

THE RESOURCES AGENCY OF CALIFORNIA  
DEPARTMENT OF FISH AND GAME  
MARINE RESOURCES OPERATIONS

REPORT FOR THE MONTH OF FEBRUARY 1967

The first anchovy tag recoveries demonstrating southerly migration between major fishing areas have been received. The first was tagged October 3, 1966 off San Clemente Island and recovered January 14, 1967 in the Ensenada fishery. The second was tagged July 21, 1966 in Monterey Bay, near Santa Cruz, and recovered February 23, 1967 at a Terminal Island cannery by boats fishing off southern California.

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Rockfish, barracuda, and bonito catches on partyboats through January were ahead of January catches for 1966, but kelp bass, sand bass, and California halibut catches were lagging behind those of a year ago.

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Two fish species (both southerners) were added to the marine fauna of California during February. One of these, a 20-inch snake mackerel, was picked up at White Point near San Pedro, and the other, a taper-tail ribbonfish, was found floating at the surface a few miles east of there.

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A 9-month old experimental planting of artificial kelp (plastic) off Hermosa Beach was still attractive to fishes, although heavily encrusted with an assortment of marine growths and barely retaining an upright position.

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A 131,995 pound landing by a Eureka otter trawler for 3 fishing days is reportedly the largest single catch of bottomfish received in California. The captain and 3-man crew received \$10,552.82 for their efforts.

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## I. BOTTOMFISH

### A. Fishery

Flatfish: The trawl fleet made exceptional catches of English sole in the vicinity of the Klamath River and Pt. Reyes. A record catch of 132,000 pounds of predominately English sole taken in three fishing days was landed by a Eureka trawler.

Petrals landings declined as spawning concentrations dispersed; fishing effort diverted toward English sole.

Dover catches were moderate.

Rockfish: Landings were light at Eureka while moderate landings of bocaccio and chilipepper were reported from the Fort Bragg area. Landings at Monterey were below par but moderate catches were made off Morro Bay and Santa Barbara.

Monterey draggers complained of competition from two Russian stern-ramp trawlers operating between Ano Nuevo and Davenport on productive grounds fished frequently by local vessels. One captain reported that on February 16-17, while fishing 12 miles off Davenport, two Russian vessels were fishing on both sides of his vessel. He observed both vessels with large hauls of rockfish taken with mesh smaller than our 4-1/2 inch minimum size.

### B. Research

Flatfish: Market sampling continued in all areas. Trawler logs were collected, coded, and sent to Terminal Island.

Final corrections were made on the English sole manuscript. Box sample summaries and compilation of length-weight data for juvenile flatfish were continued. Examination of meristic data for flathead sole began.

English sole tagging was conducted in the Monterey Bay area aboard the M. V. NAUTILUS; 641 fish were tagged and released between February 9 and 20.

Eight tagged fish were recovered during the month. An English sole released by the Washington Department of Fisheries was recovered SW of Crescent City. A Dover sole was recovered from a local market in the Eureka area. Two petrale sole were recovered from the Ft. Bragg area. Four English sole were recovered from the Santa Cruz side of Monterey Bay; these fish were released during the month.

Rockfish: Work continued on a revised key for rockfishes in the genus *Sebastes*.

Project is on schedule.

## 2. SHELLFISH

### A. Fishery

Abalone: Season closed.

Crab: Approximately ten boats are fishing for crab in the San Francisco area. As has been customary in the past, several boats have returned to the fishery during the latter part of January and have fished on into February. Fishing is concentrated at the Russian River, Bodega Bay, Pt. Reyes area, and out in deeper water between the Farallones and Pt. Reyes. Landings vary from several hundred pounds to over a thousand pounds, depending upon the number of traps used and the length of time the traps are fished.

Approximately 5,437,000 pounds of crab had been landed at Eureka, Trinidad, and Crescent City by mid-month. Total landings for the area from Fort Bragg to Crescent City probably will exceed six million pounds by the end of the month.

Oysters: Coast Oyster Company began harvesting from their Sand Island bed on February 6, and are currently harvesting from their Mad River bed.

Eureka Oyster Farms, a new company employing rack culture, constructed racks for which a shipment of seed from Washington State arrived late in February. They will operate from temporary headquarters in Eureka until permanent facilities can be constructed on the Samoa peninsula.

Shrimp: Season closed.

### B. Research

Abalone: A survey of the Pigeon Pt. shellfish allotment site was completed, and a report written and submitted to the Deputy Director.

Twenty-five red abalones were collected from Pt. Estero for maturation determinations.

Twenty-nine red abalone and one threaded abalone were tagged and replaced in one of our study areas near Pt. Estero.

Crab: Three more tagged crabs have been received from the San Francisco area, including the first female return. A report from Eureka was received of a tagged crab recovered in that area that was tagged off of Pt. San Pedro.

Surveys of beaches in the Bodega Bay area revealed numerous market crab casts, all of the 1966 year class.

At Eureka, trawling in Humboldt Bay produced 890 market crabs. The majority of the catch was composed of the 1966 year class. A splitting strap and lazy line was installed on the net to facilitate the landing of the large catches.

Two rectangular prawn traps were rigged for crab fishing with hopes of selecting the 1965 year class for tagging. These traps were fished six nights and yielded 138 crabs primarily of the 1965 year class and some from the 1966 year class. One set yielded 39 crabs of the 1965 year class per trap.

Eighty-two crabs were tagged and released in Humboldt Bay. Approximately 230 tags remained to be used, and hopefully these can be put on crabs of the 1965 year class.

Commercial crab fishermen turned in or reported eight suture tag recoveries. Seven were from undersize crabs tagged during the November-December cruise. The other one was from a crab tagged off Pt. San Pedro in August 1966. This crab was reported taken off Patrick's Pt. and thus had traveled some 240 miles. It had increased in size from 154 mm to 175 mm shoulder width, a total of 21 mm.

Shrimp: The N. B. SCOFIELD will depart for Eureka for the pre-season shrimp cruise on February 25. Trawling is expected to begin on March 1.

A manuscript on "The use of predator food habits in estimating relative abundance of ocean shrimp, *Pandalus jordani*" was completed, edited by the MRO editor, and sent to the US Editor for the FAO World Shrimp Conference to be held in Mexico City in June 1967.

Personnel changes are delaying project work on crabs.

### 3. SHELLFISH & BOTTOMFISH DATA ANALYSIS (Bartlett Project M68D)

The crab data collected on cruise 66-N-13 was transcribed to forms suitable for keypunching in the INFOL format. The data, rigidly ensconced in a plethora of asterisks, are now being key-punched at Terminal Island.

The program for establishing the shellfish cruise data in the INFOL system is almost finished. In conjunction with writing the program, codes are being assigned to the fish and invertebrate species encountered during the cruises.

The Shellfish Program will field test a set of data recording forms on the pre-season shrimp cruise in March. Data from these recently designed forms will be keypunched for the INFOL system with a minimum of editing and coding. We hope to eliminate the task of hand tabulating shrimp length frequencies by executing an INFOL interrogation.

A technical paper on the advantages of using INFOL for biological data was written for the FAO World Shrimp Conference.

4. PESTICIDE MONITORING (B.C.F. Contract):

We have set up the laboratory equipment and obtained reagents necessary for gas chromatographic analysis of oyster tissue. Pesticide standards are being prepared from technical grade pesticides obtained from the Department of Fish and Game Pollution Bioassay Analysis Laboratory in San Francisco. From these standards, it will be possible to determine pesticide levels in oyster tissue.

The analysis report for samples taken during January has been received. Fresh water clams, *Corbicula*, collected at West Island in the San Joaquin River contained 20 and 21 ppb DDT. This is comparable with levels found in Elkhorn Slough during January. Endrin was reported for the first time in these clams. The sampling station at False River has been replaced. Sampling will begin at the new station after a residence period of 60 days.

Pesticide levels in oyster tissues have increased at all monitoring stations. Increased run-off during rainy weather is believed to have resulted in this increase.

Project is on schedule.

5. SHELLFISH LABORATORY OPERATIONS (Bartlett Project M64R1)

The effect of four chlorinated hydrocarbon insecticides on crab larvae is being studied to determine their pesticide tolerance. Endrin and DDT are highly lethal to 4th stage crab larvae producing complete mortality in 2.5 parts per billion. Larvae growing in lesser concentrations have shown some effect of the pesticides. Earlier tests with 1st stage larvae indicate that much lower concentrations would kill these very young larvae. Aldrin and Dieldrin are almost as deadly as DDT. Endrin causes total mortality at 5.0 ppb.

These tests point out the effect agricultural waste can have on valuable crustacean populations which are highly receptive to pesticides.

First and second stage larvae of the slender crab, *Cancer gracilis*, have also been grown for study of larval characteristics.

6. OYSTER DISEASE AND MORTALITY STUDY (B.C.F. Contract)

Routine sampling trips were made to Humboldt Bay, Tomales Bay, Drakes Estero, Elkhorn Slough, and Morro Bay during February. Samples of Pacific and eastern oysters were collected from their respective stations for histological examination. Mortalities among the stocks of Pacific oysters in all areas during the proceeding month was negligible. Heavy mortalities continued in the experimental stocks of European oysters in Tomales Bay, Drakes Estero, Elkhorn Slough and Morro Bay; samples of the surviving oysters were collected for examination.

Processing and examination of previously collected material continues according to schedule. Peritrichous ciliates of the genus *Trichodina* continue to infest a small proportion of the Pacific oysters in Humboldt Bay. Examination of dead and live European oysters from Morro Bay and Elkhorn Slough revealed most of them to be infested by the organism described in previous reports. This organism occurs in the Leydig tissue and epethelium of the digestive system. These organisms are characteristically small (2 to 3 microns in diameter with a single nucleus approximately 1 micron in diameter). These cells are often seen in the leucocytes of the host, giving the overall appearance of a plasmodial structure.

Project is on schedule.

7. PORT SAMPLING (Bartlett Project 66D)

One tagged sublegal crab was caught off Gold Bluffs and was released in the Crescent City harbor.

Favorable weather throughout most of the month resulted in regular landings of crabs in Crescent City, Brookings, and Port Orford.

Market sampling included 300 crabs at Crescent City, 100 at Brookings, and 400 at Port Orford. The following results were obtained:

	Crescent City	Brookings	Port Orford
Percent soft	1.3	0	5.8
Mean weight	2.05	2.31	2.14
Mean shoulder width	178	184	178

Seventy-one commercial fishermen were interviewed for catch per unit of effort at Crescent City; 11 at Brookings, and 30 at Port Orford. Best catches were those of Crescent City fishermen whose traps yielded 14.8 pounds/trap overnight. Brookings and Port Orford fishermen averaged 7.5 and 7.7 pounds/trap respectively for a one-day set.

The crab sport fishery in Crescent City continues to be slow. The six skiff fishermen interviewed averaged 0.52 crabs per angler hour. Fishermen ringing from the dock had even less luck. Ten dock fishermen were interviewed and no crabs had been caught after a total of 18 angler-hours.

Bottomfish sampling continues at Crescent City and Brookings. Three samples of English sole, two of petrale sole, and three of rockfish have been taken in February.

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There are two trawlers now fishing from Crescent City and two from Brookings. All have been delivering consistently good catches of English sole.

8. PELAGIC

A. Fishery

Landings in tons <u>Species</u>	<u>February</u>		<u>January 1 - February 28</u> 10 yr. mean		
	1967*	1966	1967*	1966	1956-1965
Anchovy	6,723	2,308	17,966	4,602	1,513
Mackerel, jack	2,000	912	2,575	1,455	6,032
Mackerel, Pacific	60	192	85	286	2,232
Sardines	15	30	25	33	881
Squid	<u>326</u>	<u>970</u>	<u>614</u>	<u>2,036</u>	<u>1,161</u>
Total	9,124	4,412	21,265	8,412	11,819

\*Estimated. Accumulated landings are revised monthly.

B. Anchovy

Fishery

Experimental Anchovy Reduction Landings

Zone	Quota	Landings to date	Landings During February
I	10,000 tons	3,660 tons	968 tons
II	10,000	5,498	2,828
III	10,000	760	499
IV	35,000	11,599	2,280
V	<u>10,000</u>	<u>7,149</u>	<u>117</u>
Total	75,000	28,666	6,688

(Zones: I-inshore, Pt. Conception to Port Hueneme; II-inshore, Port Hueneme to Dana Pt.; III-inshore, Dana Pt. south; IV-offshore of Zones I, II, and III, V-north of Pt. Conception.)

Twenty-three boats operating out of San Pedro and three out of Port Hueneme delivered 6,571 tons of anchovies for reduction. Fishing activities were centered in the San Pedro Channel with catches also being made near Anacapa Island and La Jolla.

Three boats operating in the Monterey area delivered 117 tons of anchovies caught in Monterey Bay and south to Point Sur. Anchovies are in deep water (35-65 fathoms) and consequently difficult to catch.

Live bait: Fishing for bait remained light throughout the month, with good supplies available to the fisherman.



Research: Experimentation in enumeration of anchovy egg counting methods for fecundity studies was conducted at Terminal Island utilizing a Coulter counter. Due to limited funds a menometer tube costing \$350-400 and needed for satisfactory calibration, was not purchased. Therefore, we were not able to complete the study.

High nitrogen levels and supersaturation of oxygen in the water of the fish holding tanks at USBCF Laboratory (La Jolla) killed all the anchovies being used in our dye marking experiments. The dye marks, reported last month, were still visible when the fish died, eight weeks after the test began.

Tagging: One hundred and one tags were recovered from San Pedro reduction plants during the month increasing total returns to 358. Included in this total are ten tags released just outside San Pedro Harbor last March.

The most significant anchovy tag recoveries during the month gave the first demonstration of southerly interchange between major fishing areas. One moved from central California to southern California. This tag was from a fish released July 21, 1966 in Monterey Bay, near Santa Cruz, and caught in southern California waters and recovered at a Terminal Island reduction plant on February 23, 1967.

The second came from a fish tagged off San Clemente Island on October 3, 1966 and recovered by the Ensenada, Baja California fishery on January 14, 1967.

#### C. Mackerel and Sardines

##### Fishery

Good weather prevailed throughout most of the month, and jack mackerel landings increased nearly 200 percent over the January landings. Total mackerel landings for the first 2 months of the year are greater than the same period in 1965 and 1966.

During the first two-and-a-half weeks of February most of the catches were made around San Clemente Island. The fish were generally deep (15 to 25 fathoms) and some of the boats made as many as three "skunk" sets in one night. Large quantities of squid, schooling at the same depth as the mackerel, were present in the area, and many of the purse seiners set on them by mistake. Two vessels were temporarily disabled when squid plugged up their intake ports.

During the last week of February, part of the fleet began catching fish at Tanner Bank.

The 1966-67 sardine cannery season closed March 1, 1967. This was the poorest season on record and the first one in which not a single load of sardines was delivered to the canneries on Terminal Island. Statewide landings during the cannery season

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are estimated to be less than 175 tons. Nearly all of the fish were sold for bait because of the higher price of \$200 to \$400 per ton. Catches during the past season were composed almost completely of large, old fish and consisted primarily of fish mixed with mackerel or very small schools of 1/4 to 3 tons. All available evidence indicates our sardine population is at a seriously low level with the prospect of significantly improved catches in the near future extremely dim.

Pacific mackerel landings remained low, about 60 tons. Most of the fish were landed at the fresh fish markets.

No sardines or mackerel were landed at Monterey.

#### Research

Charles Peckham from Van Camp Sea Food and Gunnar Rollifson from Star-Kist Foods, Inc. met with Clark Blunt to discuss the outlook for mackerel landings during the next five years. A summary of Pacific mackerel age and length data for 1964-65, 1965-66, and 1966-67 was compiled for Van Camp's use.

Considerable time was expended editing fish receipts from the San Pedro markets in an effort to estimate the percentage of mixed loads of jack mackerel, Pacific mackerel and sardines landed by roundhaul boats.

Routine sampling produced 74 log-interviews of fishing trips, 39 jack mackerel, 3 Pacific mackerel and 3 sardine length and age samples.

Reading of Pacific mackerel otoliths for the 1964-65 season was completed.

An overnight trip was made by project personnel aboard the ST. JUDE to observe fishing methods.

#### D. Fisheries Resources Sea Survey (Bartlett M63R2-2)

The scheduled February echo sounder survey of southern California was cancelled due to a long delay in completing annual overhaul of the ALASKA. The January cruise was also cancelled for the same reason. Shipyard labor shortages and Vietnam War priorities have caused this major delay. An electronic bathythermograph and a high power hydraulic system were installed on the ALASKA and will be used on the March cruise in central California.

The computer program for producing data reports of sea surveys is being revised to process the new echo-sounder surveys initiated last year. The major revisions have been completed and will soon be ready for "debugging". New coding forms were constructed to enter data for card punching and, editing of data collected last year was begun. Echo traces of fish schools detected on the last five cruises were measured for horizontal extent with the aid of a newly constructed viewing apparatus. This information will be

used together with school counts to evaluate echo-sounder surveys.

E. Data Analysis (Bartlett M63R3)

Our first involved computer program, for the analysis of past Sea Survey data, was completed and successfully run on the 1107 computer.

Since this initial program supplies summaries for "cruises" only, we are now modifying it to extract and summarize the data into discrete time and geographical units. In addition, we are adding a sub-program which will supply us with a summary of sea-surface temperatures.

9. TUNA

A. Albacore

Research: Several days were spent preparing the Multi-year Program Budget.

Work continued on summary and analysis of the backlog of oceanographic and biological data.

A paper entitled "Ocean Temperatures and Albacore Behavior" was prepared and submitted to the III Congreso Nacional De Oceanografio, Campeche Mexico.

B. Bluefin Tuna

Fishery: On Feb. 23 a San Pedro seiner landed 12 tons of bluefin caught, Jan. 6, off Guadalupe Island. The fish ranged from 70 lbs. to 200 lbs.; and in addition to the regular scale samples we obtained ovary samples from some of the 150+ pounders.

Research: Several hours were spent preparing data for Multi-Year Program Budgeting.

Summary and analysis of the bluefin fishery, since 1957, continued.

Anticipating continued staff vacancies in the albacore study, we have begun reading their remaining 1966 scale samples.

C. Bonito

Landings to date 778 tons are up 279% over 1966.

10. SPORTFISH

A. Partyboat

Research: Two sand bass were recovered. One grew 17 mm in 187 days, no growth data were received for the second fish. Neither

moved from the release locality. Angling regulations posters, 1967 season, were sent to the State Printing office.

Fishery: The partyboat catch of key species compares with 1966 as follows:

	<u>January</u>	<u>1967</u>	<u>1966</u>
Rockfish		118,327	94,047
Kelp-sand bass		7,598	9,840
Barracuda		4,709	2,803
Bonito		2,996	13,955
Calif. halibut		998	1,571
Striped bass		240	255
Yellowtail		113	117
Salmon		none	none

B. Environmental and Behavioral Studies of Coastal Sport Fishes (D-J F22R-3)

Our contract report, The Marine Environment in the Vicinity of the San Gabriel River Mouth, was accepted by the Santa Ana River Basin Regional Water Quality Control Board. Strachan presented and discussed this report at the Board's February meeting.

As part of a routing survey dive off Palos Verdes Point, we collected a variety of plants and animals for Diana Wait, Director of the Fresno Central Museum. These specimens will be added to their inchoate collection of California marine life.

On another routine survey dive, at the Hermosa Beach WCB reef, we observed our 9-month old artificial kelp easily floating 4 to 5 feet above the sand, despite the weight of encrusting organisms. Numerous fishes were orienting to it, as if it were real algae.

During a dive on a reef offshore from Redondo Beach, 100-foot depth, a 30 foot gray whale, *Eschrichtius gibbosus*, made 3 successive passes at Chuck Mitchell, definitely a non-routine occurrence for us.

On February 27, project divers conducted a survey of Avalon Harbor and Lovers Cove, observing the amount and effect of siltation caused by harbor construction. This survey was made at the request of the State's Department of Harbors and Watercraft. A contract to cover expenses for this and additional survey work, is currently being negotiated between DFG and DHW in Sacramento.

Warm harbor water (60° F) and shallow depths (to 50 feet) allowed the divers to work with only the upper torso covered by exposure suits. While working with our legs uncovered, we apparently were stung by a hydroid, *Aglaophenia* sp. These hydroid stings produced an irritating rash on our legs which, in a few places, resulted in moderately severe skin lesions.

C. Northern California Sportfish Survey (DJ F12R9)

Field data for calendar year 1966 are being processed by the statistical unit at Terminal Island. The adjustment machine program has been "de-bugged" and the data are now being keypunched for final run.

Miller spoke to 22 members of the Santa Cruz Aqua Techs Skindiving Club on February 2.

The blue rockfish manuscript was reviewed and is now being prepared for publication as an administrative report. One day was spent in Sacramento discussing final arrangement of the report.

All 1966 airplane flight data have been collated and will be used in computation of total sportfish shore effort. Results show that about 97 percent of rocky shore fishermen and 89 percent of the surf fishermen were in the areas surveyed in 1966 by the unit sample method.

Several days were spent with Mel Odemar of the new Ecological Study in study of sportfish project data of value to the background survey of the new study.

Project is on schedule.

D. Southern California Marine Sportfish Survey (D-J F20R)

Approximately one-half of the project's effort was directed at re-analyzing and rewriting the population dynamics section of the White Seabass Manuscript. The remaining time was consumed in providing technical assistance to the Northern California Sportfish Survey (D-J F12R) and in the analysis and write-up of the results of our private boat and shoreline creel census. Progress in the latter was slight.

Project is on schedule.

11. FOOD HABITS STUDY (Bartlett Project M67-R)

Work progressed slowly this month due to the termination by one of the project's MB II's.

Stomachs obtained at the Long Beach Skindiving meet in October were examined. Decapod crustaceans and bryozoans from these stomachs were identified. Work on other groups continues.

Contents of some stomachs from the summer cruise of the N. B. SCOFIELD were also examined.

Samples captured by the JET near Santa Catalina Island were obtained for later scrutiny.

12. SPECIAL PROJECTS

A. Southern California

One day was devoted to red tide research.

The pier census continued routinely, with good weather bringing out large numbers of fishermen.

Finishing touches were given to the Santa Monica Bay Trawl Study paper and it was ready for editing at month's end.

Project is on schedule.

B. Northern California

Kelp bed maps were prepared from aerial photographs taken along the California coast from Pt. Conception to San Francisco in 1961. A new aerial photograph series from a flight on February 3 will be used to compare kelp areas then with those that exist now.

Several days were spent on the construction of an ultraviolet light water purifier for the Shellfish Culture Project. On February 22, Aplin supervised a field trip of the Boy Scout Explorer Post 700 of Sacramento to Drakes Estero to observe oyster growing. A new tower for the thermograph at the Johnson Oyster Company was built and a new thermograph installed.

13. BIOSTATISTICS

A. Data Processing

Regular Reports:

The October statistical reports of landings and shipments were completed and distributed.

The January cannery and processor reports were completed and the monthly and annual letters summarizing the tuna case pack were mailed.

The January marine partyboat catch reports were completed and the letter summarizing the data was mailed.

The Pacific Mackerel III report for September was compiled for Pelagic Fish Investigation.

The list of unregistered boats landing fish during the current license season was prepared for Wildlife Protection Branch.

Annual (1966) kelp harvesting reports were completed and distributed.

Annual (1966) ocean shrimp effort data were key punched, sent out for computations, and reports were prepared for Shellfish Investigation, Menlo Park.

The final period reports (late 1966 records) for partyboat catch records were completed and distributed.

Special Jobs and Reports:

A table showing species caught by trawlers in selected origin blocks during 1963, 1964, and 1965 was prepared for Mr. G. Baker, Shell Oil Co.

A list of partyboats by port and landing from Crescent City to Monterey was prepared for Sunset Magazine.

A table of boat lengths for selected salmon trollers was prepared for L. B. Boydston, Ocean Salmon Project, Eureka.

Copies of origin block reports for the 1962 commercial catch and 1962 through 1965 partyboat catch were produced for Mel Odemar.

An IBM card deck of about 15,000 cards was punched and verified for S. J. Nicola, Coldwater Reservoir Project, Inland Fisheries, Sacramento.

An IBM card deck was punched and verified from Volume I, Station Element Data for Dave Mackett, Menlo Park.

Work in Progress:

Statistical reports of landings and shipments for the months of November and December are being processed in the machine unit.

January market receipts, February cannery receipts, and February partyboat logs are being edited.

Annual processor reports have been checked and balanced. These reports are being key punched to prepare tables for the Statistical Circular.

Field:

The month was spent working on field problems in the Santa Barbara, Los Angeles, and San Diego areas.

B. Technical Assistance and Biometrical Analysis

Statistical and Mathematical Analysis:

Patrick Tomlinson presented a seminar on "Estimating the Number of Schools of Fish Using Line Transects" at the Fisheries-Oceanography Center, La Jolla.

Considerable time was devoted to discussing statistical and mathematical problems with several Terminal Island projects.

Computers:

A procedure was developed for preparing the MRO roster of employees on a Univac 1004 computer.

A University of Washington program for fitting a least squares line to any continuously differentiable function was modified for our use.

The card-to-tape program for commercial records was fully documented.

14. VESSELS

ALASKA

The Vessel was in the yard for overhaul and hull repairs the entire month.

Operating days scheduled 20: Day operated 0. Shipyard crowded with Navy ships, repairs took longer than anticipated.

N. B. SCOFIELD

Vessel undergoing maintenance and yard overhaul the entire month. Set to sail March 1.

Operating days scheduled 11: Days operated 0. Contract for annual drydocking and overhaul not approved on time.

NAUTILUS

The vessel conducted a seven day (7) salmon study cruise (67-N-4) off San Francisco and sixteen days of bottomfish tagging off Monterey and S. F. Operating days scheduled 23; days operated 23.

MOLLUSK

Worked abalone five (5) days in Morro Bay area. Scheduled 5; worked 5.

15. BIOLOGICAL NOTES

During a 7- to 10-day period in mid-February, three rare fish occurrences that were called to the attention of CSFL personnel suggest that something "lethal-to-fishes" happened in the Meso-or bathypelagic environment between San Pedro and Santa Catalina Island. What happened to kill these fishes (anoxic layers at great depth, dumping of very toxic pollutants into the San Pedro basin, drastic changes in oceanic temperatures, or some other lethal phenomenon) remains unexplained at the end of the month.

On February 13 a high school student, fishing from the rocks at White Point, picked up a feebly-alive 20-inch snake mackerel, *Gempylus serpens*, in a tide pool where it had been left stranded by the receding tide. This species normally inhabits tropic oceanic waters, and had never previously been seen this far north. During the next week, a report was received of two small

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snipefish, *Macrorhamphosus gracilis*, being cast ashore at Toyon Bay, Santa Catalina Island, and a freshly-dead 4-foot tapertail ribbonfish, *Trachipterus fukuzakii*, was picked up floating at the surface just outside the San Pedro breakwater. As with the snake mackerel, these two also are considered pelagic or meso-pelagic in their habits, and prefer tropic areas. Snipefishes have been taken off California on at least two other occasions, but the tapertail ribbonfish represented a new addition to our fauna.

Also of interest during February were: (i) a minor fishery for bramble sharks, *Echinorhinus cookei*, in the Ventura to Point Conception area; and (ii) the capture of a mature male sevengill shark, *Notorynchus maculatus*, at San Carlos, Baja California.

Bramble sharks generally are quite rare off our coast, but a halibut fisherman caught one in his nets (off Elwood) on February 6 and two more in the same area the next day. One of the two taken on the 7th was a female 5 feet 11 inches long weighing 101 pounds, the other, a male, was 6 feet 6 inches long and weighed 146 pounds. Within a week of these three captures, a gill netter at Ventura reported he had been taking bramble sharks in quantity for 10 days or more. This same fisherman had caught and saved bramble sharks on several previous occasions, so even though he didn't save any of his latest catches, we feel his report is reliable.

The sevengill shark at San Carlos represents a southern extension of its range by several hundred miles. This fish, a 7-foot, 96-pounder, was the first sexually-mature male known. Female sevengill sharks reportedly do not mature until 11 to 13 feet long.

On February 9 a skilfish, *Erilepis zonifer*, 30.6 inches total length, was taken on a commercial setline that was fished on the bottom for sablefish in 220 fathoms of water in the channel off Moss Landing, Monterey Bay. (Boat, WEST WIND, Captain Nash Favalora). Previously, only four specimens of this species have been reported from California waters. The last report was in California Fish and Game, 52(3):151-156, 1966.

## 16. MISCELLANEOUS

### A. Meetings, Talks and Visitors

- Feb. 1 - Abramson attended a symposium on the interface between computers and statistics in Santa Monica.
- Feb. 1 - Gotshall and Warden Gastineau met with the Crescent City Manager and the harbor master to discuss their plans for removing sand from the intertidal area and possible adverse effects on clam populations.

- Feb. 2 - Roedel & Petrich attended a meeting with representatives of the Legislative Analyst regarding replacement of the N. B. SCOFIELD, Sacramento. Reaction sounds favorable.
- Feb. 3 - Present San Gabriel River report to the Santa Ana River Basin Regional Water Quality Control Board: Strachan.
- Feb. 4 - Gotshall attended the annual South Humboldt Bay Sportsman Association's crab feed with Warden Ken Brown.
- Feb. 6 - Reserve wardens' training session, Terminal Island: lecture on diving surveys and DJF22R program; Turner.
- Feb. 6-10 - Orcutt attended the Middle Management School at San Clemente.
- Feb. 7 - Fred Phebus, Manager of Fishermen's Marketing Association, briefed the Eureka lab personnel on the highlights of the US-Soviet fisheries talks in Washington, D. C. Mr. Phebus spent 22 days in Washington, D. C. representing West Coast fishermen at the meetings.
- Feb. 7 - Ebert presented an illustrated talk on abalones to 25 members of the Peninsula Diving Club.
- Feb. 7 - Roedel & Turner attended a meeting regarding diving officer duties, Sacramento.
- Feb. 8 - Pinkas spoke to 36 members and guests of the Southern California Rod and Reel Club about marine sportfishing and the live bait industry.
- Feb. 8 - Gotshall and Smith attended a luncheon talk on Northern California Marine Resources by Milner B. Schaeffer, sponsored by the Humboldt County Planning Commission.
- Feb. 9 - Wickwire and Aasen presented talks on marine Biology and Oceanography to students at the Arcadia High School as part of a career day program.
- Feb. 9 - Young discussed career opportunities with La Serna High School biology students, Whittier.
- Feb. 9 - Phelan gave career day talks, on Marine Biology and Oceanography, to about 75 students at El Rancho High School, Pico Rivera.
- Feb. 10 - Cooperative Nearshore Environmental Studies Program: University of Southern California: Turner.

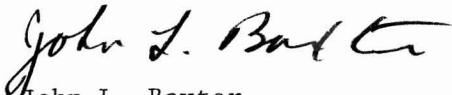
- Feb. 13 - Fitch gave an illustrated talk on otoliths to about 50 members and guests of the Fellows, San Diego Society of Natural History.
- Feb. 14 - Heimann met with Lew Osteen of the State Personnel Board to discuss tabulating machine operator classifications.
- Feb. 14 - Smith attended the monthly meeting of the Humboldt Bay Fisheries Association.
- Feb. 16 - Several staff members attended an annual meeting of the AIBS Shark Panel at San Francisco.
- Feb. 16 - Meeting to discuss central coast ecology study: Turner, Strachan and Mitchell.
- Feb. 17,18 - South Pacific Regional Planning Meeting for the U. S. Marine Activities in the International Biological Program: La Jolla; Carlisle, Turner, and Gotshall.
- Feb. 20 - A fish identification class and a short talk on sportfish investigations were presented at the Marine Reserve Wardens' School, T. I.
- Feb. 20 - Fitch attended a fish seminar at Occidental College, wherein papers on trout behavior in a Convict Creek experimental stream, and sciaenid taxonomy were presented.
- Feb. 21 - Dr. Takeo Imai, world leader in abalone, oyster, clam, and scallop culture, visited the Menlo Park Laboratory and presented a talk on marine culture techniques. Dr. Imai also accompanied us on field trips to oyster production and experimental culture areas at Tomales Bay and Drakes Estero.
- Feb. 21 - Gotshall presented statistics on northern California market crab biology and shell condition to the Humboldt County Fish and Game Advisory Committee.
- Feb. 21 - Aplin spoke to the Boy Scout Explorer Post 700 of Sacramento at the Department Field Station on oyster seed production in Japan. Thirty-two members were present.
- Feb. 23 - Dr. John Harville, biology teacher Calif. State College, San Jose, spent a fair amount of time discussing with Fitch and others at CSFL a proposal he is drafting for a sea grant college in the Monterey area. He anticipates this institution will be funded primarily by the federal government under the National Sea Grant College

and Program Act of 1966. His current efforts are aimed at solidifying his ideas with the help of others into a practical proposal, obtaining support for this type of institution, and establishing an advisory committee.

- Feb. 23-24 - Roedel attended the regular monthly staff meeting in Sacramento.
- Feb. 27 - Roedel and Baxter attended a CalCOFI meeting, La Jolla.
- Feb. 27 - Clemens discussed the tuna program with a dozen reserve wardens.
- Feb. 28 - Roedel, Heimann, Turner, Pinkas, Carlisle, and Abramson attended a meeting of the Southern California District of the American Institute of Fishery Research Biologists.
- Feb. 28 - Several staff members participated in a MRC meeting, La Jolla.
- Feb. 28 - Several staff members attended a meeting of the A.I.F.R.B. in Surfside.

B. Personnel

- Jan. 18 - Stanley Katkansky appointed Assistant Fish Pathologist, Oyster Disease and Mortality Study, Menlo Park.
- Jan. 27 - Barbara A. Barmore appointed Librarian I, Terminal Island.



John L. Baxter  
Acting Manager