

CALIFORNIA DEPARTMENT OF FISH AND GAME REPORT ON PROPOSED  
COMMERCIAL AND RECREATIONAL THRESHER SHARK MANAGEMENT  
MEASURES FOR THE  
2009-2010 HMS FMP BIENNIAL MANAGEMENT CYCLE

At the June 2008 meeting, the Council directed the Highly Migratory Species Management Team (HMSMT) to develop a suite of potential management measures to regulate the harvest of common thresher shark, *Alopias vulpinus*, by recreational and commercial fishermen operating in State and Federal waters off California. The HMSMT gathered and assessed the available data in order to develop management options to limit an apparent recent increase in recreational thresher shark catch and effort, with emphasis on protecting pregnant and pupping sharks in the springtime. At the September 2008 meeting, the Council adopted a range of alternatives proposed by the HMSMT for public review and identified a preferred alternative of a recreational and commercial fishery closure from February 1 through August 14.

Upon a more complete review of all the available data, the California Department of Fish and Game (Department), agrees with the HMSMT that (1) a precautionary management approach is warranted for thresher shark due to their low productivity and low resilience to exploitation, (2) the recreational landings of thresher shark have increased from 2005 to 2007; however, catches are still within the range of variation observed in historic recreational landings, and (3) additional biological information (i.e., pupping times and locations) and more detailed recreational catch data (e.g., refined estimates for private access fleet and catch-and-release mortality) is needed.

**However, the Department believes that current commercial and recreational landings remain within the established harvest guideline (HG) and that no seasonal closure is necessary during this management cycle. The Department continues to support the Team's recommendations relative to research and improvements in monitoring and collection of biological data as follows below.**

- Continued survivorship studies to determine mortality rates for fish taken and released in the recreational fishery
- Mandatory federal data reporting requirement for all west coast HMS shark fishing tournaments to NOAA fisheries
- Identification of the spatial/temporal extent of thresher shark pupping grounds and nursery areas
- Improved and expanded recreational monitoring data, including ongoing support for CDFG and RecFIN pilot studies to estimate catch and effort from vessels departing from private access marinas
- Improved monitoring and data collection for the commercial shark hook and line fishery and for non-HMS fisheries such as bottom set net and small mesh drift gillnet
- Research on gear modifications to minimize or eliminate tail-hooking in the recreational fishery

- An enhanced outreach and education component to engage anglers in adoption of best practice and ethical angling incentives and to involve them in data collection efforts such as angler-based conventional tagging programs.
- Review of the current thresher shark harvest guideline of 340 metric tons.
- Support for NOAA Fisheries' position that an updated thresher shark stock assessment needs to be a high priority.

### Catch Estimates for Thresher Shark

Based on updated commercial and recreational fishery data, the average annual catch for thresher shark during the period from 2002 to 2007 was 229 metric tons or only 68 % of the established HG of 340 mt (Table 1). The thresher shark HG of 340 mt was incorporated into the 2004 HMS FMP from a 1990 management review of the drift gill net fishery which began in California in 1977. The OY adopted by the PSFMC in an interjurisdictional fishery management plan was set equal to an OY estimate specified as 0.75MSY. The MSY used is the local MSY (LMSY), as the stock-wide maximum sustainable harvests were not known. Totals of all commercial catches were used to establish the HG; recreational catches were not considered in establishing the 340 mt HG. The HG methodology has not been changed since the 1990 report.

**Table 1. Catch Estimates (metric tons) for thresher shark harvested by commercial and recreational fisheries for the period 2002-2008 compared to the current 340 metric ton HG.**

Year	Commercial DGN (all sizes)		Commercial Hook & Line		Recreational (all modes)		Commercial Other Gears		Total	
	MT	%HG*	MT	%HG	MT	%HG	MT	%HG	MT	%HG
2002	216	63.5	5.4	1.6	3.2	0.9	79.1	23.3	303.6	89.3
2003	241	70.9	3.8	1.1	27.4	8.0	55.5	16.3	327.7	96.4
2004	67	19.7	4.3	1.3	3.3	1.0	43.0	12.7	117.7	34.6
2005	155	45.6	1.1	0.3	11.6	3.4	22.0	6.5	189.7	55.8
2006	99	29.1	7.4	2.2	22.7	6.7	53.3	15.7	182.4	53.6
2007	166	48.8	8.8	2.6	52.4	15.4	28.0	8.2	255.2	75.0
2008**	31	9.1	7.8	2.3	28.4	8.3	0.0	0.0	67.2	19.8
Avg. 02-07	157.3	46.3	5.1	1.5	20.1	5.9	46.8	13.8	229.4	67.5

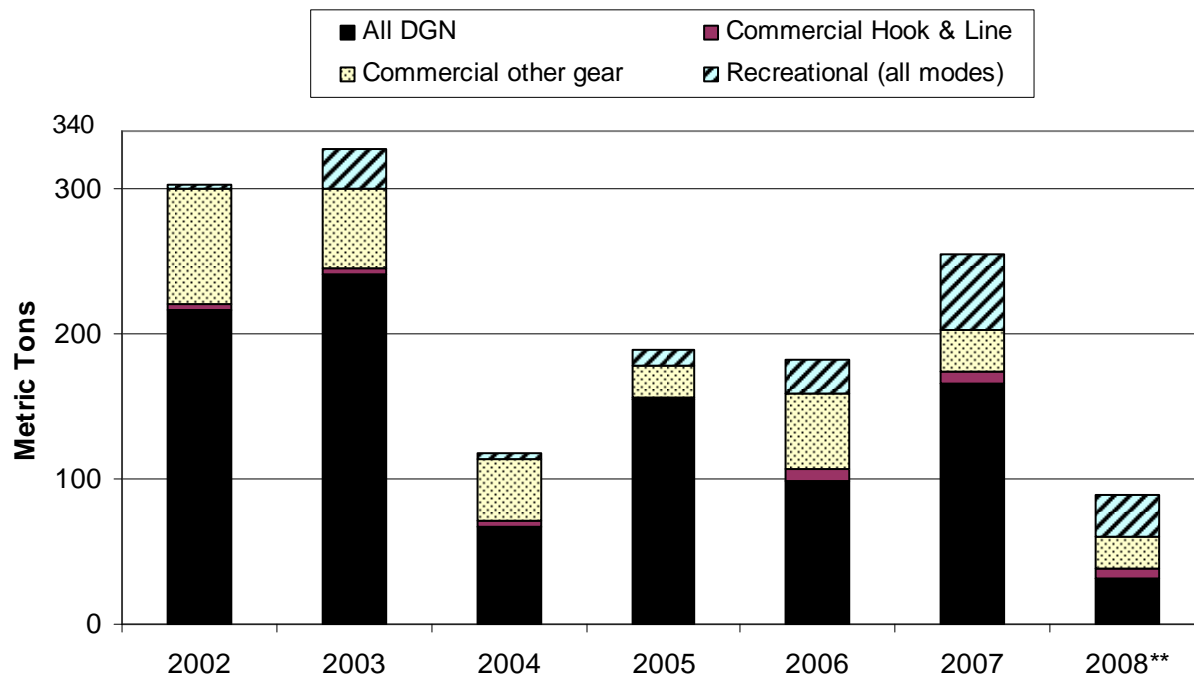
\*Thresher HG - 340 mt

\*\*2008 preliminary through August

CFIS, converted from pounds to round weight in mt; Recreational estimates from RecFIN, MRFSS (2002-2003) and CFRS (2004-2008)

The drift gill net category above includes both large mesh drift gill nets which are subject to the current fishery closure and small mesh drift gill nets which may take thresher sharks incidentally during the closure if fishing for either barracuda or white seabass.

Other commercial fisheries that may incidentally catch thresher shark include small mesh set gill nets targeting halibut and white seabass. Both of these small mesh gill net fisheries are not included in the large mesh shark and swordfish drift gillnet restricted access permit program and require only a general gill and trammel net permit for participation. In addition, these small mesh gear types may land up to 10 HMS sharks per day outside the closure period.



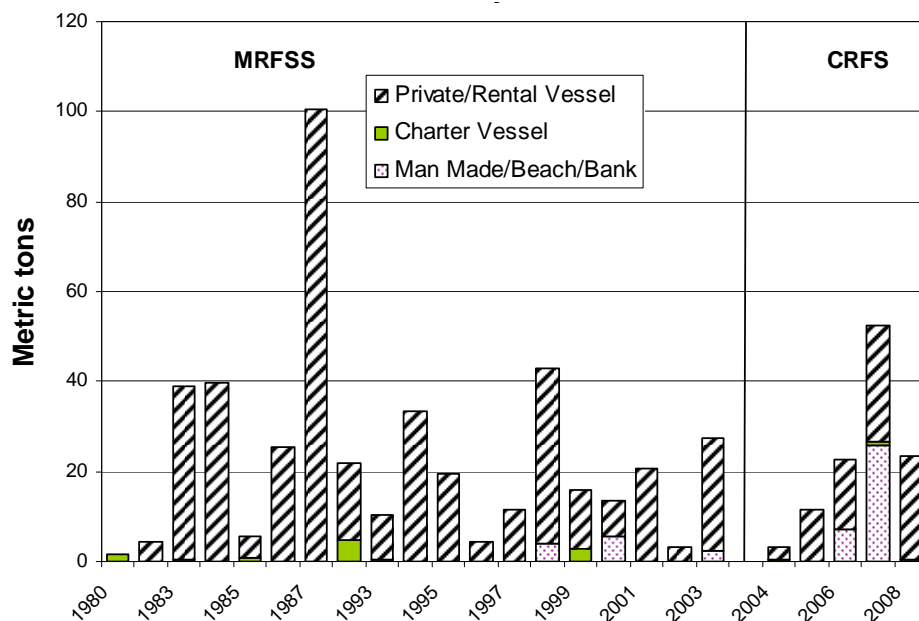
**Figure 1. Catch Estimates (metric tons) for thresher shark harvested by commercial and recreational fisheries for the period 2002-2008. \*\*2008 preliminary through August.**

Based on the composition of the commercial catch above, the Department does not believe that a seasonal closure on all commercial gears similar to the closure on the large mesh drift gillnet fishery is warranted at this time, given these catches comprise only about 15 percent of the total recent commercial thresher shark catch. Moreover, for some incidental fisheries such as the set gillnet fisheries for white seabass and halibut, any thresher taken incidentally would be discarded dead if retention was prohibited.

### Recreational Catch Estimates for Thresher Shark

RecFIN data is available from 1980 to present and provides the best available information regarding recreational thresher shark catch off California (Table 2). The Department believes that even though there has been an increase in recreational landings from 2005 to 2007, when compared to prior years, the 2007 catches are within the range of catch estimates for prior years. Thresher shark are rare samples compared to other sportfish and were sampled at a comparable rate in the MRFSS and CRFS programs.

Approximately 86% of all recreational thresher shark take occurs with private or rental boats (Figure 2, Table 2). Thresher shark take estimates did increase in 2007; however the very large amount taken in Manmade/Beach/Bank mode as shown in the table below included one very large shark which potentially skewed the estimate in that mode upward. Preliminary 2008 estimates through August 31st within the Private/Rental Vessel mode are comparable to 2007 suggesting that the high 2007 estimate was in part due to the very rare event of the capture of a very large thresher shark from a pier.



**Figure 2. Estimated catch A+B1(mt) of thresher shark in all fishing modes by anglers sampled in the Marine Recreational Fisheries Statistics Survey (MRFSS, 1980-2003) and the California Recreational Fisheries Survey (CRFS 2004-8/31/2008).**

The September HMSMT statement originally used an average weight from a sportfishing website, but was amended to use average weights from CRFS sampling data. The Department believes that at this time the estimated catch and estimated weights in the CRFS sampling program provide a reasonable basis for determining the metric tonnage of thresher sharks taken in the recreational fishery (Table 3).

**Table 2. Estimated catch A+B1 of thresher shark in metric tons by fishing modes by anglers sampled in the Marine Recreational Fisheries Statistics Survey (MRFSS, 1980-2003) and the California Recreational Fisheries Survey (CRFS 2004-8/31/2008).**

Year	Man Made Beach/Bank	Charter Vessel	Private/Rental Vessel	Total of All Modes	Percent Private/Rental Vessel
1980	0.0	1.8	0.0	1.8	0.0%
1982	0.0	0.0	4.4	4.4	100.0%
1983	0.5	0.0	38.5	39.1	98.7%
1984	0.0	0.0	39.7	39.7	100.0%
1985	0.0	0.0	4.9	5.7	86.3%
1986	0.0	0.0	25.5	25.5	100.0%
1987	0.0	0.0	100.5	100.5	100.0%
1988	0.0	4.8	17.2	21.9	78.3%
1993	0.2	0.0	10.3	10.5	97.9%
1994	0.0	0.0	33.5	33.5	100.0%
1995	0.0	0.0	19.6	19.6	100.0%
1996	0.0	0.0	4.3	4.3	100.0%
1997	0.0	0.0	11.7	11.7	100.0%
1998	3.8	0.0	39.2	42.9	91.2%
1999	0.0	2.7	13.1	15.8	82.8%
2000	5.7	0.0	7.9	13.6	58.1%
2001	0.0	0.0	20.6	20.6	100.0%
2002	0.0	0.0	3.2	3.2	100.0%
2003	2.5	0.0	24.9	27.4	90.9%
<b>Sub-Total</b>	<b>12.7</b>	<b>9.2</b>	<b>419.0</b>	<b>441.8</b>	

<b>Avg. 80-03</b>	<b>1.3</b>	<b>0.9</b>	<b>41.9</b>	<b>44.2</b>	<b>88.6%</b>
2004	0.0	0.5	2.8	3.3	85.3%
2005	0.0	0.0	11.6	11.6	100.0%
2006	7.1	0.0	15.6	22.7	68.5%
2007	25.9	0.6	25.9	52.4	49.4%
2008*	0.5	0.0	23.0	23.5	97.8%
<b>Sub-Total</b>	<b>33.1</b>	<b>1.1</b>	<b>55.9</b>	<b>90.1</b>	
<b>Avg. 04-07</b>	<b>8.3</b>	<b>0.3</b>	<b>14.0</b>	<b>22.5</b>	<b>75.8%</b>
<b>Total</b>	<b>46.3</b>	<b>10.3</b>	<b>497.9</b>	<b>555.3</b>	
<b>Avg. 80-07</b>	<b>2.0</b>	<b>0.4</b>	<b>20.6</b>	<b>23.1</b>	<b>86.4%</b>

In twelve of the sampling years since 1980, estimated numbers of threshers released alive (B2) have been comparable or higher than A+B1 estimates (A-sampler examined or B1 - angler reported kept) (Table 3). During four of the five years estimates are available of tonnage of angler released catch, metric tons reported released are higher than A+B1 metric tons. Anglers contacted informally as to the disposition of released threshers reported limiting themselves (or sometimes a group of anglers) to keeping one fish per year, and releasing the rest.

Additionally, thresher shark are often caught incidentally in the recreational fishery rather than as direct targets. In Northern California, thresher shark were never identified as the primary fishing target in instances where they were taken and retained; most were reported as incidental to salmon and halibut fishing. In Southern California, about 69 percent of the thresher sharks taken and retained were reported to be the primary target by the angler, and in the other instances, halibut, yellowtail and barred sand bass were most commonly reported as the primary target species.

**Table 3. Estimated weight in metric tons and numbers of recreationally caught thresher shark from MRFSS (1980-2003) and CRFS (2004-2008).**

<b>YEAR</b>	<b>Estimated Weight Mode A</b>	<b>Estimated Weight Mode B1</b>	<b>Estimated Weight Mode A+B1</b>	<b>Estimated Weight Mode B2</b>	<b>Estimated Number A+B1</b>	<b>Estimated Number B2</b>
1980	1.8	0	1.8		1,013	0
1982	4.4	0	4.4		2,205	1,184
1983	31.9	7.2	39.1		3,182	375
1984	39.7	0	39.7		769	0
1985	5.7	0	5.7		522	0
1986	25.5	0	25.5		1,359	2,798
1987	100.5	0	100.5		4,829	7,135
1988	21.9	0	21.9		1,426	5,672
1989	7.8	2.7	10.5		776	838
1993	28.8	4.7	33.5		2,726	2,536
1994	15.3	4.3	19.6		3,600	362
1995	4.3	0	4.3		2,654	276
1996	11.7	0	11.7		703	333
1997	42.9	0	42.9		461	2,670
1998	15.8	0	15.8		830	172
1999	13.6	0	13.6		1,502	1,788

2000	20.6	0	20.6		2,340	2,333
2001	3.2	0	3.2		2,204	2,948
2002	24.5	2.9	27.4		1,644	2,717
2003	3.3	0	3.3		2,208	3,949
2004	10.7	0.9	11.6	0.65	4,554	653
2005	21.3	1.4	22.7	37.54	305	1,141
2006	49.3	3.1	52.4	22.88	939	634
2007	23.5	4.9	28.4	68.56	1,598	1,672
2008*	1.8	0	1.8	30.93	715	2,415

\*2008 preliminary through August. Estimated weights for Mode B2 not available prior to 2004.

### Seasonal Catch Distribution in the Recreational Fishery

Thresher shark catches are highest in summer months, both for fish that are retained and released in the recreational fishery (Figure 3). Although the proposed seasonal closure would likely result in significant catch savings given peak catches have been from May through August, the Department does not believe the measure is warranted given the overall thresher shark catches remain below the harvest guideline.

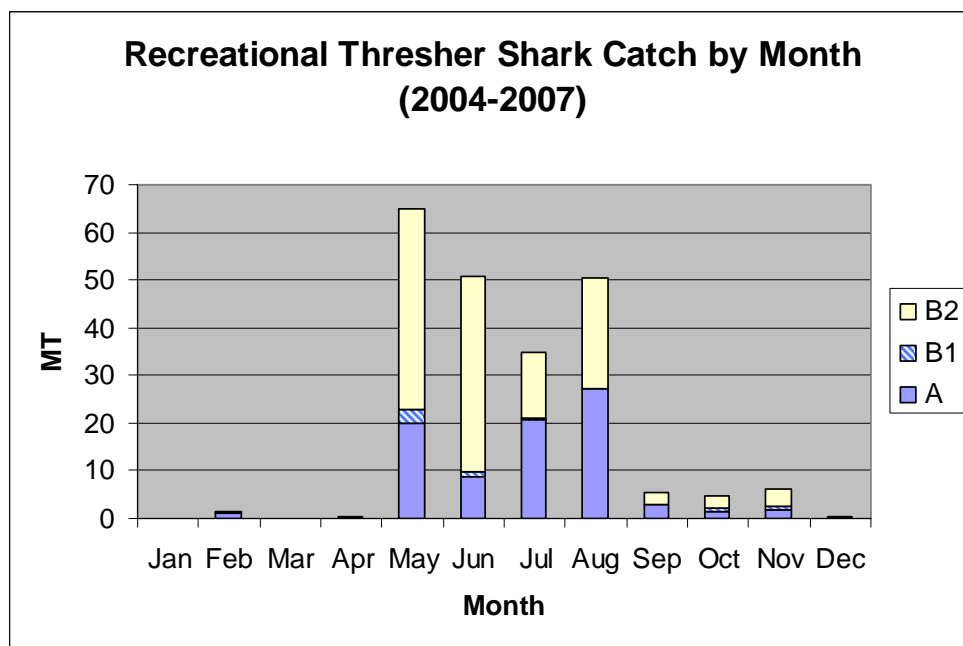


Figure 3. Estimated weight in metric tons of recreationally caught thresher shark from CRFS (2004-2007) by Types A, B1, and B2 by month.

### Analysis of Thresher Shark Recreational Bag Limit Reduction

Although not part of the preferred Alternative, the Department has reviewed the portion of Alternative 4 which proposes changes to the current recreational bag limit of two thresher sharks per day in light of refinements in the landings data. Proposed alternatives to the existing daily limit are to reduce the limit to either 1 HMS shark per day (1 shortfin mako, or 1 common thresher, or 1 pelagic thresher, or 1 bigeye thresher, or 1 blue shark) or one shark of each HMS species per day. The seasonal limit would

limit each angler to a range of between 1-5 sharks per year. Or, a combination of the proposed daily limit and seasonal limit can be imposed.

The Department has examined RecFIN catch data to evaluate savings which might be achieved from reducing the thresher shark bag limit from two fish per day to one fish per day. Between 1980 and 2008, field samplers in California observed 199 thresher sharks in anglers' bags ("type A" catches). A summary of the number of contributing anglers to these bags, and the number of thresher sharks per bag is provided in Table 4.

**Table 4. Examined catch of thresher sharks observed by MRFSS and CRFS samplers including the number of anglers contributing to the bag and the number of fish in the bag for all contributors from 1980- August 31, 2008. Highlighted cells represent bags that would have been impacted by a bag reduction from two to one fish.**

Number of anglers contributing to the bag	1	2	3	4	5	6	Total
Number of fish in Bag for all contributors combined							
1	76	51	30	11	1	1	168
2	6	3	5	3	1	0	18
3	0	0	4	3	1	0	8
4	0	1	0	0	0	0	1
5	0	0	0	0	0	0	0
>5	0	0	1	1	0	0	2
Total with catch	82	55	40	18	3	1	199

In the table above, a bag limit reduction from two to one fish would only have impacted thresher shark catches taken in the bags identified in the cell highlighted in the table above; i.e., where a single angler took more than one thresher shark in a trip. A total of 190 of 199 total bags (96%) with threshers in the cells not highlighted above would not have been impacted by a reduction in the daily bag limit. Additionally, it is important to recognize that under California law, boat limits would allow for retention of one fish per person aboard the boat for any thresher sharks taken by boat modes. Since most of the recreational catch comes from boat modes, the boat limit provision would further curtail realization of savings from a bag limit reduction. Because we cannot determine if any of the bags identified in the highlighted cell above would have been prohibited under a one-fish bag limit given the boat limit laws, it is unclear that there would be any actual savings from a bag limit reduction from 2 to 1 fish per day.

Because available recreational catch data does not suggest additional regulatory action is needed to curtail recreational catches at this time, CDFG does not support a need for bag limit reductions for this purpose. Moreover, from examination of type A catch records, it appears that a reduction from two to one fish would not have a measurable impact on total recreational catches. While including thresher sharks in an aggregate HMS bag limit would likely produce somewhat more catch savings than reducing only the thresher shark limit, there has been neither data nor analysis to support a need to make such a change at this time. However, CDFG recognizes thresher shark bag limit reductions could be established for other purposes. These purposes might include, but would not be limited to, promoting resource conservation, prohibiting waste, and to reinforce a public policy desire that recreational anglers should harvest only what they can utilize.

Annual bag limits may be implemented through a report card requirement. In a report card program the Individual acquires a card in which recreational fishing information on catch, releases, and effort for the target species may be required of the cardholder. Some of the cards have tagging requirements associated with them if an annual limit is established for the species. The State of California currently manages report card programs for steelhead trout, sturgeon, abalone, and spiny lobster harvest. Harvest reporting requirements associated with tags may lead to better compliance and more accurate harvest monitoring; however, report card programs are very expensive to implement and maintain.

### **Analysis of One Thresher Shark per Boat Option**

In its November supplemental report, the HMSMT recommends establishing a one thresher shark per boat limit under the bag limit options. This boat limit would apply to private and six-pack charter vessels but not to larger CPFV vessels that carry in excess of six passengers.

The Department does not support distinguishing in a regulation between CPFV vessels and private six-pack charter boats. The Department currently licenses any vessel for hire that fishes off California in ocean waters as a CPFV, regardless of the size or carrying capacity of the vessel. It would be difficult or impossible to draft a regulation to distinguish between these two classes of vessels that would serve the needs of enforcement and the public, as they are both subject to the same license requirements.