

**MEXICAN PROGRESS REPORT TO THE 5 ISC**

(Tokyo, Japan, March 28-30/2005)

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**MARCH 2005**

## FISHERIES AND CATCHES

In this region the Mexican fleet concentrates mainly in the yellowfin (*Thunnus albacares*), which is the prime target tuna species. The Mexican tuna purse seine fishery has been the largest in the (ETP) since the mid 1980's. This tropical tuna represents for its large volumes the main component in the total catches. Other tuna species which are also caught, but contrastingly in lower proportions are: the skipjack, (*Katsuwonus pelamis*), the bigeye (*Thunnus obesus*), the black skipjack (*Euthynnus lineatus*) and more recently, in northerly zones of the Mexican EEZ, the bluefin (*Thunnus thynnus orientalis*) and the albacore (*Thunnus alalunga*). This paper describes the recent trends of the Mexican tuna fishery for the bluefin and albacora tuna and also for the swordfish (*Xiphias gladius*). It updates the statistics for those species in reports presented before at the 4 ISC (Ulloa, Fleischer, Dreyfus and Vaca, 2004).

Fishing operations of the Mexican purse seine fishery comprise a vast area in the EPO, (figure 1).

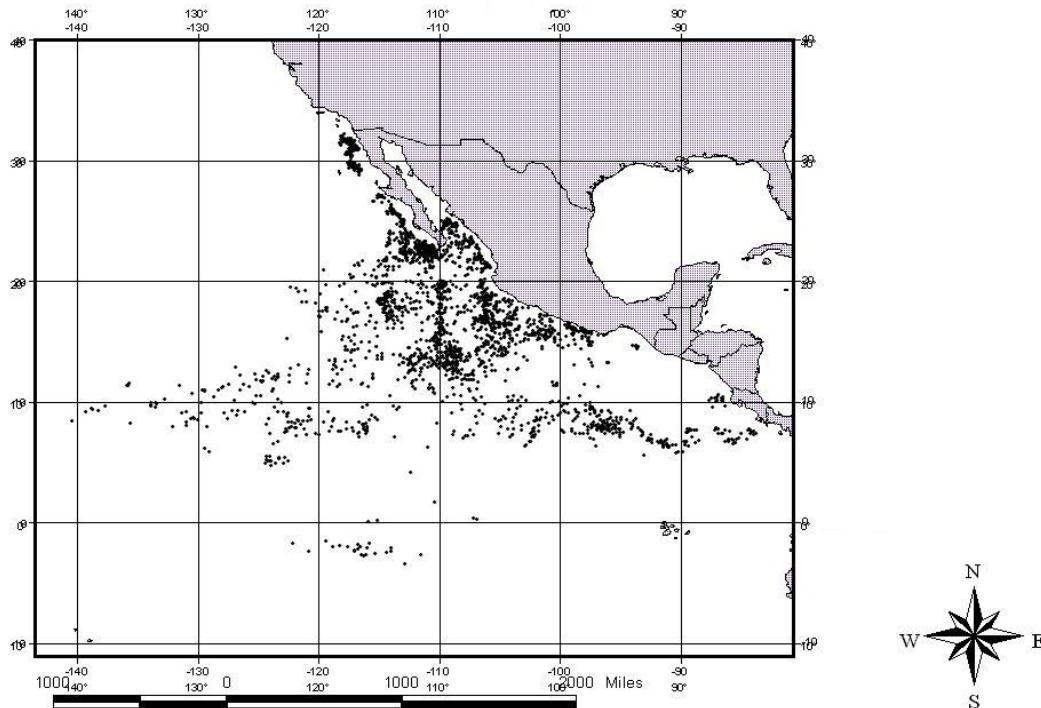


Figure 1. Fishing grounds of the Mexican purse seine fishery

The recorded levels of tuna captures in the ETP zone by the Mexican fleet from 1992 till 2004 are shown in figure 2. This information has been reported on a yearly base to the regional fisheries bodies, such as the Inter American Tropical

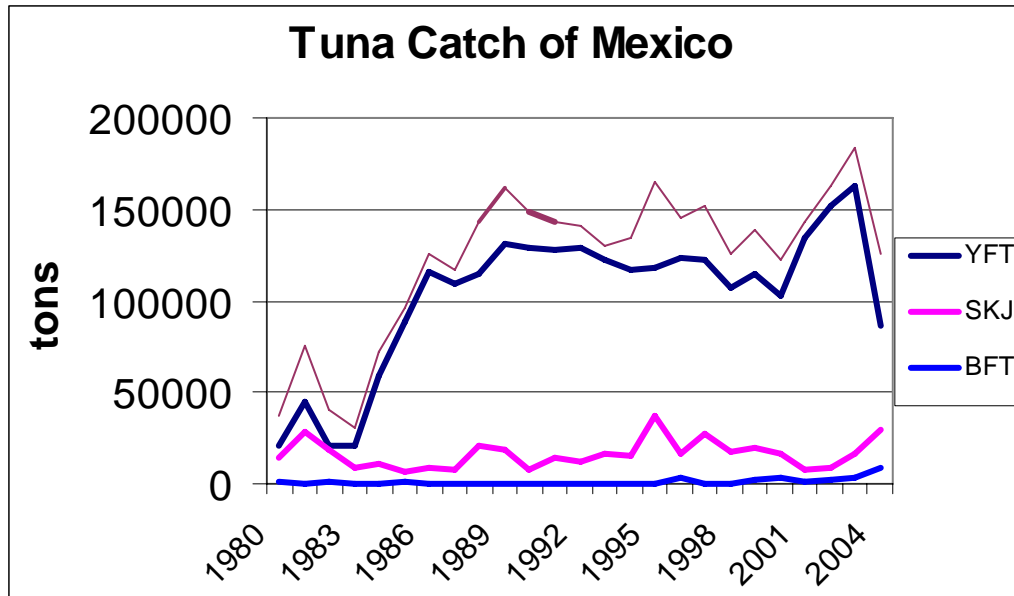


Figure 2. Mexican tuna catch of yellowfin tuna (YFT), skipjack (SKJ) and bluefin tuna (BFT), 1980-2004.

Tuna Commission (IATTC) and in the Northern Pacific region, to the Interim Scientific Committee (ISC).

The total tuna landings of Mexico in 2003 were 183,199 mt. Value which represents the highest historic record for this fishery since 1992 and more than a (10 %) increase from the attained level of the year before, in which a total catch of 164, 048 mt. was reported. Comparatively, the lowest recorded capture in this fishery during recent years was in the 2000 season, with only 119, 962 mt., value which is closer to that obtained in 1993 (Table 1). Similarly in 2004 the total tuna catch was 125,985 mt.

These high consistent reported catches are the result of the combination of the fishing experience and performance of the fleet as well as the effect of high recruitments in previous years and are not related with any significant increase in the fishing effort or a greater expansion of its carrying capacity during the corresponding years.

Being the largest in numbers, the Mexican tuna fleet is not diverse in terms of fishing gear, mobility, scale operation and species targeting. It consists only of two main fisheries. These includes: a greater component of purse seiners which is the largest and a comparative small portion of Bait boats vessels.

The purse seiner fleet is subdivided for management and conservation purposes in three different categories: type I, those boats larger than 1000 metric tons, and representing 43.33 % of the total fleet. Type II corresponds to medium to small size ships, more than 363 mt., but less than 1000 mt. with a 21.666 % of the total

and finally, the type III category, in which the small size seiners, less than 363 mt. are grouped and which represents 31.66%.

The second tuna fishery identified is composed by bait boats, from which in the period reported in here, from 1992-2004, averaged 13 as active fishing ships. Of this category, in 2004, only 2 bait boats were reported active (3.33%, Table 1). From the data tabled we can calculate the total number and averages of the different tuna boats types which have been operating every year: 59 were type I; 24 belonged to type II and 13 were from the type III. The average carrying capacity of the Mexican fleet from 1992-2004 has been 41,030 mt. and 7 is the average number of active bait boats in the same period.

In 2003, the yellowfin captures yielded 159, 521 mt. and represented (87.1%) of the total annual catch. Second in importance was the skipjack, with 19, 971 mt., equivalent to (10.9 %) of the total landings. The other tuna species contributed all together, only with 2, 739 mt.. or (1.5%) of the total reported catch. There was also in that year a (0.5 %) proportion, which was reported by the fleet as unsuitable fish for process or human consumption. In 2004, again the yellowfin was the most significant with 86,713 mt., representing 69.5 % of the total Mexican catch. The skipjack was the second with 29,722 mt., and comparatively a 23%). The other tuna species together represented only 9,550 mt. or 6.5% of the catch of that year, (Table 2). This table also summarizes the total catch of all tunas by the Mexican fleet, by year and by species composition, from 2000-2004. This tabled information reflects the great importance of the yellowfin tuna in the Mexican catches and the secondary level of all the other tuna species in the total catches obtained by this fleet in the ETP.

The great significance of the yellowfin tuna in the Mexican fishery and the contrasting small proportions of the other caught tuna species is reflected in the contents of Table 2.

**Table 1. Total landings, size, composition and carrying capacity of the Mexican tuna fleet from 1992-2004.**

<b>YEAR</b>	<b>Total Landings (All tuna species) (mt.)</b>	<b>No. of active tuna boats</b>	<b>No. of large PSeiners &gt;1000 mt.</b>	<b>No. of m PSeiners &gt;363 mt. &lt;1000 mt.</b>	<b>No. of PSeiners ≤363 mt.</b>	<b>No. of active Bait Boats</b>	<b>Total Carrying Capacity of the Fleet (mt.)</b>
<b>1992</b>	<b>127,121</b>	<b>52</b>	<b>29</b>	<b>14</b>	<b>4</b>	<b>5</b>	<b>43,158</b>
<b>1993</b>	<b>115,768</b>	<b>47</b>	<b>23</b>	<b>12</b>	<b>6</b>	<b>6</b>	<b>37,553</b>
<b>1994</b>	<b>127,866</b>	<b>54</b>	<b>24</b>	<b>14</b>	<b>11</b>	<b>5</b>	<b>38,670</b>
<b>1995</b>	<b>149,189</b>	<b>55</b>	<b>22</b>	<b>15</b>	<b>12</b>	<b>6</b>	<b>38,255</b>
<b>1996</b>	<b>149,375</b>	<b>62</b>	<b>22</b>	<b>15</b>	<b>12</b>	<b>6</b>	<b>37,302</b>
<b>1997</b>	<b>154,184</b>	<b>63</b>	<b>27</b>	<b>14</b>	<b>12</b>	<b>10</b>	<b>42,836</b>
<b>1998</b>	<b>128,514</b>	<b>63</b>	<b>25</b>	<b>14</b>	<b>12</b>	<b>12</b>	<b>41,330</b>
<b>1999</b>	<b>139,851</b>	<b>66</b>	<b>25</b>	<b>15</b>	<b>14</b>	<b>12</b>	<b>41,690</b>
<b>2000</b>	<b>119,962</b>	<b>64</b>	<b>25</b>	<b>14</b>	<b>16</b>	<b>9</b>	<b>42,035</b>
<b>2001</b>	<b>147,960</b>	<b>64</b>	<b>24</b>	<b>12</b>	<b>18</b>	<b>10</b>	<b>41,427</b>
<b>2002</b>	<b>164,048</b>	<b>59</b>	<b>23</b>	<b>13</b>	<b>18</b>	<b>5</b>	<b>41,004</b>
<b>2003</b>	<b>183,199</b>	<b>62</b>	<b>24</b>	<b>15</b>	<b>19</b>	<b>4</b>	<b>43,601</b>
<b>2004</b>	<b>128,914</b>	<b>60</b>	<b>26</b>	<b>13</b>	<b>19</b>	<b>2</b>	<b>44,532</b>
<b>AVERAGE</b>	<b>141,227</b>	<b>59</b>	<b>24</b>	<b>13</b>	<b>13</b>	<b>7</b>	<b>41,030</b>

**Table 2. Total tuna landings and the proportions of the different tuna species in the Mexican fishery from 2000-2004**

YEAR	TOTAL LANDINGS All tuna species (mt.)	Yellowfin (mt.) and ( %)	Skipjack (MT.) and ( %)	Others Species (mt.) and ( %)
2000	119,962	100,261 (83.57%)	15,635 (13.03%)	3,434 (2.86%)
2001	147,960	136,390 (92.18%)	10,410 (7.04%)	661 (0.45%)
2002	164,048	151,833 (92.25%)	9,844 (6.0%)	1,884 (1.2%)
2003	183, 199	159,521 (87.07%)	19,971 (10.9%)	2,739 (1.49%)
2004	128,914	88,732 (68.83%)	30,414 (23.59%)	9772 (7.58%)

Notes:

- 1) The missing small portions needed to complete the 100% each year, were reported by the fleet as broken or unsuitable fish for process or human consumption. Those are not tabled in here.
- 2) Other species are: albacore (*T. alalaunga*), bluefin (*T. orientalis*), bigeye (*T. obesus*) and the black skipjack (*Euthynnus lineatus*).

### **Bluefin tuna (T. orientalis):**

The full historical record of bluefin tuna captured by the Mexican tuna boats from 1980-2004 is presented in Table 3 and figure 3. These catches represents only a very small proportion of the total tuna caught by the Mexican fleet and represents an average catch of 1,109.4 mt. for the entire period. This only represents 0.9% of the total. The 3, 700 mt. reported in 1996 was the first historic highest record for this fishery. Again, in 2004, a total of 8,973 mt. established a higher new catch record for this tuna species in Mexico, (Table 3: Data sources from INP-PNAAPD, Programa Nacional para el Aprovechamiento y Protección de los Delfines).

The information provided makes clear that fishing for bluefin has not being a foremost significant activity in Mexico for many years. It also shows that even in some fishing seasons there were no captures on this stock, or those were only of low levels. In general, it is observed that in some years, the presence of bluefin tuna landings was small, or even zero. Therefore, it is clear that fishing bluefin in Mexico was considered only incidental. However, more recently, in the years (1996-2002) there has been a greater interest devoted to this species, mainly for the ranching activities developed since 1996 in the Northwest region of Mexico.

Table 3. Bluefin tuna catch of Mexico, 1995-2004.

	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004
MEXICO	13	4142	323	1	2327	2966	711	1120	3225	8973

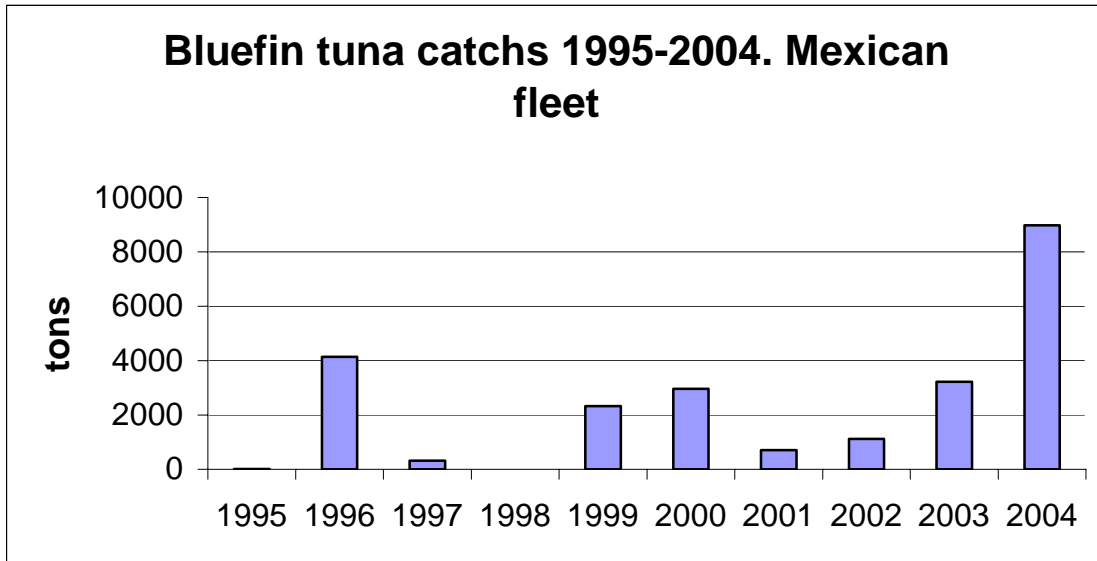


Figure 3. Bluefin tuna catch from 1995-2004, Mexican fleet

All the fishing zones for bluefin tuna used by the Mexican fleet are located in the Northwest side of the Baja California peninsula, inside the ZEE of Mexico, closer to the ranching locations. The fishing season usually runs five months, from June to October, which is the time in which the transpacific migration of this stock is closer to the Mexican Pacific coast, due to the sea conditions and colder currents,. This sea conditions together with the presence of the species, permits the development of this new fishery in the Mexican Northwestern coastal area. (Figure 4).

The catch of young bluefin for ranching are performed only with commercial purse seiners. Some times, the holding nets with the bluefin tunas are transferred to tugboats, which then, make slowly the trip to the enclosures and fattening nets located in the Baja California peninsula, while the tuna purse seiner is fishing again.

### Ranching Activities

The ranching activities for bluefin tuna started in Mexico in 1997 in Isla de Cedros, located in the mid section of the Northwest coast of the Baja California peninsula. There in holding pens and fattening enclosures, they for the first time produced 64 mt. of bluefin tuna for the sashimi market in Japan. But in the same year, for several reasons, this first Mexican ranching company closed its operations after only one season of work. The following year, other company started similar operations but in an other area of Baja California, at the Todos

Santos Bay, located in front of the port of Ensenada, near the border with the USA. Four years later in 2002, the third company started operations in the Cedros Island zone. Nowadays, they are only 5 companies registered for ranching bluefin tuna in Mexico, all are located in the northern part of the Baja California peninsula, which are places closer to the captures areas. Not all the companies have been successful.

This new tuna fishery component or modality triggered recently, higher proportional catches of bluefin and the reported highest record of 8, 973 mt. caught in 2004. From this total, 80% was utilized for the ranching companies and the other 20% went for Mexican consumption. This new activity represents a new economic incentive for the Mexican tuna fishery.

For conservation and monitoring purposes, a set limiting the ranching process was imposed by the Mexican government only in the two of the existing five companies, up to 120 mt. per year.

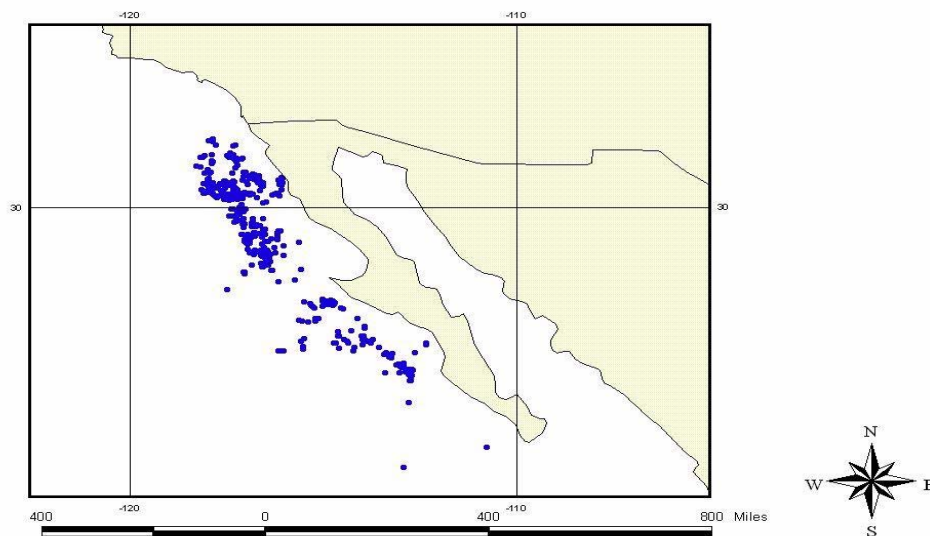


Figure 4. Fishing Zones for bluefin tuna in the Northwest region of Mexico, offshore the Baja California peninsula. 1992-2004.

### **Albacora (*T. alalunga*)**

The related Mexican information for this fishery has been consecutively reported to ISC, The IATTC and to the Eighteen (Hawaii) meeting and recently to the Nineteen (Nanimo) reunion North Pacific Albacore Workshops. To the first, the catch for Mexico was tabled by the IATTC (M. Hinton, pers. com), for the period 1961 through 2002. For the second meeting identified, Fleischer, Dreyfus and Robles (2004) revised, corrected and expanded the data, with the 2003 available information. Here these records are enlarged with the 2004 information, (Table 4).



This table shows the total catch reported for Mexico. The data indicates that the fishery for albacore is performed in Mexico optionally, or incidentally, as a non target species. Consequently, no data is available for the effort. This is, however, an important aspect which will be considered by the INP-PNAAPD to be monitored in the upcoming seasons. The data presented here is considered to be our best estimate of the Mexican historic catches for this tuna species.

**Table 4. Mexican albacore tuna catches from 1980-2004.**

<b>YEAR</b>	<b>MEXICAN CATCH</b>
1980	0
1981	10
1982	0
1983	0
1984	179
1985	54
1986	0
1987	0
1988	0
1989	0
1990	0
1991	0
1992	0
1993	0
1994	0
1995	0
1996	0
1997	0
1998	8
1999	23
2000	79
2001	22
2002	29
2003	29
2004	97
<b>AVERAGE</b>	<b>20.4</b>

**Swordfish (X. gladius):**

In accordance with (FAO, 2000) the total world captures of swordfish are about 90,000 mt. each year. From those, 25, 000 mt. are taken from the Pacific Ocean and the Mexican fleet contributes to those with an average of 950 mt. each season. This represents only (3.8%) of the total Pacific ocean captures. In the ETP, the swordfish shows a stable CPUE since 1995 (Bartoo and Coan, 1989; Joseph, 1981).

The development of the swordfish fishery in Mexico has two different historical periods. One was started in 1964 using long liners and the second began in 1986, with gillnets. Also, since 1990, all the billfishes (including the swordfish), had been reserved by Mexican law only for sport fisheries operations and they are not subject to any commercial catches. This regulation also designated a strip of fifty miles from the Mexican coast as a reserved zone for this activities. From those species reserved to the sport fisheries, the swordfish is the only commercially captured outside the defined corridor.

In 1992 the swordfish fleet was integrated by 24 active fishing boats. In 1995 this fleet reduced its size to 22 ships, number which has not changed since. The main ports used by this fishery are: Ensenada, San Carlos, and some times, la Paz, in the Baja California peninsula and also across the Gulf of California in Mazatlan in the mainland Mexico.

The fleet operates mainly in the Autumn and Winter, fishing some years from five to six months (from September-October to February). Nowadays the Mexican long liner fleet operates between the latitudes  $21^{\circ} 30'N$  and  $32^{\circ} 20'N$ . The greater effort is concentrated in two areas from September to January. One is south of Punta Eugenia in the Baja California peninsula to the  $23^{\circ}N$  and the other fishing zone, from the  $30^{\circ}$  parallel, to the northern limit of the Mexican ZEE (Castro, et. al. 1995; Sosa et. al. 1992, (Figure 5).

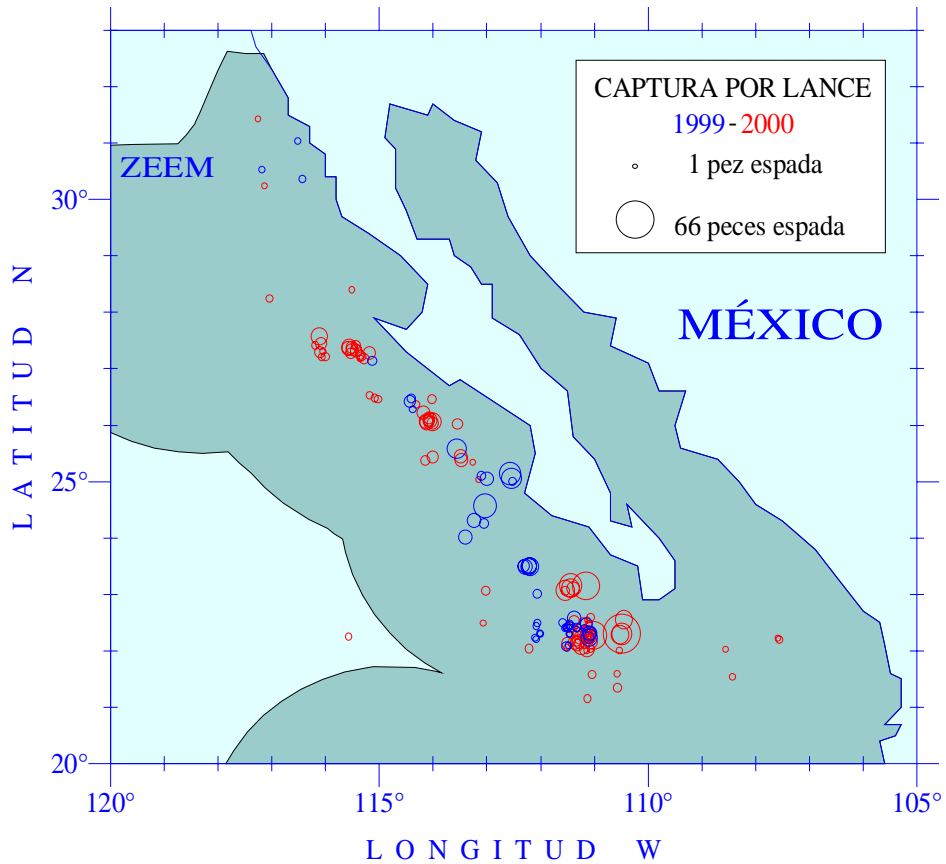


Figure 5. Swordfish fishing grounds in Mexico and catches by set.

The historic records of the swordfish fishery of the Mexican fleet is presented in Table 5 and Figure 6. These indicates three different pick periods: 1981 (1,575 mt.), 1990 ( 2,650 mt.) and 1998 ( 3,603 mt.), which is the highest historic record for this fishery. In 2003, the reported catch was 671 mt. The variation is attributed to the changes in the two fishery methods described above.

**Table 5: Historic records of the Mexican swordfish fishery from 1979-2003**

<b>YEAR</b>	<b>MEXICAN CATCHES (MT.)</b>
1979	7
1980	380
1981	1, 575
1982	1, 365
1983	120
1984	47
1985	18
1986	422
1987	550
1988	613
1989	690
1990	2, 650
1991	861
1992	1,160
1993	812
1994	581
1995	437
1996	439
1997	2, 365
1998	3, 603
1999	1, 136
2000	2, 216
2001	780
2002	465
2003	671

Notes:

1) Data sources from INP-CONAPESCA-Mexico

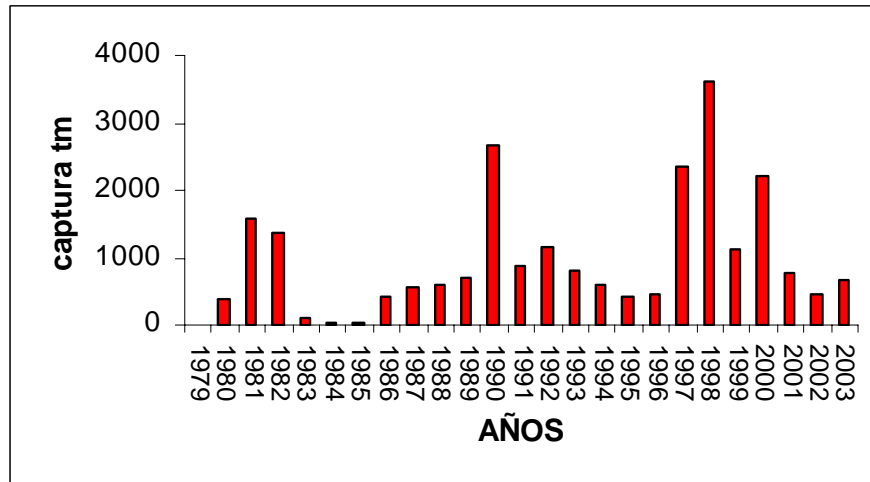


Figure 6. Swordfish captures by the Mexican fleet from 1979-2003.

### FISHERIES MONITORING, DATA COLLECTING AND REPORTING

The National Institute of Fisheries of Mexico (Instituto Nacional de la Pesca, INP-Mexico) conducts systematic scientific work and has developed fisheries, aquaculture and technological research for more than 40 years. Since 1992, it has also incorporated to this effort, the monitoring and research work of their National Tuna-Dolphin program, PNAAPD (Programa Nacional para el Aprovechamiento del Atún y Protección de los Delfines), to monitor and study the tuna fishery of their large commercial fleet.

#### Purse seine and live bait ship fisheries:

Catch and effort data and the purse seine tuna fishery performance had been closely monitored with a 100% coverage by scientific observers aboard all the large commercial Mexican tuna ships. From these monitoring program, 50% are observers from the Mexican National Program (PNAAPD) and the remaining vessels are covered by the IATTC international observers program. Pertinent data from the two observers programs has been available on a regular basis to the IATTC, ISC and other regional meetings. There is also a national administrative regulation (Norma Oficial Mexicana-EM-002-PESC-1999) which regulates in Mexico the yellowfin fisheries operations and establishes a quota for the national fleet. This quota is determined with the scientific recommendations set by the IATTC in the EPO. Besides this, logbooks are submitted by the fleet to the Fishery agency in Mexico, CONAPESCA (Comisión Nacional de Pesca), Ministry of Agriculture, Live stock and Fisheries). Landings are obtained from each vessel with (100% coverage). Fish are measured for fork length by PNAAPD observers on board. The IATTC Secretariat in close coordination with the INP-PNAAD continues to compile the data and related effort, catch and

statistics from all the Mexican tuna fleet operations and the PNAAPD covers those vessels which are not monitored by the IATTC.

### **Swordfish fishery**

The swordfish fishery was also monitored since 1998 till 2000 by the observers of PNAAPD, aboard the longliners and the gillnet ships which operated outside the 50 miles defined zone. Also logbooks are submitted by the fleet to the Fishery agency in Mexico CONAPESCA This fishery is also regulated by a special Mexican administrative regulation (NOM-017-PESC-1994).

## **RESEARCH**

Since 1998 the INP and the PNAAPD have also organized an annual scientific meeting in Mexico to review the research activities developed by Mexican and other scientists. These studies are related with tunas, large pelagic and other oceanic species. Available information of those seven scientific meetings could be obtained directly from the authors listed, or from the INP-PNAAPD sources. Here we summarize the original titles (in Spanish) of the most recent papers presented on December 2004.

List of the Scientific Papers of Tuna and Tuna-Like Species Developed during 2004 and presented at the VII National Forum celebrated at Manzanillo, Colima, Mexico from the 8-10 of December 2004:

- **Simulación con redes neuronales artificiales de las estrategias de pesca de embarcaciones atuneras y efecto de la pesca en grupo en la CPUE como indicador de abundancia.** Michel J. Dreyfus León
- **Evaluación multicriterio de áreas pesqueras mediante un análisis espacio-temporal considerando diferentes ponderaciones: la pesquería del AAA en el OPO (2003).** Ricardo Carrara Rosales y Juan Guillermo Vaca Rodríguez
- **Estimación de capturas anuales de especies objetivo. Aplicaciones de muestreo probabilístico en pesquerías con programas de Observadores a bordo.** Rubén Urbina Pastor, et. al.
- **Diagnóstico de la pesquería mexicana del atún en el Golfo de México (1995 – 2000).** Rafael Solana Sansores, Armando Wakida K., Rubén U. Pastor, Cecilia Qiroga B., Jaime Otilio Gonzalez P., Myrna I. Wong R. y Karina Ramírez López
- **Diferencias en la distribución de larvas de atunes y volúmenes de zooplancton sobre una montaña submarina en el Golfo de California.**

Rogelio Gonzalez Armas, A. Muhlía Melo, A. Trasviña Castro, G. Gutierrez De Velasco, A. Valle Levinson y R. Funes Rodriguez

- **Análisis de “alerones” en las redes de cerco atuneras para la liberación de delfines.** Humberto Robles Ruiz y Michel Dreyfus León
- **Impacto de ENOS en las razones óptimas de uso del recurso atún aleta amarilla (*Thunnus albacares*) en el océano Pacífico oriental.** Juan Suárez Sánchez, Walter Ritter Ortíz, Leonel O. Pérez Rodríguez e Hipólito Muñoz Nava.
- .
- **Evaluación de la productividad excedente de la población de atún aleta amarilla (*Thunnus albacares*) en el océano Pacífico oriental durante el periodo 1934 – 2003.** José Manuel Grande Vidal.
- **Determinación de la carga parasitaria de la sardina monterrey (*Sardinops sagax caerulea*) y su relación con la alimentación del atún aleta azul (*Thunnus thynnus orientalis*) utilizado en maricultivo.** Samuel Sánchez Serrano y Jorge Cáceres Martínez.
- **Estudio de la pesca deportivo-recreativa en la región de los cabos, B.C.S., con énfasis en el destino de las capturas.** Sergio Alejandro Pérez Valencia, Germán Ponce Díaz y Sofía Ortega García.
- **Resultados de un experimento realizado con tres tipos de anzuelo y dos tipos de carnada, en palangres de deriva de mediana altura dirigido al tiburón en el Pacífico central mexicano.** Heriberto Santana Hernández y Juan Javier Valdez Flores.
- **La pesquería deportiva de marlin azul (*Makaira nigricans*) en Cabo San Lucas, B.C.S., México.** Sofía Ortega García, Alexander Klett Traulsen y Rubén Rodríguez Sánchez.
- **Ranchos de Engorda de atún aleta azul (*Thunnus thynnus orientalis*) en Baja California: Un análisis general de la industria.** Miguel Angel Lozano Huguenin y Juan Guillermo Vaca Rodríguez.