FINAL REPORT

for

SEA GRANT

A COORDINATED PACIFIC COAST ALBACORE RESEARCH PROGRAM

Coordinated by the

PACIFIC MARINE FISHERIES COMMISSION

APRIL 1977

FINAL REPORT

A COORDINATED PACIFIC COAST ALBACORE RESEARCH PROGRAM

1972-1977

coordinated by the

PACIFIC MARINE FISHERIES COMMISSION

under a three year grant from the National Sea Grant Office
Grant No. 04-3-158-35

and through continuing support from National Marine Fisheries Service
Contract Nos. 03-6-208-34375 and 03-6-208-34315

April 1977

TABLE OF CONTENTS

I. OBJECTIVES, ORGANIZATION, AND COORDINATION OF THE PACIFIC COAST ALBACORE RESEARCH PROJECT

A. Brief Description of the Pacific Albacore Fishery

The Pacific albacore fishery is one of the most valuable of the west coast of North America, yielding an average annual harvest of 22,800 tons of premium quality tuna to California, Oregon, and Washington fishermen. Annual landings fluctuate in total and by State, and catch distribution shifts among Pacific States. For example, total landings ranged from 30,400 tons in 1972 to 19,716 tons in 1973. In 1972, California landings accounted for 34.5 percent of the landings, Oregon landings were 38.8 percent, and Washington landings were 26.7 percent. In 1973, California landings were only 21.5 percent of the total while Oregon and Washington had 41.7 percent and 36.8 percent respectively. A comparison of 1972 and 1973 landings distribution indicates a substantial northward shift of landings in 1973. The 1972 U.S. landings of 30,400 tons had an ex-vessel value in excess of $20 million. Canadian trollers harvested an additional 3,547 tons, about double that for any previous season.

West coast sport fishermen consider the albacore *(Thunnus alalunga)* one of the most desirable game fishes for both recreation and food. With the advent of larger and faster charter vessels able to carry anglers to offshore albacore schools, a major fishery has developed in recent years, particularly off Southern California. Recorded landings have averaged about 90,000 fish per year, with peak years approaching 240,000.

Any Pacific consideration of the Pacific albacore fishery must encompass the North Pacific ocean, since the stocks follow extensive trans-Pacific migrations which subject them to Japanese as well as North American harvest. Albacore schools are available to U.S. jig boats and bait boats only during late spring and summer months. During other seasons these same schools are subject to a surface pole-and-line fishery off Japan and a Japanese subsurface longline fishery in the central Pacific. It is generally accepted that all three fisheries are exploiting a single stock composed of six or seven year-class groups having extremely complex, not well-understood migration patterns.

The total harvest from the three fisheries approximates 80,000 tons annually. In recent years the Japanese pole-and-line fishery has taken the largest share--approximately 60% in 1972 as compared to 10% by Japanese longlines and 30% by North American bait boats and trollers (jig boats).

B. Problems of Albacore Management which Generated the Present Project

Over the past decade, both Japanese and North American fishing fleets have increased their pressure on the albacore stocks. United States segments of the industry have become particularly concerned because this increase in North American fishing effort has not yielded a commensurate increase in catch. Albacore population dynamics are not sufficiently well understood to evaluate the effects of the increased fishing effort on future harvests or on the economic health of individual vessels and the industry as a whole. Raw catch records can be misleading since there have always been substantial year-to-year variations in the abundance and distribution of albacore.

Because of the high value of the albacore harvest, and also because of significant scientific interest in these trans-Pacific migrants, extensive researches have been conducted on albacore over the past several decades by scientists of State and Federal agencies and a number of Pacific Coast universities. However, these researches have been individualized and fractionated, with no effective mechanism for reasonable coordination of effort toward common purposes, even within the United States. While this lack of coordination may not be particularly significant with respect to basic scientific studies, it can be a major deterrent to effective management-related studies and therefore to development of necessary management practices and mechanisms.

Albacore fishing interests were particularly concerned with the need for developing a reliable data base for albacore management. Since Pacific Coast fisheries data are collected by the individual States, coordination of effort is required to avoid fractionation of that data base. Fishing interests recognized the even greater problems of standardizing data so that harvests by different kinds of vessels and gear may be compared and combined. This task requires data input from the States; however, it is the Federal government which has the capability for data standardization. Also it is at Federal levels *that U.S.*-Japanese coordination must be sought.

By early 1971 Pacific Coast albacore fishermen and fisheries agency scientists became convinced that a new effort was needed; first, for better coordination of albacore research and data collection, and second, to achieve an oceanwide understanding of Pacific albacore population dynamics. The major impetus for action was supplied by the albacore fishing industry through its American Fishermen's Research Foundation.

C. Role of the American Fishermen's Research Foundation

In 1971 the albacore fishing industry, under the leadership of F. Robert Insinger of San Diego, injected a major new element into albacore research. Albacore fishing boat operators formed the American Fishermen's Research Foundation, governed by a 12-man Board of Directors, headed by Insinger as President. To support AFRF, the industry taxes itself $10 per ton on U.S. albacore landings, thereby generating approximately $250,000 per year in revenues earmarked for research of benefit to the U.S. albacore industry.

AFRF set itself two primary objectives for use of these new self-generated funds:

1. To plan, fund, and execute a research program of its own aimed primarily at maximizing the economic return to the U.S. fishery and tuna industry;

2. To establish an effective mechanism for planning and coordination of all albacore research efforts being conducted by Federal, State, university, and industry organizations.

Towards the first objective, AFRF collaborated with the National Marine Fisheries Service, Southwest Fisheries Center in La Jolla, California to develop an exploratory fishing and tagging program, for which AFRF provided funds for fishing vessel charter, equipment, and supplies. NMFS provided scientific advice and leadership, oceanographic researches, and certain necessary scientific equipment. AFRF financial support during the first year (1971) totaled some $60,000, and during 1972 nearly $180,000. NMFS contributions during the first year were more than $34,000, and in 1972 $400,000.

This joint AFRF-NMFS program has continued at approximately the 1972 level of input through the present (1977). Since 1974 the AFRF leadership has been provided by its President, Jack C. Bowland. Leader for the National Marine Fisheries Service since inception of the project has been Dr. R. Michael Laurs of the Southwest Fisheries Center, La Jolla, California. Attachment A to this report provides a detailed outline prepared by Dr. Laurs for one year of this cooperative private sector-Federal government program.

Toward its second objective of facilitating improved coordination of albacore research among Federal, State, university, and industry organizations, Insinger and the American Fishermen's Research Foundation determined to pull together a discussion and planning body drawn from all concerned organizations to address both short- and long-term research needs, and to plan cooperatively for meeting them. Accordingly, on February 24-25, 1972, AFRF convened such a review and planning body in San Diego, California. Results of that meeting are outlined in some detail in the following section.

D. 1972: Inception of the Coordinated Pacific Coast Albacore Research Program

1. Organization of the ad hoc Albacore Coordinating Committee

In response to the need for improved coordination of albacore research, more than 20 government, university, and industry representatives met on February 24-25, 1972, and organized themselves as the ad hoc Albacore Coordinating Committee.[1/] Dr. James Joseph, Director of Investigations, Inter-American Tropical Tuna Commission, served as chairman of the first organizational meeting, and together with the Committee agreed to initiate a new approach to coordinated Pacific Coast albacore research.

Under Dr. Joseph's leadership, potential areas for future albacore research were explored under eight general headings:

- catch and effort statistics
- exploratory fishing
- albacore migrations in the North Pacific
- environmental studies

---

[1]Minutes for this meeting were reproduced in full as an appendix to the 1972 proposal to Sea Grant for support of A Coordinated Pacific Coast Albacore Research Program (29 pp.).

- life history studies
- population dynamics
- economics of the fishery
- management approaches

In the context of these research areas, representatives of fourteen Pacific Coast organizations reported on current and planned activities with respect to albacore research and management. From these discussions, the Committee identified certain gaps in the information base for albacore management, and assigned priorities for future action. Recommended program developments may be summarized as follows:

Catch and effort statistics:

- bolster Pacific Coast acquisition of catch and effort statistics and management sampling;

- coordinate data collection among States;

- assess data collection approaches to determine adequacy, and modify as appropriate.

Exploratory fishing: continue AFRF-NMFS cooperative program.

Albacore migrations:

- undertake studies to determine areas, number, and other factors necessary to assure proper design of tagging studies;

- explore use of sonic tags for migration and behavior studies.

Environmental studies:

- augment National Weather Service marine forecast capabilities of the San Francisco unit;

- continue full support of NMFS station WWD in La Jolla and improve its transmission capabilities and that of other stations;

- increase facsimile reception capabilities of albacore fishing fleets;

- improve mechanisms for transmission of weather service information to user groups--e.g., long-distance teletype lines;

- improve flow of weather observations from fishing vessels;

- develop workshops on use of weather data and facsimile charts;

- expand long-range weather forecast capability to five, seven, or nine days (rather than present 36-72 hrs.);

- expand long-term general ecological studies of albacore and ecosystem.

Life history studies:

- increase general knowledge of albacore growth, spawning and early life history information (expensive, long-term project, not highest priority);

- study forage and food preferences, perhaps using CalCOFI materials;

- study feeding mechanisms and habits.

Population dynamics:

- urge joint U.S.-Japan analysis of albacore population dynamics on a Pacific-wide basis, with coordinated effort by U.S. agencies in support of this effort;

- complete gear standardization work begun in California.

Economics of the fishery--expand data base with emphasis on fleet operation by vessel size and type, to include:

- an examination of capital costs, operating expenses, return on assets employed and fishermen renumeration for various sizes and types of vessels employed in the United States fishery;

- an analysis of the economic efficiency of the various sizes and types of vessels employed in the United States fishery;

- a forecast of the probable economic effects of increases in fleet size as a result of new construction or the entry of multi-fishery vessels;

- the biological impact of increases in fishing effort (and fishing mortality) by the international fleet and an assessment of the resulting economic effects on each of the major industry segments in Pacific-wide operations.

- an examination and evaluation of cost accounting practices used by individual vessel owners with the objective of developing a simple but more useful system to improve financial control and insight into operations.

Directory of emergency services: extend PASGAP publication to cover entire Pacific Coast.

As outgrowth of that first organizational meeting and a second one on April 17, 1972, long-term first-priority goals for a coastwide albacore research program were agreed upon as follows:

- to determine the population dynamics of the stock and its present status;

- to understand the relationships among environmental parameters and fluctuations in abundance and distribution of the fish;

- to maximize economic return to the fishery through extension of the fishing period, both before and after the traditional season;

- to improve current weather forecasting and its dissemination to the industry;

- to provide an understanding of economic aspects of the fishery.

For immediate implementation of these goals, the Committee recommended that:

- A master plan for albacore research be developed and a proposal be prepared requesting Sea Grant funding during fiscal 1973 for urgent research projects required to provide a balanced level of effort for the total albacore research program;

- The Pacific Marine Fisheries Commission be requested to act as administrator for the proposed Sea Grant program on albacore research and that PMFC, in turn, subcontract the approved research to State, university, and industry research groups in accordance with the approved research plan.

Gordon Broadhead of Living Marine Resources, Inc. accepted the Committee's assignment for preparation of a Sea Grant proposal to fund a Coordinated Pacific Coast Albacore Research Program. With consultation from other Committee members and The Office of Sea Grant, the proposal was completed, approved by the Committee, and submitted for funding May 25, 1972. This proposal requested Sea Grant support for three major project components: an augmented albacore port-sampling program in California and Oregon (California Department of Fish and Game, and Fish Commission of Oregon); development of industry-oriented albacore forecasting system (Living Marine Resources, Inc.); and overall project planning, integration, and coordination (Pacific Marine Fisheries Commission). The funds generated by AFRF and used in the cooperative fisheries exploration and oceanography program with NMFS were offered for matching purposes.

The program proposed by the ad hoc Albacore Coordinating Committee was funded by Sea Grant for $74,600 for the fiscal year 1972-73 (Grant No. 04-3-158-35). The grant was extended subsequently for two additional years ($64,500 and $67,200). The ad hoc Albacore Coordinating Committee extended its general oversight responsibilities for the project throughout these years, and provided continued direction for subsequent program development.

2. The Pacific Marine Fisheries Commission as Project Coordinator

The Pacific Marine Fisheries Commission was established by act of Congress in 1947 (P.L. 232, 80th Congress, 61 Stat. 419).[2/] The original contracting States of California, Oregon, and Washington agreed to the following purposes as stated in Article I of the Compact:

> *The purposes of this compact are and shall be to promote the better utilization of fisheries, marine, shell and anadromous, which are of mutual concern, and to develop a joint program of protection and prevention of physical waste of such fisheries in all of those areas of the Pacific Ocean and adjacent waters over which the compacting States jointly or separately now have or may hereafter acquire jurisdiction.*

Idaho joined the Commission in 1963 and Alaska in 1968. As presently constituted, 15 Commissioners (three from each State, appointed by the Governors for four-year terms) serve the Commission, assisted by 31 Advisors representing recreational and commercial fisheries interests of the Pacific Coast (seven from each coastal State, three from Idaho). The fisheries staffs of the member State fisheries agencies provide research and management capabilities for the Commission.

---

[2]The 25th Annual Report of the Pacific Marine Fisheries Commission (1972) contains three papers on the history of PMFC in relation to a quarter century of changes in national and West Coast fisheries needs and problems.

In 1970 PMFC adopted a formal statement of Goal and Objectives (cf. Attachment B for complete text). The first two prime objectives of the four stated below provide the basis for active participation by the Commission in the Coordinated Pacific Coast Albacore Research Program.

I. *Provide energetic leadership in recognizing and resolving fishery problems.*

II. *Coordinate research and management projects relating to fisheries of concern to two or more states.*

III. *Develop PMFC positions and communicate them to the legislatures of the respective states, the Congress, the concerned agencies of federal, state, or local government, and to the private sector.*

IV. *Propose compatible fishery regulations based on scientific evidence and with full consideration of ecological, biological, recreational, aesthetic, social, economic, and political matters.*

PMFC's Executive Director, assisted by a small administrative staff, conducts the business of the Commission. Fisheries research and management projects are carried out by working committees drawn from the State fisheries agencies and organized by fishery: e.g., Albacore, Groundfish, Salmon-Steelhead, Shellfish. Overall coordination is provided by the PMFC Coordinators Group comprised of a senior fisheries manager from each participating agency.

In view of the purposes for which PMFC was originally established, its objectives as formally stated in 1970, and its management research capabilities via its secretariat and working committees, PMFC was asked by the ad hoc Albacore Coordinating Committee to undertake overall management of the Coordinated Pacific Coast Albacore Research Project. PMFC's Executive Committee approved this action, and instructed Executive Director John P. Harville to provide the necessary coordinational leadership and support.

Objectives and guidelines for the first year of the Coordinated Pacific Coast Albacore Research Program were set forth by the ad hoc Albacore Coordinating Committee at its initial meetings in February and April 1972. At the request of that Committee, Gordon Broadhead of LMR, Inc., La Jolla, prepared the initial proposal for Sea Grant support of this project.[3/]

---

[3]May 25, 1972. A Coordinated Pacific Coast Albacore Research Program. Proposal submitted to the Office of Sea Grant, NOAA, Dept. of Commerce; 42 pp. + Appendix.

E. 1972-73: Coordination of the First Year of the Project

1. Proposal Approval and Areas Funded

The Coordinated Pacific Coast Albacore Research Program was funded by the Office of Sea Grant for $76,400 (Grant No. 04-3-158-35) for FY 1972-1973. These Federal expenditures were matched by $178,000 of American Fishermen's Research Foundation funds, primarily for the cooperative program with the National Marine Fisheries Service for exploratory fishing, albacore tagging, and oceanographic research. NMFS, through its Southwest Fisheries Center, provided key scientific leadership and active field participation, with commitment of direct services valued in excess of $400,000.

Other active participants in the 1972-73 project were a private research group, Living Marine Resources, Inc. of La Jolla, California, which conceived and developed an albacore forecasting pilot project as an important component of the total research effort; and the three State agencies responsible for management of Pacific Coast fisheries--California Department of Fish and Game, Fish Commission of Oregon, and Washington Department of Fisheries. Matching in-kind contributions by the State agencies concerned totaled in excess of $75,000.

The proposal designated PMFC's Executive Director as project leader, with responsibility for overall coordination in five general areas:

- interagency liaison and coordination;
- planning and coordination of present and future research for the project area defined, and within policies and guidelines established by the Coordinating Committee;
- organizing and convening an annual meeting of the Coordinating Committee to evaluate progress and plan for future program development;
- coordination of proposal development for the subsequent year;
- fiscal management of project funds

Sea Grant funding for this first year of project activity supported work in three general areas:

- Coordination and general support ($12,900), including:
  - PMFC logistic and overall management support;
  - meetings and other functions of the Albacore Coordinating Committee;
  - scientific committee planning and field research and management functions.

- Augmented albacore data acquisition through port-sampling programs along the Pacific Coast and development of a uniform West Coast albacore logbook ($24,400).

- Industry-oriented albacore forecasting system development through subcontract with LMR, Inc.; cf. Section IV of this report for review of accomplishments ($39,100).

2. Summary of Coordinating Activities

In fulfillment of responsibilities designated by the ad hoc Albacore Coordinating Committee and specified in the proposal, PMFC initially concentrated on continued development of appropriate interagency communication and liaison to facilitate overall project planning and coordination of effort, particularly with respect to augmented coastwide data collection through the States' port sampling programs and logbook systems. When it became apparent that the logistics of the Sea Grant fiscal process would delay receipt of funds beyond the start of the 1972 fishing season, PMFC advanced the necessary funds (about $6,000) to enable the project to commence at the beginning of that season.

Over the critical first year of the project, PMFC established the necessary interagency fiscal arrangements for multi-State participation in the project. PMFC's Albacore Committee provided the professional nucleus for cooperation among agencies to complete and field-test the uniform coastwide albacore logbook which had been subject to sporadic stages of development by agency scientists over a number of years previously.

The Albacore Committee also worked to standardize methods of data collection and reporting of samples taken from landings at Pacific Coast ports in order to assure coastwide compatibility of these critical data elements. Key scientific and technical assistance was provided this phase of the project by Dr. R. Michael Laurs and his staff of the Fishery-Oceanography group, NMFS Southwest Fisheries Center, La Jolla, California.

As an essential corollary to activities directly a part of the Sea Grant sponsored project, PMFC devoted major attention to the relations of that project to programs of other agencies and institutions. Interactions with the National Marine Fisheries Service, Southwest Fisheries Center, were explored particularly carefully to assure mutually supportive functions, both with respect to fisheries-oceanography researches and to the Center's long-term interests in population dynamics studies. Similarly, planning for economics-related phases of data collection were reviewed with economists attached to NMFS Northwest and Southwest Regions, with particular attention to interrelations with economics studies concerning other fisheries such as Dungeness crab.

PMFC also sought effective communication with universities engaged in albacore-related studies, and an excellent rapport was developed with responsible officers and scientists of these institutions. For example, in October 1972 a meeting was held at the Oregon State University campus in Corvallis, Oregon, of biologists and economists particularly interested in economics studies of West Coast fisheries. While this meeting centered upon Dungeness crab problems, the group stressed the operational interrelationship of most fisheries of the Pacific Northwest. Since many boats and fishermen normally harvest crabs, albacore, and salmon in a single season, it follows that economics studies cannot realistically confine themselves to a single species approach in most cases.

In response to a request from Dr. George Shor, Manager of the University of California's Sea Grant Program, PMFC's executive officer prepared a review of research activities within the present Sea Grant supported project, and offered tentative estimates of additional research needs which might be of university interest. The most important suggestion advanced was for university consideration of socioeconomic goals for fisheries management, and particularly for the development of models which would contribute to decision-making with respect to those goals.

PMFC also maintained a continuing effective liaison with the marine advisory program officers of the University of California; California State University, Humboldt; Oregon State University; and the national offices in Washington, D.C. During the 1972-73 season, a particular effort was made to enhance the working relationships of State fisheries biologists and local marine advisors and extension officers.

Since many of the problems facing coastwide fisheries management relate to improvements in data collection, processing, and interpretation, PMFC has developed a mutually productive working relationship with the NORFISH project of the University of Washington. Initial activities related to groundfish data, for which Jim Buss, NORFISH programmer, developed ADP techniques for manipulation of PMFC's coastwide data series (California, Oregon, Washington, British Columbia, and Alaska landings by species, area, and month, with subdivisions by gear type and market use). Extension of this relationship was undertaken to assure expert ADP advice with respect to present and planned developments of coastwide albacore data, particularly in relation to economics studies. NORFISH's Sam Bledsoe provided key assistance with this effort.

PMFC kept members of the Albacore Coordinating Committee advised of project progress throughout 1972, and in early 1973 reconvened that Committee for its second annual meeting. Committee recommendations developed at that March 6-7, 1973 meeting are summarized in the following section.

F. 1973-74: Coordination, Second Year of Project

1. Ad hoc Coordinating Committee Actions

The Committee held its second annual meeting March 6-7, 1973 (for roster of attendees, cf. Attachment C). After review of first year program activities and approval of progress to date, the Committee organized itself into a biology-oceanography panel and an economics panel to address program development needs and priorities for the ensuing year.

a. The Biology-Oceanography Panel recommended four main areas of effort for the 1973-74 season:

1) enhance effectiveness of the States' port-sampling program in order to increase data on albacore landings to 20% - 30% over the entire season;

2) expand the NMFS-AFRF tagging program as already planned by the principals;

3) expand albacore scouting efforts during pre-, mid-, and post-season periods;

4) continue uniform coastwide data program development by the States in conjunction with NMFS, and continue enhancement of communication among all responsible agencies.

The Panel also addressed standards for sampling, agreeing that measurements of albacore should be to the lower nearest whole centimeter, and that sample size should be about 50 fish; however, larger samples sometimes are feasible and no agency should be discouraged from so doing where desirable. Jig and bait boat samples should be kept separate. The Panel also recommended comprehensive sampling throughout the season for all sectors of the coast, with care to avoid biases through methods of drawing samples.

The Panel recommended renewed efforts at coordination among State and Federal agencies in data collection and processing, including use of marine advisory programs for information dissemination, logbook issue and collection, etc.

b. The Economics Panel defined two areas of major concern for recommended future study:

1) Development of an economics data base which will permit the matching of vessels and fishermen with landings by species, poundage, and value. Broadhead pointed out that the Pacific Coast does not have a separate albacore fleet, but rather a mixed fleet, with many of the same vessels harvesting salmon, albacore, crabs, and perhaps groundfish. Three data sources need further development:

a) vessel registration (unique for the entire coast);

b) landing ticket system (related to the vessel);

c) commercial fisherman licensing, which should provide demographic data.

This data system must be compatible with the uniform logbook system, and with other existing data systems of the several States. It also must protect confidentiality of data and other legal aspects.

2) Study of capital structure of the albacore fishing fleet. As update of recommendations in 1972, the Panel proposed:

a) an examination of capital costs, operating expenses, and return on assets employed and fisherman renumeration for various sizes and types of vessels employed in the U.S. (albacore) fishery.

b) an examination and evaluation of cost accounting practices used by individual vessel owners with the objective of developing a simple but more useful system to improve financial control and insight into operations,

The ad hoc Albacore Coordinating Committee endorsed recommendations of both its Panels, and directed that the proposal for project work in 1973-74 include augmented efforts on port sampling and logbook data management, and a new subproject to develop the economics data base proposed by the Economics Panel. Industry representatives emphasized need to safeguard confidentiality of data, but concurred in the need for developing data relevant to future decision-making. Industry participation in the study was strongly recommended. Committee members concurred in need to develop a data base for all fisheries, not albacore alone, in view of the multiple-fisheries nature of Pacific Coast operations. With respect to the capital structure of the albacore fishing fleet, the Committee named a working team to develop a request for proposal for submission to universities and other interested organizations, in order to stimulate interest in an external study. (Such a request for proposal was prepared--cf. Attachment D for its text. It was widely distributed but did not generate any specific proposals, presumably because of its short time frame. Consequently no substantive follow-up action was possible.)

c. Population dynamics

Committee members continued to stress urgent need for a trans-Pacific approach to the population dynamics of albacore. NMFS representatives reviewed their existing programs in summarizing U.S. catch and effort data, development of a uniform logbook, and general study of international problems to be met. U.S. and Japanese scientists are seeking compatible data and formats for comparison purposes.

The Committee urged all possible priority for this effort, and suggested that organizations interested in population dynamics contact NMFS.

2. Summary of Coordinating Activities

In accordance with instructions of the ad hoc Albacore Coordinating Committee, PMFC prepared a proposal for continued Sea Grant support through the second year of the project (July 1, 1973 - June 30, 1974). This proposal sought continuation of the albacore port sampling and uniform logbook programs, and initiation of a new subproject for development of a coastwide vessel, fisherman, and landing data system having particular values for coastwide economic analysis of albacore and related fisheries.

This proposal (dated May 1, 1973) was funded by the Office of Sea Grant for $64,500, of which approximately 20% was applied to coordination functions, 41% for port sampling and the uniform logbook, and 39% for coastwide data system development.

This second year of the project launched a balanced program of albacore data collection through logbooks and port sampling procedures, and improved data management through development of the coastwide data system. The Pacific Marine Fisheries Commission continued coordination of the albacore project throughout its duration according to patterns established in the first year. The only essentially new function undertaken in the second year of the project was organization of the coastwide data program.

In September 1973, PMFC employed Mr. Robert J. Williams as full-time investigator for that subproject. Williams continued effectively in that task throughout the project period. Since this program required extensive interagency discussion, it also was necessary for PMFC's Executive Director to participate actively in developing the necessary liaison for effective interactions.

Throughout the project period, PMFC looked to the Sea Grant ad hoc Albacore Coordinating Committee for general policy direction and guidelines. Through memos and reports as appropriate, the Committee was kept apprised of project progress.

G. 1974-77: Coordination, Continuation of the Project

1. Ad hoc Coordinating Committee Actions

The Committee convened for its third annual meeting April 29-30, 1974, in San Diego, California. Progress of the project for the past year was reviewed and approved, and related studies of various organizations were summarized. Considerable discussion centered upon continuing need for improved marine weather forecasts, operational attrition as a result of level-funding of Federal programs, and difficulties in securing adequate training opportunities for students and others interested in fisheries or oceanographic jobs.

The Committee evidenced particular interest in economics studies reported by Oregon State University and data management projects conducted by NORFISH of the University of Washington. The Committee again emphasized need for the economics studies recommended in 1973, and urged extended communication among agencies and individuals to effect the necessary coastwide coordination of data collection, particularly for economics information. The need for fishing industry participation at all stages of research planning and execution was stressed. Certain programs received some criticism for failure to involve industry viewpoints at early stages.

With respect to research priorities for the third year of the Coordinated Pacific Coast Albacore Research Project, the Committee took the following actions:

a. Exploratory fishing, oceanographic research, and albacore tagging
The Committee commended progress to date of this joint AFRF-NMFS project and recommended its continuance, emphasizing the need for data over a series of years as basis for significant benefits to the industry.

b. Albacore port sampling and uniform logbook program
The Committee commended the increased sampling of landings made possible through Sea Grant support, noting that an improved data base would be vital to future trans-Pacific analysis of population dynamics (cf. also sec. c, below). Inclusion of Washington data was particularly commended.

The Committee also approved progress on the Uniform West Coast Albacore Logbook, including recent format changes to accommodate recommendations from fishermen, and expanded use of the logbooks as result of public informational meetings. The Committee attached particular value to development by NMFS of information sheets for cooperating fishermen, advising them of catch per unit of effort for 1 degree squares for the previous season, size composition of the catch, etc.

The Committee endorsed continuation of these key data development programs for the 1974-75 project period.

c. Population dynamics

The Committee emphasized the urgent need to achieve joint U.S.-Japan coordination of data and research toward developing a trans-Pacific knowledge of albacore population dynamics. The Committee pressed for assurances that U.S. data on file and presently being collected will constitute adequate U.S. input to this cooperative effort. The Committee also directed that the National Marine Fisheries Service be advised by resolution of the need for U.S. initiative in developing joint U.S.-Japan analysis of albacore population dynamics.

The Committee subsequently unanimously approved a resolution formally expressing its concerns and recommendations, and ordered that this resolution be sent to Robert Schoning, Director of the National Marine Fisheries Service, with a request for his supportive action. That resolution (complete text supplied in Attachment E) notes the importance of the albacore fishery, the increasing pressures on the stocks, and the international implications of their effective conservation and management. The Resolution expresses Committee concerns for the lack of aggressive attention to the population dynamics of these stocks, the substantial lead-time required for such studies, and the fiscal difficulties besetting management agencies and therefore inhibiting their efforts. The Resolution calls upon the National Marine Fisheries Service to provide the Committee with a summary report on the status of albacore population dynamics, and to take the initiative in developing a plan of action for intensifying relevant research efforts.[4/]

---

[4]PMFC's Executive Director, on instructions of the Committee, forwarded the Resolution to NMFS and NOAA with amplifying comments. Those agencies responded with positive supportive action (cf. Attachment E). Most tangible evidence of this support was the convening in Honolulu, December 1975, of a U.S.-Japan workshop on albacore population dynamics (cf. section G.3.c., of the present paper, p. 23).

d. Coastwide Vessel, Fishermen, and Landings Data System

The Committee approved progress to date on this subproject, as reported by Task Force leader Clemens B. Bribitzer (NMFS) and Project Investigator Robert J. Williams (PMFC). By unanimous motion, the Committee recommended deletion of social security numbers from data reporting requirements (since an unnecessary source of concern to fishermen).

The Committee recommended continuation of the project as outlined through FY 1974-75, but recommended that the pace of progress be accelerated by augmented effort through external contract or other arrangements. A supplemental proposal therefore was approved for attachment to the basic proposal for Sea Grant funding.[5/]

e. National Fisheries Plan Review

Clemens Bribitzer (NMFS-SW) reviewed objectives and progress to date of the National Fisheries Plan, and requested Committee comments on a series of questions relating to development of new fisheries, sport-commercial conflicts for albacore, and various management considerations including adequacy of data base, biologic potential of stocks, impacts of regulations, and priorities for action.

The Committee discussed management needs and problems with respect to albacore and other tunas, and provided recommendations to NMFS Southwest Regional Director Gerald V. Howard for incorporation into the National Fisheries Plan. The Committee reemphasized concerns for an adequate data base and trans-Pacific knowledge of albacore population dynamics.

In accordance with Committee recommendations, PMFC developed a proposal for Sea Grant funding of the third year of the Coordinated Pacific Coast Albacore Program, and submitted it on May 31, 1974. The Office of Sea Grant funded the base program for $67,200 to continue project elements from the previous year through July 1975. However, in view of severe budget constraints at the national level, Sea Grant was unable to fund the proposed augmentation for a pilot study to accelerate development of the coastwide data system.

---

[5]This supplemental proposal, as drafted by a committee task group, was included in the 1974 Sea Grant proposal (total added cost: $46,800). Under the severe budgetary strictures of that fiscal year, Sea Grant was not able to approve this subproject for funding.

2. Summary of Coordinating Activities, Third Year of Project

Funding provided by Sea Grant, in supplement to matching contributions from the participating States and the American Fishermen's Research Foundation, supported an expanded albacore port sampling and logbook program through the 1974 and 1975 fishing seasons, and provided for continuation of the coastwide data system development project over that same period. PMFC continued its coordinating functions for these project elements. The port sampling and logbook programs are described in some detail, p. 27-32 of the present report; the coastwide data system, p. 32-47.

Also in implementation of Coordinating Committee instructions, PMFC's Executive Director advised the National Marine Fisheries Service of strong Committee support for U.S.-Japanese cooperative studies of albacore population dynamics. NMFS Director Robert Schoning took positive supportive action on this recommendation (cf. Attachment E for details). Outgrowth was assignment of lead responsibility for integration of U.S. and Japanese data to the NMFS laboratory in Honolulu, Hawaii; also convening of a special U.S.-Japanese workshop on albacore population dynamics at that laboratory in December 1975 (for details, cf. sec. c, p. 23 of the present paper).

As for the first year of the project, PMFC continued to devote attention to areas of interface with relevant programs of other agencies and institutions. This concern for effective interaction of albacore-related projects and programs had continuing values for all agencies concerned.

In recognition of the finite term of Sea Grant project support (normally three years), PMFC began in 1974 to seek mechanisms for continuing support of program activities beyond the termination of Sea Grant funding. Through careful management of funds and some supplementation from other resources, it was possible to continue program support through 1976. Therefore, a project extension (without added funding) was requested and subsequently authorized. A short term product of this effort was extension of three years of Sea Grant funding to cover four albacore seasons. Longer term results are outlined in section 3 following.

3. Preparation for Project Continuance

a. Role of PMFC's Albacore Committee

Supported by Sea Grant funding for necessary meeting and program activities, the PMFC Albacore Committee developed over 1974-76 as the key scientific and technical entity for coordinating albacore data collection among the Pacific States and with the National Marine Fisheries Service. Its members include albacore project leaders for California, Oregon and Washington and from the Southwest Fisheries Center of the National Marine Fisheries Service. Because of their assigned leadership functions for their own agencies, these fisheries managers are in position to implement effectively the decisions made by the group.

This Committee effectively carried forward the albacore port sampling and uniform logbook program as outlined in Section II of the present report. Through the four successful seasons completed, the Committee established a framework for operations and developed the necessary experience with coastwide coordination of data collection and management. NMFS continued to collate data for the entire coast, and to integrate the information thus derived with Japanese data toward development of a North Pacific data base. NMFS also agreed to participate in the funding of the port sampling program; thus the future of this project appears assured (cf. section b, p. 22).

The solid basis thus achieved for the albacore data collection and management program has particular significance since albacore alone among major West Coast fisheries will not be subject to the regional management planning purview of the new Regional Fishery Management Councils established under the Fishery Conservation and Management Act of 1976 (P.L. 94-265). That legislation specifically excludes highly migratory tunas from Council jurisdiction. Thus the coordinating capabilities established with the assistance of Sea Grant support will have particular values for future management planning for albacore.

As outgrowth of the coordinated port sampling and logbook data collection program, State representatives on the PMFC Albacore Committee were invited to attend as participants in the NMFS-convened North Pacific Albacore Workshop in Honolulu, Hawaii, 10-12 December 1975 (cf. section c, p. 23). It is anticipated that similar workshops will be scheduled in the near future, with continued participation by members of this coastwide coordinating body of fisheries scientists.

The PMFC Albacore Committee is responsible each year for summarizing the status of the albacore fishery as contribution to PMFC's Annual Report. This document provides cumulative harvest records by State from 1951 to the present and summarizes the current year. The albacore fishery status report for 1975 is included as Attachment F of the present document.

b. NMFS Funding for Future Albacore Data Collection

Late in 1975 a tacit agreement was reached with the National Marine Fisheries Service for continued support of the coastwide albacore port sampling and logbook program, in order to continue that project on a sustaining basis after termination of Sea Grant support. In April 1976 a proposal was submitted to NMFS for that program support through the 1976 season. The proposal stated (in part):

> *The States of California, Oregon, and Washington, with coordinational support from the Pacific Marine Fisheries Commission, propose continued cooperation with the National Marine Fisheries Service in dissemination of the Uniform U.S. West Coast Logbook for albacore to Pacific Coast fishermen, in collection, verification, and data processing of completed logs from those logbooks, and in the collection of biological data from selected samples of albacore landings along the Pacific Coast. Albacore scientists hope to maintain sampling effort at levels approximating those achieved in 1974 and 1975, and to improve the geographic distribution of that effort. Additionally they will intensify their program of fisherman interviews in support of the uniform coastwide logbook system in order to maximize the effectiveness of data retrieval from those logbooks.*

NMFS funded the project as proposed for the 1976 season ($30,000), to accomplish the following tasks:

> *In support of the Coordinated Coastwide Albacore Logbook and Port Sampling Program, the Pacific Marine Fisheries Commission and its participating States agree to perform the following tasks to the fullest extent possible under the proposed funding and as integrated with the States' ongoing fisheries monitoring programs:*
>
> 1. *Distribute Uniform U.S. West Coast Logbook for Albacore to fishermen (NMFS to provide logbooks for this purpose).*
>
> 2. *Collect logbook records from fishermen and obtain albacore catch and effort sampling information through fishermen interviews according to a sampling regime which distributes interview efforts and other sampling activities as effectively as possible along the coast.*
>
> 3. *Process, edit, and quality-control logbook and inteview data collected from the fishermen.*

4. *Appropriately sample and record fork-length measurements from representative albacore landings along the coast.*

The Pacific Marine Fisheries Commission and its participating States will provide the following specific items as output from this contract:

1. *Provide NMFS with fork-length measurements of albacore, keeping measurements of fish caught by trolling and by live-bait fishing separate.*

2. *Provide NMFS, in a form compatible with ADP procedures, with edited albacore catch and effort data from logbooks and interviews.*

3. *Provide NMFS with albacore fishing operations information collected from log records and interviews.*

It is anticipated that this NMFS support will continue into the future in recognition that albacore must be managed on a North Pacific Ocean basis, and therefore will require national and international levels of coordination. Since the States by themselves can accomplish very little of management significance, State funding for albacore monitoring is understandably limited. Project scientists will continue to assess data adequacy and at the close of the 1976 season, hope to be able to determine the level of sampling effort necessary for adequate monitoring of the fishery and effective input to population dynamics studies.

c. North Pacific Albacore Population Dynamics

As outlined earlier (p. 18), the ad hoc Albacore Coordinating Committee by Resolution in 1974 urged that NMFS develop a summary report on the status of Pacific albacore population dynamics, and also take the initiative in developing a plan for intensification of relevant researches and data development. Text of the Committee Resolution is provided in Attachment E.

NMFS Director Robert W. Schoning responded positively to that Resolution, and as outgrowth the Southwest Fisheries Center directed the Hawaii Laboratory to initiate a population dynamics program for all Pacific albacore (both north and central stocks), and also to develop an interface with the Japanese on albacore work. The Southwest Fisheries Center in La Jolla, California will initiate an otolith collecting program, with otoliths sent to Hawaii for aging. The Hawaii staff will develop a planning document on the population dynamics program for albacore at a later date. (cf. Attachment E for full text of Director Schoning's response.)

On December 10-12, 1975, the NMFS Hawaii Laboratory convened an international workshop on albacore population dynamics in Honolulu. A report on that workshop was prepared by its Chairman, Dr. Jerry A. Wetherall, head of the North Pacific albacore population dynamics task at the Honolulu Laboratory. That report described workshop makeup and objectives as follows:

> *The workshop was conducted at the National Marine Fisheries Service (NMFS) Laboratory in Honolulu, Hawaii, on 10-12 December 1975, as part of an informal agreement established in 1974 between the Southwest Fisheries Center, NMFS and the Far Seas Fisheries Research Laboratory of the Japan Fisheries Agency to promote and accelerate joint investigations into the population dynamics of North Pacific albacore. Participants at the workshop included representatives of the Southwest Fisheries Center, the Far Seas Fisheries Research Laboratory, the California Department of Fish and Game, the Oregon Department of Fish and Wildlife (previously Fish Commission of Oregon), the Washington Department of Fisheries, and the Pacific Marine Fisheries Commission . . . .*
>
> *Richard S. Shomura, Director of the Honolulu Laboratory, welcomed the participants, reviewed the terms of reference for the workshop and set out the objectives, which were:*
>
> *a. To produce a rapid, preliminary assessment of the status of the albacore stock in terms of standard equilibrium yield and yield per recruit criteria,*
>
> *b. To identify weaknesses in the preliminary assessments, and*
>
> *c. To recommend a set of goals for the next phase of the cooperative research program.*

Chairman Wetherall produced an executive summary of workshop conclusions and plans (cf. Attachment G) which reviewed recent annual levels of harvest by Japanese and U.S. fisheries, considered maximum sustainable yield level, and laid plans for continued cooperation among the fishery agencies of California, Oregon, and Washington in collecting and processing fishery statistics as input to NMFS stock assessment functions. The workshop particularly commended the significant scientific contributions of the West Coast albacore industry through the American Fishermen's Research Foundation and emphasized the need for continued government-industry cooperation.

This first workshop provided a most salutary example of possible international cooperation at the scientist-to-scientist level, as implemented by informal agreements between the laboratories concerned. Laboratory leaders Richard S. Shomura of NMFS and Toshio Shiohama of the Far Seas Fisheries Research Laboratory, Shimizu, Japan facilitated these meetings and participated actively in the discussions. Jerry Wetherall was an effective chairman and prime contributor of U.S. scientific input. Tamio Otsu of the Honolulu Laboratory performed the arduous and indispensable task of continuous two-way language interpretation.

d. Coastwide Data System (CWDS)

From the inception of this subproject, the coastwide data system investigations considered procedures for improved coordination of data management for all fisheries. This broad approach has been necessary since most albacore fishermen also engage in other fisheries (e.g., troll salmon, pot fishery for Dungeness crab); therefore vessel and fisherman statistics also must consider these alternative fisheries in which they may engage.

With recognition that support under Sea Grant would terminate with conclusion of the three-year project period, PMFC determined that the coastwide data program should be placed under the supervision of an administrative entity having broad concerns for all relevant fisheries. An ideal entity existed in a body originally designated the PMFC Coordinating Council,[6/] a name subsequently changed to Pacific Fisheries Directors to avoid any possibility of confusion with the new Regional Councils established under the Fishery Conservation and Management Act of 1976.

At its November 1975 meeting in San Diego, California, the Pacific Fisheries Directors accepted oversight responsibility for the continuation of the coastwide data system project. The Directors instructed its Executive Secretary to advise fisheries agencies of the States' commitment to maintain momentum of that project and to achieve a compatible fisheries data file at the base level 2 as previously agreed. The Directors also reconstituted the CWDS Task Force as its designated planning and implementary agent for the coastwide data system.

Further details of development of this project are presented in Section III of the present report, p. 32).

---

[6]This change of name was formalized in June 1976. However, to avoid confusion, the body will be referred under its present name of Pacific Fisheries Directors throughout this report.

e. Future Planning for the Coordinated Pacific Coast Albacore Research Program

As the previous sections a-d indicate (p. 21-25), a major coordinating function during the final year of the project has been the assurance of continuation of that project into the future. From all evidence presently available, these efforts have been successful. PMFC's Albacore Committee is operating effectively as coordinating entity for the States' collection and manipulation of albacore statistics. The National Marine Fisheries Service is collating the data thus assembled, and has taken the initiative to develop a necessary liaison with Japanese scientists for melding U.S. and Japanese albacore data into a single North Pacific data base. NMFS also has established a research task at its Honolulu Laboratory on Pacific albacore population dynamics, and has taken steps to involve interested fisheries scientists from other agencies in this process. Finally, the coastwide data program is proceeding toward goals made considerably more cogent by recent enactment of the Fishery Conservation and Management Act of 1976, and the much increased demand for regionally compatible fishery statistics. Progress on that program will be coordinated in the future by the Pacific Fisheries Directors.

The review provided in this section has emphasized those portions of the total project which have been closely related to PMFC's coordinating responsibilities. In addition, major note should be taken of the independent progress of the joint American Fishermen's Research Foundation-National Marine Fisheries Service exploratory fishing, albacore tagging, and related researches. These cooperative studies began before the Sea Grant-sponsored program was launched, and will continue into the indefinite future. It was the concern of the albacore fishing industry, as expressed through the American Fishermen's Research Foundation, which generated both the ad hoc Albacore Coordinating Committee and the Sea Grant sponsorship for the program reviewed here.

An earlier section of the present report (p. 3) reviews the key role of the American Fishermen's Research Foundation in establishing the Sea Grant project. Attachment A summarizes a single year (1973) of joint NMFS-AFRF exploratory fishing and albacore tagging activities. Subsequent years have followed somewhat parallel patterns, modified as appropriate to meet changing needs. Each year's activity has been supported by approximatley $200,000 in industry-generated funding, derived from a self-imposed tax on U.S. landings of albacore. This program constitutes a salutary example of private enterprise commitment of

funds and other support for research activities of benefit to that industry and to the nation and its economy. It also demonstrates the effectiveness of that commitment in influencing activities of governmental agencies concerned with the same resources.

Annual reports on the joint NMFS-AFRF project are available as administrative reports from the National Marine Fisheries Service Southwest Center in La Jolla, California. Dr. R. Michael Laurs is responsible for NMFS input to this program and for preparation of these reports.

II. ALBACORE PORT SAMPLING AND UNIFORM LOGBOOK PROGRAM

Prior to 1972 and the beginning of Sea Grant support, albacore data collection in the States of California, Oregon and Washington was sharply limited by lack of funding. In California, one student assistant helped at the canneries on Terminal Island. Other ports in California were sampled by permanent project personnel on an intermittent basis. Oregon had a similar arrangement. Washington had no special data collection system for albacore.

Sea Grant funding (contract 04-3-158-35) provided major impetus and financial support toward achieving the goal of coordinated management-related studies for the development of necessary management and practices for the albacore fishery.

An intermediate objective of coordinating and expanding albacore port sampling, and the development and refinement of a uniform West Coast albacore logbook was established as basis for achieving that goal. The PMFC Albacore Committee (consisting of principal albacore scientists from each State) agreed to coordinate activities on a coastwide basis and to oversee operations within their respective States.

A. Port Sampling Activities and Uniform Data Processing

Sea Grant funding greatly extended the sampling capabilities of all three States. For example, in 1971 California sampled 0.15% of 36 million pounds of albacore. In 1972 this sample increased to 0.7% of 21 million pounds. In 1973 the sample level increased to 1.5%, but only 8 million pounds were landed. Available logbooks provided information on 34% of the weight of fish landed for all three years; this shows a high level of interest in the logbook program even during a poor season.

Over the same period, Oregon sampled 0.2% of 8.4 million pounds in 1971, 0.3% of 23 million pounds in 1972 and 0.4% of 16.3 million pounds in 1973. The logbook program in Oregon has improved catch data from 18% of total pounds in 1971 to 37% of total pounds in 1973. This represented an increase from 6% to 25% of total trips.

Washington joined the logbook program in 1973 and with the added waterfront personnel funded by Sea Grant they were able to sample the 1973 season on a level comparable to the well-established programs of Oregon and California.

During the post-1973 years over 300 logbooks were distributed and lengths were taken on an annual average of 10,000 fish in Washington. The number of samples from Oregon increased by threefold, from about 3,000 to about 9,000 fish. Because the fishery for albacore had shifted substantially northward in recent years, biological sampling of California landings did not increase significantly.

The PMFC Albacore Committee in consultation with Dr. Michael Laurs (National Marine Fisheries Service) developed uniform data processing procedures that facilitate coastwide collation of the catch and effort data from all three States. They agreed upon a common procedure for machine processing of albacore statistics, based upon ADP experiences and programs developed in California. This common data-processing procedure provides the necessary link to collect and transfer edited information from the separate States for centralized analysis and coastwide interpretations by the NMFS Southwest Fisheries Center in La Jolla. Data analysis procedures by NMFS-La Jolla then produce State-by-State summaries as well as those for the entire coast.

The achievement of an efficient common data processing procedure constitutes a major link in the chain of data improvements necessary to produce an adequate base of Pacific Coast albacore statistics for population dynamics studies. The second facilitating link is provided through continued improvement and extended use of the uniform coastwide albacore logbook.

B. The Uniform Pacific Coast Albacore Logbook

For more than two decades, albacore scientists have recognized that data collection and interpretation would be enhanced enormously by coastwide use of a single uniform logbook. Since fishermen range the entire coast and may land catch in any of the States, their logbook reporting would be made easier by this

uniform logbook than in the older system of different reporting procedures for each State. This facilitation should produce a greater willingness to cooperate in logbook reporting and accordingly a greater efficiency and accuracy. Scientists also hoped to devise a logbook in check-off style to reduce the subjectivity of responses and facilitate data accumulation and interpretation.

Three objectives were established for the logbook program:

1. to simplify fishermen's record keeping by consolidating the several logbooks used along the coast into one, and by improving the logbook's design for efficiency and ease of use;

2. to provide a common system of record keeping among the participating States so that the information obtained can be readily interpreted and made available as feedback to the fishermen and fishery agencies;

3. to obtain more complete information on the U.S. albacore fishery in order to ensure its continued success.

With Sea Grant funds supporting active participation by State albacore scientists, and under dedicated and effective leadership from Dr. Michael Laurs of NMFS Southwest Fisheries Center, a first-draft logbook was developed, revised according to fisherman recommendations, and a final format translated into copy for publication by technicians of NMFS Southwest Fisheries Center in early 1973. The logbook is composed of two functional sections. The first section is a questionnaire which requests information on fishing operations in order to evaluate efficiency changes in the fleet; the second and major section accumulates daily catch records in a calendar format. Approximately 1000 copies have been published annually with costs shared by Sea Grant funding and by NMFS.

Logbook distribution to fishermen was aided materially by the American Fishermen's Research Foundation, which mailed 650 copies to members of the Western Fishboat Owners Association. F. Robert Insinger, President, AFRF, and General Manager of W.F.O.A. wrote a covering letter endorsing the program and urging fisherman cooperation. The fisheries agencies of the States of California, Oregon, and Washington directly distributed 350 copies to non-W.F.O.A. members. Also, information sheets were inserted in the logbooks providing the fishermen with summaries and interpretations

of data made possible by their cooperation in the project. These sheets include information on the size composition of the previous year's catch based on jig boat data and log charts showing catch per unit of effort (CPUE) by 1 degree squares.[7/]

As a result of Sea Grant support, the amount of logbook data on catch and effort has been increased substantially. The average amount of logbook data obtained from 1961 through 1970 is compared with the amount of logbook information obtained during years of Sea Grant support in Table 1.

Table 1. Number of boats that kept logbooks or were interviewed, number of boat-days for which catch and effort data were recorded, and mean number of days boats kept logbooks or interview data are available.[1/]

Year	Number of boats	Percent increase	Number of boat-days	Percent increase	Mean number of days log kept	Percent increase
1962-70	418*		6,025*		14.4*	
1973	470	12	7,260	20	15.5	8
1974	520	11	10,333	42	19.9	28
1975			(not available)			

[1]Adapted from original table. Laurs et al, 1975.

*Mean value for 1961-1970.

C. Accomplishments and Future Plans

1. Accomplishments

The primary accomplishment achieved under Sea Grant funding was the completion and implementation of the uniform West Coast albacore logbook and data system. The Sea Grant project provided funds which enabled Washington to become part of the system and resources for additional field personnel in California and Oregon to augment their ongoing programs. Also of significant importance, the Sea Grant project provided a forum for the three States, Federal agencies, and industry to work together toward coordinated management of the albacore fishery. It is noteworthy that this Sea Grant project provided the foundation

[7]Laurs, R. M., C. Hooker, L. Hreha, and R. Lincoln, 1975, "A Uniform U.S. West Coast Logbook for Albacore, *Thunnus alalunga* (Bonnaterre), and Coastwide Albacore Fishery Data System", Marine Fisheries Review, vol. 37, no. 11, p. 14-21.

and incentive for the Washington Department of Fisheries to create a new management position for oversight of albacore fishery activities. Similarly, the expansion of port sampling activities provided employment opportunities and experience for many fisheries graduate student samplers.

Implementation of the uniform albacore logbook and expansion of port sampling activities has led to an increased data base which has significantly improved the present state of knowledge concerning albacore. The increase in length frequency data on albacore landed in the Pacific Northwest has provided supporting information in studies conducted by the NMFS to show that albacore which comprise the fisheries off the Pacific Northwest and California are independent groups of fish.

Data derived from the uniform U.S. West Coast albacore logbook will make possible two new publications under joint authorship of Federal and State albacore scientists: a paper concerning catch-per-unit effort by U.S. jig vessels for the years 1971-1973, and a report on characteristics of U.S. albacore fishing vessels. The first publication will update a previous catch-per-unit effort paper covering the years 1961-1970.[8/] The second report will utilize fishing operations data to help explain changes in fleet efficiency and facilitate standardization of effort from year to year.

Changes in vessel efficiency can be very important in studies relating to the population dynamics of the North Pacific stock of albacore. The increased catch and effort data base, with improved procedures for collecting and compiling data, contributes significantly to the timely assessment of the North Pacific stock of albacore which was initiated recently as a result of cooperation between the NMFS and the Japanese Far Seas Fisheries Research Laboratory. Studies are currently underway by the NMFS and the PMFC member States to assess the level of sampling necessary to complement the ongoing research on population dynamics of the North Pacific albacore.

---

[8]Laurs, R. M., H. B. Clemens, and L. Hreha, 1976, "Nominal catch-per-unit effort of albacore, *Thunnus alalunga* (Bonnaterre), caught by U.S. jig vessels during 1961-1970", Marine Fisheries Review, vol. 38, no. 5, p. 1-32.

2. Future Plans

Under Sea Grant support the uniform albacore logbook and port sampling program was tested, effectively implemented, and expanded on the West Coast. Termination of Sea Grant support required that another source of funding be solicited to maintain the logbook and port sampling program. NMFS support, approximating that provided for this program under Sea Grant funding, was requested for the 1976 season (April 1, 1976 - March 31, 1977).

The States of California, Oregon, and Washington, with coordinational support from the Pacific Marine Fisheries Commission, proposed continued cooperation with the National Marine Fisheries Service in dissemination of the Uniform U.S. West Coast Logbook for albacore to Pacific Coast fishermen, in collection, verification, and data processing of completed logs from those logbooks, and in the collection of biological data from selected samples of albacore landings along the Pacific Coast. Albacore scientists hope to maintain sampling effort at levels approximating those achieved in 1974 and 1975, and to improve the geographic distribution of that effort. Additionally they will intensify their program of fisherman interviews in support of the uniform coastwide logbook system in order to maximize the effectiveness of data retrieval from those logbooks. NMFS approved and funded the proposal in May 1976 (for details cf. Section G.3.b., p. 22).

III. COASTWIDE VESSEL, FISHERMEN, AND LANDINGS DATA SYSTEM

A. Outline of the Problem

Existing State statistical systems generally are adequate for internal State needs, but are not presently capable of providing compatible input to a coastwide data system. This inability to merge State data into a coastwide framework is the product of a combination of factors, principally: 1) differences in the individual State data requirements, 2) differences in the individual State data collecting and processing priorities, and 3) institutional constraints, i.e., laws requiring data confidentiality. Difficulties in developing coastwide analyses from conbinations of State data were clearly demonstrated when the albacore study group found it impossible to determine accurately the number of albacore boats operating

on the West Coast. Since many albacore vessels operate on a coastwide basis and are separately registered and identified by each State, the cumulated data derived from the States produced a figure significantly in excess of the actual total number of albacore vessels.

Clearly a coastwide approach is required for management of such wide-ranging species as albacore, which enter the U.S. fishery far off the coast of southern California and are harvested from that point northward to British Columbia. A coastwide data system also is required to monitor many more localized fisheries in which fishermen from various States participate for only part of their working year. Neither fish nor fishermen are confined by political boundaries which presently circumscribe the scope of individual State fisheries statistical systems.

A major foundation step toward this coastwide data system was achieved with publication of a uniform U.S. West Coast Albacore Logbook, and development of a uniform system for collecting and processing the data generated by that logbook (cf. Section II for details). The new logbook system and related data management programs provide the catch data required for albacore management purposes, and also a useful basis for estimating total effort in relation to that catch.

However, three significant barriers still inhibited coastwide analysis of effort data to produce estimates which fully consider variations in fishing power, or to provide a quantitative understanding of the economics of the fishery. First, many fishing vessels and their crews harvest fish along the entire coastline, and may land their catch in several coastal States during the course of a season. Second, laws protecting the confidentiality of individual catch data prevent exchanges among the States of the specific records of catches by vessel. Third, fishermen themselves carefully guard their independence as entrepreneurs, and in many cases seek to maintain secrecy as to gear type used, locations fished, and other practical matters of actual operation.

These major problems interact to induce significant anomalies into effort calculations and fisheries economics studies, particularly with respect to fishing operations of those more productive vessels--the high-liners--which are capable of efficient operation along the entire Pacific Coast. For example, a given ship may land its catch in three coastal States during the season; however, the normal summing of the statistics from those States, with no mechanism available to detect this triplication, will credit that total catch to three vessels.

This type of anomaly becomes particularly serious with respect to fisheries economics studies, since in its home port State such a vessel may distribute its effort among several fisheries (e.g., albacore, crab, salmon) dependent upon price and market conditions, relative availability of target species, and other seasonal variants. In another State, the same vessel may concentrate on a single species. Quite clearly separate economics studies in these several States would analyze that vessel quite differently, and neither would present a view consistent with reality.

B. Actions Taken to Achieve a Coastwide Fisheries Data System

At its annual meeting in March 1973, the Sea Grant Albacore Coordinating Committee accepted the recommendation of its Economics Panel that these problems be accorded high priority in planning for researches for FY 1973-74. Accordingly, Sea Grant funds were requested (and subsequently awarded) to support the necessary studies to devise a coastwide data reference system which will permit the sorting out of fish catch, value, and effort by vessel, yet at the same time be compatible with existing principles and regulations governing the confidentiality of individual catch and economic data.

General objectives set for this proposed study were:

1. comparative review of Pacific States' vessel coding system with special attention to difficulties in combining data on a coastwide basis;

2. comparative review of the States' confidentiality regulations;

3. analysis of alternative number systems which might be used to create a unique coastwide vessel coding system to resolve the above problems;

4. develop a plan for a coastwide system based on above analyses;

5. provide staff assistance to PMFC and its member States to secure necessary approvals for implementation of a coastwide system; and

6. assist in implementation of the system approved.

C. Project Operation, Organization and Scope

1. Operation

The entire process of data collection, compilation, and dissemination is one of great sensitivity, as demonstrated by the special State regulations regarding confidentiality of data. The success of the project depended wholly on cooperation and commitment by the States to make necessary modifications of their statistical systems in order to establish the capability for a coastwide data system. For these reasons, the following operational liaisons were carefully developed and maintained:

a. with data management experts, managing scientists, and administrators to assure compatibility with existing systems, feasibility within budget limitations, and appropriateness in view of agency research and management goals;

b. with State and Federal authorities with respect to confidentiality restrictions;

c. with representatives of the fishing industry;

d. with an advisory panel from the Sea Grant Albacore Coordinating Committee to assure proper interdisciplinary guidance of the overall effort.

2. Organization

To guide the actual progress of this project, a Data System Task Group was named, representative of concerned State and Federal agencies, and drawn primarily from the membership of the Sea Grant Albacore Coordinating Committee. Clemens Bribitzer, Regional Economist, NMFS Southwest Region, was named Convenor, and subsequently selected as Chairman of that Group.

Following funding of this project by Sea Grant, Mr. Robert J. Williams was employed as project investigator, to work out of the Portland office of the Pacific Marine Fisheries Commission under the general supervision of John P. Harville, Principal Investigator for the Sea Grant Albacore Project, but with technical direction to come from Mr. Bribitzer and his Data System Group. Lines of responsibility and accountability are as indicated in the diagram on the following page:

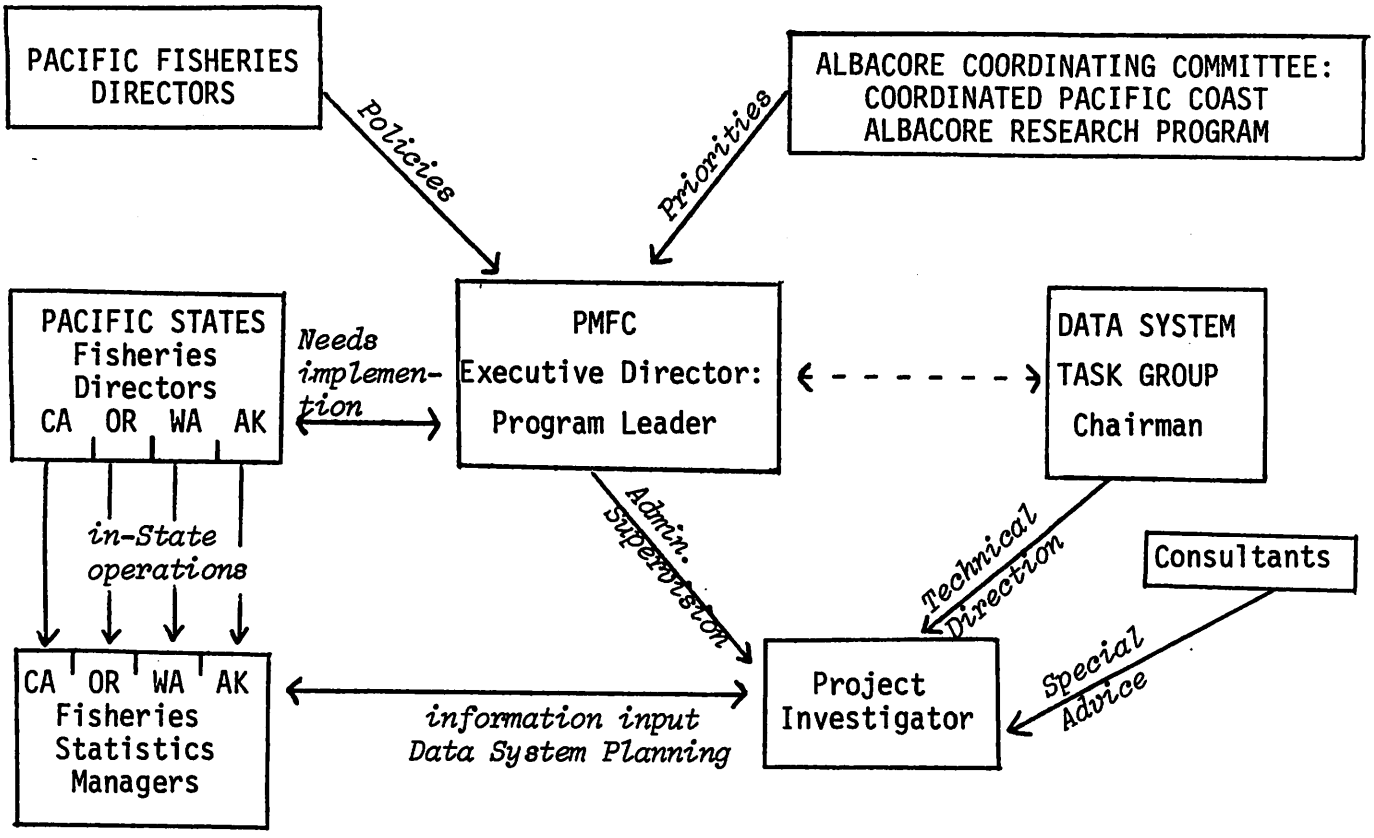

Table of Organization and Accountability: Coastwide Vessel, Fishermen, and Landings Data System Project.

3. Scope

Initially the project goal was to design a plan for establishing a coordinated albacore fishery data system for the States of California, Oregon and Washington, but which would be sufficiently flexible to include Alaska as needs warrant. Soon after the project began, it was agreed that the project should be expanded to include all commercial species since albacore fishermen also fish for other species. Subsequently, the project reference was expanded to include statistics from important recreational and subsistence fisheries. Thus, Idaho was formally included in data development activities.

D. Accomplishments Made Possible by Sea Grant and NMFS Support

Sea Grant support for the coastwide data system project commenced in September 1973, and with careful management of funds, extended through March 1976. Since it was not possible during Sea Grant support of this project to complete the extensive consultations necessary to secure coastwide agreement to implement a coastwide data file, a proposal seeking six months additional funding was submitted to the National Marine Fisheries Service. NMFS approved the proposal and granted funding (Contract No. 03-6-208-35315) which enabled project support through December 1976.

In total, approximately 3½ years of Sea Grant and NMFS funding supported this successful cooperative effort between the PMFC States, NMFS and industry. Significant achievements during this period of support are reviewed in the following sections. The value of this effort is measured not only by these major accomplishments, but by intangible by-products as well. These include the development of interest, improved communication and a commitment within the NMFS, the State fisheries agencies, and the fishing industry toward a common goal of developing timely, accurate data necessary for effective fisheries management. This achievement is particularly significant in view of the expanding needs for these data by the Regional Fishery Management Councils established pursuant to the Fishery Conservation and Management Act of 1976.

1. September 1973: Establishment of Sea Grant Data System Task Force

The Sea Grant Data System Task Force was drawn from the Sea Grant Albacore Coordinating Committee and was comprised of State and Federal fisheries biologists, economists, and representatives of the fishing industry, to provide technical guidance and evaluation of reports and recommendations for the coastwide data system project. Mr. Robert J. Williams was hired as full-time Project Investigator, reporting to the Task Force for technical guidance.

2. Fall 1973: Evaluation of State Fisheries Agencies Statistical Capabilities

Through on-site visits and extensive correspondence, and with the direct participation of key personnel from the coastal States, the Project Investigator developed narrative descriptions comparing the States' statistical operations, procedures, capabilities, and priorities for data retrieval. This preliminary evaluation revealed that the States' statistical operations and procedures were basically compatible, but that the systems

capabilities and priorities for data retrieval varied significantly by State. It also was evident that the vessel identification number would provide adequate reference for cumulating coastwide statistics and monitoring interstate vessel activities.

3. April 1974: Endorsement in Principle of CWDS Project Objectives and Approach by the State/Federal Fisheries Management Program for Dungeness Crab Policy Committee

An important endorsement of the objectives and approach of the Coastwide Data System project (originally the Coastwide Vessel, Fishermen, and Landings Data System project) was secured in early April 1974 from the State/Federal Fisheries Management Program for Dungeness Crab Policy Committee. That Policy Committee is comprised of the Pacific States fisheries agency directors and the Pacific coast National Marine Fisheries Service Regional Directors. Since the proposed coastwide data system was considered to be equally useful for management of the Dungeness crab fishery the Policy Committee unanimously voted support for the concept of a common data base and encouragement for continuation of the project. This endorsement provided necessary impetus and credibility for the CWDS project and reflected the considerable interest of the Pacific coast fisheries management leaders.

4. January 1974 - November 1975: Determination of Commercial Fisheries Management Data Requirements with Priorities for Inclusion in a Coastwide Data System

The Project Investigator canvassed State and Federal fisheries biologists and economists to determine priorities for collection of specific data elements necessary for biological and economic analyses to be included in a CWDS. Responses were collated into an extensive list of prioritized data elements and arrayed by suggested source document. Most of the first priority statistics were available already through the State data systems, but some of the more detailed data (e.g., gear number and size, area of catch, etc.) were not recorded on a coastwide basis. Many fisheries specialists suggested specific logbook programs (e.g., the Uniform West Coast Albacore Logbook) as most effective for obtaining detailed effort statistics, especially where daily statistics are desired instead of trip information.

Because there was concern as to the large number of the recommended first priority data elements, and particularly since the collection of some data elements would require substantial modification of State data collection procedures and system formats, the Pacific Fisheries Directors[9] requested the Project Investigator to reevaluate the statistical priorities for inclusion in a CWDS by major fishery (i.e., albacore, groundfish, shellfish, and salmon). The Project Investigator conducted several follow-up surveys of State and Federal fisheries management specialists with a final review by the PMFC Albacore, Groundfish, Shellfish, and Salmon-Steelhead Standing Committees. As a result, the total number of first priority data elements was reduced considerably to include only those having coastwide management values. Supplemental lists of data elements which either were not presently machine retrievable or not regarded as truly essential for present management needs were retained for future reference. (cf. Attachment H for list of data elements originally considered and evaluated for inclusion in a coastwide data system; cf. Attachment I (p. 4 and 5) for list of data elements ultimately recommended for inclusion in the Base level 2 data file, i.e., regarded as essential for coastwide management purposes. See also section D-12, p. 45 and Attachment K for follow-up action including expansion of the Base level 2 data file, and for Base level 2 data formats and documentation.)

5. June 1974: Modification of California Fish and Game Code Confidentiality Statute

At the urging of key California Fish and Game personnel closely associated with both the State/Federal Fisheries Management Program for Dungeness crab and the Coastwide Data System project, Assemblyman McLennan introduced Assembly Bill 3824 to amend Section 8022 of the Fish and Game Code relating to confidentiality of commercial fishing records. In June 1974 the California Legislature amended Section 8022 to permit the Director of Fish and Game to use and disseminate commercial landing receipts and certificates for commercial boat registration filed with the Department as necessary for development of interstate management plans for Dungeness crab. The amended Section 8022 was interpreted to exempt Dungeness crab and associated vessel landing statistics (i.e., all landings made by Dungeness crab vessels) from the California confidentiality requirement.

---

[9] The Pacific Fisheries Directors (previously called the PMFC Coordinating Council) *constitutes* a pro tem planning and coordinating entity for oversight of State/Federal Fisheries Management Program functions in all multi-state fisheries not subject to Pacific Fishery Management Council jurisdiction. The Pacific Fisheries Directors include the responsible officers for all agencies having relevant jurisdiction; i.e., the Directors of the Pacific States fisheries agencies, and NMFS Regional Directors.

6. July 1974 - March 1975: Development of Alternatives for Implementation of a Coastwide Data System

The alternatives for implementation of a coastwide data system proposed levels of modifications and costs required of the States to provide computer manageable data as input to a CWDS and were evaluated by benefit and cost. The alternatives are summarized briefly as follows:

a. Base level 1 plan proposes a coastwide data system containing all data currently collected and keypunched by the participating State fisheries agencies.

b. Base level 2 plan calls for an additional minimum uniform data base. Data identified as first priority need by fisheries management specialists and which presently are collected by at least two States, would become required data for the other States.

c. Intermediate level plan suggests supplementing Base level 2 statistics with coastwide recreational, logbook, sample, and research data which presently are machine retrievable on a coastwide basis.

d. Optimal level plan provides for the inclusion of all data identified as first priority need by fisheries management specialists.

e. Ideal level plan incorporates data valued as priorities two and three as well as desired logbook and other sample data.

7. December 1974 - March 1975: Initiation and Completion of Subcontract for Computer Consultant Services to Investigate Mechanisms for Accumulating State Statistical Outputs into a Coordinated Coastwide Data System

Approximately 30 computer consulting firms were invited to bid for a CWDS subcontract to examine the technical and economic feasibility of establishing a coastwide fisheries data system. In December 1974 the PMFC entered into a subcontract with I.P. Sharp Associates, Inc. to determine the feasibility of a CWDS, to develop a simulation of the proposed CWDS, to conduct a comparative analysis of alternative data base structures for the CWDS, and to estimate costs for establishing and maintaining mechanisms for coastwide integration of State fisheries statistics. In May 1975 the subcontract was completed and approved by the PMFC. A detailed report, The Coastwide Data System Subcontract, summarized the contract accomplishments and was circulated widely among PMFC constituents. Copies of this report are available in the PMFC archives.

8. June - September 1975: Initiation and Completion of Computer Consultant Subcontract for Coastwide Accumulation and Analysis of 1972-74 Dungeness Crab Data

In April 1975 the Dungeness Crab Subcouncil (originally the SFFMP for Dungeness Crab Policy Committee) agreed to reprogram a portion of unobligated SFFMP Dungeness crab funds to incorporate 1972-74 Dungeness crab data into the coastwide data system because of its potential usefulness both to the Dungeness crab project and as first component of the proposed coastwide data base. In June 1975 the PMFC contracted with SeaScan International, Inc. to use real data for further testing of the computer programs developed under the first subcontract. The purpose of this contract was to produce useable output for studies of fleet mobility, interfishery mobility, and vessel efficiency and fishing power. The successful completion of the subcontract illustrated two important concerns for a CWDS: 1) the proposed CWDS is feasible and applicable from a practical standpoint, and 2) the primary deterrent to achievement of a CWDS was the lack of coastwide data compatibility and inadequate documentation for existing State statistical files. A detailed report, The Coastwide Data System Subcontract II, summarized results of that contract and was circulated widely among PMFC constituents. Copies of this report are available in the PMFC archives.

9. June 1975 - March 1976: Determination of Recreational Fisheries Management Data Requirements with Priorities for Inclusion in a Coastwide Data System

At its June 3, 1975 meeting, the Pacific Fisheries Directors requested that the CWDS project also consider recreational fisheries statistics in addition to commercial fisheries statistics. It was reasoned that to manage certain fisheries effectively (e.g., salmon) it would be necessary to include recreational statistics in order to account for all uses of the stocks.

Accordingly, the Project Investigator conducted a postal survey of recreational fisheries scientists to determine what recreational fisheries statistics were being collected and keypunched, and what priorities these data elements have for inclusion in a coastwide data system. Using the Base level 2 definition as criterion for determining what recreational statistics should be included in a CWDS, only selected salmon and steelhead data qualified.

As follow-up to the postal survey, the Project Investigator summarized the State recreational statistics collection and data management procedures for review by the contributing management specialists. That review revealed some significant differences in the type and scope of data collected. Variances in data collection methods and data interpretation also were detected. The PMFC Salmon-Steelhead Committee, a group consisting of lead salmon and steelhead fishery scientists from each State, considered the differences among the States and determined that they are not substantive. With advice from the PMFC Salmon-Steelhead Committee, the CWDS Task Force examined the recommended modifications to achieve Base level 2 data compatibility (cf. sec. D-11, for follow-up action).

10. November 1975: Agreement by States to Establish Coastwide Data Compatibility as Defined by the Base Level 2 Plan

At the 1975 PMFC Annual Meeting in San Diego, the Pacific Fisheries Directors reviewed coastwide data system project activities and considered a recommendation to implement the coastwide data system at the Base level 2. The Base level 2 plan proposes a minimum data base of compatible statistics judged by fisheries management specialists to have coastwide management values (cf. Attachment I). After considerable discussion, the five State directors agreed unanimously to devote sufficient time and resources to investigate further and modify as necessary State data collection and management procedures to achieve coastwide data compatibility as defined by the Base level 2 plan.

To facilitate communication and coordination the Directors designated the CWDS Task Force as its planning and implementing agent for data development activities. The Directors instructed the Task Force to concentrate its efforts toward achieving coastwide data compatibility and to investigate further alternatives for regional pooling of those data on a timely and accurate basis.

11. January-June 1976: CWDS Task Force Review and Evaluation Pertaining to Base Level 2 Data Compatibility; Alternatives for Regional Pooling of Base Level 2 Data; and Model Legislation to Permit Interstate Exchange of Fisheries Statistics.

In accordance with actions taken in November 1975 by the Pacific Fisheries Directors, Chairman Charles Woelke (Washington Department of Fisheries) convened the CWDS Task Force in January 1976 to plan activities for the project. Three subgroups derived from the Task Force membership were assigned to specific work activities: data compatibility studies, identification and evaluation of system support alternatives, and development of model legislation to permit interstate exchange of data.

- Data compatibility subgroup

  The data compatibility subgroup was charged with examining State data collection procedures to determine what action must be taken to achieve Base level 2 data compatibility. Under the able leadership of Lou Fredd, Oregon Department of Fish and Wildlife, the subgroup comprehensively reviewed each State's data collection methods, data files, and data processing capabilities. Through several meetings and extensive correspondence the subgroup identified areas of data incompatibility and developed recommendations to establish compatibility.

- Systems evaluation subgroup

  The systems evaluation subgroup was asked to identify and analyze alternative system configurations for establishing a suitable coastwide support system to store and process Base level 2 statistics. In order to evaluate alternatives seven criteria were identified as requirements which must be met to establish an effective CWDS. Several alternatives were identified and preliminarily evaluated according to ability to satisfy the criteria. The Central/State alternative was selected as most suitable and was recommended for further study. The Central/State alternative calls for interstate agreement to provide duplicate detailed data records (with complete documentation) to a centralized hardware/software system for coastwide compilation and analysis.

- Model legislation subgroup

  A two man team was assigned to develop model legislation which would permit data exchange for coastwide compilation which is necessary for interstate or regional management. After a thorough review of existing State and Federal statutes, and with particular concern to preserve the legitimate data security obligation to fishermen, the subgroup drafted model legislation (cf. Attachment J). The proposed legislation suggests that it be the agency directors' perogative to release data for the purpose of fisheries management.

In April 1976, the Pacific Fisheries Directors met to review progress and provide further instructions to the Task Force. In response to a Task Force recommendation, the Directors agreed to promote the essence of the draft model legislation for data confidentiality in States where legislative action is necessary to permit exchange of fisheries data. The Pacific Fisheries Directors met again in June to act on additional Task Force recommendations. At that meeting a particularly useful

distinction was made between data files and data systems which is reflected in the Directors' instructions to the Task Force. It was noted that a data file is an ordered amalgamation of compatible data while a system includes capabilities for retrieval and analysis of data. It was stressed that a coastwide data file must be developed before a data system.

The Pacific Fisheries Directors provided the following instructions to the Task Force:

a. Development of a coastwide Base level 2 data file is top priority.

   1) Base level 2 data should be expanded to include commercial fishing effort, sport fish catch and effort, subsistence catch, and vessel horsepower statistics.

   2) Base level 2 data compatibility must be established.

   3) Common magnetic tape format should be developed for submitting and storing Base level 2 data.

   4) At least three years of historical data should be included in the coastwide data file.

   5) Nothing in the planning for a CWDS should preclude the incorporation of accessible data deemed useful for management purposes.

b. Identify and evaluate systems alternatives for establishing a CWDS.

   1) The Central/State system should be examined in detail but is a secondary responsibility to development of the Base level 2 data file.

   2) An incremental approach is desirable for development of a Base level 2 CWDS.

c. CWDS project activities should be coordinated closely with the NMFS, PMFC Salmon-Steelhead Committee, and other West Coast data development plans to minimize duplication of effort.

d. The CWDS Task Force should include representation from Environment Canada to facilitate exchange of information.

In accordance with the Directors' instructions, the Project Investigator contacted Environment Canada's Pacific Biological Station in Nanaimo, B.C. to invite an observer to attend CWDS Task Force meetings. Dr. W. E. Johnson, Director of the Pacific Biological Station, assigned a representative to the Task Force. The Project Investigator also requested a review of data development plans and activities from the NMFS regions, PMFC Salmon-Steelhead Committee, and other data development groups. As a result of that review, it was determined that no significant duplication exists between the various programs. It was recommended that all programs continue to be pursued, and that communication and coordination be maintained between the programs (cf. sections D-12, and E, p. 47 for Task Force follow-up to the other instructions given by the Directors).

12. <u>October - November 1976: Development of Uniform Formats and Documentation for Storage of Base Level 2 Data, and Decision to Defer Further Evaluation of the Central/State System Support Alternative</u>

In October the data compatibility subgroup met in Portland, Oregon to develop formats and documentation for the Base level 2 data file. It was agreed that the Base level 2 data file would be comprised of four data sets: 1) vessel data, 2) commercial landings data, 3) recreational catch statistics, and 4) ceremonial/subsistence catch information. Formats with documentation were prepared for each of the four data subsets (cf. Attachment K for Base level 2 data formats and recommended documentation).

In November 1976, Chairman Woelke convened the CWDS Task Force to provide final review for the data compatibility studies, to examine the status of the Central/State system support evaluation, and to develop recommendations and future Task Force plans for review by the Pacific Fisheries Directors. The following actions were taken:

a. It was agreed that Base level 2 data compatibility had been established.

b. Final refinements were made on the Base level 2 data subset formats.

c. Internal documentation for each data subset were defined.

d. Further evaluation of the Central/State system alternative was delayed *until* clearer definition of need is determined, particularly with reference to the newly created Pacific and North Pacific Fishery Management Councils.

In addition to the preceeding Task Force decisions, the following recommendations were made for submission to the Pacific Fisheries Directors:

a. The States should proceed in the most effective manner possible to produce data files in the compatible formats developed for vessels, commercial landings, recreational catches, and ceremonial/subsistence catches at the earliest possible date.

b. A strong coastwide Data Task Force with appropriate staff support should be continued in some form for the following two specific purposes:

1) To assure implementation of Base level 2 at the State level by,

- pushing for trial data runs in the immediate future;
- coordinating resolution of problems that arise during trial runs;
- pursuing the goal of getting 1973 and subsequent years data externally available in Base level 2 formats on tapes or discs;
- ensuring adequate documentation of data files; and
- providing a single forum where users, data processors, and those operating data collection systems can meet to resolve coastwide data issues or problems of mutual concern.

2) To be available to make appropriate recommendations and/or judgments with respect to future utilization of coastwide data files commensurate with the needs of users or potential users of the coastwide data file.

13. <u>December 1976: Pacific Fishery Management Council Action Supporting Development of Base Level 2 Data File</u>

At the December meeting of the Pacific Fishery Management Council, the Scientific and Statistical Committee, a blue ribbon advisory committee to the Council, developed the following recommendation for Council action:

> *With respect to the coastwide domestic data exchange, both Councils (Pacific and North Pacific Fishery Management Councils) should support the following recommendations . . . to ensure free exchange of compatible vessel and catch information.*

Namely:

1. *In those States, where needed, the enactment of recommended confidentiality legislation should be pursued to permit coastwide exchange of Base level 2 data.*

2. *All coastal States should have catch, vessel, recreation and subsistence data files available in the recommended Coastwide Data Task Force format as soon as possible*

E. Future Plans

The long-range objective of this project effort is to develop a comprehensive fishery data system for the Pacific Coast. Recognizing that development of such a system will entail an incremental approach to meet and solve unknown problems, a preliminary proposal for one year's support was submitted to NMFS in January 1977. The specific objective of this proposal is to assemble the existing backlog (1973-76) of fisheries statistics into the agreed upon Base level 2 formats and to provide the necessary resources and coordination to enable the States to produce current and future statistics in compatible formats (cf. sec. D.12, p. 45 for discussion of coordinational needs).

Because there are many competing needs for limited NMFS financial support, the PMFC Executive Director also initiated a preliminary investigation regarding the availability of Commercial Fisheries Research and Development Act (P.L. 88-309) funds for continued support of coastwide data file development activities. It is reasoned that the development of readily accessible coastwide compatible data will benefit fisheries management on a regional as well as national basis. This is precisely the kind of purpose for which the Commercial Fisheries Research and Development Act of 1964 was originally conceived and funded by the Congress.

IV. INDUSTRY-ORIENTED ALBACORE FORECASTING SYSTEM

As component of the original 1972 proposal for Sea Grant funding, the consulting firm of Living Marine Resources, Inc. proposed a study of the feasibility of developing an albacore forecasting system "broadly based on prediction of industry trends in fishing activity and effort, individual year class strength, the sum effect of each of the fisheries in the North Pacific, and the interrelationships among catch, effort, and catch per effort among the fisheries . . ." This proposal was endorsed by the Albacore Coordinating Committee both for its potential contribution as a predictive instrument, and for its generation of much-needed basic data on fisheries and fishing effort of the eastern and western North Pacific.

The research project undertaken by Living Marine Resources, Inc. under Sea Grant funding of the Coordinated Albacore Research Program, is complete and a draft report was prepared and submitted to the Pacific Marine Fisheries Commission in fulfillment of contract requirements.

LMR President Gordon C. Broadhead provided the following summary of findings and achievements accomplished during the Sea Grant supported research project. The LMR study:

- Updated a 22-year series of data on total catch of albacore from the North Pacific, by fishery. This involved adjustment in the longline catch for 1958 and 1959 and estimation of the yearly catch from that fishery, 1960-1972.

- Surveyed the United States and Canadian fisheries and compiled a baseline list of vessels, by size and gear type, participating in the 1971 and 1972 seasons.

- Documented a more than 50 percent increase in average United States albacore vessel efficiency during the past 20 years, and 50 percent increase in Japanese pole-and-line fishing effort during the 20-year period (most of the increase has been during the past four years), and noted the general decline in fishing effort and albacore catch by the Japanese longline fleet fishing the North Pacific during the period.

- Noted that total production of albacore from the North Pacific stock has ranged from a low of 42,000 metric tons in 1951 to a high of 102,000 metric tons in 1972. The average catch during the past several years has increased by 50 percent over that of earlier years.

- Noted the economic climate has been very favorable for albacore fishing in recent years which has been largely responsible for the increase in fishing effort and that product value has increased an average of 15 percent per year in the past nine years.

- Found that eastern Pacific catches deviated a maximum of about 25 percent from the 20-year trend. Japanese pole-and-line catches have had a maximum yearly deviation of 60-70 percent from the trend. Longline catches have deviated a maximum of 50 percent.

- Produced graphs to illustrate that very early season landings (to July 31) in the eastern Pacific could be used to forecast accurately the total season's landings. Maximum error in the forecasts were 4,300 tons (19 percent) while average error was 2,400 tons (eleven percent).

- Documented that Yaizu pole-and-line landings of albacore could be utilized to estimate total Japanese pole-and-line landings for the year. Results were substantially less reliable than forecasts for the eastern Pacific fishery.

- Updated earlier work that shows there has been a fourfold spread between maximum and minimum production from the various year-classes of albacore and that there was a noted periodicity in the good and poor year groups with about a four-year interim between successive maxima.

- Found that there was a significant correlation (but not highly so) between year class strength and sea surface temperatures in western Pacific during the albacore spawning period. Cold water years tend to produce poor survival and subsequent low commercial production.

LIST OF ATTACHMENTS

A. Report of Joint NMFS-AFRF Albacore Studies Conducted During 1973.

B. PMFC Goal and Objectives.

C. Roster of Attendees, March 6-7, 1973 Meeting.

D. Request for Proposal: Costs and Earnings of U.S. West Coast Albacore Vessels, dated 4/12/73.

E. Correspondence relating to 1974 Resolution of the Albacore Advisory Committee concerning need for augmented studies of albacore population dynamics.

F. Status of the 1975 Pacific Coast Albacore Fishery.

G. Workshop on the Population Dynamics of North Pacific Albacore, Executive's Summary Report, May 1976.

H. Data Requirements for a Coastwide Vessel, Fishermen and Landings Data System.

I. Memorandum from John P. Harville to the PMFC Coordinating Council recommending implementation of a coastwide data system, 10/13/75.

J. Draft Model Legislation relating to confidentiality of data statutes.

K. Base Level 2 Data Formats and Recommended Documentation.

REPORT OF JOINT NATIONAL MARINE FISHERIES SERVICE - AMERICAN FISHERMEN'S RESEARCH FOUNDATION ALBACORE STUDIES CONDUCTED DURING 1973 **

INTRODUCTION

The National Marine Fisheries Service La Jolla Laboratory and the American Fishermen's Research Foundation have cooperated on albacore research studies during the 1971, 1972, and 1973 albacore seasons. The study in 1971 was conducted to obtain background information which may be useful to extend the albacore fishing season beyond the normal end of the season by staying on the fish longer at the close of the traditional season. The cooperative studies conducted during the 1972 and 1973 seasons were more extensive than those in 1971 and were designed to obtain information to expand the fishery early in the season by developing techniques to get on the fish earlier and follow them from well out at sea in to the coast, and to obtain information on large-scale and small-scale migratory patterns of albacore tuna and the marine environmental factors that may affect them.

The joint NMFS-AFRF studies are considered highly successful by many members of the albacore fishing industry and fishery scientists. The cooperative efforts have been mutually beneficial to the albacore fishing industry and fishery scientists. Results of the studies indicate that commercial quantities of albacore can be found far offshore and earlier than the usual fishing season. Also, much has been learned about the migratory patterns of albacore into and within the geographic area of the U.S. fishery. In addition, our understanding has been improved of the underlying factors affecting the prediction of the onset and subsequent seasonal development of the fishery.

A great deal of the success of the joint NMFS-AFRF albacore studies has resulted from the outstanding cooperating received from albacore fishermen working with fishery scientists and the fishermen are acknowledged for their contributions.

EXAMINATION OF OFFSHORE DISTRIBUTION AND AVAILABILITY OF ALBACORE AND THE MIGRATION ROUTES FOLLOWED BY ALBACORE INTO NORTH AMERICAN WATERS

The National Marine Fisheries Service (NMFS), Southwest Fisheries Center (SWFC), La Jolla Laboratory and the American Fishermen's Research Foundation (AFRF) cooperated in an early-season albacore research survey in May, June, and July 1973, similar to the one conducted during the same period in 1972. The purposes of these surveys were

---

** prepared by Dr. F. Michael Laurs, Project Leader, Southwest Fisheries Center, NMFS, for presentation to the Albacore Coordinating Committee 4/29/74.

to study the shoreward migration of albacore tuna into the North American west coast fishery and the associated marine environmental factors that could influence the migration, and to study the early season distribution of albacore in the offshore and nearshore regions. This study was designed to improve our understanding of the underlying factors affecting the prediction of the onset and subsequent development of the fishery and to examine the possibilities for fishermen to extend the fishery farther offshore and to start the fishery earlier than is usual.

CRUISE OPERATIONS, 1973

The AFRF charter vessels sailed in three groups of four each; the first two groups left on May 10 and May 25 from San Diego, California, and returned on June 22 and 6. The other four vessels left Astoria, Oregon, on June 17 and returned July 16. The fishing vessels and captains that participated in the 1973 joint NMFS-AFRF albacore studies were:

	Fishing vessel	Captain
Charter 1 -	Jinita	Jim Brandenburg
	Pacific Dawn	Tom Estes
	Taurus	Harold Whitehead
	Vivian M	Ron Myking
Charter 2 -	Barbara Anne	Lawrence Effie
	Joann Marie	Bill Michaels
	Quicksilver	Frank La Gamma
	War Lord	Bob Mason
Charter 3 -	Blue Bell	Wayne Smith
	Michael Lisa	Lawrence Cooper
	Sun Ray II	William Harder
	Wendy	Jim Cope

The vessels on charter to AFRF, which worked in pairs for safety reasons, 1) conducted exploratory fishing, 2) kept detailed fishery logs, 3) made oceanographic observations including surface and subsurface temperature measurements (one of each pair of vessels was outfitted with an expendable bathythermograph), water transparency measurements, and surface ocean condition observations, 4) made synoptic weather observations, and 5) conducted albacore tagging operations. In addition, one vessel with NMFS technicians aboard attempted to conduct ultrasonic tagging and tracking experiments with Jordan and on its own, to study small-scale movements of albacore.

A summary of the daily observations made by the fishing vessels was radioed ashore and to the Jordan each day. The information received from the cooperating vessels was used along with that from other sources in the albacore tuna fishery advisory operations at the NMFS La Jolla Laboratory and was also transmitted to interested boats by WFOA. The subsurface temperature BATHY and weather observations were also passed to the Navy Fleet Numerical Weather Central and weather observations to the National Weather Service. The operations of the vessels on charter to AFRF were also coordinated by NMFS with the Fish Commission of Oregon early season albacore exploratory cruise.

Jordon conducted a series of oceanographic stations taking measurements of the physical, biological, and chemical characteristics of sea water. Net tows were also made to obtain estimates of the availability of potential albacore food organisms. In addition Jordan trolled 4-6 hours on many days and preserved albacore stomach, liver, and muscle samples. Radio contact was maintained with independent vessels, as well as the charter vessels and XBT bathythermograph messages and other information were relayed ashore to radio station WWD.

Commercial concentrations of albacore were found far offshore and earlier than the usual fishing season. Greater quantities of fish were caught by AFRF charter boats in the offshore area this year than were last year. A fleet of independent vessels, which at times numbered up to about 25 boats also fished the offshore area with varying degrees of success. There were indications during the 1972 survey that conditions for bait fishing may be good in the offshore area. Results from bait fishing efforts this year, however, were disappointing. Three main size groups of fish were caught in offshore waters this year, but only small numbers of large fish were taken. It also appears that medium size fish caught this year were somewhat smaller than those caught last year.

The results from the 1973 study substantiate earlier findings that the shoreward migration and early distribution of albacore are strongly related to factors in the marine environment; the Transition Zone water and the associated oceanic fronts are important factors in this relation. An improved understanding of the Transition Zone and the driving forces that influence its development would likely improve the ability to predict factors in the migration of albacore. Also an improved understanding of the ocean environmental effects on albacore may aid the fisherman. A knowledge of the subsurface temperature structure appears to be particularly important to fishing strategy early in the offshore region.

It was expected that the results of the 1973 survey would be similar to the previous survey in some circumstances and different in others. The discovery of these circumstances has been valuable to furthering the understanding of the migration patterns of albacore.

Several areas of research remain open questions. The albacore that are found in Pacific Northwest waters during the fishing season may not move through the region of large catches near 35°N, 140°W, but through higher latitudes. The NMFS R/V Cromwell trolling record in 1972 and perhaps also Jordan's fishing record show some catches at higher latitudes beyond 137°W. This region has not yet been scouted sufficiently by fishing vessels.

JOINT NMFS-AFRF ALBACORE TAGGING STUDY

The purposes of the joint NMFS-AFRF albacore tagging study are to 1) examine movement of albacore within North American coastal waters during the U.S. fishing season, 2) obtain information on the proportion of fish that may re-enter the U.S. fishery in subsequent years, and 3) obtain information on growth for use in population studies.

A total of 1,738 albacore were tagged and released during the 1973 charter operations of the joint NMFS-AFRF tagging project. Several hundred more fish were tagged and released during the fishing season by fishermen with payment for the tagged fish made by AFRF. About 4,800 fish have been tagged and released since the start of the joint NMFS-AFRF tagging study: 891 in October 1971, 2,081 in 1972 and, 1,738 plus the several hundred tagged during the 1973 season.

The overall recovery rate (up to October 31, 1973) of fish tagged and released is 3.3% - 2.6% for fish tagged in 1971, 6.1% for fish tagged in 1972, and less than 0.1% for fish tagged in 1973.

Most of the tagging completed by the boats on charter to AFRF during 1973 was in waters between 135°-145°W and 33°-35°N with additional tagging in an area centered at about 130°W, 40°N. The number of fish tagged in 1973 in waters far offshore and early in the season is the best on record. Most of the fish tagged and released in 1973 in the offshore area were in June and those closer to shore and to the north were in early June.

ULTRASONIC TRACKING OF ALBACORE

The 1972 NMFS-AFRF experiments designed to track albacore tuna with ultrasonic transmitters were quite successful. These experiments revealed many characteristics of albacore movements and their response to lateral thermal gradients and other marine environmental factors. Further ultrasonic tracking experiments were conducted during

the 1973 NMFS-AFRF cruise operations in an attempt to study albacore behavior 1) in relation to offshore frontal features, 2) during their shoreward migration, and 3) to evaluate the feasibility of fishermen using ultrasonic tracking techniques during fishing operations.

The 1973 albacore tracking operations were only very limitedly successful. This in part may have been due in some cases to poor weather conditions and in some cases to equipment failure, but it also appears that insufficient time was devoted to the tracking operation to give it a fair test. There was some concern that frequent clutching and declutching and slow speeds during tracking operations may have been harmful to the tracking vessel.

Several fish were tagged with transmitters and lost soon after they were returned to the water and tracking operations were begun; however, tracking data for two fish revealed slow average swimming speeds and frequent changing of swimming direction which suggest that the transmitter-tagged fish were not actively migrating through the area, but may have been spending some time in the vicinity of the offshore oceanic frontal features.

The experiences this year were not encouraging with regard to fishermen using ultrasonic techniques during fishing operations. However, the method deserves further evaluation.

R. Michael Laurs
NMFS
April 24, 1974

PACIFIC MARINE FISHERIES COMMISSION

GOAL AND OBJECTIVES

as reprinted from the 23rd
Annual Report, May 1972, p.9

"Mutual problems of management of marine, shell, and anadromous fishes led the Pacific Coast states to form the Pacific Marine Fisheries Commission in 1947. By 1970 these problems had increased in number and complexity, and membership in the Commission had expanded numerically and geographically. Consequently, urgent need exists for solution of the economic, social, political, legal, and biological problems confronting fishery management, development, and utilization. The Commission, in light of present conditions, recognizes a need to reaffirm the goal of PMFC and to establish objectives to guide its future activities.

"GOAL

"The goal of PMFC is to promote the wise management, development and utilization of marine, shell and anadromous fisheries which are of mutual concern, and to develop a joint program of protection, enhancement and prevention of physical waste of such fisheries.

"OBJECTIVES AND ACTION PROGRAMS

"In order to accomplish the goal of PMFC*, the following objectives are established. Priority actions to accomplish these objectives are listed.

Objective I. Provide energetic leadership in recognizing and resolving fishery problems.

Action:

A. Establish an adequate secretariat.

B. Invite *all* federal and Canadian agencies concerned with fishery matters to participate in PMFC affairs in a nonvoting capacity.

C. Seek additional sources of funding to carry out PMFC's programs and research.

D. Assist the federal government in international negotiations.

Objective II. Coordinate research and management projects relating to fisheries of concern to two or more states.

Action:

A. Publish data reports, mark lists, scientific papers, and administrative documents on a current basis.

B. Develop a coordinated plan to assess scientific knowledge as to the magnitude, distribution, and availability of unexploited or underexploited fishery resources, and to determine what additional inquiry is needed.

C. Develop a coordinated plan to monitor and assess the effects of foreign fishing on West Coast fishery resources.

D. Provide a mechanism for the collection and dissemination of information on the fishery resources, such as: life histories, ecology, management, and propagation. This would include, for example, cataloging and disseminating information on salmon research, management, and protection currently being done on the Pacific Coast, or encouraging studies leading to the identification of various subpopulations of marine and anadromous fishes.

E. Determine the division of responsibility for research and management projects of PMFC, as represented by the Secretariat, the member states, and the federal government.

Objective III. Develop PMFC positions and communicate them to the legislatures of the respective states, the Congress, the concerned agencies of federal, state, or local government, and to the private sector.

Action:

A. Monitor the opinions and activities of member states on environmental changes and water quality and propose appropriate action.

B. Poll member states on all important issues to coordinate state positions and develop, when appropriate, a single PMFC position.

C. Determine appropriate and definite ways and means to effectuate each PMFC position.

Objective IV. Propose compatible fishery regulations based on scientific evidence and with full consideration of ecological, biological, recreational, aesthetic, social, economic, and political matters.

Action:

A. Evaluate fishing regulations for compatibility and effectiveness on a coast-wide basis.

B. Evaluate the effectiveness of fishing agreements with foreign nations.

C. Develop recommendations for regulations necessary to prevent overharvest.

*References to the PMFC throughout is to its member states and not to its Secretariat.

Roster of Sea Grant Albacore Coordinating Committee Members
Participating in the Meeting of March 6 and 7, 1973
Sheraton Half Moon Inn, San Diego, California

FEDERAL & INTERNATIONAL AGENCIES

Mr. Isadore Barrett
National Marine Fisheries
Service Southwest Fisheries Center
P.O. Box 271
La Jolla, California 92037

Mr. Clem Bribitzer, Regional Economist
Southwest Region
National Marine Fisheries Service
Federal Bldg., 300 So. Ferry Street
Terminal Island, California 90731

Mr. Gerald V. Howard
Regional Director
National Marine Fisheries Service
Federal Bldg., 300 So. Ferry Street
Terminal Island, California 90731

Dr. Michael Laurs
NMFS Southwest Fisheries Center
P.O. Box 271
La Jolla, California 92030

Dr. Jim Joseph
Director of Investigations
Inter-American Tropical Tuna Commission
c/o Scripps Institute of Oceanography
La Jolla, California 92037

Dr. Brian Rothschild, Director
Southwest Fisheries Center
P.O. Box 271
La Jolla, California 92037

STATE AGENCIES

Doyle Gates
California Department Fish & Game
350 Golden Shore
Long Beach, California 90802

Charles Hooker
California Department Fish & Game
350 Golden Shore
Long Beach, California 90802

Larry Hreha
Fish Commission of Oregon
818 Commercial Street
Astoria, Oregon 97103

Fritz Walgenbach
California Department Fish & Game
1416 Ninth Street
Sacramento, California 95814

Henry Wendler
Washington Department of Fisheries
115 General Administration Building
Olympia, Washington 98504

PRIVATE SECTOR

Jack C. Bowland
4904 N. Harbor Drive
San Diego, California 92106

Gordon Broadhead
Living Marine Resources Inc.
11339 Sorrento Valley Road
San Diego, California 92121

F. Robert Insinger
4904 N. Harvor Drive
San Diego, California 92106

Frank J. Martins
1023 Vaquero Road
Pebble Beach, California 93953

Lewis Wright
Bumble Bee Seafoods
Astoria, Oregon 97103

Continued on second page

(Roster, continued)

UNIVERSITIES

Lewis J. Bledsoe
Center for Quantitative Science
University of Washington
202 Pacific Annex 2
Seattle, Washington 98195

Dr. Glenn A. Flittner
Dir., Bureau of Marine Sciences
San Diego State College
San Diego, California 92115

Dr. George Shor, Jr.
Office of Sea Grant
UCSD
Box 109
La Jolla, California 92037

GUESTS

Dr. Maynard W. Cummings
University of California, Davis, California

Christopher M. Dewees
University of California, Davis, California

Tracy Lewis
University of California, San Diego, California

Paul H. Patterson
Living Marine Resources Inc.
San Diego, California

Charles Peckham
Living Marine Resources Inc.
San Diego, California

PACIFIC MARINE FISHERIES COMMISSION

342 STATE OFFICE BUILDING • 1400 S.W. FIFTH AVENUE
PORTLAND, OREGON 97201

REQUEST FOR PROPOSAL: COSTS & EARNINGS OF U.S. WEST COAST ALBACORE VESSELS

The Pacific Marine Fisheries Commission welcomes proposals by qualified university or private enterprise research groups for a study of costs and earnings of U.S. West Coast albacore vessels. We plan to submit the proposal we select as a part of our Coordinated Pacific Coast Albacore Research Program for Sea Grant funding next fiscal year. Unfortunately, time is very short: our proposal must be submitted by about May 1, 1973.

The Economics Panel of our inter-agency Albacore Coordinating Committee has recommended a study somewhat similar to those by Green and Broadhead or Perrin and Noetzel (see footnote). The Panel suggests that studies produce results which can be arranged by type of vessel, with a part of the task being determination of appropriate vessel groupings for this purpose. Factors to be considered include

operational costs
capital costs
returns to fishermen and to owners
analysis of factors contributing to high returns

To be effective, this study must coordinate closely with state agency data sources and with commercial fishing interests, since it is from these two sources that data must be drawn. We believe that such a coordinated approach has major educational values for the graduate student who possesses a proper blend of academic preparation and active interest in the practical economics of fisheries operations.

Because most boats which harvest albacore also fish for other species, this study must consider the interaction of these complementary fishing activities in order to establish total costs and revenues for those vessels. Quite clearly this interlocking of fisheries presents project design problems; at the same time the economic choices made by the fisherman have major management implications.

For practical reasons, we believe the study should include at least a cursory examination and evaluation of cost accounting practices used by representative vessel owners for their own purposes of developing improved financial control and insight into financial aspects of vessel operation.

We suggest the proposal include the following:

Introduction and statement of the problem
Objectives and scope of proposed study
Study approach
Project organization: personnel relations and responsibilities
Qualifications, including biography of principal investigator(s)
Proposed budget

Please submit proposals to Dr. John P. Harville, Executive Director, Pacific Marine Fisheries Commission, 342 State Office Building, 1400 S. W. Fifth Avenue, Portland, Oregon 97201. Telephone (503) 229-5840 for further discussion if desired.

Green, Roger E. and Gordon C. Broadhead (n.d.) COSTS AND EARNINGS OF TROPICAL TUNA BOATS BASED IN CALIFORNIA. Fishery Industrial Research, Vol. 3, No. 1, pp.29-45.

Perrin, William F. and Bruno G. Noetzel, 1970. ECONOMIC STUDY OF THE SAN PEDRO WETFISH BOATS. Fishery Industrial Research, Vol. 6, No. 3, pp.105-138.

Economics Recommendations of the Ad Hoc Albacore Advisory Committee
February 24-25, 1972

G. Economics of the Fishery: Recommendations

1. The acceleration and expansion of economic studies of the fishery, with emphasis on fleet operation, by vessel size and type are recommended. Such studies should include:

   a. An examination of capital costs, operating expenses, return on assets employed and fisherman remuneration for various sizes and types of vessels employed in the United States fishery.

   b. Analysis of the economic efficiency of the various sizes and types of vessels employed in the United States fishery.

   c. A forecast of the probable economic effects of increases in fleet size as a result of new construction or the entry of multi-fishery vessels.

   d. The biological impact of increases in fishing effort (and fishing mortality) by the international fleet and an assessment of the resulting economic effects on each of the major industry segments in Pacific-wide operations.

   e. An examination and evaluation of cost accounting practices used by individual vessel owners with the objective of developing a simple but more useful system to improve financial control and insight into operations.

ATTACHMENT E

PACIFIC MARINE FISHERIES COMMISSION

342 STATE OFFICE BUILDING • 1400 S. W. FIFTH AVENUE
PORTLAND, OREGON 97201
PHONE (503) 229-5840

May 16, 1974

Mr. Robert W. Schoning, Director
National Marine Fisheries Service
3300 Whitehaven Parkway
Washington, D.C. 20240

Dear Bob:

You will recall that in early 1972 the American Fishermen's Research Foundation convened an ad hoc committee, composed of albacore fishery experts representing government agencies, universities, and commercial fishermen, to evaluate the state of knowledge concerning the albacore fishery and to propose guidelines for additional research. At that first meeting, chaired by Dr. James Joseph, Director, Inter-American Tropical Tuna Commission, Izadore Barrett and Dr. Michael Laurs represented the Southwest Fisheries Center, NMFS.

Out of that February 1972 meeting came a proposal for support of a "Coordinated Pacific Coast Albacore Research Program." That project was subsequently funded by NOAA's Office of Sea Grant, and the Pacific Marine Fisheries Commission was designated project coordinator. Matching requirements have been met from AFRF expenditures of industry-generated funds for exploratory fishing and albacore tagging work carried out in conjunction with your Southwest Fisheries Center. The original committee convened by AFRF has been retained and broadened to provide continuing overall policy guidance for this Sea Grant supported project. My office keeps the Committee informed of progress on the project, and the Committee meets annually to evaluate not only the Sea Grant funded work, but also to assess related studies being carried out by other groups external to the Sea Grant project. This Albacore Coordinating Committee has proved to be a highly satisfactory communication and planning mechanism, particularly between representatives of the fishing industry and researchers in governmental agencies and universities.

At its April 29-30 meeting in San Diego the Albacore Coordinating Committee addressed itself particularly to the need for intensified effort with respect to the population dynamics of albacore. The Committee recognized the need for an ocean-wide approach to this problem, since albacore are harvested by fishermen of several nations on both sides of the North Pacific. The Committee also is aware of serious budgetary exigencies within the Federal government, and therefore of the difficulties NMFS faces in assigning priorities to various fisheries problem areas.

Out of these considerations, the Albacore Coordinating Committee approved two resolutions without dissent, the first citing several areas of major concern and offering specific recommendations for future action; the second instructing my office to convey that resolution to you, to NOAA Administrator Robert White, and to others. Those resolutions are attached for your review, and I hope for your strong support.

Bob, I believe there are compelling domestic and international reasons for giving highest possible priorities to maintenance of our initiatives with respect to albacore monitoring and research, and particularly for extending them in the area of population dynamics. Albacore provide one of our most valuable ocean harvests. The fishery presently enjoys an unparalleled cohesion of effort among all sectors concerned with research and management. This coherence is a direct outgrowth of the cooperation developed between your Southwest Fisheries Center and AFRF, and has been further facilitated by our Coordinated Pacific Coast Albacore Research Program. The very material financial participation by the albacore fishing industry (via AFRF) in the research process is unique for the United States, and has led to levels of joint program planning and evaluation which should be strongly encouraged. Finally, effective management of albacore clearly requires international cooperation for pooling and assessment of data. The groundwork has been laid for such cooperation between the United States and Japan toward the goal of real understanding of albacore population dynamics on an ocean-wide basis. The initiative presently rests with the United States, and I am advised that we must exercise that initiative if further progress is to be expected. Here I suspect that our potential gains in international cooperation might far transcend benefits to be derived for the albacore fishery alone.

On behalf of the Albacore Coordinating Committee, I respectfully request your careful consideration of the concerns they have expressed in their resolution and the recommendations they have presented for constructive action.

Yours sincerely,

John P. Harville, Executive Director and
Convenor, Albacore Coordinating Committee

JPH:b
Att.
cc: Dr. Robert M. White, Administrator, NOAA
Dr. William Royce, Associate Director, Resources Research, NMFS
Dr. Brian Rothschild, Director, Southwest Fisheries Center, NMFS
Mr. Gerald V. Howard, Regional Director, Southwest Region, NMFS
Members, Albacore Coordinating Committee

The Albacore Coordinating Committee, having noted with concern that,

Whereas the North Pacific Albacore Tuna Stock is the world's largest for the species, and

Whereas this stock supplies 40 to 60 percent of the total world harvest of this species each year, and

Whereas the United States consumes approximately 80 percent of the world albacore tuna supply, and

Whereas the stock provides significant revenues to more than 2,000 U.S. flag vessels, as well as a major recreational fishery, and

Whereas the stock is now being fished by United States, Canadian, Mexican, Japanese and other flag vessels, and

Noting that intelligent conservation and management of the stock has important international implications, and

Noting further that harvest rates have remained approximately level since 1950, and

Noting further that fishing effort and total catch have increased sharply (more than 50 percent) in the past three years, and

Observing further that projected fishing effort is expected to increase further because of unrelenting worldwide demand for albacore tuna,

Hereby expresses its conviction that a serious international conservation, management and allocation problem may be developing.

The Committee therefore resolves that appropriate national authorities be advised of our concerns as follows:

1. Albacore population dynamics studies are lagging. Problems which exist in the standardization and combination of fishing effort from the fishery components have prevented the examination of the overall effect of fishing effort on the stock;
2. Population dynamics research requires substantial lead time to prepare useful inputs to any practical management system;
3. Environmental conditions have substantial effects on the success of spawning, larval survival, and the migration, distribution and availability of the adults. Thus, evaluation of the effects of fishing activity, in combination with environmental impacts on the abundance of stocks requires careful study;
4. NMFS, State agencies and various Japanese government research agencies all are experiencing major increases in research demands concurrent with serious budget restrictions.

The Committee therefore recommends that

1. *NMFS be requested* to take leadership by providing our Committee members with a summary report on the status of the albacore population dynamics studies in the North Pacific;

2. *NMFS, in cooperation with PMFC,* acting on behalf of the state agencies, take the initiative to develop a plan of action for intensifying research efforts on albacore tuna stock dynamics. Such action should also include preparation and dissemination of a status report; call for a meeting of interested parties to review the subject and to develop a plan; and to consider alternate methods of obtaining technical assistance for work on this internationally important problem through additional funding and/or cooperation of national and international research agencies.

Moved, seconded and carried unanimously, 30 April 1974 at the annual meeting of the Albacore Coordinating Committee in San Diego, California.

The Albacore Coordinating Committee,

having reviewed the substance of discussion relative to the North Pacific Albacore fishery resource, its status, and future requirements for intelligent management and utilization,

Hereby resolves that the Executive Director, Pacific Marine Fisheries Commission be charged to carry forward the Committee's concerns to appropriate authorities in the National Marine Fisheries Service, the National Oceanic and Atmospheric Administration and others as may be desirable.

Moved, seconded and carried unanimously, 30 April 1974 at the annual meeting of the Albacore Coordinating Committee in San Diego, California.

JUL - 8 1974

U.S. DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
Washington, D.C. 20235

JUN 8 1974

Dr. John P. Harville
Executive Director
Pacific Marine Fisheries Commission
342 State Office Building
1400 S.W. Fifth Avenue
Portland, Oregon 97201

Dear John:

I am responding to your letters of May 16 and 17 to me and to Bob White concerning the resolutions passed by the Albacore Coordinating Committee. It is apparent from the text of the resolutions that you are keenly aware not only of the problems of the albacore stocks and of the international fisheries on them, but also of the budgetary exigencies that we are facing in fiscal year 1975.

Just how it will shape up in the coming year is not clear yet, but we are doing two things to make them a little clearer. The first is a meeting this week of all of our Regional and Center Directors which will consider overall priorities for FY 1975. The second is a meeting within our Southwest Fisheries Center in a week or two to determine how their research activities can be best shaped to fit your needs in the coming year while considering, of course, their other responsibilities.

So, around the middle of July, I should be able to give you some definitive information.

With best wishes.

Sincerely,

Robert W. Schoning
Director

1871 1971 **A Century of Fish Conservation**

U.S. DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
Washington, D.C. 20235

AUG

Dr. John P. Harville
Executive Director
Pacific Marine Fisheries Commission
342 State Office Building
1400 S. W. Fifth Avenue
Portland, Oregon 97201

Dear John:

I now have the definitive information on our albacore program that I mentioned in my letter of June 28. The matter was not discussed at the meeting with Regional and Center Directors, but the SWFC people tell me that a program will be conducted by them and the Hawaii office of the SWFC.

The Hawaii office will initiate a population dynamics program for all Pacific albacore (both north and central stocks). Hawaii will also develop an interface with the Japanese on albacore work. The SWFC is initiating an otolith collecting program. Otoliths will be sent to Hawaii for aging. Our Hawaii staff is developing a planning document on the population dynamics program for presentation at a later date.

With best wishes.

Sincerely,

Robert W. Schoning
Director

Appendix 2 – Status Reports

Status of the 1975 Pacific Coast Albacore Fishery

Pacific albacore make annual trans-ocean migrations which subject them to 3 major fisheries on both sides of the north Pacific. It is generally accepted that all 3 fisheries are exploiting a single stock of 6 or 7 year-class groups having extremely complex and not well-understood migration patterns. The total harvest from the 3 fisheries approximates 160,000,000 pounds annually and represents more than 35% of the world albacore catch. The U.S. catch of Pacific albacore averages 44,450,000 pounds annually, and the preliminary 1975 U.S. catch is 44,919,000 pounds (Table 1).

Development of the summer and fall fishery off the Pacific Coast of the United States and Canada varies each year according to fluctuations in the northerly migrations of the fish. During years of restricted northerly migrations the fishery occurs mainly off Baja and southern California. In years of more extensive migrations commercially significant catches are made as far north as British Columbia, with resultant shortened seasons and small total catches in the southern extent of the fishery.

Albacore movement northward along the Pacific Coast correlates well with shifting of the 58°-66°F isotherms. Forecasting the duration and stability of these "optimum" water conditions in the eastern and southern portions of the range is used to predict the nature of the upcoming season. However, short and long-term meteorologic and oceanographic phenomena may produce situations counter to established trends, thereby causing the less well understood annual fluctuations in the range and character of the fishery.

California

California's inshore fishery began on June 14 with the first sport fish being caught on the Sixty Mile Bank south of San Diego. Some commercial fishing occurred south of San Diego and out to Guadalupe Island during the remainder of June. However, a price disagreement existed and some major canners hinted that they would not buy albacore. Thus, many boats did not leave port and landings for June were only 17,094 pounds.

A price settlement of $675 per ton on July 8, considerably below the 1974 price of $830 per ton, resulted in increased fishing effort. Commercial fishing was scattered along most of the West Coast with best success south of San Diego, west of Morro Bay, and offshore from Point Arena. Sport catches were consistently good during July south of San Diego, with some surprisingly good catches made within 5 miles of shore near major population centers. Landings for July were 950,000 pounds.

Most commercial boats moved to the Pacific Northwest in August but began to return south by the end of the month due to storms and scattered fish concentrations. California effort was centered off Point Arena and Point Sur. Sport catches continued good south of San Diego. Commercial landings for August totalled slightly more than 1,000,000 pounds.

During September poor weather in the Pacific Northwest drove the remainder of the southern jig fleet to central California, where fishing was good between weather fronts. Landings for September were 4,500,000 pounds. Sportfishing continued good south of San Diego and offshore from Morro Bay.

October catches were centered mostly south of San Diego and off central California. Sportfishing remained good but with reduced effort. October landings were 3,546,683 pounds. Steady fishing off Baja California continued into November and December with some boats still in the Guadalupe Island area in January. This late development brought the 1975 season catch to a figure higher than previous estimates. November landings went over 1,000,000 pounds and December landings nearly reached the 500,000-pound mark. Season totals for 1975 should reach 12,000,000 pounds, still 17,000,000 pounds short of the 24-year average of 29,000,000 pounds (Table 1).

Oregon

Scattered small catches were reported off Oregon during the first week of July, but most boats did not fish until the price settlement on July 8. Fishing effort increased rapidly during the middle of July and good fishing was reported all along the coast from Cape Blanco, Oregon to Cape Flattery, Washington. Catches ranged up to 500 fish per day for some boats, with averages of 100 to 150 fish per boat day. During the last week of July fishing improved particularly off Washington around the Willapa fingers and off Cape Flattery, with catches averaging 200 to 300 fish per boat day. July landings amounted to 1,327,394 pounds.

During early August, fishing success decreased in the northern areas with catches dropping to 100 to 150 fish per boat day and becoming scattered, especially north of the Columbia River. Success south of the river remained more consistent, averaging around 200 fish per boat day. A vigorous mid-August storm off the Pacific Northwest cooled water temperatures and scattered fish even further. By month's end jig scores dropped and fishing was very spotty. The landings during August totalled 12,232,921 pounds.

During September most jig boats went south to California. Bait boats did moderately well during the month with catches up to 11 tons per boat day. Weather progressively worsened by month's end and September landings totalled 2,799,000 pounds. Boats fishing off California and unloading in Oregon at the conclusion of their season brought combined landing totals for October and November to 789,801 pounds. Thus, the 1975 season's total for landings in Oregon was 17,149,000 pounds, about 5 million pounds greater than the 24-year average (Table 1).

TABLE 1. Albacore landings in California, Oregon, and Washington (in 1,000's of lb.)

Year	California	Oregon	Washington	Total
1951	30,915	2,917	625	34,457
1952	49,804	2,586	177	52,567
1953	33,836	776	89	34,701
1954	26,107	469	421	26,997
1955	29,002	503	233	29,738
1956	37,055	3,654	630	41,339
1957	43,525	2,702	433	46,660
1958	27,188	9,754	1,503	38,445
1959	32,740	10,582	2,961	46,283
1960	35,113	4,563	526	40,202
1961	29,123	3,251	456	32,830
1962	36,622	8,936	365	45,923
1963	48,860	11,413	527	60,800
1964	42,551	4,452	1,055	48,058
1965	23,218	12,122	2,048	37,388
1966	18,189	18,041	1,101	37,331
1967	17,858	29,243	1,240	48,341
1968	15,077	37,752	3,050	55,879
1969	14,722	29,828	3,561	48,111
1970	29,932	21,779	4,390	56,101
1971	36,082	8,420	5,250	49,752
1972	21,001	23,560	16,239	60,800
1973	8,458	16,350	14,446	39,254
1974	11,700	25,225	17,983	54,908
Average	29,112	12,037	3,305	44,454
1975*	11,473*	17,149	16,297	44,919

* Preliminary

Washington

Most effort off the Washington coast began in mid-July, with some fishing occurring as far north as Vancouver Island. By the end of July most boats were fishing from the Columbia River north to Cape Flattery. July landings were 1,538,365 pounds.

Catch rates decreased in early August and no fishery developed off Vancouver Island as in recent years due to cold water temperatures. Storms during the last half of August further scattered fish and reduced water temperatures, causing many jig boats to turn southward. Landings in Washington during August totalled 9,306,413 pounds.

During most of September, weather conditions permitted good success by the bait boat fleet centered in the Astoria Canyon and off Grays Harbor, while most northern based jig boats finished the season. Early October storms finally ended fishing off the Pacific Northwest. Landings totalled 4,726,701 pounds in September and 599,341 pounds in October. Late fishing off California brought November and December landings to a combined total of 125,928 pounds. The 1975 season total of 16,296,748 pounds was comparable to 3 previous years of record landings in Washington and about 13,000,000 pounds above the 24-year average (Table 1).

Monitoring the Fishery

Coastwide logbook studies continued in 1975 along with port sampling in all three States; these were made possible largely through Sea Grant funds. Coincidental to collecting catch and effort information on a daily basis from logbooks Washington conducted an experimental program to collect catch and effort data on a trip basis using fish landing receipts. Five broad catch areas were developed on a trial basis, ranging from Mexico to Alaska. For each trip the fishermen were requested to provide the buyer with the following information: (1) catch area where most fish were caught; (2) gear on which most fish were caught (jig or bait); (3) number of days actually fished; and (4) total number of fish caught. Preliminary analysis of this new monitoring system indicates good cooperation and accuracy of data. A second year of the experiment will be conducted to refine the system and evaluate its possible use on a coastwide basis to monitor albacore catch and effort on a timely basis.

Compiled by Rich Lincoln, Washington Department of Fisheries

Other Contributors:

Charles W. Hooker, California Department of Fish and Game

Larry H. Hreha, Oregon Department of Fish and Wildlife

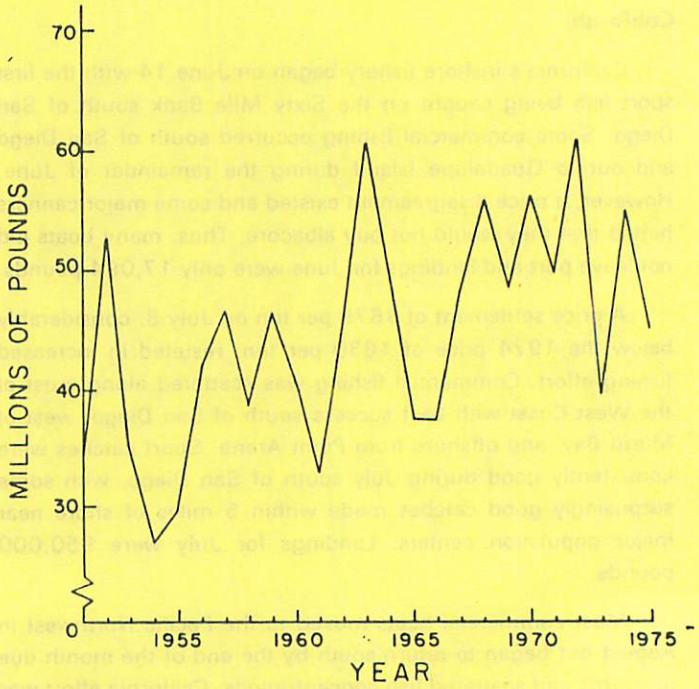

FIGURE 1. Combined annual landings of albacore in California, Oregon and Washington, 1951-1975.

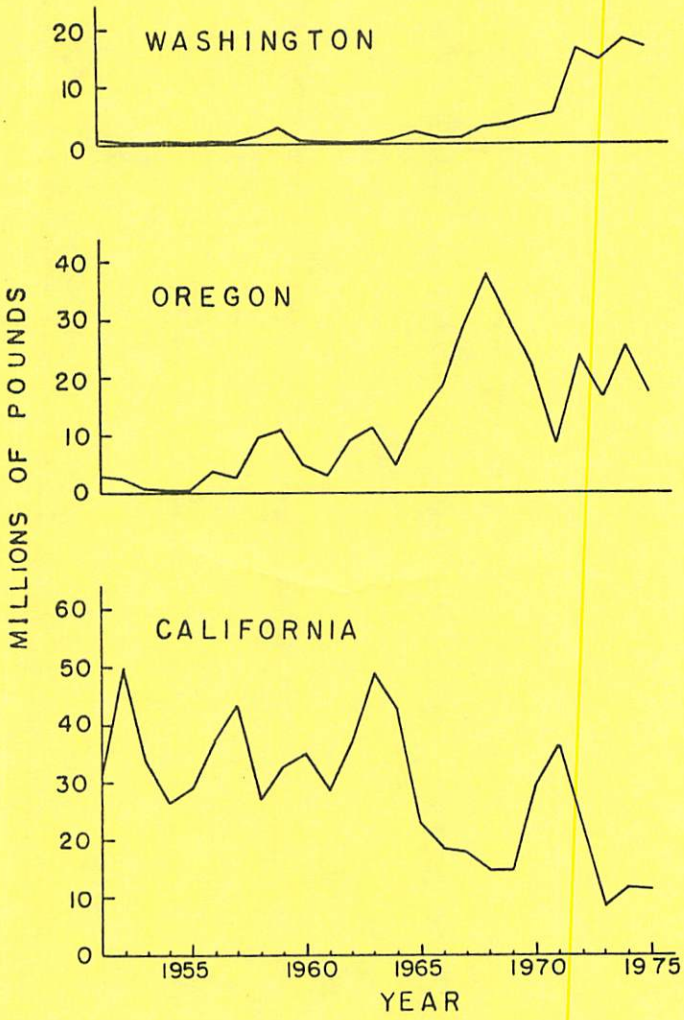

FIGURE 2. Annual albacore landings by State, 1951-1975.

Executive Summary

Workshop on the Population Dynamics of North Pacific Albacore
Honolulu, Hawaii, 10-12 December, 1975

Prepared by its Chairman, Dr. Jerry A. Wetherall
Honolulu Laboratory, National Marine Fisheries Service

The status of the North Pacific albacore stock was assessed at a workshop held at the NMFS Honolulu Laboratory in December 1975. The workshop was part of an informal agreement between the Southwest Fisheries Center and the Far Seas Fisheries Research Laboratory, Shimizu, Japan, to promote and accelerate joint research on the North Pacific albacore stock. Participants included biologists from NMFS, FSFRL, California Department of Fish and Game, Oregon Department of Fish and Wildlife, Washington Department of Fisheries, and the Pacific Marine Fisheries Commission.

In recent years the total annual harvest of North Pacific albacore has risen to about 100,000 metric tons (MT), primarily due to expansion of the Japanese pole-and-line fishery, which took about 64% of the catch in 1974. The other major fisheries are the Japanese longline fishery (15%) and the United States troll and live-bait fisheries (21%).

The preliminary stock assessments discussed at the workshop were based on standard analyses of catch, effort, and size composition statistics.

The maximum sustainable annual yield for the North Pacific albacore stock was judged tentatively to be in the neighborhood of 115,000-125,000 MT. Thus the present annual catch is less than, but is approaching, the biological limits of the stock. The average yield per recruit could be increased if age at capture were increased, but this is infeasible under the present structure of the fisheries.

Recruitment to the North Pacific albacore stock shows a fourfold or fivefold annual variation. No relationship between recruitment and spawning stock can be demonstrated.

The joint investigations by the Honolulu Laboratory and the Far Seas Fisheries Research Laboratory will continue, focusing on critical research areas identified during the workshop. The fisheries will be monitored and stock assessments will be updated at regular intervals.

It was agreed that the continued cooperation among the fishery agencies of California, Oregon, and Washington in collecting and processing albacore fishery statistics is fundamental to the NMFS stock assessment capabilities and that every possible means (state and federal) should be taken to strengthen and support inter-state and state-federal albacore programs.

The significant scientific contributions of the west coast albacore industry, through the American Fishermen's Research Foundation, were acknowledged and applauded at the workshop, and the need for continued government-industry cooperation was emphasized.

DATA REQUIREMENTS FOR A COASTWIDE VESSEL, FISHERMEN, AND LANDINGS DATA SYSTEM

The following represents a synthesis of recommendations from State and Federal fisheries scientists and managers regarding data requirements for a Coordinated Pacific Coast Albacore Research Program. Please note that these statistics are arrayed by source and ranked according to priority of need. The number 1 indicates highest priority, 2 somewhat less priority, and 3 a desirable statistic.

Data Derived from Commercial Fishing Vessel Registration:

Priority

1 Vessel numbers - these include the USCG official number or the State registration number, and the boat plate number as issued by the State fishery agency. It is crucial that two identifying numbers be recorded since these numbers provide a means for identification of vessels on a coastwide basis.

1 Vessel's name - this could serve as nother identifying factor in case part of the identifying number was obscured, missing, or illegible. Would also be useful as reference for preparation of new, unique numbering system.

1 Radio call signal - these signals rarely change and therefore may be regarded as permanent for documented vessels. Serves as additional identifying factor and is most appropriate for fishing craft in the albacore fishery.

3 Home port - this refers to the port where the documented vessel's official documented papers are kept by USCG and should not be confused with that port where the catch is normally landed. Knowing the home port will aid in determining physical mobility of the fisherman (i.e., across State jurisdictions).

Vessel's dimensions - should aid in vessel classification useful for economic analyses.

1 Length - "registered length", measured from the forwardmost point of the craft's skin back to the stern post, should not be confused with "overall length" which is generally longer. Length can be related to efficiency and therefore can be used to monitor changes in the efficiency of a standard unit of effort. NOTE: Only the "overall length" is available for undocumented craft.

3 Beam - for explanation of need, see "length" above.

1 Catch capacity - this roughly corresponds to "net tonnage". This is an important factor concerning how long a fishing craft can stay at sea. NOTE: The USCG maintains this statistic for documented vessels, but such data may not be available for undocumented craft.

1 Gross tonnage - the NMFS, in work with cost and earnings data, has found that "gross tonnage" is a more significant variable than "length", in explaining the variance in some cost categories (e.g., fixed costs).

Priority

1 Vessel's age - useful for determining the efficiency of a craft versus new craft of same class.

2 Vessel's rig (gas, diesel, etc.) - useful for comparing similar craft with different rigs for efficiency studies. In light of possible fuel allocation problems, this would seem to be an ideal statistic to have on hand, as well as an aid to economic studies for a particular fleet.

3 Fuel capacity - provides indication of vessel's range, how long it can stay out fishing, and through comparison, some indication of efficiency.

1 Horsepower - would permit continuity with historical records in each State. (Also vital re fishing efficiency, esp. in trawling.)

2 Cruising speed - might be able to derive some method for indicating fishing time and effort.

2 Fuel consumption - this would be approximated and could prove useful for efficiency studies.

1 Crew complement (including skipper) - this would be useful for CPUE and cost-earnings analyses within a fishery. Useful for monitoring changes occurring on a fishing craft which switches fisheries, etc. and would tie in with labor force studies.

1 Refrigeration (type) - might indicate whether a fishing trip were terminated because of capacity, length of trip due to fish quality, or some other reason. Also, would assist investigators in estimating changes in efficiency.

3 Intended use of craft - would enable classification of craft by use.

1 Anticipated fishing activities - this is important information from the standpoint of fishery management (number of vessels in a given fishery). The gear type statistic alone may not be in some cases a sufficient indicator, since the same type of gear may be used in different fisheries (e.g., purse seines, pots, and troll lines).

2 Some indication as to whether it is initial registration or renewal - useful for monitoring trends in commercial fisheries.

1 Gear number and size - these data categories must be analyzed by individual gear type. When combined with data from landing tickets, should provide useful information for CPUE analysis.

Gear Type	Data
Haul Seines	No. and Size
Purse Seines	" " "
Beam Trawls	" " "
Otter Trawls	No., Kind and Size
Pots and Traps	No.
Gill Nets, Setnets	No. and Size
Trammel Nets	" " "
Lines, Hand	No. and Hooks
Lines Troll	" " "
Lines, Set	" " "
Dip Nets	No.
Scoop Nets	"

Priority

1 Vessel's value (with electronics) - might provide background data necessary for evaluation of future economic studies and/or license limitation (effort control) programs.

1 Gear value (by fishery) - for explanation of need, see vessel value above.

1 Owner's name and address - for correspondence.

1 Operator's name and address (if different than owner) - for correspondence.

Data Derived from Commercial Fisherman Licensing Activities:

Priority

1 Fisherman's name - necessary since the captain (owner/operator) is the only fisherman whose name is listed in the catch record or the registration files, thus required for cross-referencing.

2 Fisherman's mailing address - for correspondence.

3 Fisherman's home address - for correspondence.

1 Fisherman's state of residence/citizenship - would give valuable data on nonresident fishermen which could be used to manage fisheries.

3 Fisherman's social security no. -

1 Fisherman's data of birth - a more accurate statistic than "age". Useful for demographic studies.

2 Fisherman's experience - useful for analyses of the fishing success of different fishing craft.

3 Percent of annual income derived from commercial fishing - would provide background data for determining what constitutes a commercial fisherman. A breakdown by fishery would be even more useful.

Data Derived from Fish Landing Receipt Records:

Priority

1 Vessel's name - required for vessel identification.

1 Vessel's boat plate no. - required for vessel identification.

1 or 2 Area fished - crucial for biological studies. NOTE: Research agencies must agree upon a grid pattern, however, designations may vary among fisheries.

1 No. of days fishing - necessary for biological and economic studies. Catch per day fishing is used by biologists in some fisheries as an index of abundance. Similarly it would be useful for CPUE analyses. Date of departure and especially date of landing are crucial for economic studies and should be collected in addition to days fishing.

Priority

1 Port of landing - permits division of landings into more defined areas. Would also maintain continuity with historical records.

1 Gear type(s) - useful for effort studies and for monitoring vessel efficiency changes.

1 Pounds and value of landings by species - necessary for cost-earnings analyses. Might prove useful for setting seasons, management of stocks, and should indicate the economic importance of a species by a time period and abundance.

3 Fisherman's license no. (captain only) - required to cross-reference to the fisherman license data file.

1 Fish ticket no. - to facilitate orderly keypunching of data and retrieval of information.

Memorandum • **P M F C COORDINATING COUNCIL**
FOR STATE/FEDERAL FISHERIES MANAGEMENT PROGRAM PLANNING

TO : PMFC Coordinating Council

DATE: October 13, 1975

FROM : John P. Harville, Executive Secretary

SUBJECT: Implementation of a Coastwide Data System

I recommend that at its next meeting (November 10-11 in San Diego) the Council take the necessary actions to implement at earliest possible date the basic objectives of the Coastwide Data System. If you agree that this is an appropriate agenda item, I will ask Bob Williams who has staffed this project, and Clemens Bribitzer who heads the CWDS Task Group, to be present to review the project to date and to answer any questions you may have. I will assume your concurrence for inclusion of this agenda item unless Chairman Kruse or I hear major objections.

A. Reasons for this recommendation for supportive action now.

After almost two years of work on this project and careful study of many alternatives, it seems clear to me that we should move at once to implement this system at least at the revised Base level 2 which proposes a minimum uniform data base of statistics which have been judged by our scientists to have coastwide management values.[1] Under this plan, first priority data elements which are keypunched presently in at least two States, would become required data output for all the States. The Base level 2 data base would include both commercial and recreational fisheries statistics.

In addition, there are several data elements determined to have potential coastwide management value which are collected currently by only one State. It is recommended that these data elements be included in the Base level 2 data system since there is no additional cost in doing so and they may eventually be collected on a coastwide basis (cf. Table 2 for listing of those data elements).

Major reasons for this recommendation are as follows:

1. All apparently agree that we need the capability to provide accurate, timely fisheries data concerning coastal stocks and coastal fisheries on a coastwide basis, particularly as we look forward to probable extension of fisheries jurisdiction that will give us management capability over more species and a much wider geographic area. Our data management capabilities should be in effect in advance of these augmented management needs, not after they are upon us.

---

[1] The total number of data elements recommended for the Base level 2 plan has been considerably reduced to include only those having coastwide management values. This reevaluation of priorities has resulted from discussions by Bob Williams with PMFC fisheries committees for albacore, groundfish, and Dungeness crab, as directed by the Council (cf. Table 1 for revised listing of those data elements).

2. Our present ad hoc procedures for pooling coastal data are not adequate; procedures are slow and inefficient, many data elements are not presently compatible coastwide, and reliable effort data and economics information are lacking.

3. Coastwide cooperative efforts with respect to certain specific fisheries needs have demonstrated the value of a planned, coastal approach to data collection and management (viz. the coastwide albacore logbook and data system now in its third year of effective operation; also the coordinated logbook and interview program for groundfish data now in final stages of completion by the PMFC Groundfish Committee with important technical assistance from NORFISH).

4. Steps required to bring all States up to a Base Level 2 data output are nominal in cost, and appear to be of internal value to those States as well as essential to achievement of the data compatibility requisite for any kind of effective coastwide accumulation.

5. Participation by the States in this coastwide effort can promote both the intent and needed funding for further modernizing and upgrading of the States' internal data collection and processing systems.

6. A decision to implement the Coastwide Data System does not a priori lock us into any specific system for coastwide accumulation of these data. Rather it declares our intention first to produce a coastwide compatible data output (at priority I minimum requirement levels) from our States, and to develop the best possible coastwide system for providing a timely and accurate coastwide data base.

7. An active and energetic Task Group representing all our agencies has worked over the past two years to bring us to this planning milestone--the point of decision concerning continued action. Their momentum should be maintained into the next phase of development of alternatives for implementing the actual system to accumulate data on a coastwide basis.

B. A decision to implement the Coastwide Data System at this time would require the following supportive actions:

1. by each State:

   a. Modifications of certain internal data collection and processing procedures in order to produce on a timely basis a machine-manageable data output of coastwide compatibility (at Base Level 2?).

   b. Designation of appropriate staff to oversee these modifications and (presumably) to represent the State on the coastwide data Task Group.

   c. Funding of these internal data processing modifications either from internal sources or through application for federal assistance.

2. by NMFS:

   a. Development with the aid of the States of more specific guidelines for a CWDS which take into account the expanding needs to be anticipated under extended jurisdiction.

   b. Provision of necessary funding to implement the CWDS in the regional and national interest.

3. By the Council as a whole:

   a. Designation of the CWDS Task Group as technical advisor to the Council.

   b. Instructions to the CWDS Task Group to:

      1) expedite in every way possible the achievement of coastwide compatible data output from the participating States;

      2) develop a set of alternative procedures and recommendation for organization and operation of the coastwide accumulation, processing, and data output phase of a Coastwide Data System, to include:

         a) further evaluation of cost effectiveness and other factors influencing alternative implementation systems, such as combining averaged outputs from separate autonomous State systems to provide coastwide averages vs. a single coastwide system for accumulating and processing raw data from the States, etc.

         b) recommendations concerning software, hardware, computer language to be used, and other technical matters;

         c) alternatives concerning physical location and organization responsible for management;

         d) assessment of staffing needs;

         e) projection of desired outputs of the system and of their values for fisheries research and management;

         f) estimates of start-up and annual operational costs and of distribution of both costs and benefits.

JPH:b

Att: Table 1: Data Elements determined to have Coastwide Management Value which would be included in a Base Level 2 Data System

Table 2: Data Elements determined to have potential Coastwide Management Value which could be included in a Base Level 2 Data System at no additional cost to the States.

TABLE 1

DATA ELEMENTS DETERMINED TO HAVE COASTWIDE MANAGEMENT VALUE WHICH WOULD BE INCLUDED IN A BASE LEVEL 2 DATA SYSTEM

N.B.: Blanks indicate implementation action required.

Vessel Registration/Gear Licensing	Calif.	Ore.	Wash.	Alaska
U.S.C.G. doc. no.	R	R	R	R
State agency boat plate no.	R	R	R	R
State marine board no.	R	R	R	R
Vessel length[1]	R	R	R	R
Net tonnage[2]		R		R
Vessel name		R	R	R
Gear type(s)		R	R	R
Landing/Fish Receipt				
Port of landing	R	R	R	R
Date of landing	R	R	R	R
Area of catch	R		R	R
State agency boat plate no.	R	R	R	R
Species and pounds	R	R	R	R
Gear type(s)	R	R	R	R
Value of catch	R	R	R	
Ticket no.			R	R

Actions required by States to produce uniform coastwide data at Base level 2:

California- keypunch net tonnage, vessel name and gear type data collected from vessel registration and fish ticket number from fish ticket.

Oregon- collect and keypunch area of catch, and fish ticket number from fish ticket.

Washington- collect and keypunch net tonnage from gear license application or provide valid conversion of gross tonnage.

Alaska- keypunch value of catch from fish ticket.

---

[1]Methods for measuring vessel length vary by State (e.g., overall, registered, or keel length). The U.S.C.G. collects registered length for all documented vessels, and the State marine boards collect overall length for all nondocumented vessels.

[2]The U.S.C.G. collects and keypunches gross tonnage and net tonnage for all documented vessels.

TABLE 2

DATA ELEMENTS DETERMINED TO HAVE POTENTIAL COASTWIDE MANAGEMENT VALUE WHICH COULD BE INCLUDED IN A BASE LEVEL 2 DATA AT NO ADDITIONAL COST TO THE STATES

N.B. R indicates data presently machine-retrievable.

Vessel Registration/Gear Licensing	Calif.	Oregon	Washington	Alaska
Vessel value (with electronics)			R	
Radio call signal[1]		R		
Landings/Fish receipts				
No. of days fished[2]			R	

[1]Radio call signal provides useful confirmation of vessel identity and would be necessary to include data from the Uniform West Coast Albacore Logbook program.

[2]Alaska keypunches number of pots pulled for shellfish only.

3-9-76

Draft Model Legislation Relating to Confidentiality of Data Statutes

For the purpose of management of the fisheries resources of the Pacific Ocean, the Director may release to the United States Secretary of Commerce, to any Interstate Fisheries Council which includes this state, or to any other Pacific Coast state, fish dealer and fisherman records and reports which are confidential or otherwise exempt from public disclosure. Prior to release of such confidential information, the Director shall satisfy himself that it shall be maintained by the receiver as confidential and shall not be open to the public or to any other governmental body in any form which would permit identification of individual fishermen or fish dealers. Nothing in this section is intended to limit the use which may be made of such information for fisheries management and regulatory purpose.

BASE LEVEL 2 DATA FORMATS AND RECOMMENDED DOCUMENTATION

Attached are formats and descriptions of data elements for CWDS data files pertaining to commercial, sport, ceremonial and subsistence landings; and vessel registration data. Also attached is an example of internal documentation to be included with each data set prepared for CWDS files. Documentation of CWDS data files should follow the attached example, and should be inserted at the beginning of each data file. These specifications for CWDS files were recommended by the CWDS Task Force subcommittee on Data Compatability at its November 15-16, 1976 meeting at Renton, Washington.

Lou Fredd, ODFW, Subcommittee Chairman
Chuck Woelke, WDF
Leo Pinkas, CDFG
John Jewell, ADFG
Bud Ledesma, WDG
Dave Ortmann, IDFG

Definition of Data Elements

Data Set No. 1 Commercial Landings Data

Data Element	Name	Field Length (Col. No. Inc.)	Description
1	Agency	1-2	Code of management agency making report. 01 = CDFG 04 = WDG 02 = ODFW 05 = IDFG 03 = WDF 06 = ADFG
2	Year	3-4	Year in which catch was made
3	Data Set	5-6	01 = Commercial landings
4	Subset	7-8	01 = Fish tickets. No other subsets defined at this time.
5	Ticket No.*	9-16	Number of document (e.g. fish ticket) from which data was obtained
6	Port Landed	17-21	Code for locality where fisherman or tender offloaded catch to shore (point of first landing). Agency making report to provide documentation for port codes used.
7	Date Landed	22-25	Month number in cols. 22-23, day of month in cols. 24-25
8	Type Area	26-27	Code supplied by agency making report to indicate kind of geographic area used to locate area of catch (e.g. PMFC statistical area, Columbia River statistical zone, etc.)
9	Catch Area*	28-37	Designation of area in which catch was made. Agency making report will provide thorough description of catch area boundaries as part of documentation.
10	Type Identification	38-39	Agency supplied code to indicate type of licensing or registration system used to identify vessel (or individual fisherman, if no vessel used) for which catch is reported. Recommended codes: 01 = USCG document number, 02 = State Marine Board number (or USCG undocumented number), 03 = BIA number, 04 = agency plate number for fishing vessel, 05 = agency license number for commercial fisherman, others to be assigned by reporting agency as needed.

11	Identification	40-47	Fisherman's boat license or permit number (see data element 10) under which catch was landed.
12	Species	48-52	Agency supplied code identifying species of catch reported on this record. In case of multi-species catches, one record will be made for each species or species group identified. For purposes of CWDS commercial grades (e.g. large chinook salmon), fish parts (e.g. roe) or unsorted catches (e.g. rockfish) will be assigned "species" codes. Agency making report to provide documentation for all species codes used.
13	Catch Units	53-54	Agency supplied code to indicate commercial units used to measure catch, and also to indicate condition of catch upon delivery to buyer (e.g. pounds round, pounds dressed, head on, etc.). Agency making report to supply documentation for all codes used. Recommended code: 01 = No. of fish
14	Documented Catch	55-62	Amount of catch as recorded on fish ticket, in units defined in data element 13. If catch is reported on fish ticket or other source document in both numbers and weight, record the weight as this data element, and record numbers as data element 17.
15	Catch, Pounds Round	63-70	Amount of catch expressed as live weight (pounds round or undressed). If catch is delivered undressed, data element 15 will be a repeat of data element 14. Otherwise agency will use appropriate factor to estimate catch expressed as pounds round. Report catch, pounds round for all species
16	Count/Estimate	71	Code to indicate if data element 17 (catch, numbers of fish) is a count made by the buyer, or an estimate based on agency's conversion of weight or volume of catch reported on fish ticket to numbers of fish. Agency making report will determine conversion factors based on seasonal and regional variations in average size of fish.

17	Catch, Numbers	72-79	All agencies will complete this field for salmon, using conversions from weight to numbers as necessary. For species other than salmon complete this field only if buyer reports an actual count of the catch.
18	Type Value	80-81	Code to indicate basis of cash value reported as data element 19. Recommended codes: 01 = as recorded on fish ticket. 02 = cash value of catch including both payment on date landed plus post season adjustments; others as determined by agency.
19	Value	82-91	Dollar value of catch to fisherman to nearest cent (don't show decimal point).
20	Gear*	92-94	Code to indicate category of fishing gear used to make catch. Agency making report uses own codes but provides documentation for all codes used.
21	Blank	95-120	For expansion, e.g. effort statistics.

*Signifies that data element is alpha numeric and is left justified--all other data elements are right justified.

Coastwide Data Task Force
November 15, 1976

COASTWIDE DATA SYSTEM

Definition of Data Elements

Data Set No. 2 Vessel Data

Data Element	Name	Field Length (Col. No. Inc.)	Description
1	Agency	1-2	See Data Set No. 1
2	Year	3-4	Year in which vessel was registered in fishery
3	Data Set	5-6	02 = Vessel data
4	Subset	7-8	01 = Commercial fishing vessel registration data (U.S.). No other subsets defined at present
5	Type Identification	9-10	Agency supplied code indicating type of boat documentation under federal law: 01 = USCG documented, 02 = State Marine Board Registry, 03 = None
6	Identification	11-18	Either USCG documented No., or State Marine Board No. (USCG undocumented No.)
7	Plate No.*	19-26	Plate No. issued to vessel by state fishery management regulations for year of this record
8	Type Length	27-28	Type of measurement used for reporting length. Recommended codes: 01 = overall length, ft. 02 = keel length, ft. 03 = USCG documented length, ft. Other codes designated by reporting agency as needed
9	Length	29-31	Length of vessel
10	Type Weight	32-33	Type of measurement used for reporting weight. Recommended codes: 01 = Net weight, tons 02 = Gross weight, tons Other codes designated by reporting agency as needed.
11	Weight	34-38	Weight of vessel
12	Horsepower	39-41	Horsepower of vessel as reported by fisherman.

13	Gears	42-56	Overall field consists of five sub-fields of 3 cols, each for reporting up to 5 types of fishing gear used from the vessel. Agency reporting vessel data will supply codes to designate gears
14	Name*	57-71	Name of vessel
15	Blank	72-80	For expansion

*Signifies that data element is alpha numeric and is left justified--all other data elements are right justified.

Coastwide Date File
November 18, 1976

COASTWIDE DATA SYSTEM

Definition of Data Elements

Data Set No. 3 Sport Landings Data

Data Element	Name	Field Length (Col. No. Inc.)	Description
1	Agency	1-2	See Data Set No. 1
2	Year	3-4	Calendar year in which catch was made.
3	Data Set	5-6	03 = Sport landings.
4	Subset	7-8	01 = Estimated total catch. No other subsets presently defined.
	Blank	9-10	
5	Type Period	11-12	Code for duration of time period for which total catch was estimated. Recommended codes: 01 = Entire year 02 = Calendar month 03 = Canadian statistical month 04 = Calendar week (Sunday ending) 05 = Statistical week (Saturday ending) 06 = Day Other codes as designated by reporting agency.
6	Period	13-20	Show inclusive dates for the period covered by this record. Show month number for beginning date in columns 11-12, and day of beginning date in columns 13-14. Show month number of ending date in columns 15-16 and day of ending date in columns 17-18.
7	Type Area	21-22	See Data Set No. 1.
8	Catch Area*	23-32	See Data Set No. 1.
9	Species	33-37	See Data Set No. 1.
	Blank	38-39	
10	Catch, Nos.	40-47	Total estimated sport catch (expressed as number of fish) made in the period defined by data element 7.
11	Catch, Lbs.	48-55	Estimated total catch expressed as pounds round or undressed weight. Agency making report will determine appropriate factors for converting catch in numbers to catch in pounds.

Data Element	Name	Field Length (Col. No. Inc.)	Description
12	Gear*	56-58	Code to indicate type of sport fishing gear used to make catch. Recommended code: 001 = Hook and Line. Agency making report to designate additional codes if necessary.
13	Type Effort	59-60	Code to indicate units used by reporting agency to measure sport angling effort. Recommended code: 01 = Angler days. Reporting agency to assign additional codes if necessary.
14	Effort	61-68	Total estimated angling effort.
15	Blank	69-80	For expansion.

*Signifies that data element is alpha numeric and is left justified--all other data elements are right justified.

Coastwide Data Task Force
November 18, 1976

Definition of Data Elements

Data Set No. 4 Ceremonial/Subsistence Landings

Data Element	Name	Field Length (Col. No. Inc.)	Description
1	Agency	1-2	See Data Set No. 1.
2	Year	3-4	Calendar year in which catch was made.
3	Data Set	5-6	04 = Subsistence landings.
4	Subset	7-8	01 = Subsistence; 02 = Ceremonial; other codes to be assigned as necessary by reporting agency.
5	Tribe	9-10	Code assigned by reporting agency to identify Indian tribe making catch. Codes used reported as part of documentation.
6	Type Period	11-12	See Data Set No. 3.
7	Period	13-20	See Data Set No. 3.
8	Type Area	21-22	See Data Set No. 1.
9	Catch Area*	23-32	See Data Set No. 1.
10	Species	33-37	See Data Set No. 1.
11	Catch Units	38-39	See Data Set No. 1.
12	Documented Catch	40-47	Total catch made in period defined as data element 7.
13	Catch, Lbs. Rd.	48-55	See Data Set No. 1.
14	Count/Estimate	56	See Data Set No. 1.
15	Catch, Nos.	57-64	See Data Set No. 1.
16	Gear*	65-67	See Data Set No. 1.
17	Type Effort	68-69	Code to show type of units used by reporting agency to measure effort used (e.g. net day) to capture subsistence catch. Reporting agency to document all codes used.
18	Effort	70-77	Total effort.
19	Blank	78-80	For expansion.

*Signifies that data element is alpha numeric and is left justified--all other data elements are right justified.

Coastwide Data Task Force
November 18, 1976

STATE OF ALASKA
JAY S. HAMMOND, GOVERNOR
DEPARTMENT OF FISH AND GAME
OFFICE OF THE COMMISSIONER
SUBPORT BUILDING – JUNEAU 99801

November 5, 1976

Lou,

I've enclosed sample coding sheets and a sample of how data base documentation would look if printed from a tape file. These are far from a final product and I did not bother to try and document every species or gear code for the sake of brevity.

I do believe that if it is finally determined to have separate internal documentation files accompanying each data file, the simplest form is from a basic outline, with freeform descriptions. It would be quite simple for each agency to code file documentation in a standard 80 column form and then simply build an 80 character record image file, accompanying each data tape(s) file sent to PMFC.

Again this is submitted for discussion purposes of the concept - not as a best or final solution.

Sincerely,

Butcher

Eldred Butcher

CWDS DATA BASE

DOCUMENTATION SHEET

BY: F. BUTCHER

AGENCY: ADF&G

DATE: 11-19-76

AGENCY ------- ALASKA DEPARTMENT OF FISH & GAME

*

FILE NAME ---- COMMERCIAL CATCH - 1972

CONTENT ---- THIS FILE CONTAINS COMMERCIAL FISHERIES CATCH DATA FOR THE CALENDAR YEAR 1972. THE DATA WAS COMPILED FROM FISH TICKET LANDING DOCUMENTS.

*

FILE STRUCTURE -- RECORDS = 120 CHARACTERS LONG -- BLOCKING FACTOR IS 20.

*

FILE DEFINITION -- DATA ELEMENTS DEFINED

*

DATA ELEMENT NUM & NAME	*	POSITN/LNGTH/TYP	*	DATA ELEMENT DOCUMENTATION/DESCRIPTION
01-AGENCY	*	1-2 2 N	*	CONTENT IS NUMERIC CODE OF 06 (= ADF&G)
02-YEAR	*	3-4 2 N	*	TWO DIGIT YEAR (CONTENT IN THIS FILE = 72)
03-DATA SET	*	5-6 2 N	*	CONTENT IS 01 (= COMMERCIAL CATCH)
04-SUBSET	*	7-8 2 N	*	CONTENT IS 01 (= FISH TICKET)
05-TICKET #	*	9-16 8 A/N	*	ADF&G TICKET NUMBER IS NUMERIC BUT ONLY USES

CWDS DATA BASE

PAGE 2 OF 4

DOCUMENTATION SHEET

BY: _____

AGENCY: _____

DATE: _____

					* FIRST SIX POSITION OF THE FIELD. THE LAST TWO * POSITIONS ARE BLANK. *
06-PORT LAND	* 17-21	5	A/N	* PORT OF LANDING IS NOT CONTAINED IN THIS FILE * THE FIELD IS BLANK. *	
07-DATE LAND	* 22-25	4	A/N	* THE DATE OF LANDING IS MO-DA -- SOME DATES MAY * BE MISSING (< 01%) THEN FIELD WILL BE BLANK *	
LOG-TYPE AREA	* 26-27	2	N	* THIS CODE WILL BE A CONSTANT OF 01 * INDICATING THAT ALL RECORDS ARE ADF&G * STATISTICAL-AREA. *	
09-STAT AREA	* 28-37	10	A/N	* THE STATISTICAL AREA CODE SUPPLIED BY ADF&G IS * A 5 DIGIT CODE. THE FIRST 3 DIGITS ARE THE * MAJOR AREA DESIGNATION WITH THE LAST TWO DIGITS * REPRESENTING SUB-AREA. GEOGRAPHIC LOCATIONS OF * THESE CODES MAY BE DERIVED BY CONSULTING * EXTERNAL DOCUMENTATION (STATISTICAL AREA MAPS) * FROM THE ALASKA DEPT. FISH & GAME - JUNEAU, AK. * LESS THAN 1% OF THE RECORDS CONTAIN BLANK * AREA CODES. ALSO THE STAT AREA CODE ONLY USES * THE FIRST 5 CHAR OF THE FIELD - LAST 5 = BLANKS	

CWDS DATA BASE

DOCUMENTATION SHEET

BY: _____

AGENCY: _____

DATE: _____

1 . . . 5 . . . 10 . . . 15 . . . 20 . . . 25 . . . 30 . . . 35 . . . 40 . . . 45 . . . 50 . . . 55 . . . 60 . . . 65 . . . 70 . . . 75 . . . 80				
	*			*
10-TYPE ID	*	38-39	2	N * CODE IS A CONSTANT OF 02 WHICH INDICATES THE
	*			* TYPE OF VESSEL ID - IN THIS CASE A STATE
	*			* MARINE BOARD NUMBER.
	*			*
11-VESSEL #	*	40-47	8	A/N * THIS IS THE 5 DIGIT VESSEL NUMBER (ADF&G NO.)
	*			* THAT IDENTIFIES THE VESSEL THAT MADE THE
	*			* COMMERCIAL LANDING. THE VESSELS MAY BE FURTHER
	*			* IDENTIFIED EITHER THRU MATCHING WITH THE
	*			* CDNS VESSEL DATA BASE OR EXTERNAL DOCUMENTATION
	*			* VIA THE ALASKA DEPT OF FISH & GAMES VESSEL
	*			* REGISTER (A PRINTED BOOK OF VESSELS/OPERATORS/
	*			* GEAR) AND VESSEL PHYSICAL DESCRIPTION.
	*			*
	*			* ONLY THE FIRST FIVE DIGITS OF THIS FIELD IS
	*			* USED - THE REMAINING 3 ARE BLANK.
	*			*
12-SPECIES	*	48-52	5	A/N * ADF&G SPECIES CODES ARE 3 DIGITS (LAST 2 DIGITS
	*			* OF THIS FIELD ARE BLANK). THE FOLLOWING LIST
	*			* ADF&G SPECIES CODES WITH NAMES:
	*			* 110 - PACIFIC COD - GADUS MACROCEPHALUS
	*			* 120 - FLOUNDER - FAMILY PLEURONECTIDAE
	*			* 130 - LING COD - OPHIODON ELONGATUS

CWDS DATA BASE

DOCUMENTATION SHEET

BY: _____

AGENCY: _____

DATE: _____

```
1    5    10   15   20   25   30   35   40   45   50   55   60   65   70   75   80
                  *                  * 20.0. - HALIBUT - HIPPOGLOSSUS STENOLEPIS
                  *                  * 410. - KING SALMON - ONCORHYNCHUS TSHAWYTSCHA
                  *                  * 420. - RED SALMON -          **      NERKA
                  *                  * 430. - COHO SALMON -         **      KISUTCH
                  *                  * 440. - PINK SALMON -         **      GORBUSCHA
                  *                  * 450. - CHUM SALMON -         **      KETA
                  *                  * 910. - DUNGENESS CRAB - CANCER MAGISTER
                  *                  * 920. - KING CRAB - PARALITHODES CAMTSCHATICA
                  *                  *
13-UNITS          * 53-54   2    N.  * CONTAINS CODE FOR TYPE OF UNITS FOR CATCH
                  *                  * QUANTITY MEASUREMENTS 01 = NUMBER OF FISH
                  *                  *                       02 = POUNDS DRESSED
                  *                  *                       03 = POUNDS ROUND
                  *                  * THIS DEFINES THE UNITS OF MEASUREMENT FOR THE
                  *                  * FOLLOWING FIELD (FIELD 14 DOCUMENTED CATCH).
                  *                  *
14-DOC CATCH      * 55-62   8    N.  * QUANTITY OF CATCH RECORDED ON SOURCE DOCUMENT.
                  *                  * THIS IS THE PRIMARY MEASURE USED AND THE CODE
                  *                  * IN FIELD 13 INDICATES THE UNIT USED.
                  *                  *
15-LBS. ROUND     * 63-70   8    A/N * THIS CONTAINS THE POUNDS ROUND (LANDING WEIGHT)
                  *                  * THIS MAY BE A CONVERTED FIGURE BY USING A
                  *                  * CONVERSION WEIGHT BY SPECIES X FIELD 14.
```

CWDS DATA BASE

DOCUMENTATION SHEET

BY: _____

AGENCY: _____

DATE: _____

16-EST. COUNT	71-71	1	N	1 = ESTIMATED COUNT (CALCULATED BY CONVERSION FACTOR X FIELD 15.	
				2 = ACTUAL COUNT CONTAINED ON FISH TICKET.	
17-NUM CATCH	72-79	8	N	THE NUMBER OF CATCH AS DEFINED BY FIELD 16.	
18-TYP. VALUE	80-81	2	N	A CONSTANT OF 01. THIS CODE DESIGNATES FIELD 19 AS BEING THE ACTUAL PRICE PAID TO FISHERMEN THAT APPEARS ON THE FISH TICKET. 02 = INDICATES A CALCULATED VALUE.	
19-VALUE	82-91	10	N	DOLLAR VALUE OF CATCH TO NEAREST CENT. THE DECIMAL POINT IS ASSUMED. (0000012345 = $1234.56)	
20-GEAR	92-94	3	N	THIS FIELD CONTAINS A 3 DIGIT GEAR CODE.	
				AGFEG GEAR CODES ARE AS FOLLOWS:	
				001 = PURSE SEINE	
				002 = BEACH SEINE	
				003 = DRIFT NET	
				004 = SET NET	
				005 = HAND TROLL	
				015 = POWER TROLL	

PAGE 6 OF 6

CWDS DATA BASE

DOCUMENTATION SHEET

AGENCY: ____________

BY: ____________

DATE: ____________

```
1   5    10   15   20   25   30   35   40   45   50   55   60   65   70   75   80
               *             *
21-FILLER      * 85-130  26  A/N * BLANK FILLER IS NOT USED
               *             *

***~~~~~~~~~~~~~~~~~~~~~~~~~~~ END OF DOCUMENTATION ** ~~~~~~~~~~~~~~ ***
```

AGENCY -------ALASKA DEPARTMENT OF FISH & GAME

FILE NAME --COMMERCIAL CATCH - 1972

CONTENT --THIS FILE CONTAINS COMMERCIAL FISHERIES CATCH DATA FOR THE CALENDAR YEAR 1972. THE DATA WAS COMPILED FROM FISH TICKET LANDING DOCUMENTS.

FILE STRUCTURE -- RECORDS = 120 CHARACTERS LONG---BLOCKING FACTOR IS 20.

FILE DEFINITION -- DATA ELEMENTS DEFINED

DATA ELEMENT NUM & NAME	DATA ELEMENT POSITN/LNGTH/TYP			DATA ELEMENT DOCUMENTATION/DESCRIPTION
Ø1-AGENCY	1-2	2	N	CONTENT IS NUMERIC CODE OF Ø6 (= ADF&G)
Ø2-YEAR	2-3	2	N	TWO DIGIT YEAR (CONTENT IN THIS FILE = 72)
Ø3-DATA SET	5-6	2	N	CONTENT IS Ø1 (= COMMERCIAL CATCH)
Ø4-SUBSET	7-8	2	N	CONTENT IS Ø1 (=FISH TICKET)
Ø5-TICKET #	9-16	8	A/N	ADF&G TICKET NUMBER IS NUMERIC BUT ONLY USES FIRST SIX POSITION OF THE FIELD. THE LAST TWO POSITIONS ARE BLANK.
Ø6-PORT LAND	17-21	5	A/N	PORT OF LANDING IS NOT CONTAINED IN THIS FILE THE FIELD IS BLANK.
Ø7-DATE LAND	22-25	4	A/N	THE DATE OF LANDING IS MO-DA -- SOME DATES MAY BE MISSING (≤ Ø1%) THEN FIELD WILL BE BLANK
Ø8-TYPE AREA	26-27	2	N	THIS CODE WILL BE A CONSTANT OF Ø1 INDICATING THAT ALL RECORDS ARE ADF&G STATISTICAL-AREA
Ø9-CTCH AREA	28-37	1Ø	A/N	THE STATISTICAL AREA CODE SUPPLIED BY ADF&G IS A 5 DIGIT CODE. THE FIRST 3 DIGITS ARE THE MAJOR AREA DESIGNATION WITH THE LAST TWO DIGITS REPRESENTING SUB-AREA. GEOGRAPHIC LOCATIONS OF THESE CODES MAY BE DERIVED BY CONSULTING EXTERNAL DOCUMENTATION (STATISTICAL AREA MAPS) FROM THE ALASKA DEPT. FISH & GAME - JUNEAU AK. LESS THAN 1% OF THE RECORDS CONTAIN BLANK AREA CODES. ALSO THE STAT AREA CODE ONLY USES THE FIRST 5 CHAR OF THE FIELD - LAST 5 = BLANKS

10-TYPE ID	38-39	2	N	CODE IS A CONSTANT OF 02 WHICH INDICATES THE TYPE OF VESSEL ID - IN THIS CASE A STATE MARINE BOARD NUMBER.
11-VESSEL #	40-47	8	A/N	THIS IS THE 5 DIGIT VESSEL NUMBER (ADF&G NO.) THAT IDENTIFIES THE VESSEL THAT MADE THE COMMERCIAL LANDING. THE VESSELS MAY BE FURTHER IDENTIFIES EITHER THRU MATCHING WITH THE CDWS VESSEL DATA BASE OR EXTERNAL DOCUMENTATION VIA THE ALASKA DEPT OF FISH & GAMES VESSEL REGISTER (A PRINTED BOOK OF VESSELS/OPERATORS/ GEAR/AND VESSEL PHYSICAL DESCRIPTION. ONLY THE FIRST FIVE DIGITS OF THIS FIELD ARE USED - THE REMAINING 3 ARE BLANK
12-SPECIES	48-52	5	A/N	ADF&G SPECIES CODES ARE 3 DIGITS (LAST 2 DIGITS OF THIS FIELD ARE BLANK). THE FOLLOWING LISTS ADF&G SPECIES CODES WITH NAMES: 110 - PACIFIC COD - GADUS MACROCEPHALUS 120 - FLOUNDER - FAMILY PLEURONECTIDAE 130 - LING COD - OPHIDON ELONGATUS 200 - HALIBUT - HIPPOGLOSSUS STENOLEPIS 410 - KING SALMON - ONCORHYNCHUS TSHAWYTSCHA 420 - RED SALMON - *** NERKA 430 - COHO SALMON - *** KISUTCH 440 - PINK SALMON - *** GORBUSCHA 450 - CHUM SALMON - *** KETA 910 - DUNGENESS CRAB - CANCER MAGISTER 920 - KING CRAB - PARALITHODES CAMTSCHATICA
13-UNITS	53-54	2	N	CONTAINS CODE FOR TYPE OF UNITS FOR CATCH QUANTITY MEASURMENTS 01 = NUMBER OF FISH 02 = POUNDS DRESSED 03 = POUNDS ROUND THIS DEFINES THE UNITS OF MEASUREMENT FOR THE FOLLOWING FIELD (FIELD 14 DOCUMENTED CATCH).
14-DOC CATCH	55-62	8	N	QUANTITY OF CATCH RECORDED ON SOURCE DOCUMENT. THIS IS THE PRIMARY MEASURE USED AND THE CODE IN FIELD 13 INDICATES THE UNIT USED.
15-LBS ROUND	63-70	8	A/N	THIS CONTAINS THE POUNDS ROUND (LANDING WEIGHT) THIS MAY BE A CONVERTED FIGURE BY USING A CONVERSION WEIGHT BY SPECIES X FIELD 14.
16-EST COUNT	71-71	1	N	1 = ESTIMATED COUNT (CALCULATED BY CONVERSION FACTOR X FIELD 15). 2 = ACTUAL COUNT CONTAINED ON FISH TICKET.

17-NUM BATCH	72-79	8	N	THE NUMBER OF CATCH AS DEFINED BY FIELD 16.
18-TYP VALUE	80-81	2	N	A CONSTANT OF Ø1 - THIS CODE DESIGNATES FIELD 19 AS BEING THE ACTUAL PRICE PAID TO FISHERMEN THAT APPEARS ON THE FISH TICKET. Ø2 - INDICATES A CALCULATED VALUE.
19-VALUE $	82-91	1Ø	N	DOLLAR VALUE OF CATCH TO NEAREST CENT. THE DECIMAL POINT IS ASSUMED (ØØØØ123456 = $1234.56)
2Ø-GEAR	92-94	3	N	THIS FIELD CONTAINS A 3 DIGIT GEAR CODE. ADF&G GEAR CODES ARE AS FOLLOWS: ØØ1 - PURSE SEINE ØØ2 - BEACH SEINE ØØ3 - DRIFT NET ØØ4 - SET NET ØØ5 - HAND TROLL Ø15 - POWER TROLL
21-FILLER	95-12Ø	26	A/N	BLANK FILLER IS NOT USED

END OF DOCUMENTATION