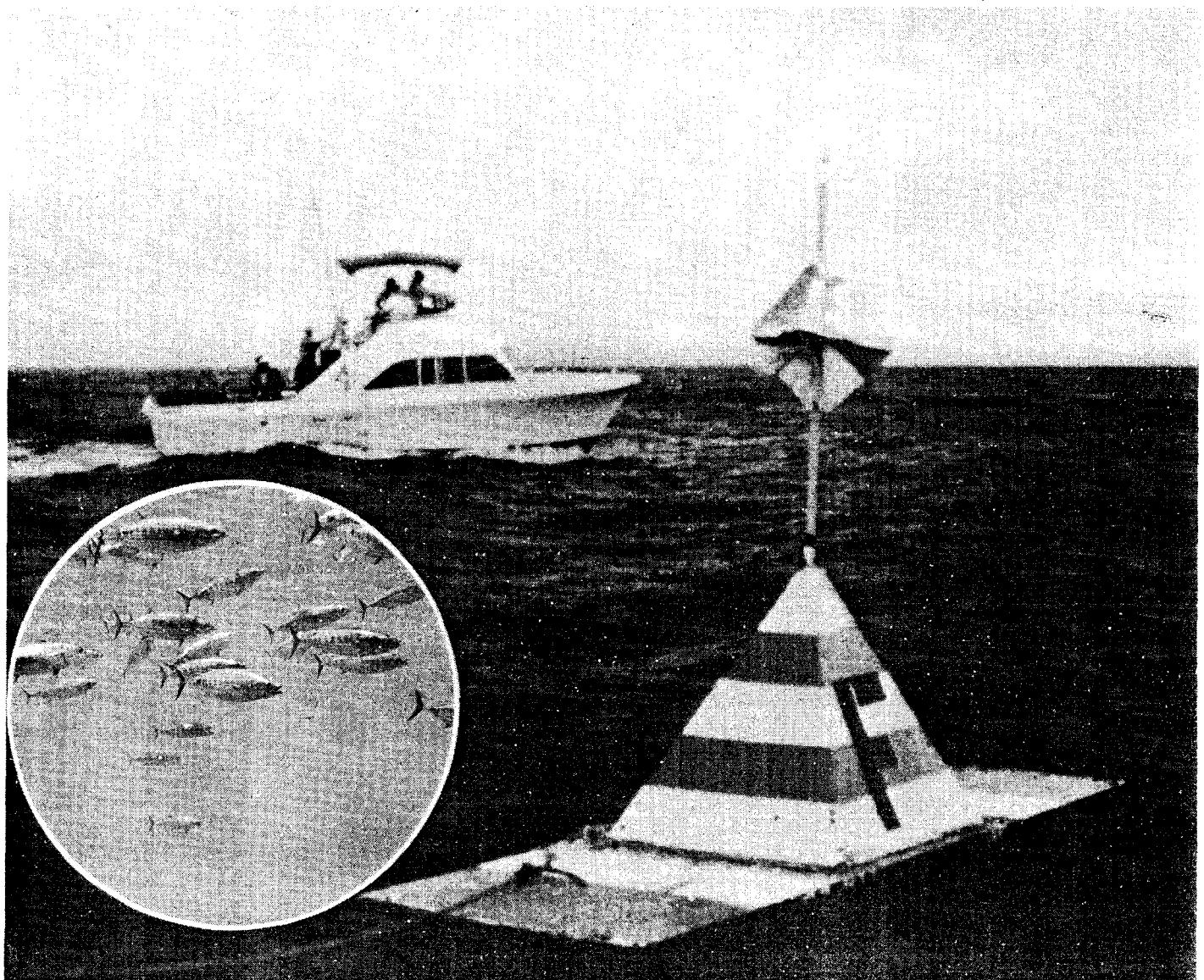


A STATEWIDE FISH AGGREGATING SYSTEM



STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES

LIBRARY
SOUTH PACIFIC COMMISSION

DECEMBER 1978

THE PROBLEM

Tunas and other pelagic fishes are seasonally abundant in the waters around Hawaii. However, these fishes are not always concentrated in the right places at the right time and Hawaii's commercial and recreational fishermen spend long hours searching for fish--hours which could more profitably be used in fishing.

THE PROGRAM

The results of an experimental fish aggregating buoy project conducted by the Honolulu Laboratory, National Marine Fisheries Service, have indicated that anchored buoys are effective in congregating and holding pelagic species of fishes such as tunas, mahimahi, ono, and other commercially important fishes.

It is proposed that a statewide system of anchored buoys be deployed around Hawaii for the use of the entire fishing community. The plans call for the deployment of buoys around all the major islands and also maintaining and monitoring them for a period of 5 years.

THE PAYOFF

The fish aggregating buoys should significantly reduce the amount of time spent by Hawaii's commercial and recreational fishermen in searching for fish and fish schools. In addition, benefits to the aku fishery include some savings in time lost to catching bait and a gain in productive fishing time around the buoys when fishing is generally poorer in the off-season on the traditional fishing grounds. Additional benefits to other sectors of the fishing community include the extension of the ika-shibi fishery from a primarily night fishery to also a day fishery. The ika-shibi fishery that initially started off Hilo has spread to Kona by virtue of the experimental buoy project and has promise of spreading to all the other islands with the inception of the statewide system. Also, increased satisfaction should accrue to recreational fishermen fishing from private and charter boats resulting from almost guaranteed catches around the buoys.

THE COST

The cost of the program is estimated at \$337,700 for the first two years.

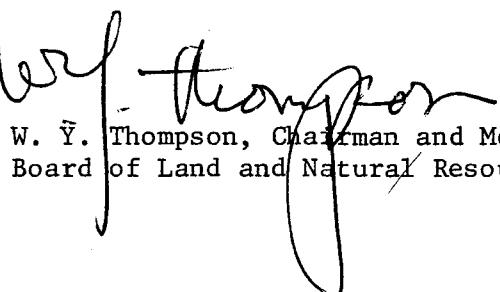
FOREWORD

Hawaii's fishing industry, after a long dormant period, appears to be moving into a new era of growth. Although the magnitude of the fisheries resource is still unknown, it is certain that catches, both commercial and recreational, can be substantially increased.

As with any development program, expansion of Hawaii's fisheries will depend on close coordination and cooperation between State and Federal agencies, public foundations, and private industry. The project outlined in this document illustrates the positive benefits of such a cooperative approach. The Honolulu Laboratory of the U.S. National Marine Fisheries Service (NMFS) has, in the past three years, developed the theoretical concept of fish aggregating devices into a highly effective working system. With financial support from the Pacific Tuna Development Foundation, and substantial input from the State and the local fishing industry, the NMFS pilot project added more than one million pounds of fish to the 1978 landings.

It is now the responsibility of the State Department of Land and Natural Resources to transfer the technology of this promising pilot project into a truly beneficial system for Hawaii's commercial and recreational fishermen. The Statewide Fish Aggregating System described herein has been conceived in close cooperation with NMFS scientists, following public hearings on Oahu, Kauai, Maui, Lanai, and Hawaii.

This project, although substantial, is just the first of a series of co-ordinated State developmental programs for Hawaii's fishing industry.

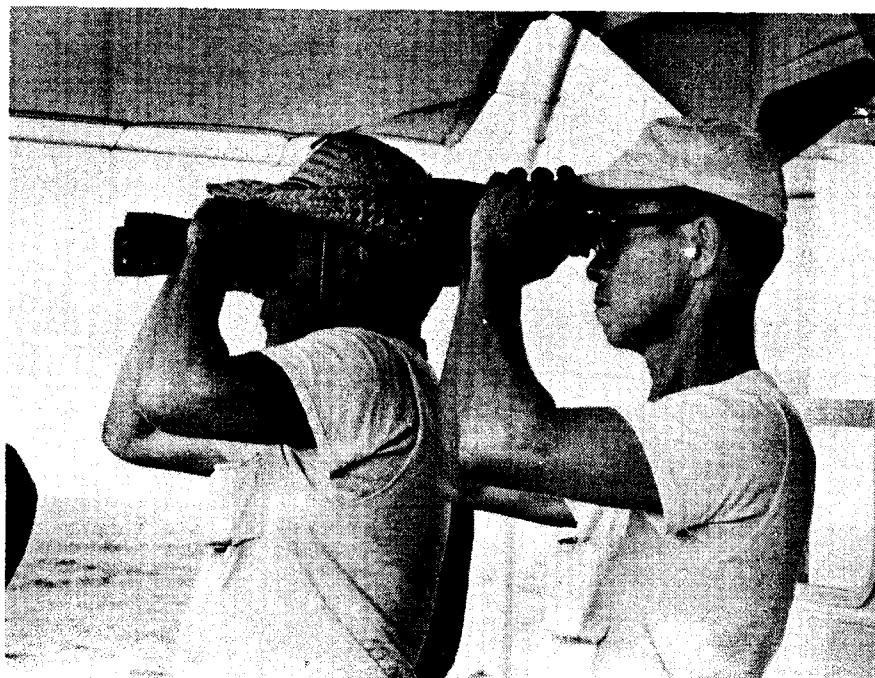

W. Y. Thompson, Chairman and Member
Board of Land and Natural Resources

A STATEWIDE FISH AGGREGATING SYSTEM

Hawaii lacks the large continental shelf from which many commercially important fishes are taken and the warm waters of the central Pacific are generally less rich than those of northern seas. However, the clear blue waters surrounding the Hawaiian Islands are the habitat of the tunas and other commercially important pelagic fishes. These fast-swimming pelagic fishes are widely distributed and seasonally abundant in the central Pacific, but there is still a need to improve the efficiency of catching them and fish aggregating devices may be one solution to this problem.

Background

Most fishing methods include a hunting phase which is relatively inefficient when harvesting a resource. In the surface tuna fisheries of the world, much time is spent by purse seiners and pole-and-line fishing vessels searching or "scouting" for tuna schools. Recreational fishermen also spend inordinately large amounts of time trailing fishing lines from a boat hoping for the occasional strike from a fish usually encountered by chance.



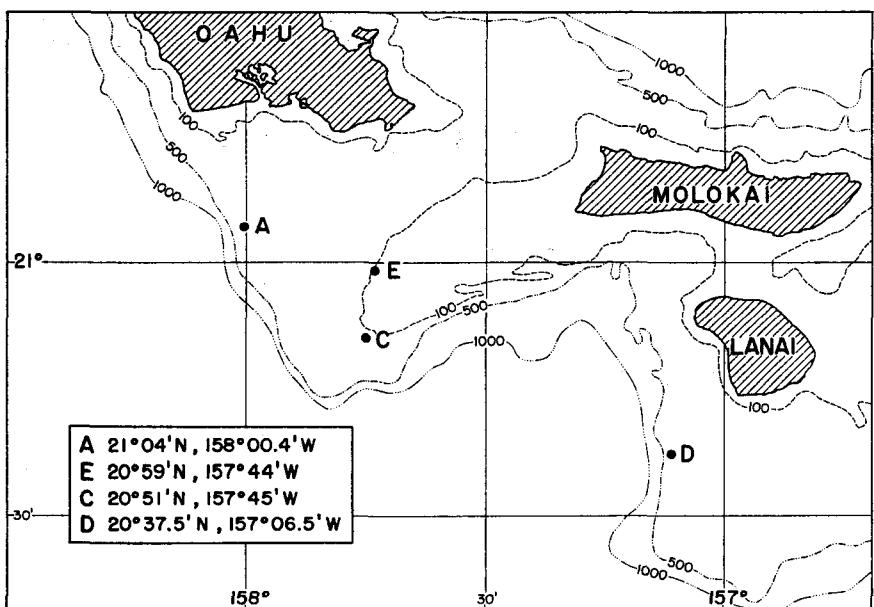
Traditionally, Hawaiian pole-and-line fishermen locate tuna schools by searching for bird flocks that are associated with them. When tuna schools are scarce the fishermen expend many hours scanning the horizon with binoculars for telltale signs of fish. Analysis of the operations of several Hawaiian pole-and-line vessels revealed that 62% of their time was spent searching for tuna schools and only 7% in actually fishing. The remaining 31% of their time was spent traveling to and from the fishing grounds.

It has long been known that tunas and other pelagic fishes are attracted to and congregate around floating objects, such as driftwood, logs, rafts, flotsam, and carcasses of whales and other animals. Enterprising fishermen around the world have taken advantage of this behavioral characteristic of such pelagic fishes to develop unique fisheries. In the Sea of Japan and in the Mediterranean Sea, rafts constructed of various material have been anchored to attract mahimahi which are then captured by the use of purse seines. In the Philippine Islands, purse seiners fish successfully around anchored bamboo rafts, making catches of well over 100 metric tons (220,000 lb) of skipjack tuna (aku) per set. In Hawaiian waters, commercial and recreational fishermen have also been using this behavior of pelagic fishes to good advantage. The fishermen keep a sharp lookout for floating objects and eagerly fish around any logs and flotsam they encounter. In the eyes of the fishermen the only problem is that such encounters with floating objects are entirely due to chance and occur only rarely.

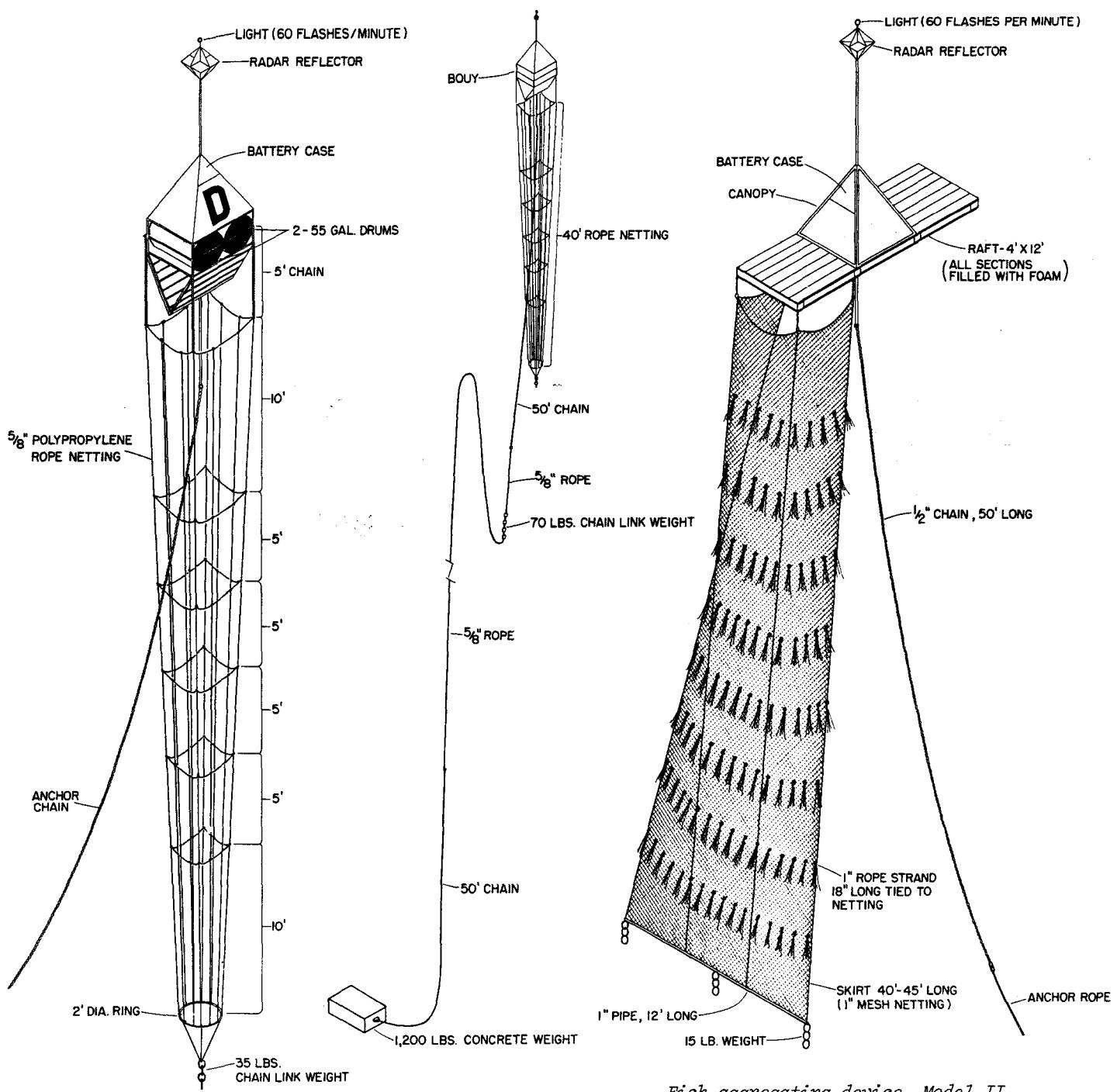
To remove the encounters with floating objects from the realm of chance and to determine if the use of such anchored floating objects could be adapted to conditions in Hawaiian waters, the Honolulu Laboratory of the National Marine Fisheries Service (NMFS) with the cooperation of the Pacific Tuna Development Foundation (PTDF), began experimenting with anchored buoys in May 1977. Floating devices were constructed and anchored in a few selected locations initially off Oahu, Lanai, and later off Kona and observations were made if such objects could attract and hold tuna schools and other pelagic fishes long enough for fishermen to fish them profitably.



Location of experimental fish aggregating devices anchored off Oahu and Lanai between August and October 1977.

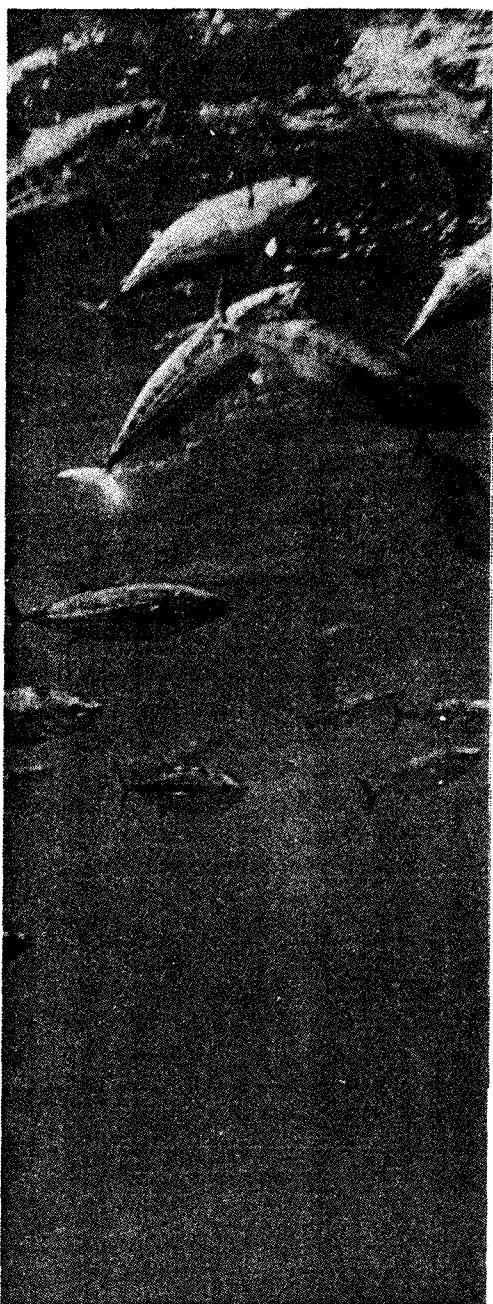


The aggregating devices consisted of a buoy made of two 55-gal oil drums which supported a canopy above to house the battery pack, a radar reflector and light, and a 45-ft long rope netting suspended beneath the buoy. Later improvements included the use of a raft in place of the 55-gal drums. The mooring system consisted of 50-ft chain lengths at the anchor and buoy, a 1,200-lb concrete block anchor, an anchor line of 5/8-inch polypropylene rope, and sufficient weight at the top third of the anchor line to keep the line submerged at all times.



Fish aggregating device, Model I.

Fish aggregating device, Model II.



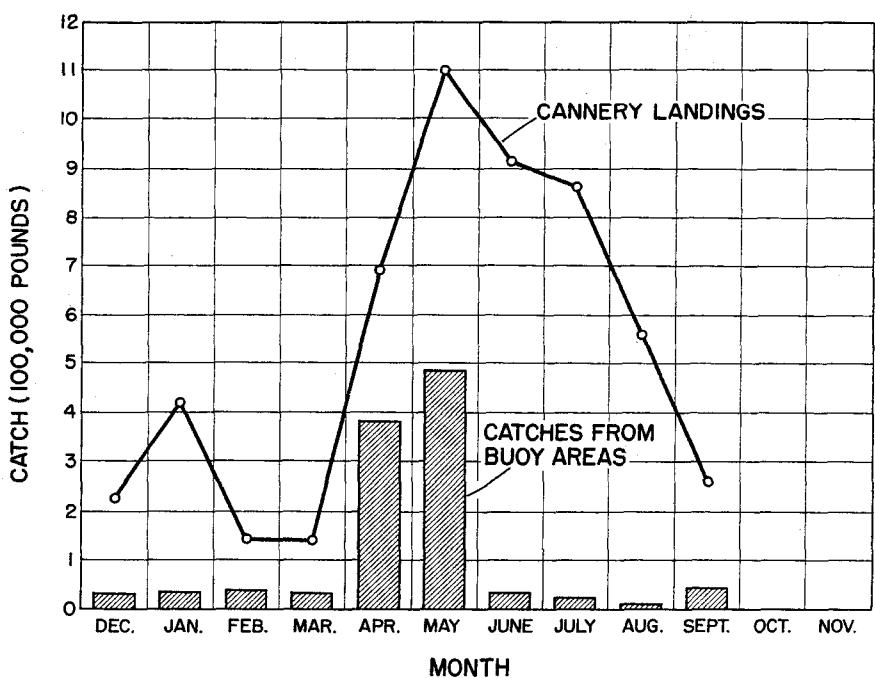
The monthly skipjack tuna catch made by the commercial Hawaiian pole-and-line fleet around the four buoys anchored near Oahu and Lanai ranged from 11,606 to 487,332 lb from December 1977 to September 1978. These catches constituted 2.1% to 54.7% of the total monthly landings at the Honolulu tuna cannery. The total catch around the buoys during this period amounted to 1,138,545 lb which translated to 21.5% of the total landings of skipjack tuna at the cannery.

Initially, the buoys were anchored on May 9, 1977 at three sites off Oahu and over Penguin Bank and a fourth site on a seamount 77 miles west of Hookena, Kona. All four buoys were lost after 2½ months and new buoys were re-anchored between August and October. The new buoys were anchored in 240 to 345 fathoms of water and from 10 to 25 miles from shore.

Two additional buoys were added to the original set, both off the Kona coast in May 1978, one (buoy F) 5 miles west of Kailua in 1,250 fathoms of water, the other (buoy G) 7 miles northwest of Keahole Point in 220 fathoms of water.

Because the buoys were initially deployed at the beginning of the aku season in May 1977 and consequently the fishermen were reluctant to leave their traditional fishing grounds, utilization of the buoys in the beginning was minimal. The aku season ended as usual in late fall most likely because of the lack of fish in the traditional fishing grounds and a few boats began visiting the buoys in late December. The number of visits continued to be minimal through January until some boats began making catches of 5,000-10,000 lb. By the end of February 1978 all the aku boats in the fleet had visited the buoys at least once and the fishermen appeared greatly pleased with the buoys. In spite of their enthusiasm, however, they failed to report their visits and catches.

The number of visits and the reporting of catches improved with time and provided some data to make preliminary evaluations of the buoys. In April 381,000 lb were reported taken in 52 visits and in May the catches



were even better: 487,000 lb were reported in 84 visits. The catches from the buoy areas declined to about 30,000 lb, reflecting the decrease in number of visits to seven in June and nine in July, as the aku fleet once again concentrated on catching the large "season" aku which began to appear in the fishery in areas away from the buoys.

The results of the commercial aku boat activities around the buoys have been extremely encouraging (see table). Briefly, the results indicated that:

1. Fish schools attracted to the buoys appeared to remain in the vicinity for up to several days.
2. Catches of 10,000-20,000 lb occurred quite frequently and the largest catch was well over 30,000 lb.
3. The average catch-per-boat-per-day around the buoys was considerably higher than the 15-year long-term average catch of the commercial aku fleet from a comparable area and time.
4. The buoys reduced the time lost due to scouting for fish schools.

Table 1.--Monthly catches of aku from buoy areas in pounds.

Year month	Buoy										Cannery landings	Percent of cannery landings		
	A		B		C		D		Totals					
	Catch	No. of visits	Catch	No. of visits	Catch	No. of visits	Catch	No. of visits	Catch	No. of visits				
<u>1977</u>														
Dec.	10,000	1	--	--	--	--	25,200	2	35,200	3	227,000	15.5		
<u>1978</u>														
Jan.	9,000	2	--	--	18,600	3	11,059	2	38,659	7	410,210	9.0		
Feb.	6,712	6	--	--	1,846	2	38,979	18	47,537	26	143,522	33.0		
Mar.	10,851	7	--	--	--	--	25,410	17	36,261	24	142,646	25.4		
Apr.	86,907	14	5,110	1	88,734	9	200,198	28	380,949	52	696,000	54.7		
May	220,261	50	--	--	--	--	267,071	34	487,332	84	1,100,000	44.3		
June	31,500	7	--	--	--	--	--	--	31,500	7	909,456	3.5		
July	28,109	9	--	--	--	--	--	--	28,109	9	869,491	3.2		
Aug.	--	--	--	--	--	--	11,606	3	11,606	3	555,940	2.1		
Sept.	--	--	--	--	--	--	25,532	6	41,432	7	1251,363	16.4		
Totals	403,340	96	5,110	1	109,180	14	605,055	110	1,138,545	222	5,290,080	21.5		
Buoy catch per visit	4,201		5,110		7,798		5,592		25,080					
Long-term catch per day's fishing	4,700		3,790		5,485		4,744		4,680					

¹Includes 15,900 lb caught at buoy G.

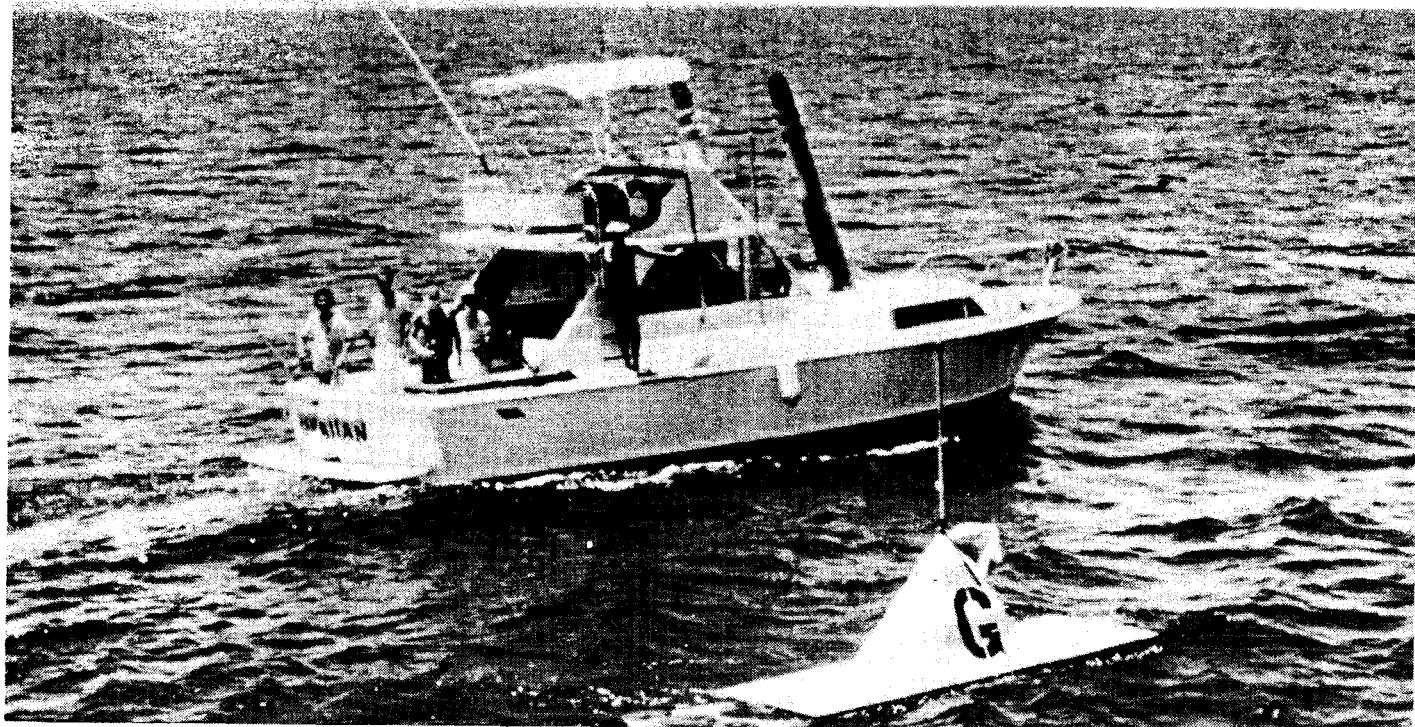
²Catch at buoy G omitted.

5. Far less bait than would normally be used for fishing schools was required to fish around the buoys.
6. Because of the need for less bait, the vessels made more fishing trips per week. Several boats fished on 5 to 6 successive days during 1 week, while another fished for 8 days over a 9-day period.

The number of trolling vessels operating in Hawaii in 1976 was estimated to be 1,806. This includes recreational and commercial trolling, and charter trolling vessels. However, in Hawaii the distinction between recreational and commercial boats is often unclear because many recreational fishermen sell their catches. The experimental fish aggregating buoys have been a boon to trolling fishermen. The recreational trollers have had increased catches and less "skunk" days fishing around the buoys; the charter trollers have had an almost unfailing source of small aku which they catch around the buoys to use as bait in trolling for billfish. A statewide fish aggregating system promises to benefit troll fishermen throughout the state.

Reports received from the troll fishing community on Oahu indicated that trolling boats began fishing around the aggregating objects within 1 month after the initial deployment of the buoys in May 1977. By the end of 2 months (early July), the trolling boats were taking 200-250 lb of fish per visit, nearly all mahimahi, a valuable market fish. Fishing was interrupted in late July, when all the buoys were lost but resumed in January after the buoys had been replaced in September and October. The catches remained low (less than 80 lb per visit) until March 1978 and then picked up to over 100 lb per visit in April. The total monthly catch reached 2,500 lb in April and 5,300 lb in May.

The Maui and Lanai trollers fared even better at buoy D, located in the lee of Lanai, 10.5 miles from Palaoa Point. There, individual boat catches ranged from 300 to 700 lb of aku and ahi and 100 lb of mahimahi per boat per weekend in April. In one weekend in April over 5,000 lb of fish were caught at buoy D by all the boats.



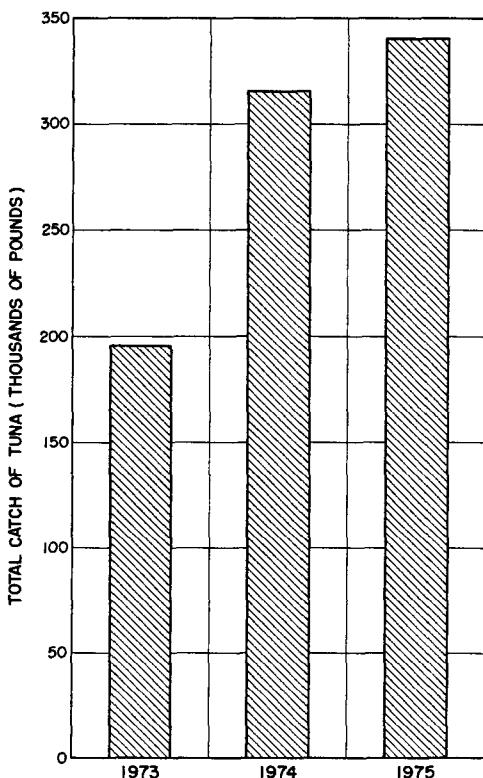
The activity of trolling boats around the buoys was hectic at times. During the second week in April, when buoy A was teeming with large schools of aku and birds estimated at over 1,000 were seen everywhere from the buoy out to 1-2 miles, no less than 15 trollers were seen within a radius of 3 miles from the buoy on a Friday. The number of boats increased to about 30 on Saturday and Sunday. Information obtained from Kona fishermen show that buoy F was used extensively by billfish tournament participants during the past summer. Nearly all of the boats headed to buoy F each morning to catch small aku which were used as bait for marlin fishing. In addition, the handline fishermen (ika-shibi style), who normally do their fishing for large yellowfin tuna at night, were reportedly fishing in the vicinity of porpoises which circled the buoys during the day.

An urgent need exists to increase the efficiency of the Hawaiian aku fishery by improving fishing practices to reduce the time lost to bait catching and scouting operations so that the boats can devote more time to actually catching fish. The present method of catching aku commercially in Hawaii requires a large supply of baitfish (nehu), which often becomes scarce at the height of the fishing season, necessitating a large expenditure of time for bait catching operations (1 day for every 1-2 days of fishing); and also long hours are spent in searching for fish schools over a wide area. A system of buoys placed at strategic locations around several of the islands could result in (1) increased fishing activity for boats which often lie idle for extended period during the winter (off-season) months, (2) increased catches, particularly during the off-season, and (3) reduced cost to the boat operators, resulting from less fishing time lost due to searching for schools.

The early results also showed that the buoys could extend the fishing period of handline (ika-shibi or drop-stone) fishermen catching large yellowfin and bigeye tunas. This type of fishing is normally done at night, but in Kona, the presence of the buoys made it possible for these fishermen to catch the large tunas during daylight also.

At present, ika-shibi fishing is done mainly off Hilo and Kona, and the large aggregate catches of ahi by numerous one- or two-man boats have made important contributions to the total state tuna catch. Already several fish exporting firms which ship fish to mainland markets by air freight have emerged in Kona and Hilo.

The buoys will provide tremendous opportunities for recreational fishing. Catches of fish are prac-

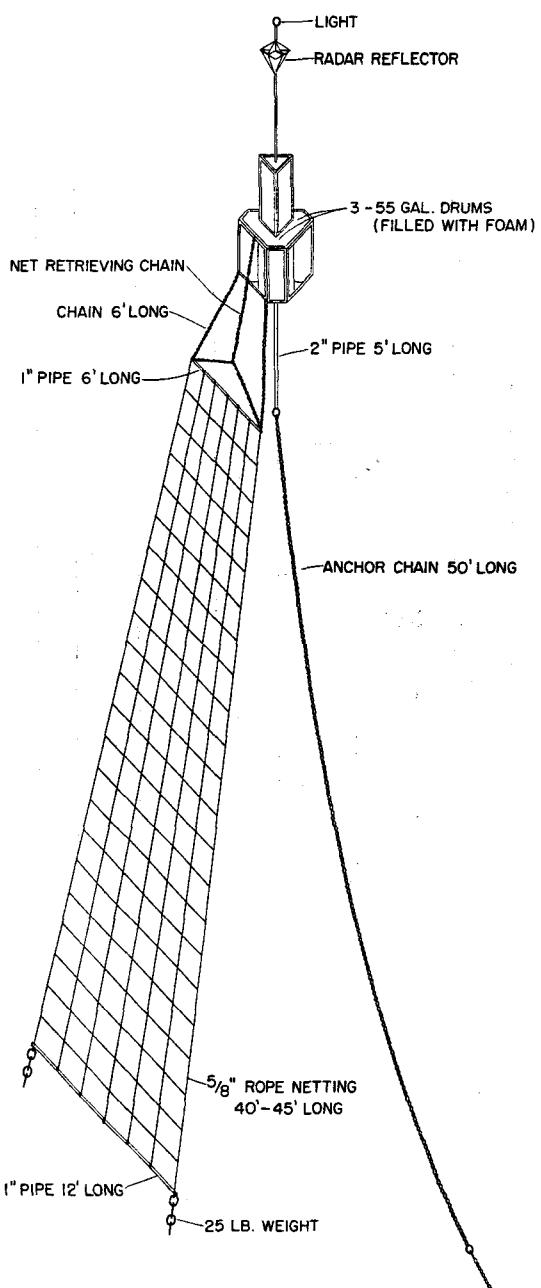


The ika-shibi fishery shows promise of becoming an important segment of Hawaiian fisheries. The term "ika-shibi," of Japanese origin, literally translates to "squid tuna" and was coined to describe a Hilo-Kona based fishery which uses handlines and squid, as bait, to catch tunas. Bigeye and yellowfin tunas and albacore, in that order of importance, are taken by the fishery. The total catch of all three species increased from 196,367 lb in 1973 to 340,991 lb in 1975. This fishery stands to expand rapidly by the deployment of a statewide fish aggregating system.

tically assured around the buoys and good fishing will result in increased economic activity among business firms dealing in fishery-related supplies, products, and services.

Program

To offset any anomalous conditions in the distribution, abundance, and availability of fishes which could affect the results in one or more years, it is anticipated that at least a 5-year program would be needed. A 5-year program should also smooth over any unusual conditions in the environment that may affect the attracting qualities of the buoys and also any setbacks caused by loss of gear and other factors.



Proposed design of fish aggregating buoy for statewide system.

The experience gained from the experimental project suggests that the buoy design for the proposed program be slightly different from that used in the test project. Tentatively, each buoy will be made of three 55-gal steel drums to increase flotation. All anchor lines will have a scope of 2:1 (i.e., length of line is twice the depth).

The tentative plan calls for anchoring 26 buoys at various sites around the main islands. The selection of sites was based on several considerations. Because the buoys are intended to serve large commercial bait boats and small recreational and commercial boats, the buoy sites selected are generally within 10 miles of the shoreline. Opinions on buoy placement expressed by fishermen from all the major islands were also considered (see Appendix 1).

Buoys will be anchored in 300-500 fathoms of water wherever possible. This will reduce the cost of the anchor lines and still place the buoys close to the 1,000-fathom contour. Buoys placed near the 1,000-fathom contour have been most effective in attracting aku schools and other sport and market fishes during the test period. Interviews with fishing boat captains have disclosed that yellowfin tuna, and perhaps skipjack tuna schools as well, migrate up and down the west coast of Oahu along the 1,000-fathom contour.

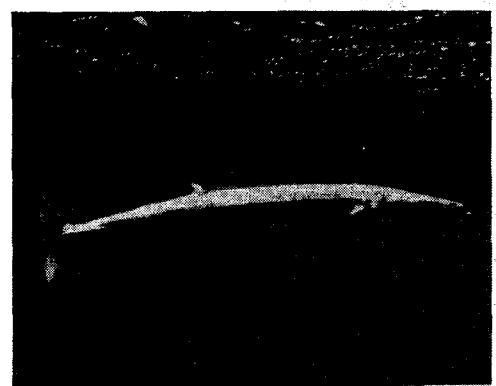
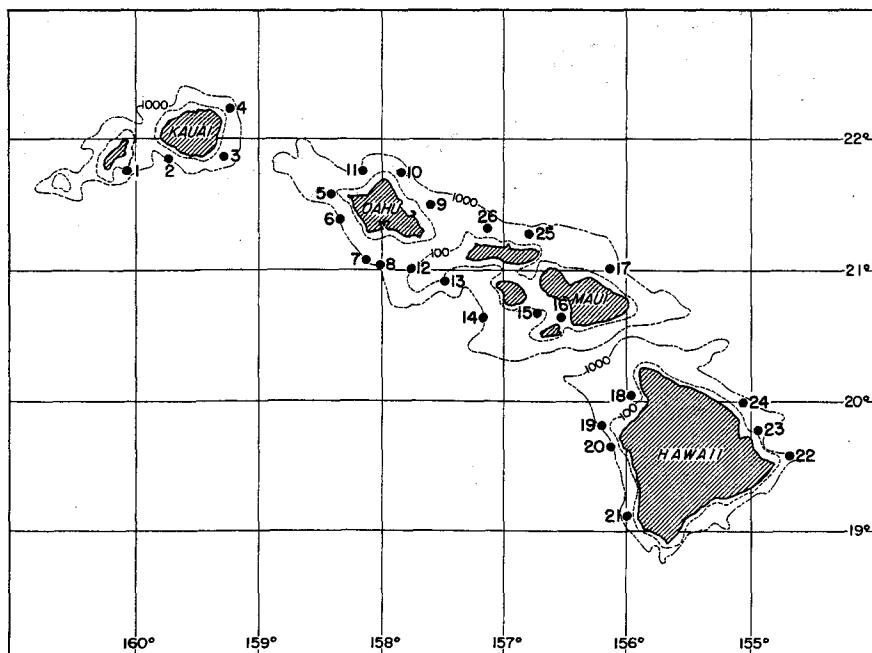
To provide for maximum coverage of those areas most used by both commercial and recreational boats, buoy sites are spaced from 10 to 20 miles apart. Buoy sites within the areas designated for submerged submarine operations are kept as few as possible to avoid accidental losses from submarine contact. Buoys in such areas include three off Kauai, two off

Oahu, one off Penguin Bank, and two between Lanai and Maui. Furthermore, because of the incompatible usage of the buoys by commercial and recreational fishermen, it may be desirable to designate a few buoys for the exclusive use of certain user groups. Perhaps it would be useful to reserve several of the more offshore buoys for the use of the commercial pole-and-line boats. However, any such arrangement must be worked out cooperatively by all interested parties.

During the 5-year period of the program, the buoys will be serviced continuously and catches of fish from the buoy areas will be summarized on a monthly basis. The program will be evaluated at the end of the 5-year period and continuation of the program will be determined at that time.

It should be mentioned here that the Honolulu Laboratory plans to continue its research work on fish aggregating devices. Some of the research plans include (1) efforts to observe the development of biotic communities around the buoys by the use of sonar supplemented by fishing and diving; (2) weekly and monthly monitoring trips to buoys to make observations on fish schools and bird flocks; (3) visiting the buoys every other day during periods of peak accumulation of tuna schools to determine the length of residence of schools within 3 miles of the buoys; and (4) to tag tunas caught around the buoys to monitor their movements among buoys.

Another planned research project is the development and testing of an attractant odor system to improve the effectiveness of the fish aggregating



Tentative proposed locations of fish aggregation buoys.

buoys. Presumably, vision plays the primary role in attracting tunas to a floating object; however, odors may provide a means of expanding the effective range of a floating object. Because an odor trail could extend beyond 10 miles, which is considerably greater than the visual range of tunas, the addition of odors should enhance the attracting property of floating objects.

The results of these studies will be beneficial to Hawaii's fish aggregating system. Insights and new knowledge gained from the Honolulu Laboratory's research will have direct application to the improvement of the state's buoy system.

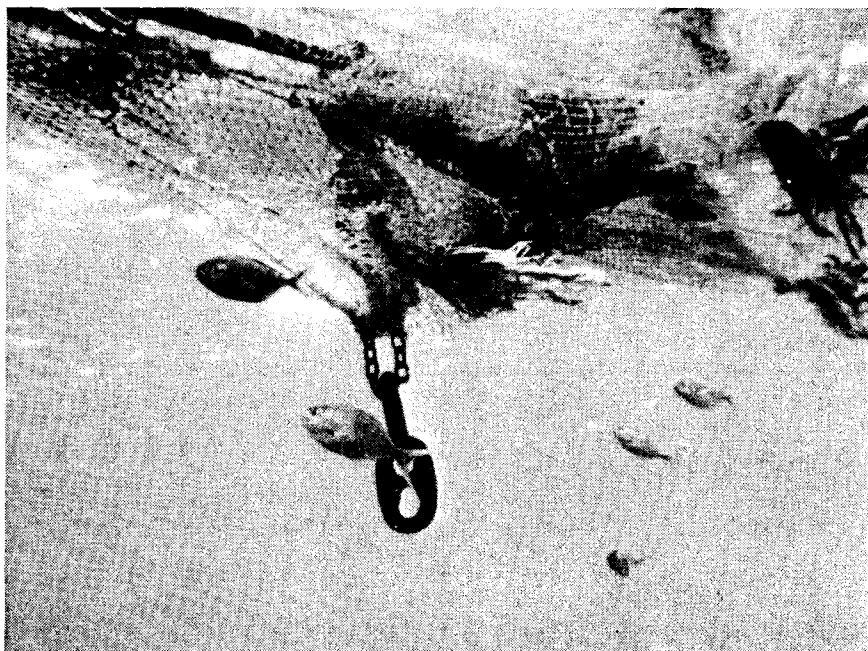
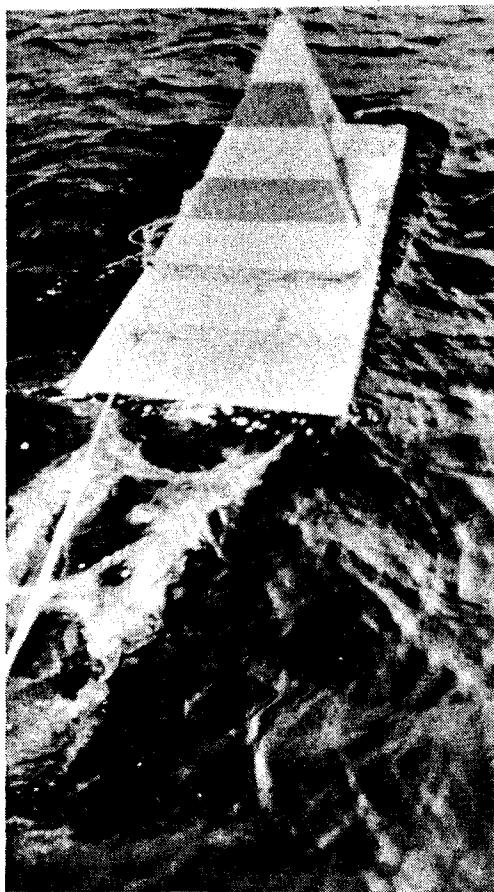
Phase I

The first 4 months will be spent in the design and fabrication of the buoys and the anchoring system. The subsequent 3 weeks will be spent in deploying and anchoring the buoys at the selected sites.

Phase II

After all the buoys are deployed a regular maintenance schedule will be followed. This will primarily involve checking the lights, replacing battery packs, and doing other things necessary to keep the buoys in proper functioning condition.

An important part of this phase of the program will be a close monitoring of the catches of fish from the buoy areas. Progress reports will be pre-



pared annually. At the end of the 5-year period a full report including an evaluation of the results and a recommendation for the continuation of the program will be prepared.

Program Management

Basically, the program will require the services of a program manager and biological technicians. Certain aspects of the program will require contract labor and the charter of vessels. A projected cost estimate of the program is shown below. If the program is implemented by the State of Hawaii, it is possible that Federal Government participation may be obtained in terms of support from Dingell-Johnson funds.

Budget Summary

Budget summary for 26 buoys

	First year	Second year	Third year	Fourth year	Fifth year
Personnel Services and Benefits	39	42	44	46	49
Services and Supplies					
Travel, per diem, etc.	6	7	8	9	10
Buoy placement boat charter	30	20	21	23	25
Survey boat charter	6	13	14	16	18
Aircraft surveillance	4	10	10	10	12
Buoy supplies and materials	65	35	38	41	44
Crane rental	5	3	4	4	5
Office supplies	4	4	5	5	8
Contract labor	12	2	2	2	2
Subtotal	171	136	146	156	173
Contingency 10%	17.1	13.6	14.6	15.6	17.3
Total	188.1	149.6	160.6	171.6	190.3

GRAND TOTAL = \$860.200

Appendix 1

SUMMARY OF MEETINGS TO DISCUSS A STATEWIDE FISH AGGREGATING SYSTEM

To familiarize the Hawaiian fishing community with the Honolulu Laboratory's experimental fish aggregating program, a series of informal meetings was held on Oahu, Maui, Lanai, and Hawaii during the period from May to August 1978. The meeting site, date, and participants are shown below.

MAY 18, 1978
9:00 A.M.
STATE CAPITOL, SENATE CONFERENCE ROOM 3
HONOLULU, HAWAII

LIST OF PARTICIPANTS

JEAN I. CRAMER, NMFS, Honolulu Laboratory
ANDREW E. DIZON, NMFS, Honolulu Laboratory
KENJI EGO, Hawaii Division of Fish and Game
DOYLE E. GATES, NMFS, Western Pacific Program Office
ANDREW J. GERAKAS, Pacific Tuna Development Foundation
RALPH HANNESSCHLAGER, Tuna Boat Owners Cooperative
STANLEY I. HARA, Senator, State of Hawaii
WALTER M. MATSUMOTO, NMFS, Honolulu Laboratory
DAVID NADA, Pacific Tuna Development Foundation
TAMIO OTSU, NMFS, Honolulu Laboratory
JUSTIN RUTKA, Hawaii Division of Fish and Game
HENRY M. SAKUDA, Hawaii Division of Fish and Game
RICHARD S. SHOMURA, NMFS, Honolulu Laboratory
JAMES W. SUTHERLAND, Hawaiian International Billfish Association
STANLEY SWERDLOFF, Marine Affairs Coordinator's Office
RAYMOND TABATA, University of Hawaii, Sea Grant
CHARLES T. TOGUCHI, House of Representatives, State of Hawaii
WILVAN G. VAN CAMPEN, Western Pacific Regional Fishery Management Council
CHARLES YAMAMOTO, Marine Fisheries Advisory Committee
WADSWORTH YEE, Senator, State of Hawaii
HEENY S. H. YUEN, NMFS, Honolulu Laboratory

JULY 15, 1978

7:30 P.M.

CLUBHOUSE, MAALAEA BOAT AND FISHING CLUB
MAALAEA, MAUI

LIST OF PARTICIPANTS

ALVIN KATEKARU, Hawaii Division of Fish and Game

WALTER M. MATSUMOTO, NMFS, Honolulu Laboratory

RICHARD S. SHOMURA, NMFS, Honolulu Laboratory

STANLEY SWERDLOFF, Marine Affairs Coordinator's Office

BROOKS TAKENAKA, Sea Grant Program, Maui

MAMORU YAMASAKI, Senator, State of Hawaii

DENNIS D. AKI, Kahului

GLENN ALIONAR, Haiku

LOUIS HUBBARD, Wailuku

GUY IBARA, Wailuku

RICHARD IBARA, Wailuku

ERIC MIYAJIMA, Kahului

ALLAN T. MURAYAMA, Kahului

MIKE NAKAMURA, Kula

LINDA NASARIO, Kihei

CARL POKIPALA, Wailuku

ANN RAY, Maui News

MIKE SAFER, Kihei

TOM YAMAFUJI, Lahaina

EDWIN YOSHITAKE, Kahului

JULY 16, 1978

2:15 P.M.

LANAI COMMUNITY LIBRARY
LANAI CITY, LANAI

LIST OF PARTICIPANTS

ALVIN KATEKARU, Hawaii Division of Fish and Game

WALTER M. MATSUMOTO, NMFS, Honolulu Laboratory

RICHARD S. SHOMURA, NMFS, Honolulu Laboratory

STANLEY SWERDLOFF, Marine Affairs Coordinator's Office

PETER CONNALLY, Lanai City

ATAKA FUCHIGAMI, Lanai City

JASON FUJIE, Lanai City

W. O. HARRISON, Lanai City

ALLEN S. KAIAOKAMALIE, Lanai City

ROBERT KANIHO, Lanai City

ALBERT MORITA, Lanai City

JULY 24, 1978

7:30 P.M.

LIHUE LIBRARY

LIHUE, KAUAI

LIST OF PARTICIPANTS

ALVIN KATEKARU, Hawaii Division of Fish and Game

RICHARD KAWAKAMI, House of Representatives, State of Hawaii

WALTER M. MATSUMOTO, NMFS, Honolulu Laboratory

STANLEY SWERDLOFF, Marine Affairs Coordinator's Office

BERNARD ALMEIDA, Koloa

WALTER CHANG, Koloa

JOHN DUARTE, Koloa

WILLIAM FASCUA, Koloa

MIKE HORITA, Lihue

DARRELL HOPPER, Lihue

GEORGE M. MASUOKA, Kapaa

WAYNE MATSUDA, Koloa

HOWARD PLAHY, Lihue

ROBERT REGO, Lihue

SCOTT YOSHIDA, Kapaa

JULY 25, 1978

7:30 P.M.

HANAPEPE RECREATIONAL CENTER

HANAPEPE, KAUAI

LIST OF PARTICIPANTS

ALVIN KATEKARU, Hawaii Division of Fish and Game

WALTER M. MATSUMOTO, NMFS, Honolulu Laboratory

STANLEY SWERDLOFF, Marine Affairs Coordinator's Office

YOSHITSUGU ANDO, Kekaha

I. GRANT, Kaumakani

RICHARD IWAMOTO, Waimea

RUSSELL MALAE, Kekaha

SHOICHI MARUGAME, Waimea

GARY MATSUMURA, Waimea

WARREN MIIKE, Hanapepe

W. T. MONROE, Kekaha

MATSUTO MUKAI, Hanapepe

JOHN RAPOZO, JR., Makaweli

NORMAN RAPOZO, Kekaha

GEORGE WACHI, Kaumakani

AUGUST 7, 1978
 8:15 P.M.
 FIRST HAWAIIAN BANK BUILDING
 KAILUA-KONA, HAWAII

LIST OF PARTICIPANTS

ALVIN KATEKARU, Hawaii Division of Fish and Game
 WALTER M. MATSUMOTO, NMFS, Honolulu Laboratory
 STANLEY SWERDLOFF, Marine Affairs Coordinator's Office

WILLIAM B. BLOK, Captain Cook
 NORMAN BRINDO-VAS, Kealakekua
 ERIC CURTIS, Kealakekua
 PETE HENDRICKS, Kailua-Kona
 MYRA HOLDRIDGE, Kailua-Kona

GEORGE PARKER, Kailua-Kona
 JAMES PAUL, Kailua-Kona
 DALE SCHUTTE, Captain Cook
 BILL STOCKLEY, Kailua-Kona

AUGUST 9, 1978
 9:00 A.M.
 SUISAN COMPANY
 HILO, HAWAII

LIST OF PARTICIPANTS

STANLEY HARA, Senator, State of Hawaii
 ALVIN KATEKARU, Hawaii Division of Fish and Game
 WALTER M. MATSUMOTO, NMFS, Honolulu Laboratory
 STANLEY SWERDLOFF, Marine Affairs Coordinator's Office
 KATS YAMADA, House of Representatives, State of Hawaii

LARRY CHOW, Hilo
 ALFRED FELIPE, SR., Honolulu
 LORETTA FELIPE, Honolulu
 M. HANASHIRO, Hilo
 K. HORIHATA, Hilo
 EMI KATADA, Hilo
 JON KATADA, Hilo
 MICHAEL KAWAGISHI, Hilo
 VIRGIL KOEHNE, Hilo
 SADATOSHI MIYAZONO, Hilo
 M. NAKAHARA, Hilo

RICHARD OGATA, Hilo
 YUKIO OKUDA, Hilo
 T. OKUNO, Hilo
 JAMES RUBIO, Hilo
 H. SATO, Kurtistown
 RUSSELL TABANDERA, Hilo
 BRUCE TAJIRI, Hilo
 HOWARD TAKATA, Hilo
 CHARLES UMAMOTO, Hilo
 CHACO YAMAMOTO, Hilo

The meetings were held under the joint auspices of NMFS, the Governor's Marine Affairs Coordinator's Office, and the Hawaii Division of Fish and Game. Presentations on the background events leading to the implementation of the experimental buoy project by NMFS and the results of the experiments were given at the meetings. Other purposes of the meetings were to describe a proposed statewide fish aggregating system and to obtain the fishing community's reaction to the proposal and the Honolulu Laboratory's experimental fish aggregating buoys. The meetings also included discussions on the possibility of user group participation in the program in the form of contribution of funds toward the cost of fabricating and maintaining the buoys.

The fishermen from the various communities had definite ideas on the placement of buoys around their respective islands. These views will be considered in the tentative placement of buoys in the proposed system.



Appendix 2

LETTERS OF ENDORSEMENT FOR FISH AGGREGATING BUOYS FROM SATISFIED USERS

April 19th 1978

Sport Diver Charters
P.O. Box 1502
Lahaina, Hi. 96761

Dear Mr. Matsumoto,

Thank you very much for your response to my letter concerning the "D" bouy off Lanai. It's nice to know that you are aware of it's great potential to the fishing fleet here on Maui.

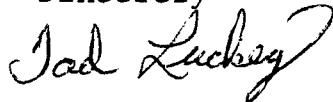
Since my last letter the "D" bouy has been producing incredible catches of Mahi, Ono, Ahi, Aku, and Marlin. During the past week we estimate that over 5000 lbs. of fish have been caught there! Most of the fish have been Ahi and Mahi with boats coming in with over 300 lbs. of fish caught in only a short time. Never before has there been any one place that has consistently produced such fine catches.

The fishermen here are aware of the problems involved with getting more bouys set out but are now willing to contribute any funds or energy needed to get at least one or two more within range of Maui.

I will be in Honolulu for a week during the first part of May and would like to get together with you personally and discuss it further if it would be possible.

On behalf of the Maui fishing fleet, I would like to thank you for your attention and concern in this matter.

Sincerely



Captain Tad Luckey, Lahaina

Gentlemen:

This letter is written on behalf of the Maui Fishing Fleet and concerns "D" buoy located approximately 12 miles off the lighthouse of Lanai.

Since its installation, "D" buoy has been an outstandingly consistent source of fish of all varieties. The constant attraction of small bait fish to the entire area surrounding the buoy has produced many fine catches of mahi mahi, aku, ahi, and marlin for both the commercial and sport fishermen.

On many occasions, boats from Lahaina and Maalaea will cover 80 miles or more of potentially good fishing areas and come up empty; particularly during the winter months. We have all been on a good number of these dry days, but since "D" buoy was installed the entire Maui Fleet has benefited greatly.

I have kept a rough log on fish caught at or near "D" buoy and it amazes me that so many boats can cover such an incredible number of miles and then end up catching their only fish at "D" buoy.

All of us are very interested in what can be done to have more such buoys located within range of the Maui boats. If there is anything we can do to help in accomplishing this, please let us know. Enclosed are the names of the captains and crews of the Lahaina fishing fleet who have visited "D" buoy many times and who are willing to assist in any way in this program.

Very truly yours,

SPORT DIVER

Tad C. Luckey

Tad C. Luckey, Skipper

Robby Smith
Brad Taylor
~~KEN TAKASHIMA~~

Phil Cole
DENNY PUTMAN

Milt Rose
J.E. Dampt
George Dorough
Monte Wilson

Kurt Rose
James & Schmidt
Andy Hamilton
Baldy Smith
Sherry MacLachlan
Kiki Foster
Guy Sander

Lynette Lucas
Wave Diver
David Heelson
Fred Uggla
Gary Christianson
Harry Sinden

Sport Diver
Sport Diver
~~KAMAHILAI~~

"Hool"
"PAU HANA"

"Reefer"
Sea Power
Vida Mia

Aerial II

AERIAL II
Kolohi
Kalahi

Zapatero

"Exact"
"Changer"
Zapatero

Sport Diver

Pele
Exact

Lahaina Fishing
Zapakro
No Pihikis