tropical Atlantic	Unclassified
2001	4200	Mex	West Tropical Atlantic	Unclassified
2002	4453	Mex	West Tropical Atlantic	Unclassified
2003	4369	Mex	West Tropical Atlantic	Unclassified
2004	4564	Mex	West Tropical Atlantic	Longline
2005	3447	Mex	West Tropical Atlantic	Longline
2006	4201	Mex	West Tropical Atlantic	Longline

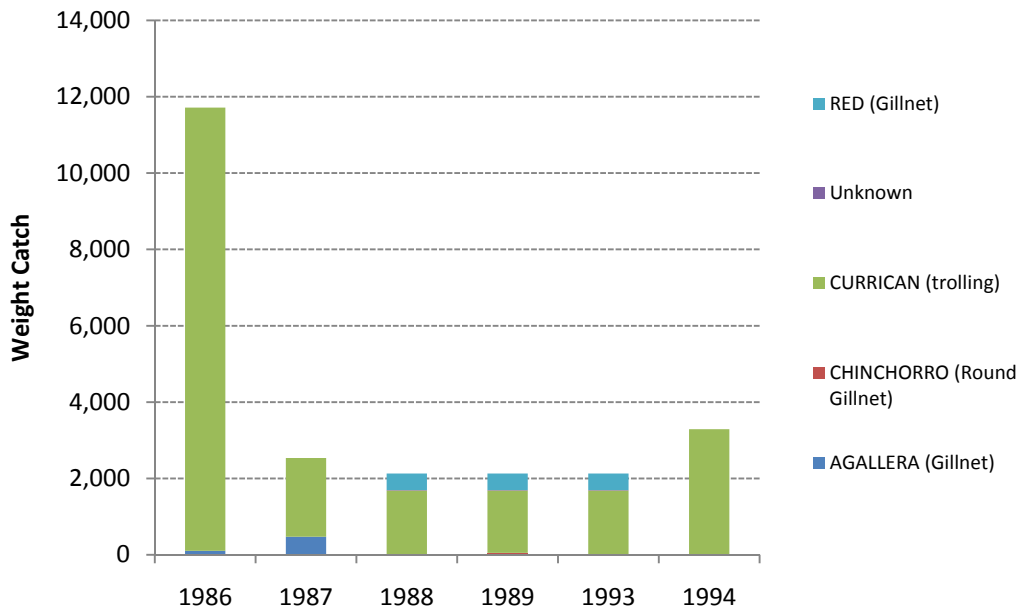


Figure 1. Summary of catch in weight (kg) by year and gear type for king mackerel Mexican fisheries catch and effort sample data provided by the Fisheries Research in the Gulf of Mexico and Caribbean Sea.

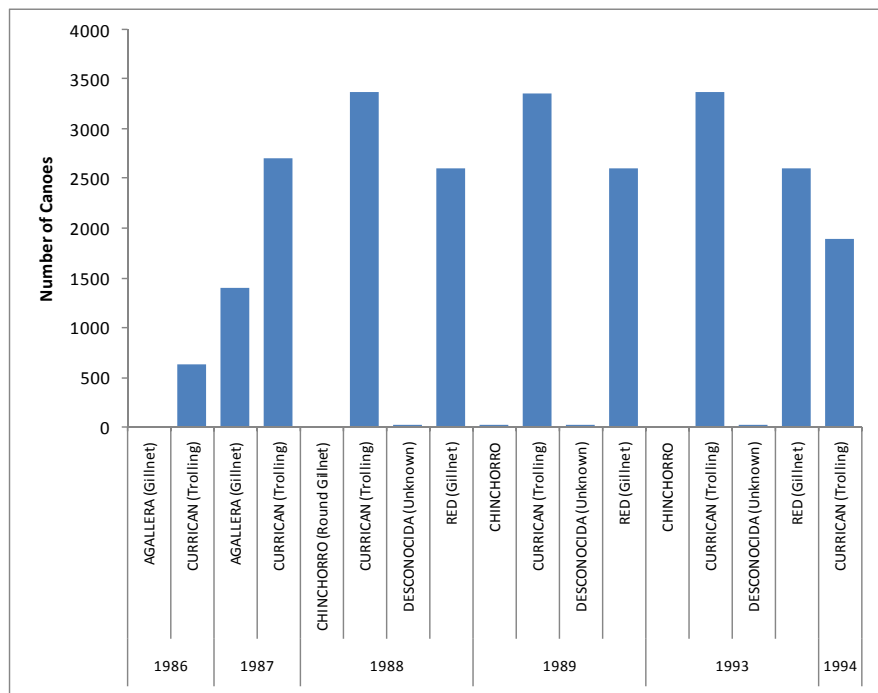


Figure 2. Distribution of the number of vessels by fishing gear type and year from the king mackerel Mexican fisheries.

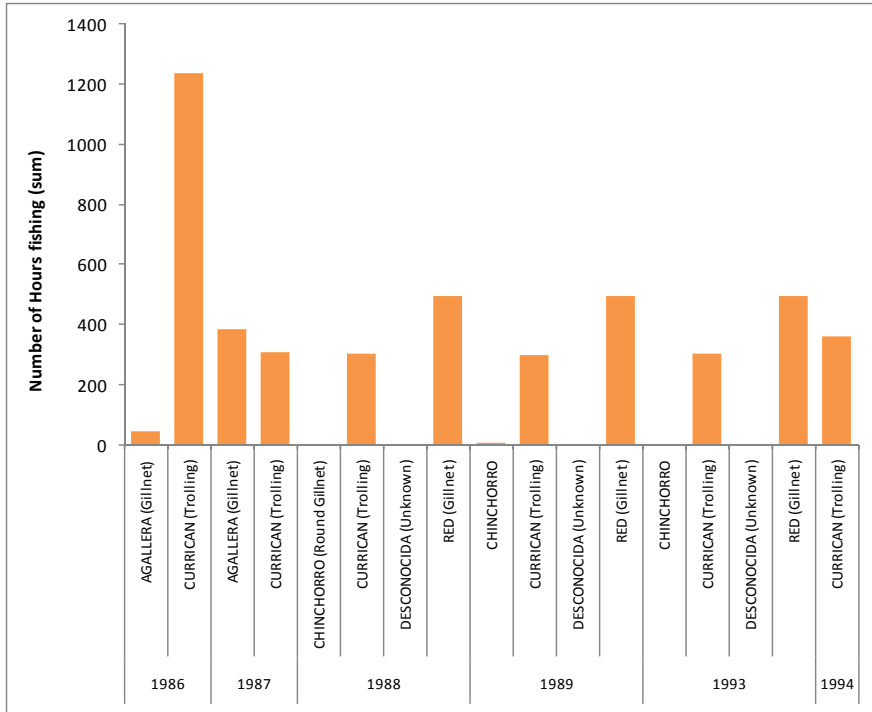


Figure 3. Distribution of the number of fishing effort (hours fishing) by fishing gear type and year from the king mackerel Mexican fisheries.

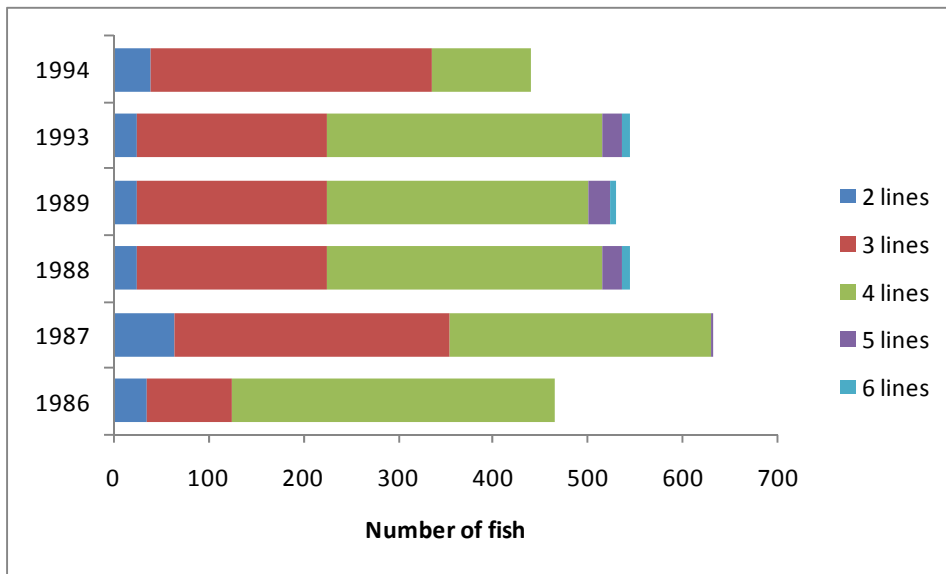


Figure 4. Number of fish caught per year and distribution of catch by number of lines used with the trolling (currican) fishing gear from the king mackerel Mexican fisheries.

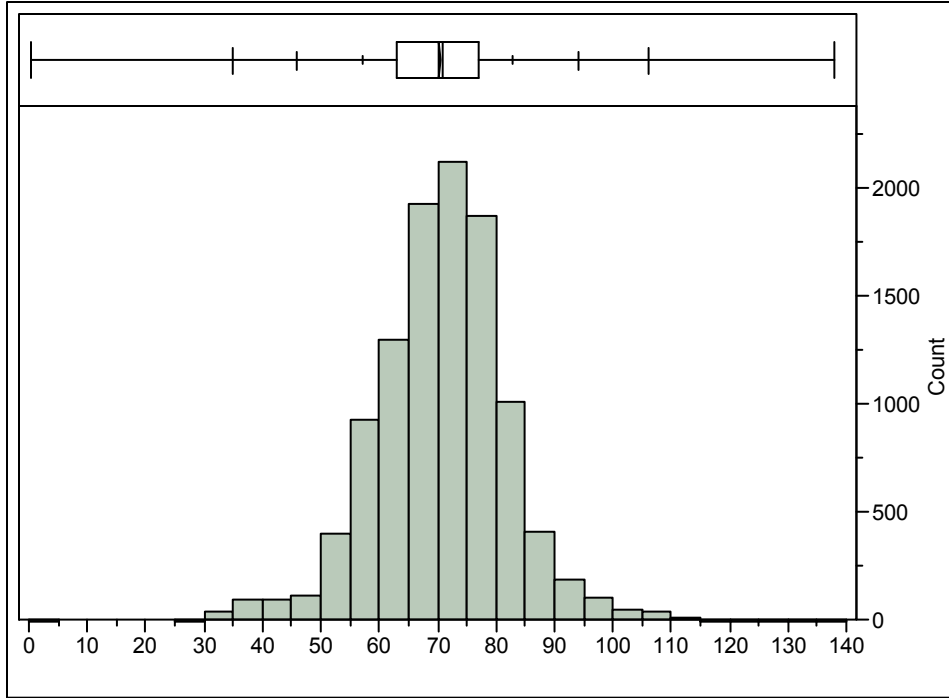


Figure 5. Size frequency distribution of king mackerel caught by the Mexican fisheries all years.

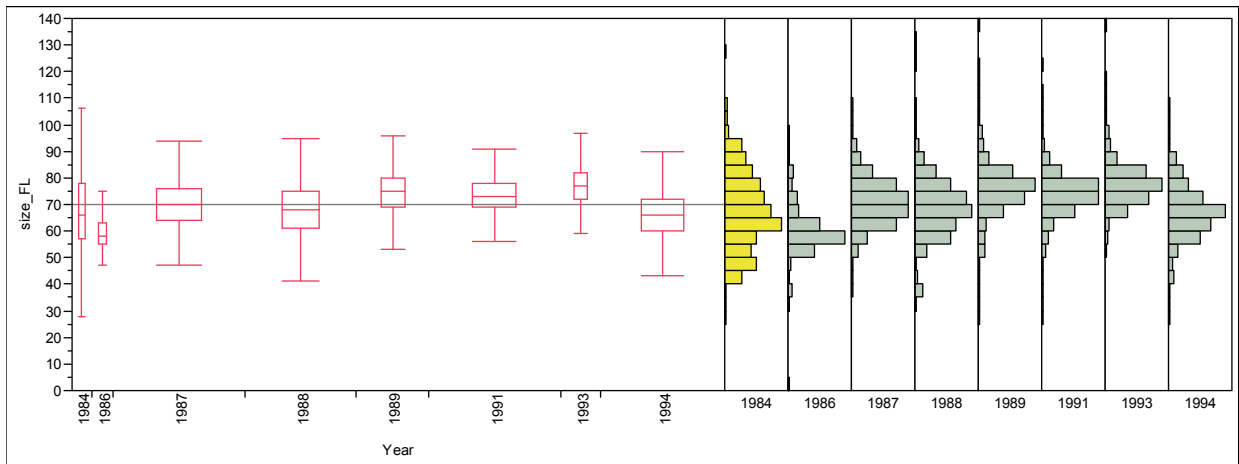


Figure 6. Size frequency distribution by year of king mackerel caught by Mexican fisheries. Box plot width is proportional to the number of samples per year.

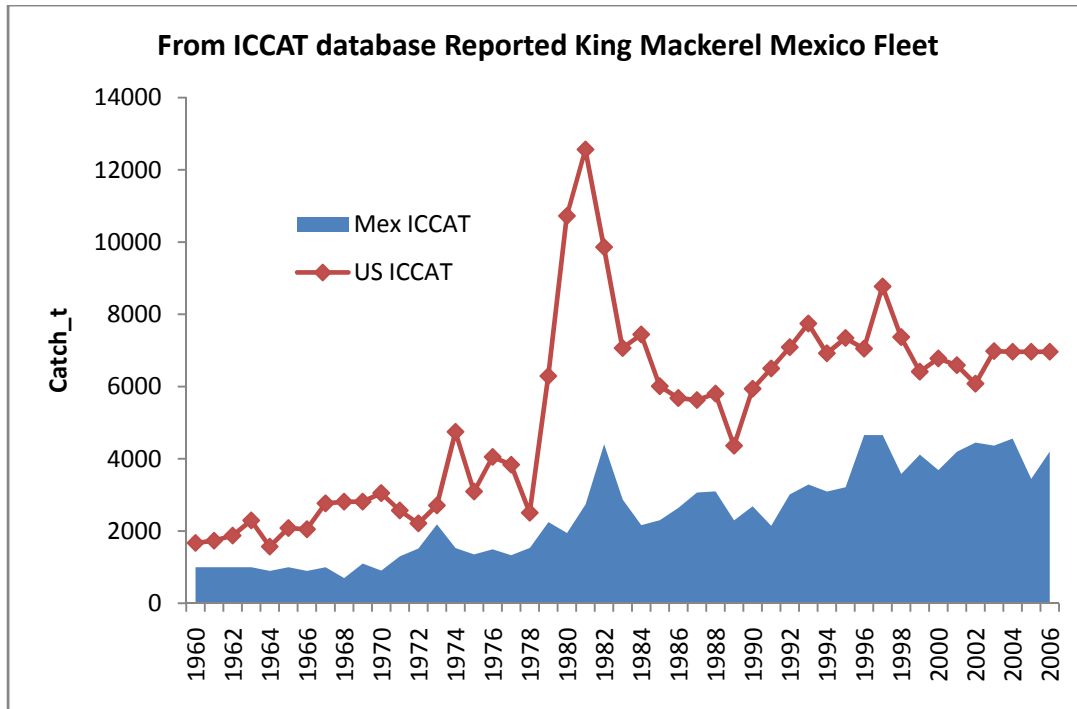


Figure 7. Reported catch of king mackerel available at the ICCAT database from Mexico fleet (blue area) and US fleet (both Atlantic and Gulf stocks).