

**THE STATUS OF
THE CALIFORNIA YELLOWTAIL RESOURCE
AND ITS MANAGEMENT**



by

Robson A. Collins

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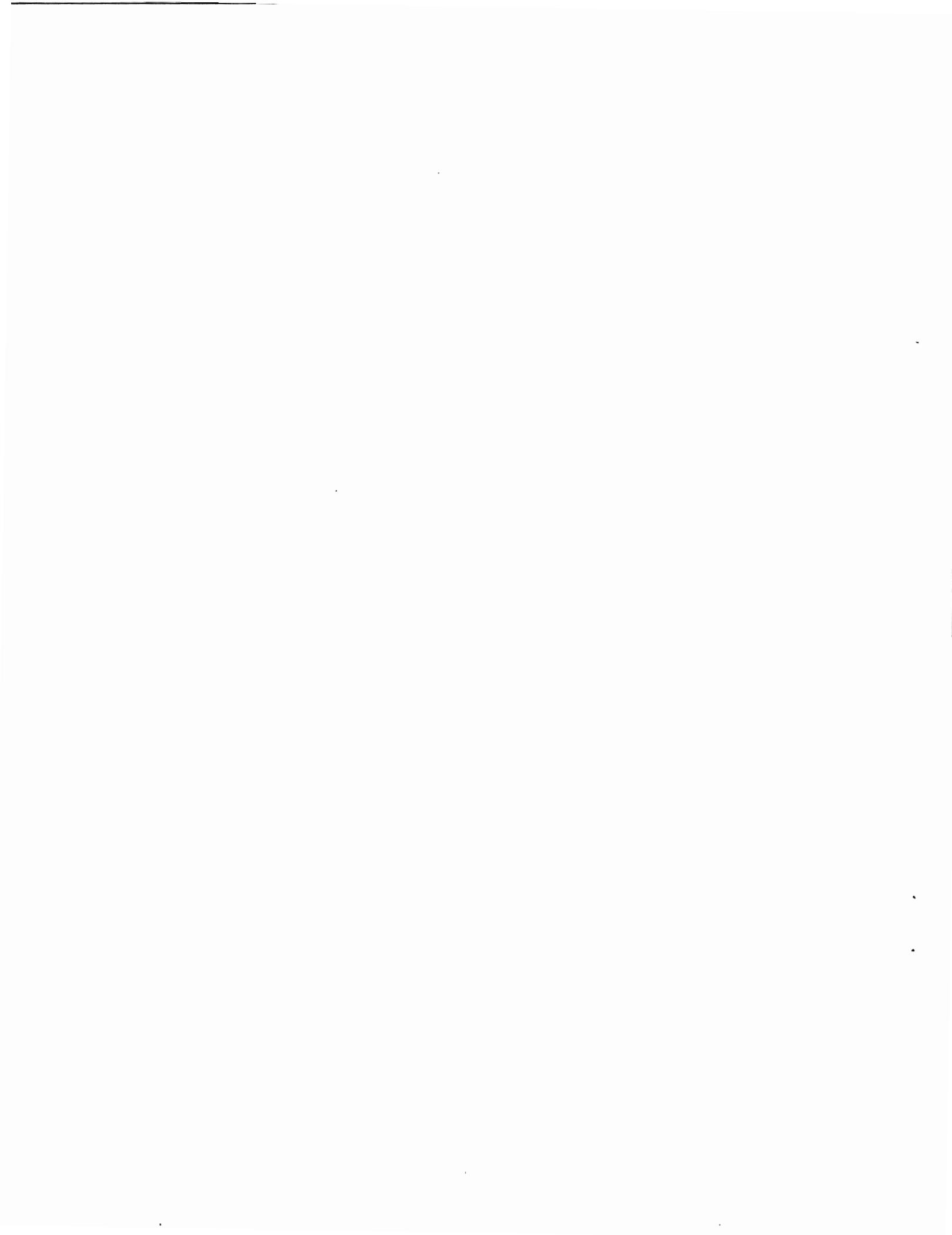
ABSTRACT

The California yellowtail, *Seriola dorsalis*, is a highly favored sport fish and a minor commercial species. Since 1954 commercial landings have been limited by demand, and the sport catch has been about three times the number of fish caught by commercial fishermen.

Recreational fishing for yellowtail in southern California waters is almost entirely dependent on annual migrants from central and northern Baja California. The resource is presently healthy but reduced catches off California could be the result of an expanded catch off Mexico.

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HISTORY OF THE FISHERY

The California yellowtail, *Seriola dorsalis*, is a highly favored sport fish. Both beginning and veteran anglers hold it in high regard for its fighting ability. This fish is a minor commercial species with most of the commercial catch being made off Baja California.

Commercial Fishery

Yellowtail landings have been sporadic throughout the history of the fishery. After a catch of 11.5 million lbs in 1918 the fishery dropped to an average of 3.5 million lbs between 1919 and 1934. An increased demand for canned yellowtail boosted the landings to an average of 6.3 million lbs from 1935 through 1953; demand and landings both fluctuated extensively during this period. In 1954 canners cut the price they were paying in half and placed virtually no orders for yellowtail even at that price. The fishery apparently died an economic death. The quantity canned since 1954 has been dictated by fresh fish market demand which has averaged only 200 thousand lbs per year (Figure 1, Table 1).

Prior to 1932, commercial landings were made by a fleet of small boats using hook and line and live bait. These boats operated off southern California and as far south as the Coronado Islands. A 1933 study indicated the quantity of yellowtail available on local grounds had declined. A law limiting the use of yellowtail caught off California to "consumption as fresh food fish" became effective in October 1933. The law did not apply to catches made in Mexican waters and delivered in California. As a result of this law and subsequent regulations including size limits,

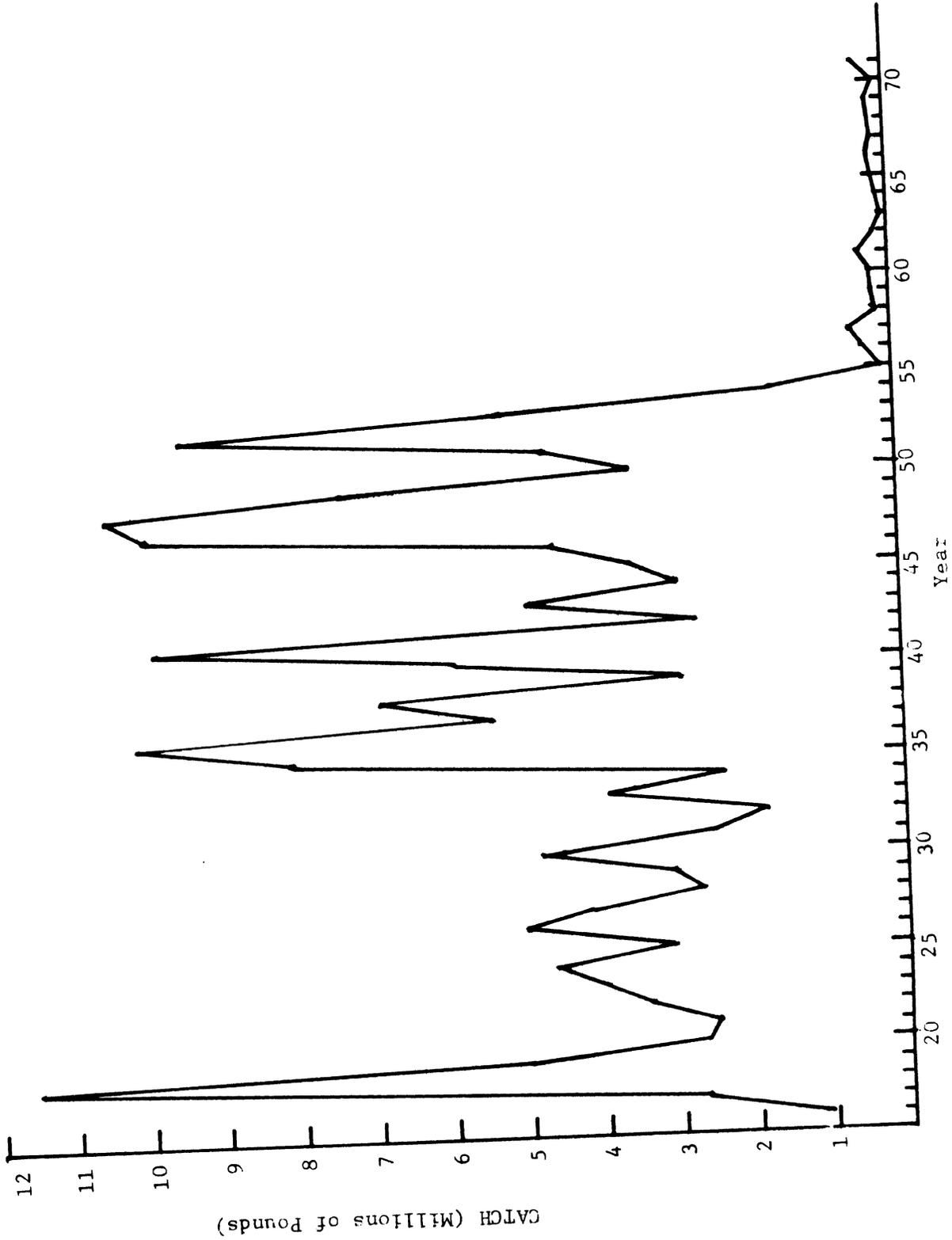


FIGURE 1. Commercial Landings of Yellowtail in California 1916-1971

the commercial fishery has been centered near Magdalena Bay, Baja California, since 1933. In recent years only about 12% of the U.S. commercial catch has been made north of the U.S.-Mexico Border.

Gill net and troll boats have dominated the commercial fishery in recent years. Bait boats and purse seiners still deliver yellowtail, but the catch has declined and is largely incidental. Data from sport and commercial fisheries based in Mexico have not been available to us.

The fishery is prosecuted from September through April with catches from May through August restricted by a law (F&G Code Section 8387) limiting possession to 500 lbs per person or 2,500 lbs per vessel.

Recreational Fishery

Yellowtail have been esteemed as sport fish since the end of the nineteenth century. California sport catch records date from 1936 when the partyboat record system was initiated. The sport catch fluctuates widely from year to year, in response to changes in yellowtail availability on nearby grounds (Figure 2, Table 2). A definite relationship between the magnitude of the sport catch in California waters and the average ocean temperature off Baja California during the first 6 months of the year has been demonstrated (Radovich, 1961). The fish tend to migrate north to California waters in response to warmer ocean temperatures. Record catches of yellowtail by sportsmen were recorded during the 1957-60 period of warm ocean waters in the California Current. The catch in 1959 was 457,350 fish which is about 9 times the average landing of 50,000 during the years after this warm period.

The catch per angler has been slightly higher in the post 1957-60 period than previously (Table 3). This may be due to reduced pressure from the commercial fishery.

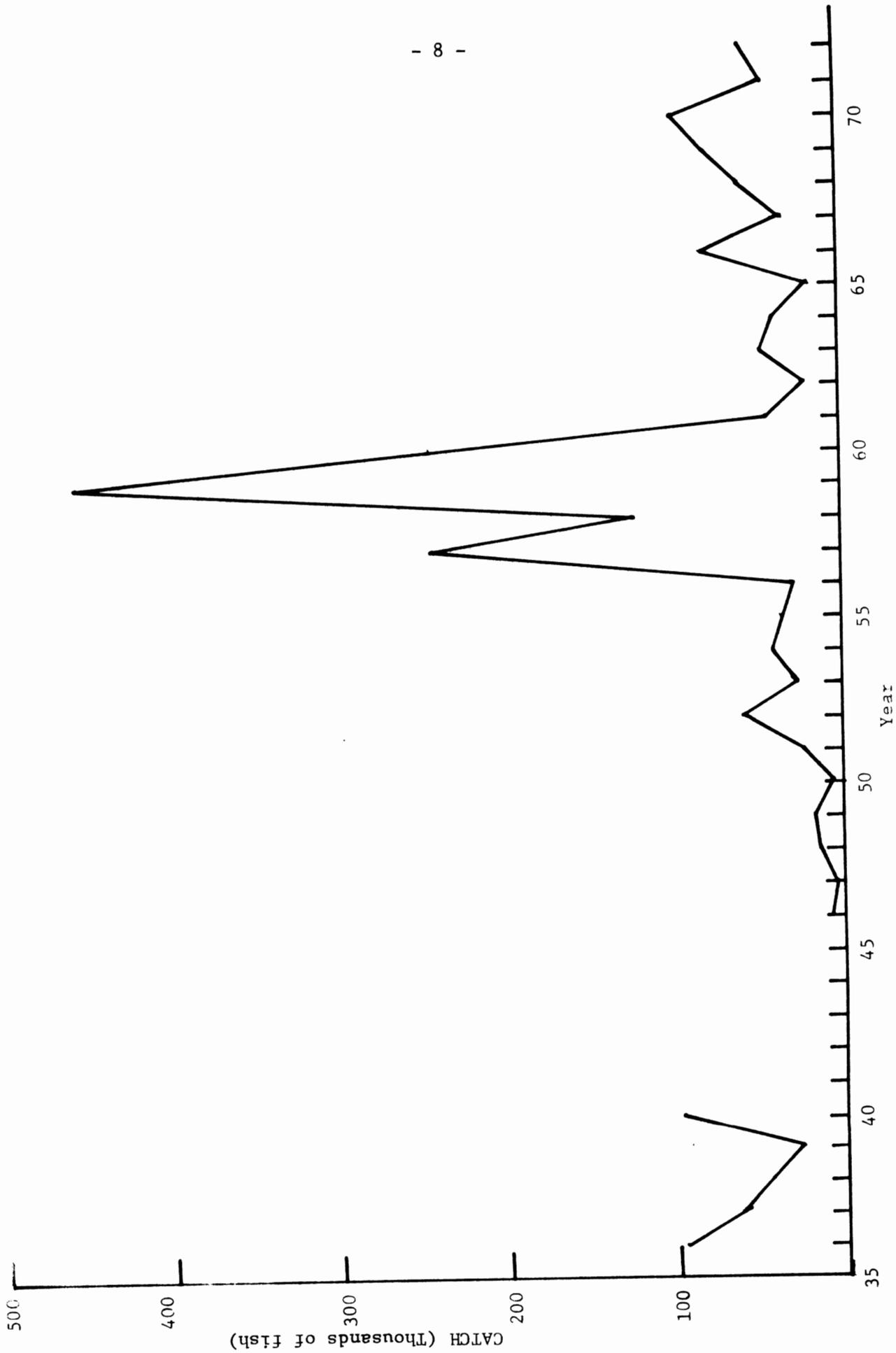


FIGURE 2. California Partyboat Landings of Yellowtail, 1936-1972.

In recent years the "long range partyboat" concept has become increasingly popular with sportsmen. These boats depart from southern California ports (principally San Diego) on 10-20 day trips into waters off Mexico. Consistent good fishing for yellowtail in "Grand Style" off Mexico at their center of abundance is one of the main attractions. This phase of the sportfishery is expected to continue to expand as long as Mexican regulations permit.

The catch and effort of private sportfishing boats can only be estimated on the basis of a nine year old study which indicated that anglers aboard private boats caught about 11% as many yellowtail as those on partyboats while shoreline and pier and jetty catches were negligible. The Department of Fish and Game is currently investigating methods to obtain more timely information on this phase of the fishery.

The Department currently samples both the U.S. commercial and partyboat fisheries for age and length composition. These data (only 1 year is complete to date) indicate that both fisheries exploit the same age groups with about 90% of the catch consisting of fish ranging between 2 and 6 years of age (Table 4), and that the recreational fishery takes about three times as many fish as does the commercial fishery.

BIOLOGICAL DATA

Range

California yellowtail occur from southern Washington to Mazatlan, Mexico, and in the Gulf of California they range at least as far north as Los Angeles Bay. The present sportfishery extends from Santa Barbara to Ensenada, with the Coronado Islands consistently providing the best fishing.

The population along the west coast of the Californias appears to be adequate to meet present fishing pressure. The relationship of stocks in

the Gulf of California to the California fisheries is unknown. It is presently assumed that stocks in the Gulf of California are separate and do not contribute substantially to the California fisheries.

Migration

Tagging and migration studies indicate there is one population living off the west coast of the United States and Baja California. Fish caught off California migrate seasonally from the population center off Baja California (Baxter, 1960). The extent of this seasonal migration is at least in part dependent on sea temperatures off northern Baja California in the first 6 months of the year (Radovich, 1961).

Spawning apparently occurs some distance offshore and is centered off Baja California. During years of favorable ocean climate, some spawning occurs off southern California. Some 2-year-old yellowtail spawn and all 3-year-old fish are mature. The spawning season is July through October and after their first spawning, yellowtail will spawn more than once each year. A 10 lb fish produces 450,000 eggs, each about .07 inch in diameter; a 15 lb fish spawns 700,000 eggs; and a 20 lb fish 940,000 eggs (Baxter, 1960).

Size, Age and Growth

In general, sportfishermen catch 12 to 18 pounders, but fish weighing 25 to 35 lbs are not uncommon. The largest recorded yellowtail weighed 80 lbs. The oldest fish for which a reliable age could be determined was a 12 year old weighing 35 lbs. The average lengths to the fork of the tail at ages one through seven are 19.9, 25.0, 27.8, 30.8, 32.7, 34.3, and 35.2 inches respectively.

Weight and length are related by the formula,

$$W(\text{weight}) = .00000007439 L(\text{length})^{2.85}$$

with no significant difference between sexes (Baxter, 1970).

Food Habits

Yellowtail are predominantly daytime feeders. Their food items indicate that they are opportunists, feeding on whatever is most abundant in the area at the time. Squid and pelagic red crabs among the invertebrates and sardines, anchovies, jack mackerel, and Pacific mackerel among the fishes are the more important foods (Baxter 1960).

REGULATION AND MANAGEMENT

The commercial fishery is now subject to the following regulations:

A size limit of 28 inches. No fish less than 28 inches total length may be bought or sold.

A season: May through August not more than 500 lbs may be possessed by any fisherman and no more than 2,500 lbs on any vessel.

Gear limits: It is unlawful to use any purse seine or round haul net to take yellowtail off California. Gill nets with meshes of a minimum length of 3 1/2 inches may be used to take yellowtail.

Hook and line may be used to take yellowtail at any time.

The sport fishery regulations which apply to yellowtail are a daily bag limit of 10 fish and a gear restriction to hook and line only.

DISCUSSION

Recreational fishing for yellowtail in southern California waters is almost entirely dependent on annual migrants from central and northern Baja California. Tagging studies have indicated that "few if any, from the area south of Abrejos Point some 390 miles below San Diego, contribute to the California sportfishery" (Baxter, 1960). Because of this dependence, a large expansion of the catch (either recreational or commercial) off central Baja California could result in reduced catches in southern California waters.

Data at hand indicates that the yellowtail stock is in a healthy state and that there is no need for further restrictions on either the commercial or recreational fishery.

Current Knowledge

We currently have fair to good information on the following:

Catch by area: Commercial and partyboat (needs refinement).

Effort: Partyboat and commercial.

Size and age composition: Partyboat and commercial.

Migration: West coast fish

Age and Growth: 0 - 12 years of age

Fecundity:

Food Habits:

Research Needs

Information on the following is needed for management:

Catch and effort data for both the commercial and recreational fisheries in Mexico.

A current measure of the non-partyboat recreational catch and effort.

Relationship of Gulf of California fish to those found off the west coast of Baja California and southern California.

Egg and larval identification and distribution.

A survey of the industry to determine if the canning of yellowtail is likely to resume on a scale comparable with the years prior to 1955.

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TABLE 1. Yearly Landings in Pounds - California Yellowtail

Year	California waters	South of state	Total Pounds
1916	1,137,253	16,141	1,153,394
1917	2,736,906	9,089	2,745,995
1918	11,375,426	139,946	11,515,372
1919	4,871,763	133,502	5,005,265
1920	2,486,537	218,400	2,704,937
1921	2,139,626	351,170	2,490,796
1922	3,111,131	303,292	3,414,423
1923	2,968,596	1,094,012	4,062,608
1924	2,863,012	1,851,137	4,714,149
1925	2,586,621	593,270	3,179,891
1926	3,173,424	1,849,690	5,023,114
1927	1,435,456	2,789,397	4,224,853
1928	1,297,037	1,386,477	2,683,514
1929	849,945	2,225,319	3,075,264
1930	1,214,959	3,555,797	4,770,756
1931	1,690,680	835,173	2,525,853
1932	1,024,086	772,278	1,796,364
1933	1,233,286	2,665,602	3,898,888
1934	210,590	2,136,571	2,347,161
1935	582,589	7,566,129	8,148,718
1936	253,723	9,838,747	10,092,470
1937	223,983	5,147,492	5,371,475
1938	246,238	6,566,080	6,812,318
1939	262,524	2,603,764	2,866,288
1940	329,036	5,627,768	5,956,804
1941	95,924	9,734,766	9,830,690
1942	55,017	2,671,252	2,726,269
1943	33,359	4,901,520	4,934,879
1944	28,464	2,928,707	2,957,171
1945	23,415	3,510,637	3,534,052
1946	31,285	4,530,298	4,561,583
1947	103,706	9,849,148	9,952,854
1948	246,553	10,138,141	10,384,694
1949	15,907	7,301,833	7,317,740
1950	5,727	3,524,174	3,529,901
1951	14,454	4,655,282	4,669,736
1952	51,116	9,395,863	9,446,979
1953	14,379	5,198,004	5,212,383
1954	11,846	1,644,932	1,656,778
1955	5,570	158,752	164,322
1956	18,598	352,289	370,887
1957	150,898	358,053	508,951
1958	105,486	64,144	169,630
1959	207,187	24,097	231,284
1960	156,518	92,115	248,633
1961	80,689	300,080	380,769
1962	37,066	151,355	188,421
1963	25,443	44,283	69,726
1964	25,878	84,221	110,099
1965	12,522	115,283	127,805
1966	35,880	209,327	245,207
1967	13,179	137,489	150,668
1968	22,460	140,717	163,177
1969	11,744	222,411	234,155
1970	56,275	127,948	184,223
1971	31,004	359,516	390,520

TABLE 2. California Yearly Partyboat Catch in Numbers - California Yellowtail

<u>Year</u>	<u>Total catch numbers</u>
1936	97,453
1937	62,847
1938	44,974
1939	26,720
1940	96,756
*	
1946	7,082
1947	6,948
1948	13,028
1949	17,710
1950	6,971
1951	23,721
1952	59,263
1953	27,702
1954	40,872
1955	36,468
1956	29,198
1957	242,686
1958	123,384
1959	457,350
1960	254,969
1961	42,367
1962	21,826
1963	45,705
1964	39,104
1965	18,367
1966	80,163
1967	31,392
1968	58,049
1969	79,202
1970	97,376
1971	44,608
1972	56,016

* No data was collected during World War II

TABLE 3. Catch per Angler - Recreational Fishery - 1947-1972

Year	Catch	So. Calif. Anglers	Catch/Angler
1947*	6,948	386,603	.0180
1948*	13,028	428,382	.0304
1949*	17,710	481,655	.0368
1950*	6,971	533,713	.0131
1951*	23,721	412,825	.0575
1952*	59,263	531,248	.1116
1953*	27,702	460,360	.0602
1954*	40,872	476,500	.0858
1955*	36,468	425,386	.0857
1956*	29,198	449,725	.0649
1957*	242,686	522,208	.4647
1958*	123,384	494,939	.2493
1959*	457,350	530,243	.8625
1960	254,969	522,387	.4881
1961	42,367	478,991	.0885
1962	21,826	468,473	.0466
1963	45,705	506,354	.0902
1964	39,104	542,753	.0704
1965	18,367	555,384	.0331
1966	80,163	677,417	.1183
1967	31,392	604,641	.0592
1968	58,392	660,663	.0884
1969	79,202	616,951	.1284
1970	97,376	666,785	.1460
1971	44,608	518,625	.0860
1972	56,016	464,879 ?	.1205

Data from Young, 1969, 1970, 1971, 1972.

* Calculated from "Angler Days" using conversion data collected 1960-61.
Anglers = 1.215 x angler days.

TABLE 4. Age Composition in Percent - Partyboat and Commercial Fisheries

Age Class	Percent of 1972 Partyboat Catch	Percent of 1972 Commercial Catch
0	.22	0
I	2.11	4.84
II	11.78	14.75
III	10.94	11.29
IV	16.33	15.90
V	32.22	30.41
VI	16.39	17.74
VII	4.56	2.53
VIII	2.28	.23
IX	1.33	.46
X	.72	.23
XI	.39	.92
XII+	.72	.92