

## ALBACORE FISHING EFFORT CHARACTERIZATION

In 2006, the Council was briefed on two resolutions adopted in 2005 by the Inter-American Tropical Tuna Commission (IATTC) and the Western and Central Pacific Fisheries Commission (WCPFC) calling on parties to not increase beyond current levels total fishing effort by their fleets on North Pacific albacore tuna. These resolutions were adopted in response to information raising a conservation concern about the future status of the stock. After receiving input on the vagaries and implications of defining “current effort,” the Council directed its Highly Migratory Species Management Team (HMSMT) to review historical fishing effort by U.S. West Coast vessels targeting North Pacific albacore in order to provide baseline information for any decision-making on what measures, if any, might be implemented to address these resolutions. Proper characterization of historical U.S. fishery effort on albacore will be used in demonstrating to the IATTC and WCPFC how the U.S. West Coast is complying with these resolutions.

At their February 7–8, 2007 meeting, the HMSMT and Highly Migratory Species Advisory Subpanel (HMSAS) discussed a proposed method to characterize historical albacore fishing effort developed by Southwest Fisheries Science Center staff in cooperation with the HMSMT. Based on these discussions, the presentation of this information has been further refined and is included here as Attachment 1. The HMSAS favors a different approach to characterizing historical albacore fishing effort and at the February 7–8 meeting adopted a resolution containing this recommendation, which is included here as the HMSAS Report.

The Council could develop a preliminary recommendation at this meeting, which could then be made available for public review and finalized at a future Council meeting, or the Council could decide to take final action at this meeting. In finalizing any recommendation the Council may wish to confer with representatives from National Marine Fisheries Service and Department of State about the necessity of making a final recommendation in advance of this year’s IATTC meeting, which occurs June 18–29.

### **Council Action:**

**Review data and recommendations from the HMSMT and HMSAS, and consider adopting a characterization of historical North Pacific albacore fishing effort, a definition of current effort, and a response to IATTC and WCPFC resolutions. Determine the process for finalizing the Council’s recommendations.**

### **Reference Materials:**

1. Agenda Item J.3.b, Attachment 1: Historical Albacore Effort Data
2. Agenda Item J.3.c, HMSAS Report

Agenda Order:

- a. Agenda Item Overview
- b. Science Center Report
- c. Reports and Comments of Advisory Bodies
- d. Public Comment
- e. **Council Action:** Take Final Action To Adopt, Or Adopt For Public Review, A Characterization Of Historical U.S. North Pacific Albacore Fishing Effort That Supports IATTC And WCPFC Resolutions.

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03/20/07

**Draft document for PFMC Review, April 2007**

**Estimating Recent Effort for the US Fisheries Landing Albacore**

1. Data were obtained on each commercial fishery from SWFSC and PIFSC. Recreational data were provided by the State Fishery Departments. Data include annual catch, number of vessels if available, and number of days fished, either as vessel days or angler days. In the case of the longline fishery, effort is the number of hooks fished. Data provided are shown in worksheet "**Available Data**".
  - A. These data are the same as compiled for the ISC albacore working group.
  - B. In recent years, a local handline/troll fishery targeting bigeye and yellowfin tuna near the Hawaiian Islands had significant catch of larger sized albacore, but these data have not been verified and are not considered reliable to use until further scrutinized. Nonetheless, they are included here. Their contribution is about 1% annually on average for those years reported, so their inclusion is considered to have a negligible effect overall.
  - C. The period of 1996-2005 was selected to represent recent catch and effort due to relatively stable landings over that period with a noticeable change from the earlier period occurring between 1995-1996.
2. The fisheries and their average annual proportion of the total US landings 1996-2006 are presented in worksheet "**Relative Contribution**".
  - A. Other Baitboat (<1%) – These are vessels which specifically declare their fishing method as baitboat, otherwise they fall in the Troll/Baitboat category. Oregon and Washington landing tickets do not distinguish baitboat from troll, so all those vessels fall under Troll/Baitboat.
  - B. Gillnet (<1%) – Targets swordfish and thresher shark in the US west coast EEZ.
  - C. Longline (5.5%) – Targets bigeye tuna primarily.
  - D. Purse Seine (<1%)
  - E. Sport Charter (9.6%)
  - F. Sport Private (3.7%)
  - G. Troll/Baitboat (79.1%)
  - H. Other (<0.01%) – Catchall for any other landings with none of the other methods identified.
  - I. Hawaii Troll/Handline (1.1%) – a small local fishery which operates only within the EEZ around Hawaii and targets bigeye and yellowfin tuna, primarily. Landings data have not been verified and are considered questionable at this time.
3. To calculate effort from those relatively minor fisheries for which it is not available (other baitboat, purse seine, and other), the number of days of effort was estimated based on the assumption of equivalent cpue as the surface fishery (troll/baitboat). Overall, the 3 fisheries for which this substitution was made account for a total of less than 3% of the landings in any given year, so even an

erroneous assumption here is considered negligible. Those fisheries which are considered to have a cpue equivalent to the troll/baitboat are shown shaded in grey in the worksheet “**Modeled Effort**”.

4. To calculate effort for the other fisheries for which the cpue differs from the troll/baitboat fishery, the ratio of

$$\text{cpue}_{(\text{other fishery})} / \text{cpue}_{(\text{troll/baitboat fishery})}$$

was used to calculate the relative cpue of the other fishery. For example, if the longline fishery catches 12mt on 1,200,000 hooks, and the troll/baitboat fishery catches 12mt in 12 days, then the relative “efficiency” of the longline fishery is 100,000 hooks per troll fishing day. This method was used to calculate effort for the other fisheries (gillnet, longline, sport charter, sport private, and Hawaii handline/troll) in the common metric of “reference fishing days”. Those fisheries and the modeled effort values are shown shaded in green in the worksheet “**Modeled Effort**”. For each fishery, an estimate of the error associated with the effort values was generated from the mean and variance of the annual estimated reference days.

5. Total modeled reference days were calculated by summing across all fisheries. Total error estimates were appropriately propagated across all fisheries to reflect the error estimate of the summed total. A “band” of recent effort could be considered the range of values for the total modeled effort from 1996-2006. Alternatively, the “band” could be considered to be the 95% confidence interval of the mean of the modeled effort across all years, 1996-2006. See worksheet “**Modeled Effort**”.
6. It may be best to recalculate these values without the 2006 catch and effort data, as the 2006 data is considered provisional at this time.
7. Based on feedback provided by the HMSMT and HMSAS at their February meeting, the commercial catch and effort data were separated from the recreational data and the modeled effort was calculated just for the commercial fisheries. Graphs represent recent catch of just the commercial fisheries east and west of 150° W longitude, and the modeled recent effort of the commercial fisheries. A final worksheet shows data for the recreational fisheries.

Worksheet "Available Data"

U.S. Albacore fisheries in the North Pacific (Annual Statistics)

Original data with best estimates of effort in various units

YEAR	OTHER BAITBOAT (EEZ)	GILLNET (EEZ)			LONGLINE			PURSE SEINE (EEZ)		SPORT Charter (EEZ, Mex)		SPORT Private (EEZ)		TROLL/BAITBOAT			OTHER (EEZ)	Hawaii Troll/Handline (EEZ, W of 150)		Total	West of 150 W	East of 150 W	
	CATCH MT	CATCH MT	EFFORT DAYS	VESSELS NUMBER	CATCH MT	EFFORT Hooks	VESSELS NUMBER	CATCH MT	VESSELS NUMBER	CATCH MT	EFFORT DAYS	CATCH MT	EFFORT DAYS	CATCH MT	EFFORT DAYS	VESSELS NUMBER	CATCH MT	CATCH MT	VESSELS NUMBER	CATCH MT	CATCH MT	CATCH MT	
1986	432	3	10,936	216			39		15	330	20,313	315		4,708	16,277	462	0	5		5,792	425	5,368	
1987	158	5	8,685	193	150		37		5	115	9,057	39		2,766	14,732	518	0	6		3,239	646	2,593	
1988	598	15	6,185	165	308		50		4	5	1,086	10		4,212	13,880	547	10	9		5,167	320	4,848	
1989	54	4	5,950	153	249		88		3	198	20,216	31		1,860	11,482	346	23	36		2,456	292	2,163	
1990	115	29	4,493	128	177	970,394	138		71	7	37	9,918		2,603	9,538	371	4	15		3,051	346	2,704	
1991	0	17	4,713	119	313	11,441,302	144		0	0	10	1,890		1,845	9,420	179	71	72		2,328	450	1,878	
1992	0	0	4,049	115	337	10,697,683	125		0	0	4	255		4,572	17,032	603	72	54	1,977	5,038	443	4,595	
1993	0	0	5,484	128	440	12,038,774	129		0	4	4	181		6,254	21,415	518	0	71	1,987	6,769	2,374	4,395	
1994	0	38	4,627	134	546	10,859,494	156		0	1	1	113	19	10,978	26,072	686	213	90	1,948	11,885	2,047	9,838	
1995	80	52	3,773	106	883	13,039,899	132		0	0	14	1,150	46	8,045	25,650	464	1	177	2,020	9,298	3,399	5,899	
1996	24	83	3,626	108	1,187	13,797,215	118		11	1	32	2,911	14	16,938	32,717	640	0	188	2,166	18,477	12,675	5,802	
1997	73	60	3,019	95	1,652	14,827,349	130		2	5	717	42,319	818	14,252	45,572	1,121	1	133	2,149	17,708	11,256	6,453	
1998	79	80	2,822	88	1,120	16,647,964	147		33	15	1,108	60,584	752	698	14,410	21,445	755	2	88	2,135	17,672	7,221	10,451
1999	60	149	356	41	1,540	18,332,090	130		48	5	2,667	88,551	1282	592	10,060	34,643	705	1	331	2,127	16,138	3,470	12,667
2000	69	55	1,229	49	940	21,713,196	129		4	2	1,337	61,160	493	337	9,645	37,331	649	3	120	1,993	12,666	3,516	9,149
2001	139	94	1,604	61	1,295	23,691,849	125		51	7	2,023	96,813	830	1296	11,210	26,566	870	0	194	1,937	15,837	5,688	10,149
2002	381	30	1,660	52	525	27,533,505	123		4	2	2,447	104,437	635	564	10,387	25,350	641	0	235	1,916	14,646	4,052	10,593
2003	59	16	1,423	46	524	30,473,166	129		44	2	2,675	85,857	1236	2313	14,102	23,442	836	0	85	1,650	18,741	2,972	15,769
2004	126	12	1,099	37	355	43,254,424	125		1	1	1,661	67,204	(347)	25941	13,346	23,979	734	0	160	1,550	16,009	1,221	14,788
2005	(66)	(20)	1,040	38	(294)	45,649,694	125		(2)	1	1,002	39,054	(82)	13883	(9,122)	(25,252)	549	0	183	NA	10,770	528	10,242
2006	(11)	(2)	112	14	(251)	37,630,188	123		(0)	0	337	19,306	(145)	9199	(12,645)	(34,860)	574	0	53	NA	13,443	376	13,067

EEZ means that the fishery operates entirely within the US West Coast EEZ

Gillnet effort in days calculated by any drift gillnet catch per total days fishing (not just albacore) from logbooks

Gillnet vessels is number of DFG vessels in logs, 1999 logbook coverage may be low since number of vessels in logs is lower than the number of vessels landing ALB.

PIFSC working on revising number of longline vessels - there may be double counting of CA vessels that fished both fisheries.

Purse seine vessels only include purse seiners fishing inside the EEZ.

Hawaii troll and handline data are new and are being reviewed for accuracy before inclusion in stock assessments.

Values in parentheses are considered preliminary

Recreational data include fish taken in Mexico waters by CA based charter boats (see "By Area..." worksheet)

CA recreational data from Recfin

CA recreational private boat average weight for 1990-1992 based on average of all other years (9.69 kg)

CA recreational CPFV average weight for 1990-1993 estimated as average for all other years (9.96 kg)

CA recreational private boat data for 1986-2003 from MRFSS and for 2004-05 from CRFS

OR recreational data from Oregon Recreational Boat Survey

OR recreational average weight = 16, 20 and 18 lbs in 2004, 2005 and 2006, respectively (used 18 lbs for other years)

WA recreational avg weight = 19.2 lbs from 2005 charter logs and 16.2 from 2006 logs; 19.2 lbs was used for 2000-2005

Recreational effort unit is one angler-day in CA, one trip in WA and OR

Washington Recreational data from Washington Ocean Sampling Program

Troll/Baitboat effort GLM corrected based on area (1 degree square) and 10 day period

2006 additional notes:

All catches are from a PacFIN extract made on January 10, 2007

Gillnet effort and number of vessels are from logbooks on hand as of January 10, 2007

Troll effort from 2005 CPUE (changed to weight per fish with 2005 average weight) generated in Childers data report.

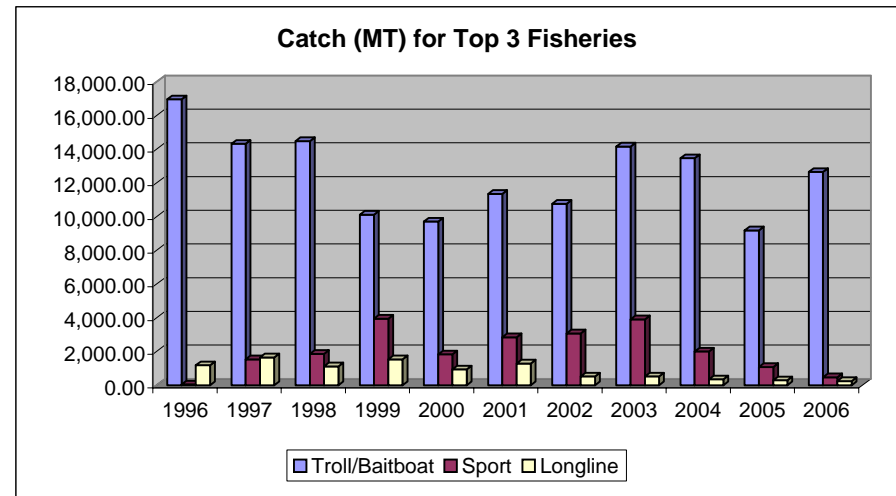
Longline effort for HI calculated using the 2005 HI longline mt/1000 hooks + the CA longline hooks from logs.

Hawaii troll/handline fishery data have not been verified and may be erroneous. Nonetheless, their contribution is less than 1% of total catch overall, so they are included.

Worksheet "Relative Contribution"

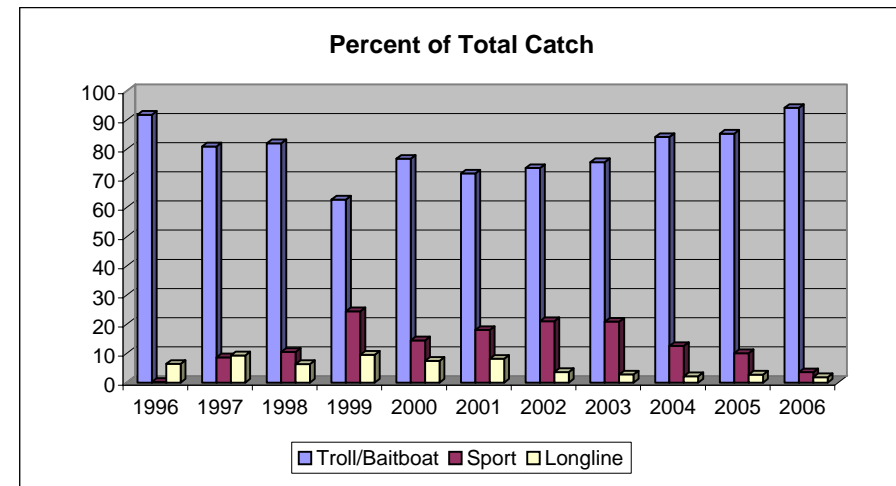
Relative Proportion (in percent) of the total US catch for each fishery 1996-2006

Year	A OTHER BAITBOAT (EEZ)	B GILLNET (EEZ)	C LONGLINE	D PURSE SEINE (EEZ)	E SPORT Charter (EEZ, Mex)	F SPORT Private (EEZ)	G TROLL / BAITBOAT	H OTHER (EEZ)	I Hawaii Troll / Handline
1996	0.13	0.45	6.42	0.06	0.17	0.08	91.67	0.00	1.02
1997	0.41	0.34	9.33	0.01	4.05	4.62	80.48	0.01	0.75
1998	0.45	0.45	6.34	0.19	6.27	4.25	81.54	0.01	0.50
1999	0.37	0.92	9.54	0.30	16.53	7.94	62.34	0.01	2.05
2000	0.54	0.43	7.42	0.03	10.56	3.89	76.15	0.02	0.95
2001	0.88	0.59	8.18	0.32	12.78	5.24	70.79	0.00	1.22
2002	2.60	0.21	3.59	0.03	16.71	4.33	70.92	0.00	1.60
2003	0.32	0.09	2.80	0.23	14.27	6.60	75.25	0.00	0.45
2004	0.79	0.07	2.22	0.01	10.38	2.17	83.37	0.00	1.00
2005	0.61	0.19	2.73	0.02	9.30	0.76	84.70	0.00	1.70
2006	0.08	0.01	1.87	0.00	2.51	1.08	94.06	0.00	0.39
max	2.60	0.92	9.54	0.32	16.71	7.94	94.06	0.02	2.05
min	0.08	0.01	1.87	0.00	0.17	0.08	62.34	0.00	0.39
avg	0.65	0.34	5.49	0.11	9.41	3.72	79.21	0.00	1.06

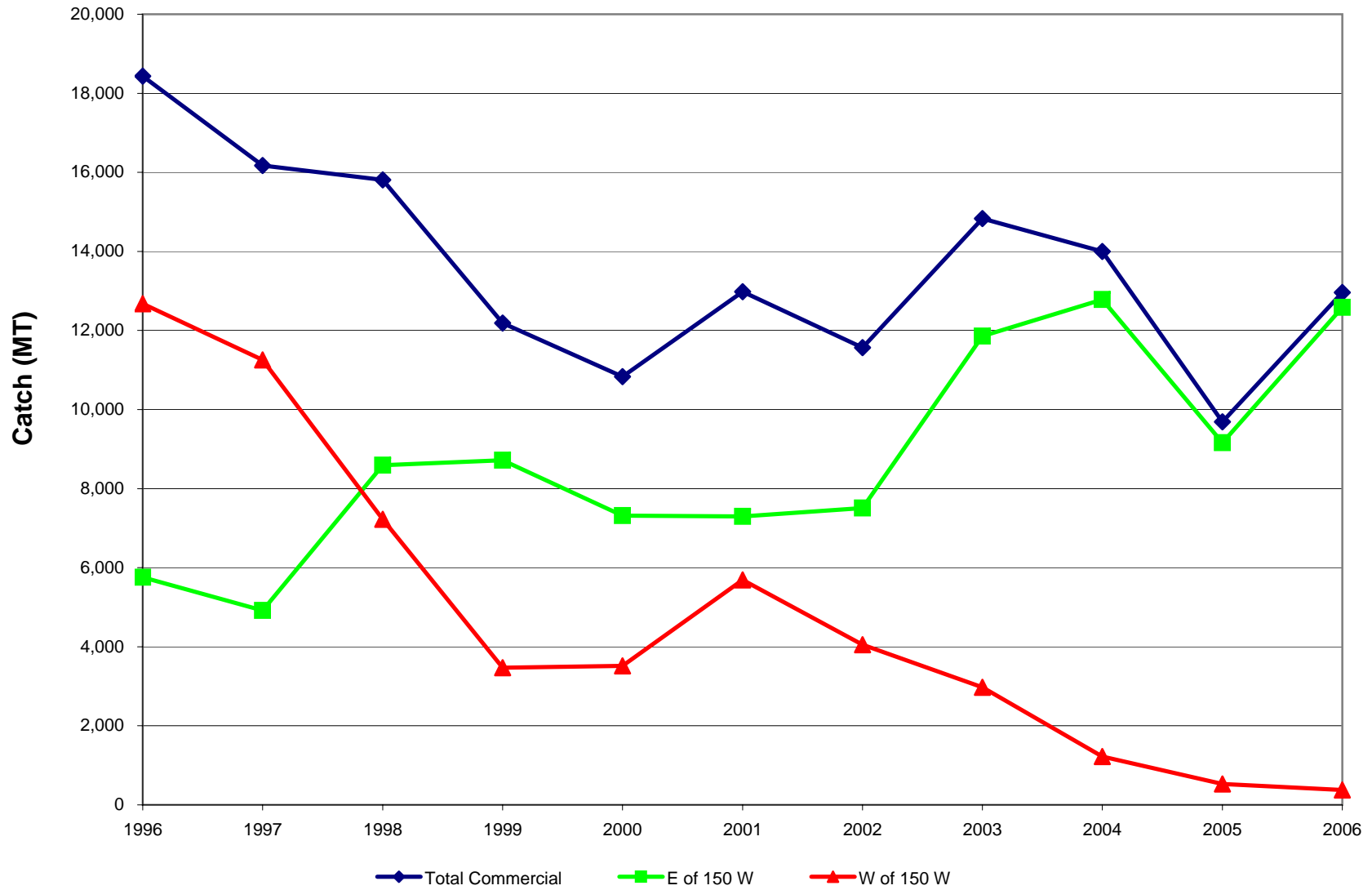


Summarized for top 3 fisheries (Troll/baitboat, Sport, Longline)

Year	Troll/Baitboat (A+G)		Sport (E+F)		Longline (C)		Others rel. %
	catch (MT)	rel. %	catch (MT)	rel. %	catch (MT)	rel. %	
1996	16,962	91.80	46	0.25	1,187	6.42	1.53
1997	14,325	80.89	1,535	8.67	1,652	9.33	1.11
1998	14,489	81.99	1,860	10.53	1,120	6.34	1.15
1999	10,121	62.71	3,949	24.47	1,540	9.54	3.28
2000	9,714	76.69	1,830	14.45	940	7.42	1.44
2001	11,350	71.66	2,854	18.02	1,295	8.18	2.14
2002	10,768	73.52	3,082	21.05	525	3.59	1.84
2003	14,161	75.56	3,911	20.87	524	2.80	0.77
2004	13,472	84.16	2,009	12.55	355	2.22	1.08
2005	9,188	85.31	1,083	10.06	294	2.73	1.90
2006	12,656	94.14	481	3.58	251	1.87	0.41
max	16,962	94.14	3,949	24.47	1,652	9.54	3.28
min	9,188	62.71	46	0.25	251	1.87	0.41
avg	12,473	79.86	2,058	13.13	880	5.49	1.51



### Recent US Commercial Albacore Landings



Worksheet "Modeled Effort"

In this model, CPUE was calculated individually for each year for each fishery 1996-2006 and used to derive a reference number of days fished based on the troll/baitboat cpue.

In the top table, estimates of effort were calculated for the minor surface fisheries (other baitboat, purse seine, other EEZ) using the troll/baitboat cpue

The four values in red are effort estimates substituted in based on the average cpue for that fishery for the years for which effort was available

YEAR	OTHER BAITBOAT (EEZ)			GILLNET (EEZ)			LONGLINE			PURSE SEINE (EEZ)			SPORT Charter (EEZ)			SPORT Private (EEZ)			TROLL/BAITBOAT			OTHER (EEZ)			Hawaii Troll/Handline (EEZ, W of 150)				
	CATCH MT	EFFORT DAYS	VESSELS NUMBER	CATCH MT	EFFORT DAYS	VESSELS NUMBER	CATCH MT	EFFORT Hooks	VESSELS NUMBER	CATCH MT	EFFORT DAYS	VESSELS NUMBER	CATCH MT	EFFORT DAYS	VESSELS NUMBER	CATCH MT	EFFORT DAYS	VESSELS NUMBER	CATCH MT	EFFORT DAYS	VESSELS NUMBER	CATCH MT	EFFORT DAYS	VESSELS NUMBER	CATCH MT	EFFORT DAYS	VESSELS NUMBER		
1996	432	1,494	NA	3	10,936	216						15	330	957				315			4,708	16,277	462	0	0	NA	5		
1997	158	842	NA	5	8,685	193	150					5	115	452				39			2,766	14,732	518	0	0	NA	6		
1998	598	1,971	NA	15	6,185	165	308					4	5	60				10			4,212	13,880	547	10	33	NA	9		
1999	54	333	NA	4	5,950	153	249					3	198	853				31			11,482	34,860	346	23	142	NA	36		
1999	115	421	NA	29	4,493	128	177	970,394				138	71	260				7			2,603	9,538	371	4	15	NA	15		
1991	0	0	NA	17	4,713	119	313	11,441,302				144	0	10	99			0			1,845	9,420	179	71	363	NA	72		
1992	0	0	NA	0	4,049	115	337	10,697,683				125	0	0	0			0			4,572	17,032	603	72	268	NA	54		1,977
1993	0	0	NA	0	5,484	128	440	12,038,774				129	0	0	4			0			6,254	21,415	518	0	0	NA	71		1,987
1994	0	0	NA	38	4,627	134	546	10,859,494				156	0	0	1			19			10,978	26,072	686	213	506	NA	90		1,948
1995	80	255	NA	52	3,773	106	883	13,039,899				132	0	0	0	14	56	46			8,045	25,650	464	1	2	NA	177		2,020
1996	24	46	NA	83	3,626	108	1,187	13,797,215				118	11	22	1	32	2,911	14	134		16,938	32,717	640	0	0	NA	188		2,166
1997	73	233	NA	60	3,019	95	1,652	14,827,349				130	2	5	5	717	42,319	818	7,730		14,252	45,572	1,121	1	3	NA	133		2,149
1998	79	118	NA	80	2,822	88	1,120	16,647,964				147	33	49	15	1,108	60,584	752	698		14,410	21,445	755	2	2	NA	88		2,135
1999	60	208	NA	149	356	41	1,540	18,332,090				130	48	165	5	2,667	88,551	1,282	592		10,060	34,643	705	1	3	NA	331		2,127
2000	69	266	NA	55	1,229	49	940	21,713,196				129	4	16	2	1,337	61,160	493	337		9,645	37,331	649	3	11	NA	120		1,993
2001	139	330	NA	94	1,604	61	1,295	23,691,849				125	51	120	7	2,023	96,813	830	1,296		11,210	26,566	870	0	1	NA	194		1,937
2002	381	930	NA	30	1,660	52	525	27,533,505				123	4	10	2	2,447	104,437	635	564		10,387	25,350	641	0	1	NA	235		1,916
2003	59	98	NA	16	1,423	46	524	30,473,166				129	44	72	2	2,675	85,857	1,236	2,313		14,102	23,442	836	0	1	NA	85		1,650
2004	126	226	NA	12	1,099	37	355	43,254,424				125	1	2	1	1,661	67,204	347	25,941		13,346	23,979	734	0	0	NA	160		1,550
2005	66	183	NA	20	1,040	38	294	45,649,694				125	2	6	1	1,002	39,054	82	13,883		9,122	25,252	549	0	0	NA	183		2,102
2006	11	30	NA	2	112	14	251	37,630,188				123	0	0	0	337	19,306	145	9,199		12,645	34,860	574	0	0	NA	53		609

YEAR	OTHER BAITBOAT (EEZ)			GILLNET (EEZ)			LONGLINE			PURSE SEINE (EEZ)			SPORT Charter (EEZ)			SPORT Private (EEZ)			TROLL/BAITBOAT			OTHER (EEZ)			Hawaii Troll/Handline (EEZ, W of 150)				
	ref. days	cpue	ref. days	cpue	ref. days	cpue	ref. days	cpue	ref. days	cpue	ref. days	cpue	ref. days	cpue	ref. days	cpue	ref. days	cpue	ref. days	cpue	ref. days	cpue	ref. days	cpue	ref. days	cpue	ref. days	cpue	ref. days
1996	46	0.023	0.04	160	0.000	0.0002	2292	22	0.011	0.02	62	0.106	0.20	27	0.518	32,717				0			0.087	0.17	363				
1997	233	0.020	0.06	192	0.000	0.0004	5284	5	0.017	0.05	2294	0.106	0.34	2615	0.313	45,572				3			0.062	0.20	425				
1998	118	0.028	0.04	119	0.000	0.0001	1667	49	0.018	0.03	1649	1.077	1.60	1119	0.672	21,445				2			0.041	0.06	131				
1999	208	0.417	1.44	512	0.000	0.0003	5301	165	0.030	0.10	9183	2.166	7.46	4415	0.290	34,643				3			0.156	0.54	1140				
2000	266	0.045	0.17	213	0.000	0.0002	3638	16	0.022	0.08	5177	1.462	5.66	1906	0.258	37,331				11			0.060	0.23	464				
2001	330	0.059	0.14	223	0.000	0.0001	3068	120	0.021	0.05	4795	0.641	1.52	1968	0.422	26,566				1			0.100	0.24	460				
2002	930	0.018	0.04	74	0.000	0.0000	1282	10	0.023	0.06	5973	1.126	2.75	1549	0.410	25,350				1			0.123	0.30	574				
2003	98	0.011	0.02	27	0.000	0.0000	871	72	0.031	0.05	4446	0.534	0.89	2055	0.602	23,442				1			0.052	0.09	141				
2004	226	0.011	0.02	22	0.000	0.0000	638	2	0.025	0.04	2985	0.013	0.02	624	0.557	23,979				0			0.103	0.19	287				
2005	183	0.019	0.05	55	0.000	0.0000	814	6	0.026	0.07	2773	0.006	0.02	226	0.361	25,252				0			0.087	0.24	507				
2006	30	0.018	0.05	6	0.000	0.0000	692	0	0.017	0.05	929	0.016	0.04	399	0.363	34,860				0			0.087	0.24	146				
mean	242.64		0.19	145.60		0.0001	2322.52	42.48		0.06	3660.48		1.86	1536.63		30105.23				2.09			0.23	421.67					
var	60568.1			20995.4			3132087.6	3047.4			6761964.6		1633625		55708874					10.4			80975.3						
std	246.11			144.90			1769.77	55.20			2600.38		1278.13		7463.84					3.23			284.56						
se	74.20			5.28		43.69	8239.84	533.61			17.95	784.04		0.54	385.37		2250.43				0.97			4.43	85.80				
1:1			0.19:1	or 5.3 days fishing to 1 troll		0.0001:1	or 8240 hooks to 1 troll day	1:1			0.06:1	or 17.9 days to 1 troll day		1.86:1	or 0.5 days to 1 troll day	N/A				1:1			0.23:1	or 4.4 days to 1 troll day					

Year	Total Effort in Modeled Reference Days: All fisheries			Band based on 95% confidence of average modeled total effort			Band based on range of total modeled effort	
	All Fisheries	Troll/bait only	Others	mean	mean - se	mean + se	min	max
1996	35,690	32,764	2,927	38,479	33,116	43,843	26,299	56,625
1997	56,625	45,806	10,819					
1998	26,299	21,562	4,736					
1999	55,570	34,851	20,719					
2000	49,023	37,597	11,426					
2001	37,531	26,896	10,634					
2002	35,743	26,280	9,463					
2003	31,153	23,540	7,613					
2004	28,763	24,206	4,557					
2005	29,815	25,435	4,380					
2006	37,061	34,890	2,171					
min	26,299							
max	56,625							
mean	38,479							
var	67,402,147							
std	8,210							
se	2,737							
95% CI	5,364							

Year	Total Effort in Modeled Reference Days: Commercial Fisheries			Band based on 95% confidence of average modeled total effort			Band based on range of total modeled effort	
	Troll/Bait only	Other Commercial	Total Commercial	mean	mean - se	mean + se	min	max
1996	32,764	2,838	35,601	33,282	27,592	38,973	23,530	51,715
1997	45,806	5,909	51,715					
1998	21,562	1,968	23,530					
1999	34,851	7,122	41,972					
2000	37,597	4,342	41,940					
2001	26,896	3,872	30,768					
2002	26,280	1,941	28,221					
2003	23,540	1,112	24,652					
2004	24,206	949	25,154					
2005	25,435	1,381	26,816					
2006	34,890	844	35,734					
min			23,530					
max			51,715					
mean			33,282					
var			59,006,558					
std			7,682					
se			2,903					
95% CI			5,691					

Potential combination model for commercial effort:

Total Modeled Effort = [Days fishing (sum of Troll, baitboat, purse seine, other)]

+ [Days fishing (gillnet)/5.3]

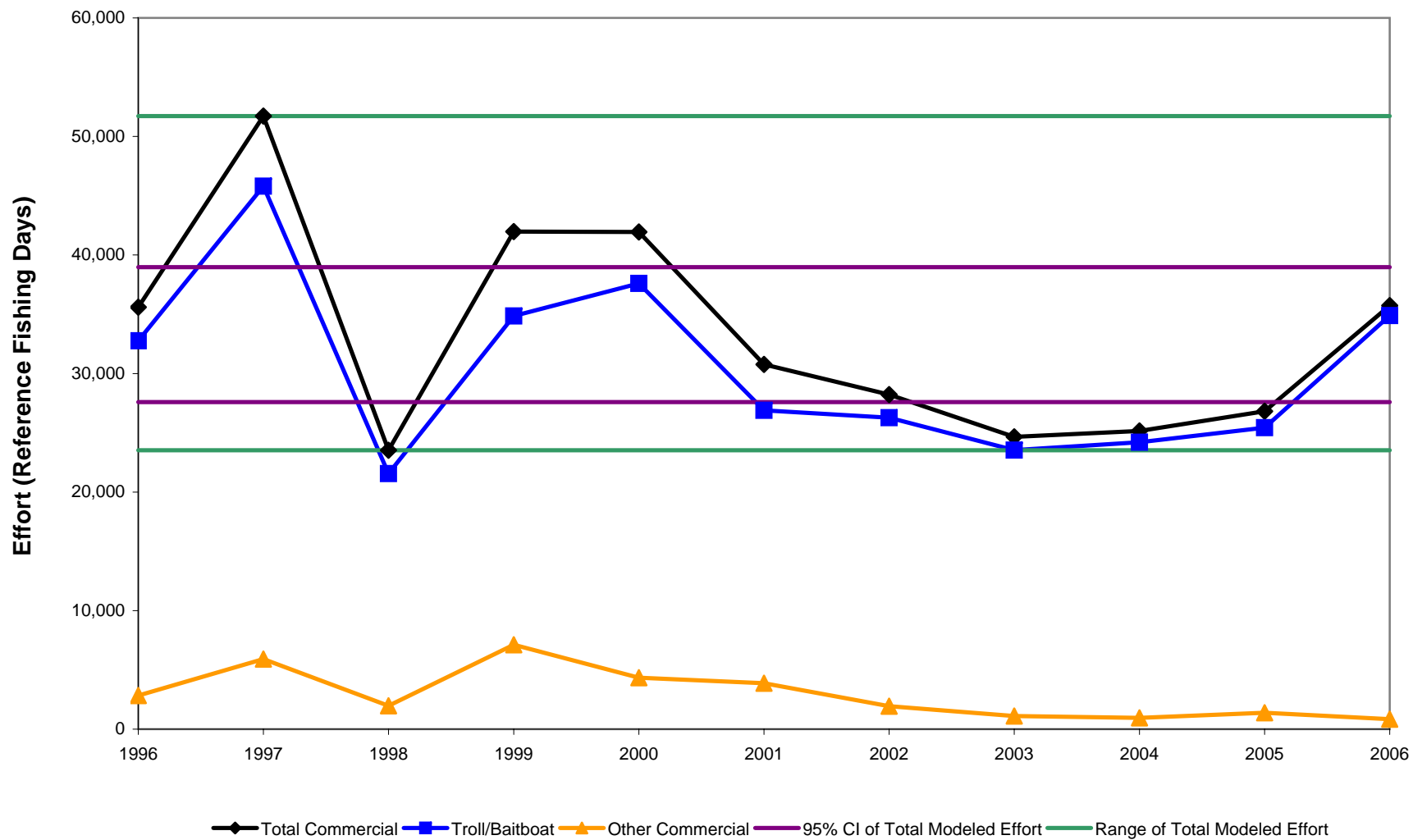
+ [Hooks fishing (longline)/8240]

+ [vessels fishing (Hawaii handline)/4.4]

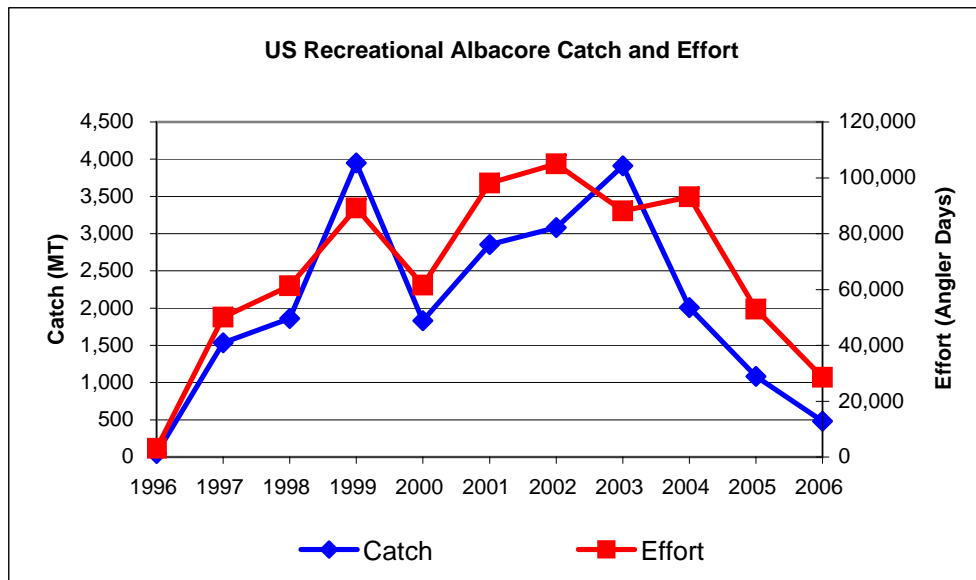
Total not to exceed 51,715

(max of 1996-2006),

### Modeled Recent US Commercial Albacore Effort



Recreational (sum of private and CPFV)		
Year	Catch MT	Effort Ang. Days
1996	46	3,045
1997	1,535	50,049
1998	1,860	61,282
1999	3,949	89,143
2000	1,830	61,497
2001	2,854	98,109
2002	3,082	105,001
2003	3,911	88,170
2004	2,009	93,145
2005	1,083	52,937
2006	481	28,505
mean	2,058	66,444



Notes:

Recreational data include fish taken in Mexico waters by CA based charter boats

CA recreational data from Recfin

CA recreational private boat average weight for 1990-1992 based on average of all other years (9.69 kg)

CA recreational CPFV average weight for 1990-1993 estimated as average for all other years (9.96 kg)

CA recreational private boat data for 1986-2003 from MRFSS and for 2004-05 from CRFS

OR recreational data from Oregon Recreational Boat Survey

OR recreational average weight = 16, 20 and 18 lbs in 2004, 2005 and 2006, respectively (used 18 lbs for other years)

WA recreational avg weight = 19.2 lbs from 2005 charter logs and 16.2 from 2006 logs; 19.2 lbs was used for 2000-2005

Recreational effort unit is one angler-day in CA, one trip in WA and OR

Washington Recreational data from Washington Ocean Sampling Program

The 2006 data are considered preliminary

## HIGHLY MIGRATORY SPECIES ADVISORY SUBPANEL REPORT ON ALBACORE FISHING EFFORT CHARACTERIZATION

The Highly Migratory Species Advisory Subpanel (HMSAS) recommends that the Pacific Fishery Management Council adopt the following definition of “current levels of effort” regarding the Inter-American Tropical Tuna Commission (IATTC) Resolution capping fishing effort on north Pacific albacore tuna fishing in the North Pacific east of 150° W latitude at “current levels.”

Definition of “current level of effort”: The current level of effort for the U.S. albacore fishery by all gear types in the IATTC jurisdiction of the North Pacific is defined as “a range from 1996-2006 of the number of commercial vessels that have landed any amount of albacore over that time period. For the U.S. fishery it is recognized that the U.S. has a recreational harvest of albacore that must be recognized but is not currently included in the definition of current effort.”

The HMSAS recommends that a similar, if not the same definition, be used with respect to the Western and Central Pacific Fisheries Commission Resolution on North Pacific albacore.

The U.S. is doing the following in regards to effort caps on effort for North Pacific albacore fishing east of 150° W longitude:

1. Limited entry on drift gillnet and longline fisheries
2. Recreational bag limits on albacore
3. Has scaled back Canadian albacore fishing effort in the U.S. EEZ under the U.S./Canada albacore treaty
4. Attrition within the U.S. albacore fleet (no new vessels or entrants)
5. New IUU enforcement initiatives under the Magnuson-Stevens Act
6. Logbook requirements
7. U.S. albacore fishery is not subsidized in any amount

PFMC  
03/20/07