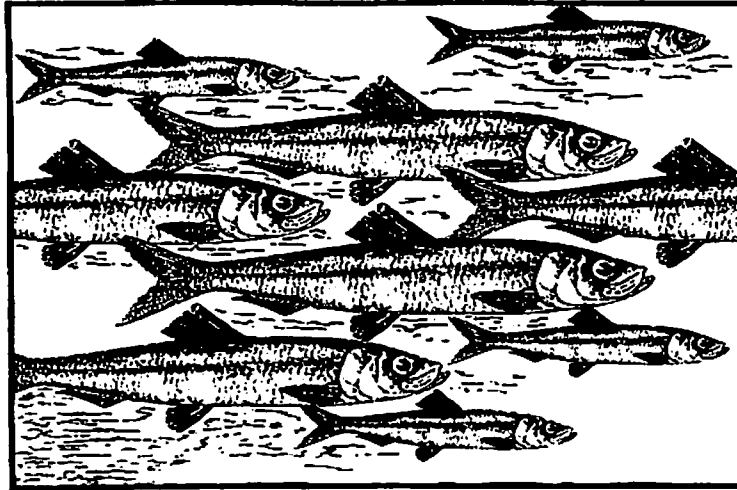


Summary of 1998-99 Spawning-Ground Surveys  
and Commercial Catch in Tomales Bay.



Prepared for:  
Director's Herring Advisory Committee  
Sausalito  
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Thomas O. Moore  
John J. Mello  
Marine Region  
Bodega Bay

## Review of 1998-99 Tomales Bay Pacific Herring Season

- ❑ Tomales Bay eelgrass beds appear to have recovered from the negative effects of El Nino with significant increases in density and area coverage seen over last season.   
*up 2 levels, new growth*
- ❑ The preliminary spawning biomass estimate of 4,069 tons is the highest estimate seen in Tomales Bay since the fishery re-opened in the 1992-93 season and is close to the 25-year long-term average of 4,535 tons. Also, the this season's preliminary spawning biomass estimate is approximately 90% greater than last season's near-record low of 586 tons which most likely resulted from adverse effects of the strongest El Nino event this century.
- ❑ There were four significant spawns this season with the first recorded on December 11<sup>th</sup> and the last and largest spawn of the season at 1965 tons occurring February 8, 9, and 10. This last spawn was noteworthy for herring spawned on eelgrass beds which haven't been touched by them since the 1987-88 season.
- ❑ The 54 ton catch was 336 tons short of the final 390 ton quota (the result of three in-season 100-ton increases) and was equivalent to an exploitation rate of only 1.3%. Age five and older herring were poorly represented in the spawning population this season. Younger and smaller fish, unavailable to commercial gear, comprised the bulk of the spawning population. This reduced catch-per-unit-effort (CPUE) by about 50% from the 10-yr average and also the total catch for the 1998-99 season.

**TABLE 1. Tomales Bay Herring Spawn Data, 1998-99 Season.**

Date	Location	Area M <sup>2</sup>	Eggs/ M <sup>2</sup>	Millions of Eggs	Conversion Factor X 10 <sup>-9</sup>	Tons
11-Dec-98	1A	64898	393957	25567	1.94	496
11-Dec-98	Hearts Desire	1632	347433	567	1.94	11
02-Jan-99	1A	53720	220694	11856	1.94	230
01-Jan-99	28	71440	123382	8814	1.94	171
01&02-Jan-99	28A	42358	1011262	42835	1.94	831
14-Jan-99	Shore of Marshall Boat Works to Marconi cove	26892	1137447	30588	1.02	312
29-Jan-99	1A	--	--	--	--	T
03-Feb-99	1(south end)	--	--	--	--	T
09&10-Feb-99	1	8686	178626	15515	1.94	301
08,09&10- Feb-99	1A(& Hearts Desire)	66530	698855	46495	1.94	902
10-Feb-99	2	7939	1759551	13969	1.94	271
10-Feb-99	2A	878	293544	258	1.94	5
10-Feb-99	3	885	815423	722	1.94	14
10-Feb-99	5	2446	885097	2165	1.94	42
10-Feb-99	6	8780	252448	2216	1.94	43
10-Feb-99	7	6838	2057936	14072	1.94	273
10-Feb-99	8	5697	895751	5103	1.94	99
10-Feb-99	9 (south)	3717	221884	825	1.94	16
26-Feb-99	28A	--	--	--	--	T
<b>TOTAL</b>						<b>4015</b>

T = Trace Spawn = <1 ton

**TABLE 2.** Tomales Bay Herring Biomass Estimates 1973-74 through 1998-99 Season.

Season	Spawn Escapement (tons)	Catch (tons)	% Catch (Exploitation Rate)	Spawning Biomass (tons)
1981-82	6,298	851	11.9	7,149
1982-83	10,218	822	7.4	11,040
1973-74	6,041	521	7.9	6,562
1974-75	4,210	518	10.9	4,728
1975-76	7,769	144	1.8	7,913
1976-77	4,739	344	6.7	5,083
1977-78	21,513	646	2.9	22,163
1978-79	---	448	--	--
1979-80	5,420	603	10	6,023
1980-81	5,128	448	8	5,576
1983-84	1,170	110	8.5	1,280
1984-85	6,156	430	6.5	6,586
1985-86	435	771	12.8	6,000*
1986-87	4,931	867	14.9	5,798
1987-88	1,311	750	36.4	2,061
1988-89	167	213	56	380
1989-90	345	--	0	345
1990-91	779	--	0	779
1991-92	1,214	--	0	1,214
1992-93	3,856	222	5.4	4,078
1993-94	2,244	219	8.9	2,463
1994-95	3,704	275	7.4	3,979
1995-96	1,704	355	17.2	2,059
1996-97	1,288	222	15.1	1,510
1997-98	586	0	0	586
1998-99	4,015	54	1.3	4,069
AVERAGE	4,210	428	10.3	4,537

*No survey*

*← largest since '92/93.*

\*Biomass estimated by cohort analysis; for all other years, biomass was estimated from spawning-ground surveys.

**TABLE 3.** Daily Landings by Tomales Bay Gillnet Fleet for 1998-99 Season.

Date	Pounds	Tons	Trips	Lbs/Trip	Roe Count
01-13-99	24190	12	9	2688	14.4
01-14-99	23578	12	10	2358	13.3
01-25-99	19099	10	11	1736	14.7
01-28-99	3677	2	5	735	15.6
02-09-99	24851	13	10	2485	16.1
02-10-99	9327	5	7	1332	16.1
TOTAL	104722	54	52	AVG = 2014	AVG = 15
AVG 94/95 - 98/99	361737	181	79	4346*	13.1
AVG 89/90 - 98/99	310150	155	79	3765*	13

\*Lbs/Trip data from 1997-98 not included in the calculation of average (no landings in 97/98).

*= 1.390 of exploitation rate*

**TABLE 4.** Mean Length (mm BL) of the Tomales Bay Commercial Gill Net Catch.

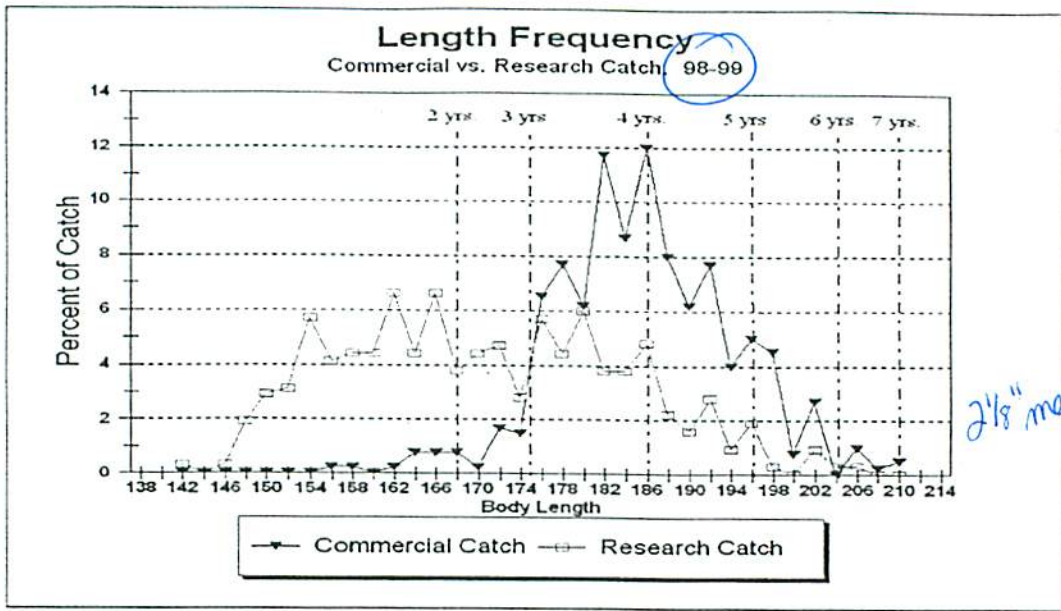
Date	Mean Length	Sex Ratio M/F
01-13-99	187.3	37.5/62.5
01-14-99	185.8	43.3/56.7
01-25-99	188.5	31.3/68.8
01-28-99	no data	no data
02-09-99	185.8	32.7/67.3
02-10-99	no data	no data

Historical Lengths of Commercial Gill Net Catch					
5-Yr Avg	1994-95	1995-96	1996-97	1997-98	1998-99
192.5	195.5	189.2	194.8	196*	186.3

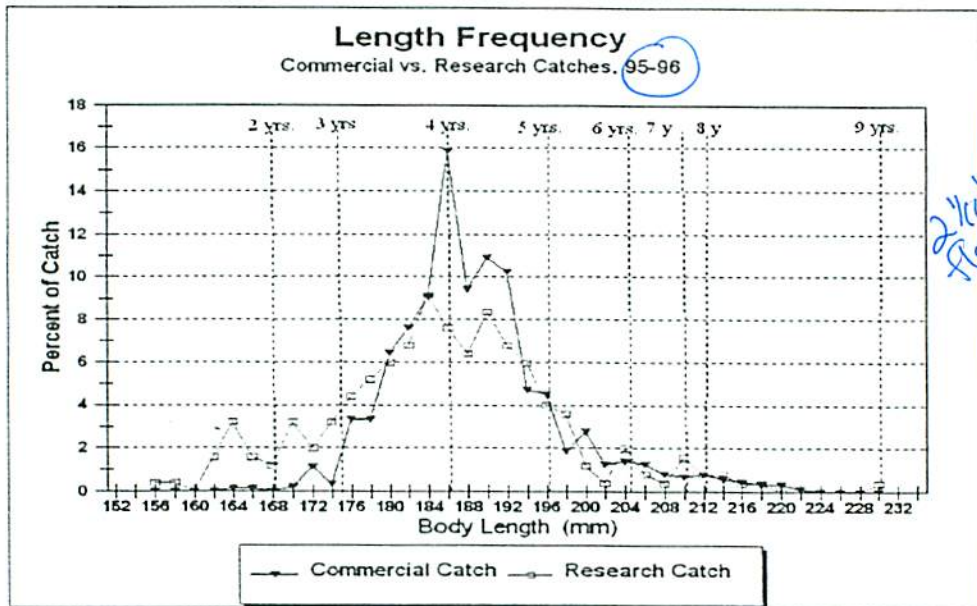
\*The fish were not commercially landed, but were caught commercially.

*Below 5-year average*



*\**

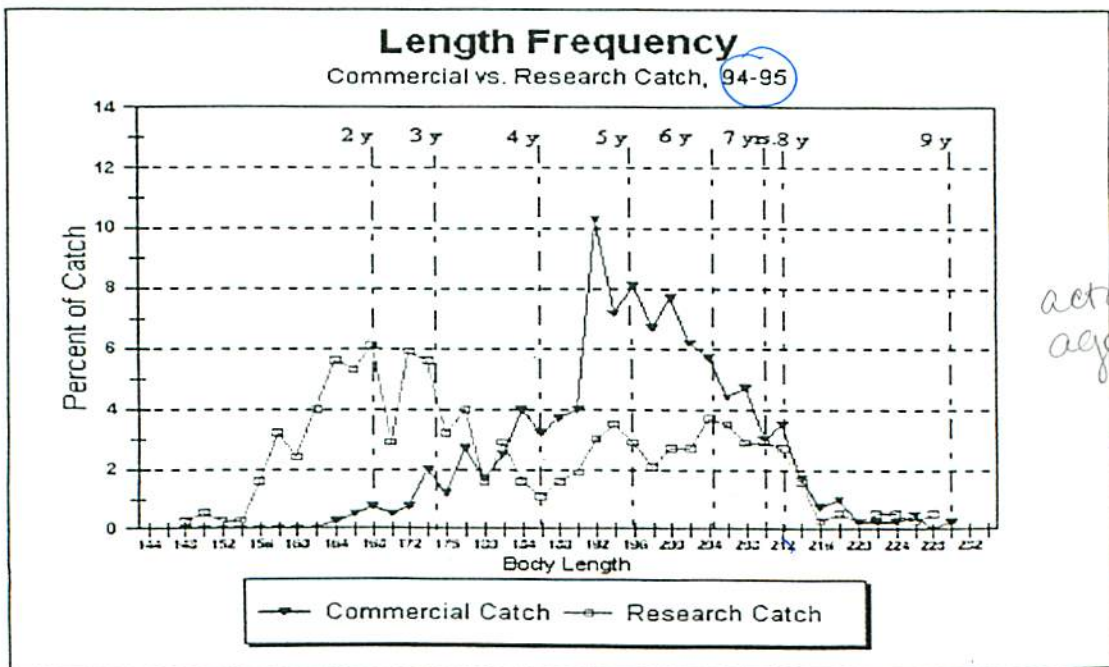
*2 1/8" mesh*



*Caught 36ctons*

*2 1/16 mesh  
flexibility  
95-0*

*One night -  
3mm size  
difference in  
study catches  
from 2 1/16, 2",  
2 1/8"*

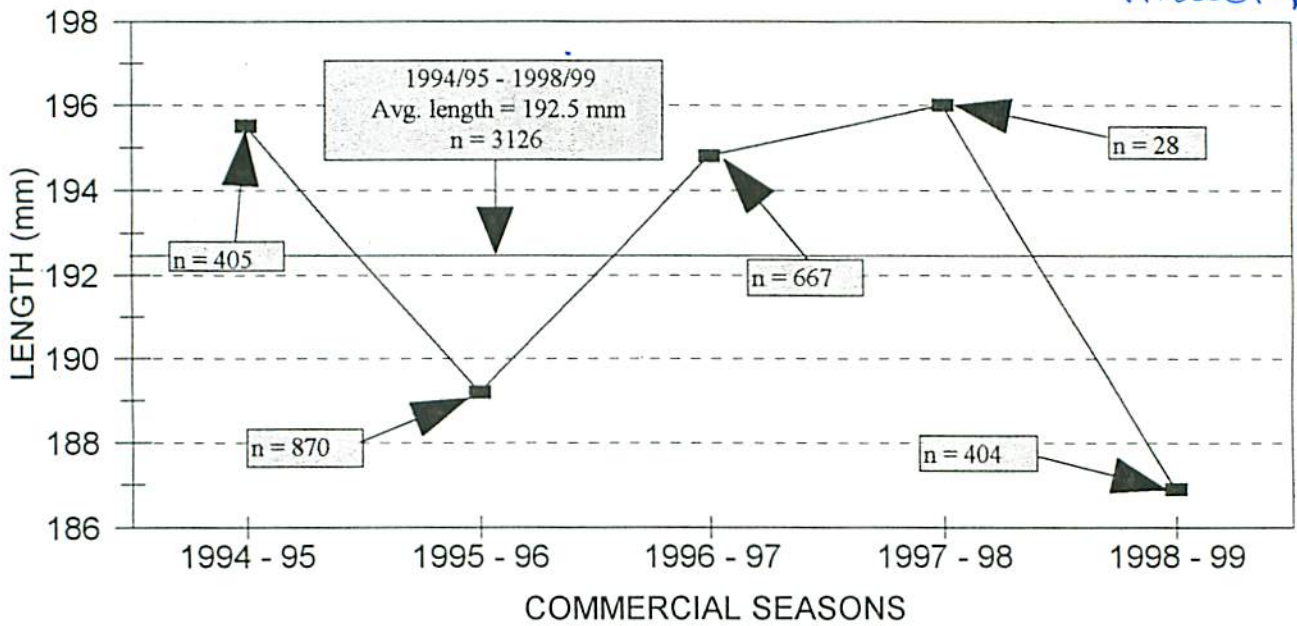


*actual  
ages*

*Landed  
150 lbs*

AVERAGE LENGTH OF HERRING BY SEASON  
*Commercial Catch*

*Research -  
multipanelled  
trawl net.  
Multi-  
mesh  
Single*



**TABLE 5. Annual Landings from Tomales/Bodega Bay Gillnet Fleet.**

Year	Pounds	Tons	Trips	Lbs/Trip	Roe Count
84-85	844,472	422.2	215	3,928	12.8
85-86	1,542,676	771.3	512	3,013	12.5
86-87	1,732,428	866.2	429	4,038	12.5
87-88	1,499,402	749.5	484	3,097	12.4
88-89	426,163	213.0	291	1,464	12.7
89-90	190,409	95.2	61	3,121	13.5
90-91	173,103	86.5	72	2,404	13.6
91-92	47,125	23.5	30	1,571	14.6
92-93*	444,312	222.3	66	6,732	11.0
93-94*	437,867	218.9	164	2,670	12.3
94-95*	550,262	275.1	84	6,551	12.0
95-96*	710,573	355.3	134	5,303	13.8
96-97*	443,128	222.0	126	3,517	11.6
97-98*	0	0	0	0	--
98-99*	104,722	54	52	2,014	15.0
Average	609,776	305	194**	3,530**	12.9

\* Catch from Tomales Bay only, outer Bodega Bay closed to fishing.

\*\* Data from 1997-98 not included.