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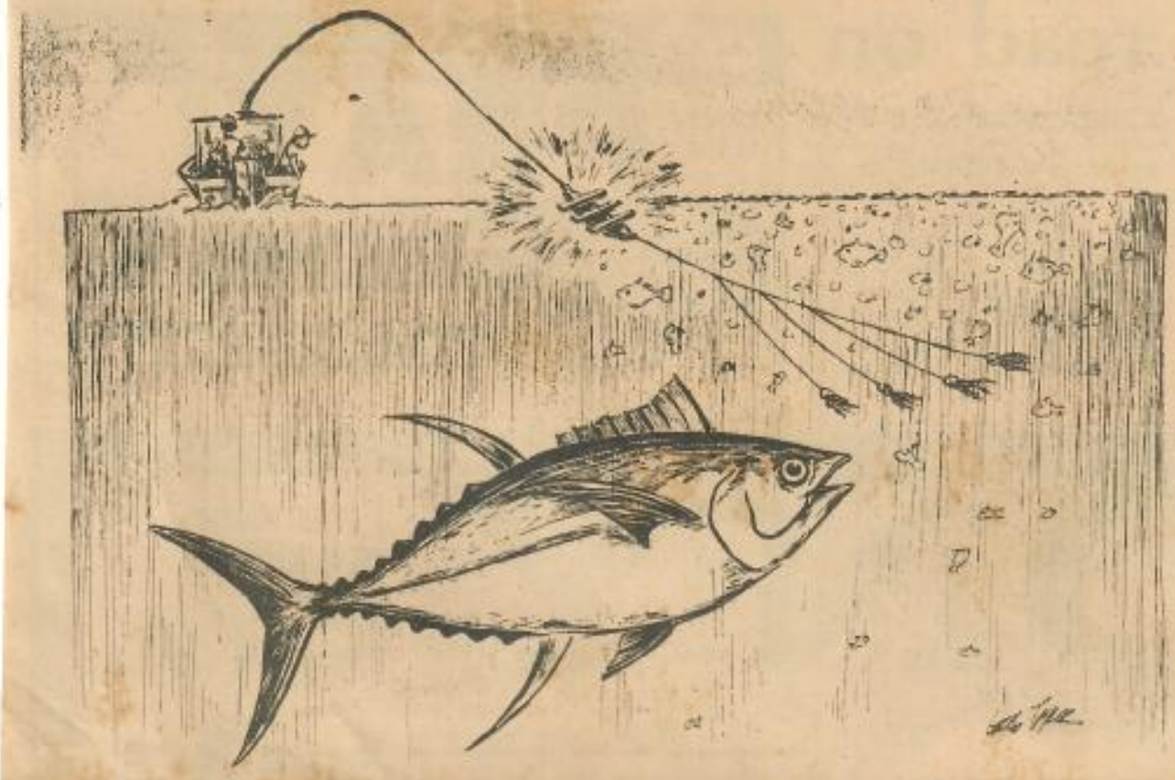
G.H. BALAZS FILE



Advertiser sketch by Greg Taylor

Fishing for ahi, using an "airplane" to simulate feeding frenzy.

When the file fish bloom — and the ahi become greedy

from the sea

mike markrich

In his 70 years of living in Hawaii, Coates Cobb-Adams has seen a lot of things. But even he was surprised last month when he took his boat, the No Panic II, on a trip toward the fishing areas off Kahuku and came across thousands of small yellow fish floating dead in the water.

"I'd never seen anything like it," he said. "They were floating all over the damn place wherever the ahi was. Whenever you would catch an ahi, they just spit it out. And when you'd cut the stomach (of the ahi) open, you'd find it inside."

The ahi were apparently so taken by this 4-inch-long, red-tailed file fish — known to Hawaiians as *o'iliuwiwi* (literally, *"o'ili"* means "to make a sudden appearance") — that they lost all interest in the fishing lures and Marquesan sardines that are generally used to catch them.

had something to do with the war.

Another smaller bloom occurred approximately 10 years ago.

Some marine biologists such as Dick Brock of the University of Hawaii's Sea Grant Program think that the sudden increase in numbers is due to special current and temperature conditions allowing the file fish population to grow to a larger size than normal.

"Sometimes they luck out," Brown said. "The time of pairing is just right, the currents are right and they get a greater return for their efforts."

He explained that one explanation for the large numbers of the fish found floating on the surface is that they are driven upward by hungry ahi. The file fish are believed to swim so hard for their lives that they die as they reach the surface.

Fisherwoman McKinney said that although the number of file fish is tapering off, she has seen the ahi go into a virtual frenzy amidst them. "They just go from side to side and won't even take a lure while feeding," she said.

She said people who fish for ahi experienced these kinds of sudden population explosions of bait fish before and have learned to adapt themselves to the changes with devices such as the "airplane."

The "airplane" — also known as the "sled" or "bird" — is an intricate Japanese fishing rig that simulates a feeding frenzy.

"They made pigs of themselves and just gorged themselves on it. And then threw up what they couldn't eat," Kaneohe Bay fisherman Ernie Choy said of the ahi.

At one point in the middle of July, the file fish became so common that Toumas Phelps and other people who fish reported that when diving, "you couldn't go 20 feet without a couple of hundred of them everywhere."

Both Phelps and fisherwoman Alana McKinney said they had seen sudden blooms of the file fish here before but never on the scale of what they had seen this summer.

Toumas said he and other divers were finding the file, which normally dwells on shallow reefs, at depths deeper than where he had ever seen them before. He said that looking over the side of the boat, he saw the fish in dark clusters "as large as cars."

No one really understands why the fish suddenly increased their population rapidly or the reason they have been found floating dead on the surface with puffed-up air bladders.

(Scientists think that during the time the file fish live in the open ocean, they stay at deeper depths than normal and that like most fishes living below a certain depth, they cannot rise rapidly to the surface without having the air in their bodies expand and burst their air bladders.)

The blooms of file fish were well known to the ancient Hawaiians and were said to foretell the demise of a great personage such as a king or chief. In 1944 the fish were found dead "by the millions" along the beaches of southeastern Oahu and, according to accounts of the period, many people thought the phenomenon

Former Wildlife Refuge

By Harry Whitten
Star-Bulletin Writer

The 12 refuges that are part of the Hawaiian and Pacific Islands national wildlife refuges include seven in Hawaii plus those in such distant places as Rose Atoll of American Samoa and such specks in the ocean as Jarvis, Baker and Howland islands.

For the past four years Robert J. Shallenberger has been refuge manager. Before leaving for Washington, D.C., he reviewed important projects completed during his tenure and the planning done to set future directions.

He will be in Washington for at least two years, the first 10 months as a participant in the Interior Department's managerial development program and the rest of the time with head offices of the U.S. Fish and Wildlife Service.

Jerry Leinecke, assistant refuge supervisor in the service's Anchorage, Alaska, regional office, will arrive Aug. 13 to succeed Shallenberger.

The most conspicuous event during his tenure as refuge manager was completion of the tripartite study of resources in the Northwestern Hawaiian Islands, Shallenberger said.

THE FISH and Wildlife Service was one of four agencies involved. The others were the National Marine Fisheries Service, the state Department of Land and Natural Resources, and the Sea Grant Program of the University of Hawaii.

Preparation of a master plan for the Hawaiian Islands National Wildlife Refuge, consisting of Nihoa, Necker, French Frigate Shoals, Gardner Pinnacles, Moro Reef, Laysan, Lisianski, and Pearl and Hermes Reef, has almost been completed, Shallenberger said.

An education program with visitors' exhibit and displays, at Kilauea Point, Kauai, is among the projects in the major Hawaiian Islands, Shallenberger is most pleased with establishing.

This refuge gets 150,000 visitors a year. The Natural History

Chief Rates Survey No. 1

Association has started an ambitious volunteer program.

OTHER refuge projects during Shallenberger's tenure include:

✔ An extensive study of the marine and terrestrial resources of Rose Atoll, done in cooperation with the government of American Samoa.

✔ An extensive environmental study, done in connection with the Johnston Atoll Chemical Agent Demilitarization Study.

✔ Eradicating all feral cats on Jarvis Island. The cats, which prey on seabirds, were eliminated from Baker Island in 1964. Next project, planned for 1985, will be de-catting Howland Island.

✔ Establishing a Fish and Wildlife field station on Tern Island in French Frigate Shoals.

✔ Completing a master plan for five wetland refuges in the major islands. Important habitat development projects were completed at four of the refuges, with the result water-bird use increased.

✔ An education program was started at James Campbell Refuge near Kahuku.

IN ADDITION, the Fish and Wildlife biologists completed a fish and wildlife management plan for the Kaneohe Marine Corps Air Station.

Shallenberger expressed some frustration at not being able to bring to fruition a plan to establish a refuge at Kealia Pond, Maui. Money has been appropriated and studies completed, but the service hasn't been able to reach an agreement with the landowners, Alexander & Baldwin Inc.

Another uncompleted project is that of setting up an improved management program for fish and wildlife on Midway. The service has proposed that an overlap national wildlife refuge be established there, with the island still under Navy management but with the Fish and Wildlife Service helping manage fish and wildlife.

Shallenberger said he'd like to see educational programs expanded for the refuges on the main islands so that the public can become more aware of what the service is doing.

HE SAID he has mixed feelings about leaving Hawaii, having come here first in 1967 as a graduate student and having met here his wife, the former Annarie Meyer of Honokaa, Hawaii.

He received his doctorate in 1973 from the University of California at Los Angeles, doing his research for his thesis on sea birds of Manana (Rabbit) and other offshore islands.

He praised the staff who worked on the various projects as "an enthusiastic group of highly competent people."

One of the most demanding but also delightful parts of the refuge manager's job is that of working with other agencies, he said, since much depends on cooperation of many agencies.

Since 1975 he has edited or revised four editions of the Hawaii Audubon Society's field guide, "Hawaii's Birds." The latest edition will come out this month.

He also contributed a chapter on fulmers, shearwaters and gadfly petrels to a new book, "Seabirds of the Eastern North Pacific and Arctic Waters," published recently by Pacific Search Press, Seattle.

The Honolulu Advertiser
Monday, July 30, 1964 A-3

New study provides an in-depth look at Northwestern Hawaiian Islands life

By Barbara Hastings
Advertiser Science Writer

The Northwestern Hawaiian Islands are unique environments which, while not untouched by humans, offer a biological research resource on wildlife that may be unparalleled in the world. The waters of these same islands offer rich fishery resources and the two together set up the standard development-versus- conservation dilemma.

Home of the endangered Hawaiian monk seals, and the watergrounds and nesting site of the Hawaiian green sea turtles, a threatened species, the leeward Hawaiian islands are also full of birds, plants and insects some of whose species are threatened. Scientists are interested in preserving these living things as they search for evolutionary links, medical cures and biological information.

Conservationists want them jealously guarded. Protectionists believe these plants and animals have rights to life, too.

Then there is the sealife — lobsters, bottomfish and shrimps — which could offer substantial commercial benefits.

These leeward Hawaiian islands, from Nihoa to Kure Atoll, are just about everybody's concern — the federal government's Fish and Wildlife Service and National Marine Fisheries service; the state of Hawaii, and even the City and County of Honolulu, since the islands fall within its jurisdiction.

In an attempt to minimize the potential for controversy, a five-year, multimillion dollar study was undertaken by agreement of federal and state agencies. The purpose: assess the wildlife resources with the aim to protect the unique wildlife while developing the fishery resources.

More than 200 scientists have been involved in the study, and the results have just been published and presented to the governor.

What the two-volume, 844-page report provides is an in-depth picture of the current ecological status on and around these bits rock and coral atolls.

It can be used as the baseline for any further studies and as a primer for any potential development (in terms of fishing resources and support facilities.)

The U.S. Fish and Wildlife Service, using the information gathered in the exhaustive study, is currently working up a management plan for the endangered and threatened species of the area as the fisheries officials draft management plans for taking the fish.

Here are some of the highlights gleaned from the massive study.

- Survival of monk seal pups has increased since protection started in 1976, but there are more adult males than females on all the islands west of the French Frigate Shoals. Reduced human use of Tern Island beaches has resulted in a marked increase in seal counts.
- The slow growth rate of Hawaiian green sea turtles means full recovery of that once overhunted species will take time, but "at present there are encouraging signs that the population has started to recover." The French Frigate Shoals is the site for 90 percent of all green sea turtle nesting.
- There are at least eight land snails, 12 plants, four land birds and in excess of 50 insects that are found nowhere else in the world. The greatest danger to these is introduction, purposeful or accidental, or what are termed exotic species — that is animals, insects or plants not originally inhabitants of a place that sometimes overrun natural residents.
- Of 26 sites surveyed for spiny lobster, only Necker Island and Maro reef "appeared to have sufficiently large stocks for commercial exploitation. Between 200,000 and 435,000 lobsters a year could be taken from the area without depleting the resource.
- Bottomfishing trips to the Northwestern Hawaiian Islands "were found to be marginally profitable." Assuming a $1.50 per pound price and 11 trips a year, each fishing trip to the islands would require a catch of 12,176 pounds to break even.
- While a full-time bottomfishing operation is currently economically unfeasible, if markets for more fresh and frozen fish can be developed, the potential for an positive economic operation is there.

Leeward Islands Ecolog

By Helen Altonn
Star-Bulletin Writer

Fisheries development and wildlife preservation may be a compatible combination in future planning for Hawaii's pristine Northwestern Islands as a result of five years of research in that area.

The findings are expected to help resolve a conflict between those eyeing the rich fishery resources of the area and those who fear fishing will threaten the ecological system and endangered species.

More than 200 scientists participated in the research program, sponsored by four state and federal agencies. It was one of the largest and most complete multidisciplinary ecological investigations ever attempted.

Two volumes of data were presented to Gov. George Ariyoshi yesterday by Richard Grigg, University of Hawaii marine biologist, and Jack Davidson, director of the University of Hawaii Sea Grant Program.

Grigg, who coordinated the massive scientific effort, compared it to the Challenger expedition sponsored by Great Britain in 1872. The ship took four years to go around the world. "What it did was to lay the foundation for modern oceanography and provided sort of an encyclopedia of information which is still 100 years later being used or drawn upon," Grigg said.

"IN LIKE FASHION, I think this study . . . should provide the state of Hawaii with an encyclopedia of information that could very well shape the course of history for the Hawaiian Islands for 100 years to come."

A special task force of the governor recommended in 1974 that resources of the Hawaiian Archipelago be surveyed and assessed to protect the unique wildlife and manage potential fishery resources.

The National Marine Fisheries Service, the state Department of Land and Natural Resources and the U.S. Fish and Wildlife Service signed a Tripartite Cooperative Agreement to undertake the project. The Sea Grant Program joined the study in 1977.

The Northwestern Hawaiian Islands consist of a group of low, rocky islets and coral atolls extending more than 1,000 miles northwest from Nihoa Island to Kure Atoll.

Responsibilities for the area and its resources are divided between federal, state and city-county governments. The area is included in the City-County of Honolulu. It is part of the national wildlife refuge system and also a state wildlife refuge.

STATE AND federal agencies are developing various management plans for the region, its fisheries and endangered species, and the U.S. Fish and Wildlife Service is drafting a wildlife refuge master plan. City Council members also have suggested developing a plan for the area.

Interviewed separately, leaders of the investigating agencies expressed enthusiasm about the cooperative venture and use of the information to make management decisions about the

7-25-84 A:1 Honolulu

ical Report Completed

Northwestern Hawaiian Islands.

"The final measure of the success of the five-year study perhaps will be the degree to which the master plan successfully meets the needs of preserving wildlife while also providing for limited developmental opportunities throughout the Northwestern Hawaiian Island chain," said Grigg and Karen Y. Tanoue, editors of the research volumes.

"I'M NOT saying we're going to open the refuge for fishing," said Al Marmelstein, Pacific Islands administrator of the U.S. Fish and Wildlife Service. "But I think we are in a better position now to work with the state to develop potential fisheries in a manner that is most consistent with our objectives for preserving and protecting the unique natural heritage of the seabirds, monk seals and sea turtles."

Marmelstein said the five-year study "has provided us with a wealth of information and understanding we otherwise wouldn't have had to help us

Turn to Page A-20, Col. 1

HISTORIC PROJECT—The results of a five-year research program in the Northwestern Hawaiian Islands are delivered to the governor by Richard Grigg, left, and Jack Davidson with the University of Hawaii Sea Grant Program. —Star-Bulletin Photo by Ken Sakamoto.

Star-Bulletin

Ecological Report Is Completed

Continued from Page One

manage the refuge and resources it contains."

He said the information was used in developing the first draft of the Northwestern Hawaiian Islands Wildlife Refuge Master Plan, which will be completed in a few weeks.

State Land Board Chairman Susumu Ono said the five-year study "is very significant in two respects. It brought together several agencies interested in the same geographic area and we pooled our talents and resources to come out with meaningful results. Secondly, it did give us, specifically our department, a lot of data we could not have otherwise gotten."

ONO SAID the study supports a "multiple use concept" for the Northwestern Hawaiian area which "recognizes both the conservation side and commercialization of fishing activities."

This is encouraging to the state because it is seeking approval from the U.S. Interior Department for joint use of Tern Island with the Fish and Wildlife Service for a fishing base, Ono said.

Richard Shomura, Honolulu Laboratory director for the National Marine Fisheries Service, said the study already is in use for management of Leeward Island resources and further research will be done on specific problems.

The Western Pacific Fisheries Management Council developed a management plan for spiny lobsters based on information from the study and the council is working on plans for bottomfish and other species.

Shomura said the study answered some basic questions on the interrelationships of endangered species and provided "better numbers, rather than guesstimates" on the bird and animal populations in the area.

"THE STUDY was the first to provide us with an idea of how important the nearshore fisheries are to seabirds and what is the consumption of fisheries by seabirds," he said. It also indicated that there is "not that drastic a conflict" between monk seals and fishermen in competing for lobsters, Shomura said.

"Decision-makers — people in the state as well as federal government — can let emotions run away but very often you have to come back and say exactly, quantitatively, what are the impacts?" Shomura said. "I think we have at least laid a foundation for that decision-making."

"It's been an exciting opportunity to do the study before the horse was out of the barn . . . before things are spoiled in a relatively pristine environment," Grigg said.

Waikiki pole fishing allow

section G
The Sunday Star-Bulletin & Advertiser
Honolulu, July 1, 1984
This section prepared by the staff of The Honolulu Advertiser

from the sea

mike markrich

The fishing poles will be back again starting today in the Waikiki-Diamond Head area after a two-year fishing ban to replenish the waters.

But statistics from the state suggest that the renewed fish population on the shallow reef area inside the shore break will be affected more by nets than by pole and line fishing during a two-year "fishing allowed" cycle beginning today.

Today's reopening to pole and line fishing is part of an ongoing *kapuku* experiment in which a two-year fishing ban is followed by two years in which fishing is allowed. Only pole and line fishing are allowed the first year; other kinds, such as net and spear fishing, are allowed during the second year.

Kapuku means "to restore life" in Hawaiian.

The Waikiki-Diamond Head area — from the junction of Kalakaua and Kapahulu avenues to the Diamond Head lighthouse — was closed to fishing from July 1978 to June 1980, opened for pole and line fishing in July 1980 and for other legal fishing methods a year after that, then closed again in July 1982. The latest two-year ban ended yesterday.

Statistics from the state division of aquatic resources seem to confirm what others have long suspected: that heavy fishing with nets and spears can virtually deplete the increased number of fish on a reef area in less than one year.

Mike Yamamoto, a biologist with the division who has done underwater fish counts in the area for the past four years, said it is too early to tell what all of the statistics mean. But he said preliminary conclusions can be drawn.

Here's how the cycle has worked so far:

- Before the experiment began, the level of fish on the reef was very low. In the year prior to the July 1978 closing, there was an average fish density of 114 pounds per acre.
- By mid-1980, the two-year ban on the reef had allowed the fish population to recover rapidly. In two years of closure, the population increased nearly 300 percent to an average of 450 pounds per acre.
- When pole fishing was permitted beginning in July 1980, the fish count dropped slightly — about a 20 percent decrease to 360 pounds per acre.
- When gill netting and other methods were allowed beginning in 1981, the count plummeted to 150 pounds per acre — only slightly higher than before the closure. Clearly, the year when gill nets, throw-nets and spears were permitted produced the more significant drop.

As Yamamoto explained: "You've got a lot more fish but you got a lot of guys out there fishing. You have a limited number of fish there and you've got to divide them up 2,000 ways."

(State workers counted 2,050 people fishing during the first month of opening in 1981).

For years it had been known to people such as fisherman Mike Teruya that the fish population in the Waikiki reef area was low. It was low enough, Teruya said, "to make it news up and down the beach" when someone caught something.

Teruya and many others familiar with the area were "more curious than anything" when the state's experimental reef management plan began July 1, 1978.

After the first two-year ban expired, Teruya claimed, fishing with pole and line was "good only for the first 10 days." He is interested to see the effects of the full eight-year experiment when it is evaluated in 1986.

After looking at the preliminary data, University of Hawaii zoologist James Parrish said he was encouraged that the heavy drop in the fish population took place gradually over the two-year fishing period rather than in the first few weeks. He said the upswing that takes place after the heavy fishing pressure ends "suggests that there is a potential for recovery."

Director Henry Sakuda said his aquatic resources division was encouraged by public response to the closures and plans to continue the experiment. There is to be a public meeting in 1986, when all the data will be in, to get public input on future management.

But biologists and people who fish, while pleased by the increase in fish, already have begun to disagree over how the area should be used.

Bruce Carlson, curator of the Waikiki Aquarium, would like to see fishing banned entirely and the Waikiki area preserved in the way Hanauma Bay is. Others think the two-year wait is too long and the ban should be reduced to one year.

Councilman Leigh-Wai Doo, a fisherman whose City Council district adjoins the area, suggests a compromise. He said people need to be able to fish but that there is also a need for a place "where schoolchildren can learn with safety and convenience about nature."

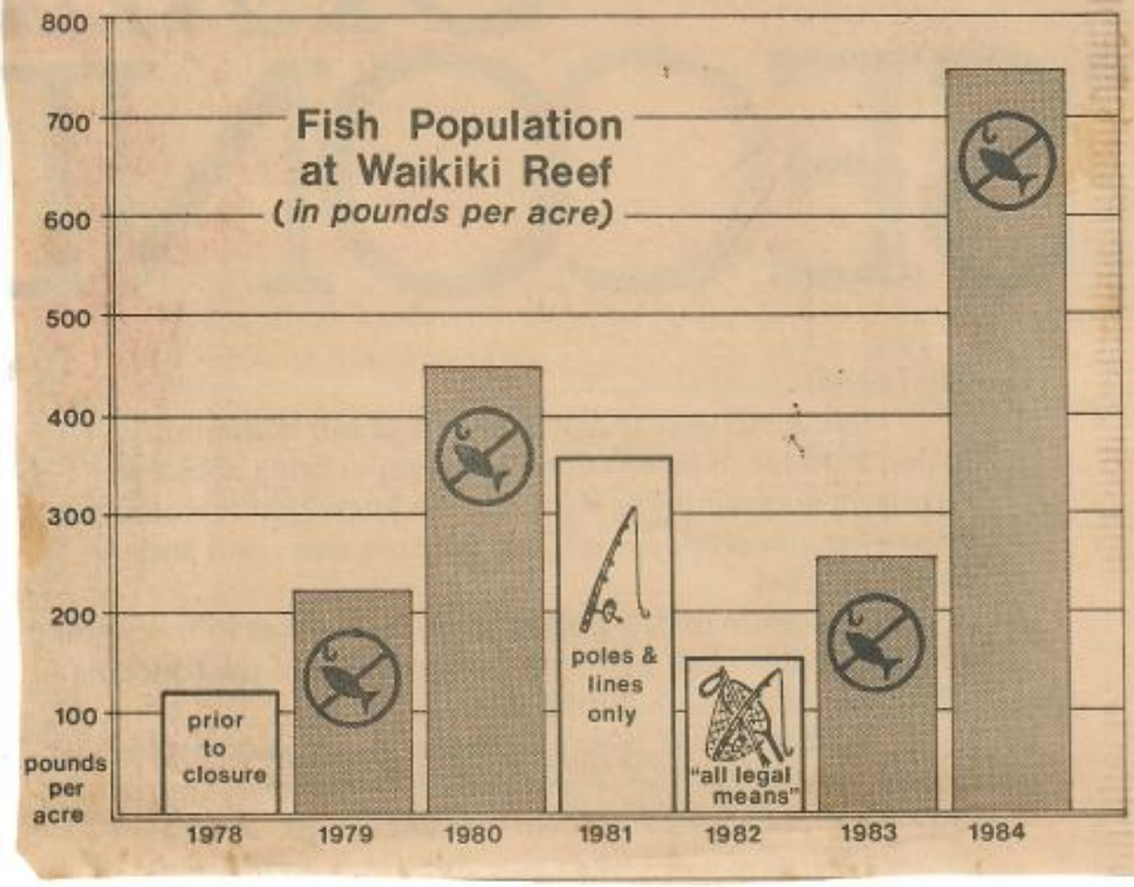
Doo would like the reef left open for fishing but said the area surrounding the aquarium should be preserved and used to educate the children of Honolulu with reef walks so that "they can learn to respect nature so that it can replenish itself."

"I want them to know that you should eat what you shoot and if you aren't going to eat it, you should leave it alone," Doo said.

ed for a year as ban ends

Advertiser file photo

Fishing off the seawall at the Waikiki Natatorium



2 Fishing Firms Ask State to End Ban on Billfish Sales

Tuesday, July 3, 1984 Honolulu Star-Bulletin A-19

By Phil Mayer
Star-Bulletin Writer

Two of Hawaii's major commercial fishing companies have asked the Circuit Court to end the state's ban on the sale of certain billfish and to stop the state from saying consumption of Pacific blue marlin may constitute a health hazard.

Attorneys for the United Fishing Agency Inc. of Honolulu and the Suisan Co. Ltd. of Hilo asked Circuit Judge Edwin H. Honda yesterday afternoon to grant a preliminary injunction against the state.

But Honda declined to issue the preliminary injunction and instead urged representatives of the state and the two firms to discuss their differences. A meeting between the two sides was to be held today.

The court action came only hours after the state Department of Health banned the sale of any billfish weighing more than 200 pounds, as well as the sale of all Pacific blue marlin because of their potentially toxic mercury content.

In addition to the Pacific blue marlin, black and striped marlin, short bill and Pacific broad bill swordfish, and sailfish also are subject to the ban.

Pacific blue marlin, as well as striped marlin, usually are sold as *au* in local markets.

IN ANNOUNCING the ban, the Health Department said that "billfish in excess of 200 pounds are very likely to contain more than 1 part per million of mercury" and that "Pacific blue marlin contains more than 1 part per million at weights below (as well as above) 200 pounds."

The concern, according to the department, is that "mercury, in its various chemical forms, is definitely toxic to humans" and that two forms of mercury are found in fish — "inorganic mercury commonly known as quicksilver and organic mercury."

Of the two forms, the latter is "distinctly more toxic," the department said in its news release.

The U.S. Food and Drug Administration (FDA) currently allows a total of no more than 1 part per million of mercury in any food product, the department said.

But the state acknowledges "it is believed the mercury in billfish occurs naturally" and that there are "no known sources of industrially generated mercury pollution in Hawaii."

In seeking Circuit Court intervention, the two fish companies said that state told them about a week ago that a ban was planned.

THEY SAID THE state's action should be stopped because:

—The FDA has not established a "tolerance level" for mercury residues in fish, despite what the state says.

—The presence of more than 1 part per million of total mercury, but less than 1 part per million of organic mercury, does not violate any state law.

—The ban will cause "immediate and irreparable" damage not only to them, but also to "all others in the chain of distribution from commercial fishermen to restaurants and retailers."

—Issuing any statement "to the general effect" that eating Pacific blue marlin may be harmful or saying that such fish caught in Hawaiian waters "may be contaminated or adulterated because of total mercury content" would damage not not only those involved commercially with marlin but everyone else in the fishing industry.

EVEN BEFORE HE knew that the companies had gone to court, Paul Bartram, of the Honolulu-based federal Western Pacific Fisheries Management Agency, said the state's actions could have "extremely serious" implications.

Fishing is "at least" an $100 million-a-year business, Bartram said. Before "w e could do something like that (the state's action), we would have to hold public hearings."

Justin Rutka, also with the fisheries agency, said the ban's most serious effects would be on the owners and operators of the 120 charter sport fishing boats in the Islands. But about 2,500 of the 3,000 persons who are licensed commercial fishermen would also be adversely affected, he said.

Rutka said that charter fishermen could lose 36 percent of their income if they were no longer allowed to sell billfish, while commercial fishermen could lose between 2 percent and 10 percent of their income.

RUTKA ESTIMATED that most of the Pacific Blue and Black marlin caught weigh over 200 pounds.

Bartram estimated that more than 1 million pounds of billfish — currently worth a total of about $1 million — are caught each year and of that total, 700,000 pounds are Pacific blue marlin.

Rutka said that such events as the world-famous Kona Billfish Tournament on the Big Island would be severely affected "if sport fishermen had to start 'dumping' fish. The image would be very negative."

from - Title 50 Code of Federal Regulations

(c) The direction of a tow boat when circling will be counter clockwise.

(d) Skiers must wear U.S. Coast Guard approved ski belts, life jackets or buoyant vests.

(e) Water skiing is prohibited within 300 feet of harbors, swimming beaches, and mooring areas, and within 100 feet of any designated swimming area.

§ 27.34 Aircraft.

The unauthorized operation of aircraft, including sail planes, and hang gliders, at altitudes resulting in harassment of wildlife, or the unauthorized landing or take-off on a national wildlife refuge, except in an emergency, is prohibited. National wildlife refuge boundaries are designated on up-date FAA aeronautical charts.

Subpart D—Disturbing Violations: With Weapons

§ 27.41 General provisions.

Carrying, possessing, or discharging firearms, fireworks, or explosives on national wildlife refuges is prohibited unless specifically authorized under the provisions of this Subchapter C.

§ 27.42 Firearms.

Only the following persons may possess, use, or transport firearms on national wildlife refuges in accordance with this section and applicable Federal and State law.

[illegible]

32.

(b) Persons carrying unloaded firearms, that are dismantled or cased, in vehicles and boats over routes of travel designated under the provision of Subchapter C.

(c) Persons authorized to use firearms for the taking of specimens of wildlife for scientific purposes.

(d) Persons authorized by special regulations or permits to possess or use firearms for the protection of property, for field trails, and other special purposes.

§ 27.43 Weapons other than firearms.

The use or possession of cross bows, bows and arrows, air guns, spears, gigs, or other weapons on national wildlife refuges is prohibited except as may be authorized under the provisions of this Subchapter C.

Subpart E—Disturbing Violations: Against Plants and Animals

§ 27.51 Disturbing, injuring, and damaging plants and animals.

(a) Disturbing, injuring, spearing, poisoning, destroying, collecting or attempting to disturb, injure, spear, poison, destroy or collect any plant or animal on any national wildlife refuge is prohibited except by special permit unless otherwise permitted under this Subchapter C.

§ 27.52 Introduction of plants and animals.

Plants and animals or their parts taken elsewhere shall not be introduced, liberated, or placed on any national wildlife refuge except as authorized.

Subpart F—Disturbing Violations: Against Nonwildlife Property

§ 27.61 Destruction or removal of property.

The destruction, injury, defacement, disturbance, or the unauthorized removal of any public property including natural objects or private property on or from any national wildlife refuge is prohibited.

§ 27.62 Search for and removal of objects of antiquity.

No person shall search for or remove from national wildlife refuges objects of antiquity except as may be authorized by 43 CFR 3

§ 27.63 Search for and removal of other valued objects.

[illegible] precious rocks, stones, or mineral specimens on national wildlife refuges unless authorized by permit or by provision of this Subchapter C.

(b) Permits are required for archeological studies on national wildlife refuges in accordance with the provisions of this Subchapter C.

§ 27.64 Prospecting and mining.

Prospecting, locating, or filing mining claims on national wildlife refuges is prohibited unless otherwise provided by law. See § 29.21 for provisions concerning mineral leasing.

§ 27.65 Tampering with vehicles and equipment.

Tampering with, entering, or starting any motor vehicle, boat, equipment or machinery or attempting to tamper with,

Families of Missing Boaters

In Hawaii...

Tuesday, June 12, 1984 Honolulu Star-Bulletin A-3

By Russ Lynch
Star-Bulletin Writer

On Kauai and in Minnesota yesterday, families of three persons who have been missing more than a week on a catamaran out of Hanalei said they were involved in a desperate fund-raising effort to extend private searches as far out as French Frigate Shoals.

And they expressed disappointment that the Coast Guard gave up the search Saturday after nothing was found.

The Coast Guard, however, said it searched 29,000 square miles, much of that three or four times, and has no reason to go out again unless some trace of the missing 18-foot boat is seen.

Jim Chouinard, 35, Milan Vucurevich, 37, and Mary Huston, 26, were reported missing when they failed to return Sunday evening, June 3, from what was to have been a short leisure sail close to shore off Kauai.

THE COAST GUARD began a search that evening but called it off late Saturday after no trace of the vessel or crew was found.

Janet Tomaino of Duluth, Minn., sister of Mary Huston, was one of those expressing disappointment at the Coast Guard's dropping of the search. "Of course we don't like to see them give up," she said. But she recognized the Coast Guard's problems with the comment that "we understand that's the extent of their searches."

Tomaino said her sister Mary arrived on Kauai only about three days before the sailboat incident, planning to spend the summer with friends. Huston had been living in Colorado but is from Duluth, where her parents live, Tomaino said.

She said there is a fund-raising effort going on in Duluth in hopes of keeping up private searches now that the Coast Guard is no longer looking.

Linda Watts in Hanalei, who volunteered her services and started what is now called the Catamaran Search Committee, said yesterday she and other acquaintances, friends and family members believe the three on the boat are still alive.

"We have been privately funding (the search effort) for the last two days. We believe the boat is still afloat," she said, adding that the three were in top physical condition, used to hardship, had fishing equipment aboard to gather food and that the boat is "unsinkable."

SHE SAID THE private search effort has covered thoroughly areas close to shore but now supporters of the idea that the boaters are still alive want to go farther out to sea.

Three private planes — from Oahu, Maui and the Big Island — searched yesterday, she said.

What the searchers wanted to do today was search a wider area, going out as far as French Frigate Shoals (400 miles west of Kauai) and working back in toward Kauai.

The problem is that a long-range aircraft is needed and that costs much more money than running private planes closer to the Islands, Watts said.

"We exhaust our funds from day to day," she said. To run the

Fund Search

long-range plane will cost $800 an hour and the fund-raisers need more than $5,000, perhaps much more, to maintain the search they want.

(To contact the search committee, write in care of Linda Watts, P.O. Box 1014, Kapaa, Kauai, 96746, or telephone Kauai 822-7936. Watts said the Post Office is immediately hand delivering to her anything that comes to that address.)

Don Vucurevich, 31, younger brother of the missing Milan, said he has been delegated the job as spokesman for the families of all three of the missing.

HE SAID THE people on Kauai are "very disappointed" that the Coast Guard gave up the search because "they've got the expertise, they've done this many times, the craft is unsinkable and there's been no negative results" — meaning no debris or bodies from the boat were found.

Both men have been "catamaran experts for 20 years" and the woman is a "downhill skier" and all are in top physical condition, he said, and they have fishing gear to get food and the means to collect rainwater.

"The Coast Guard is set up to do search and rescue," Vucurevich said. He said the Coast Guard has the aircraft and the manpower on duty and it costs very little more to put them in the air.

He said the families don't feel the search should be abandoned when there has been nothing to indicate the boaters are dead.

He said the search that has been costing "$1,500 to $1,700 a day now goes to over $1,000 an hour."

Coast Guard spokesman Bob Jones said Coast Guard aircraft searched 28,715 square miles of sea and "a lot of the area was searched three or four times."

In addition, there were daily shoreline checks along the coasts of Niihau and Kauai with Coast Guard helicopters throughout the ocean search.

"Absolutely nothing was seen," he said, and conditions for searching were "very good."

6-16-84 HSB A-3

Catamaran Search Ends

LIHUE, Kauai — Family members and friends called off a private search yesterday for two men and a woman missing since they sailed a catamaran out of Hanalei Bay June 3.

Missing aboard an 18-foot Hobie Cat are Milan Vucurevich, 37, and Jim Chouinard, 35, both of Koloa, and Mary Huston, 25, a visitor from Duluth, Minn.

Family members decided to end the search after a plane flying between Kauai and the French Frigate Shoals yesterday failed to locate the three.

"The families are emotionally drained. At this point, the search is winding down," said Linda Watts, a member of a search committee.

The Coast Guard ended its official search June 10 after aerial surveys of Niihau and coastal areas of Kauai failed to turn up any signs of the boat or its crew.

The committee, made up of family members and friends of the missing trio, has raised more than $22,000 in contributions to pay for private airplanes and helicopters since the search began June 4.

Watts said that, while aircraft will no longer be used, fishing boats have been alerted to watch for the missing sailors.

The price is right but researchers

from the sea

mike markrich

As manager of Wing Sing fish market, Donald Leong has seen a lot of changes, but even he was surprised the Tuesday after Memorial Day when the auction price of opakapaka dropped from $11 a pound to $2.35 in one week.

"Everybody went out at the same time after Mother's Day," he said. When the 10 boats came in two weeks later, they brought in so much opakapaka and other fish that prices dropped to their lowest levels in years. (Although the auction price went up to $4 last week, it is still a good buy, Leong said.)

The pinkish-gray opakapaka (known also as a pink snapper) is a prized restaurant fish that has been in great demand for more than 30 years. Fisherman Alejandro "Gabby" Gabaylo said he makes sure the price is high before he goes out so he can be assured of making some money for his trouble.

He does most of his fishing off a ridge, about 240 feet below the surface, which extends in broken segments from Kaena Point to Haleiwa. He added, however, that the best opakapaka grounds can be found off Molokai.

Fishing the area over the last 15 years, Gabaylo has managed to figure out where large groups of the fish live. Once he locates them, he tries to attract as many as possible with palu, a chum made up of finely cut pieces of fish that he drops down to where they are.

While others commonly use a chum of cut-up aku belly to attract the fish on the ledges, Gabaylo prefers finely cut pieces of cuttlefish because it is not bloody.

He feels that too many good fishing areas are ruined by people who use too much chum made from bloody fish parts. If the sharks become attracted, "You only catch the first one (fish), they get the rest," he says. That might be one of the reasons people lose so many fish to sharks, he said.

Gabaylo uses two weighted handlines with six small hooks (No. 24-26) on each. Then he baits each with cuttlefish and waits. On a good trip he will pull up to three 7- to 9-pound fish at a time on each line.

His success determines how soon he decides to go out again. "If I run 90-150 pounds, I don't go out that next early afternoon. I wait till the next day because I don't want to flood the market" (and bring down the price).

When he feels that he has caught enough opakapaka, Gabaylo pulls in his lines and changes the bait on the hooks to opelu or akule. Then he drifts with the current along the ledge hoping to pick up other kinds of fish, such as uku, to sell at the market.

Scoops Kreger's favorite opakapaka

Take about 3 pounds of cleaned opakapaka; sprinkle it inside and out with Hawaiian salt.

Wrap in ti leaves and secure with string. Place on a rack in a roasting pan with water just below rack height. Bake for half an hour at 375 degrees. Add more water if it evaporates.

Make a sauce for dipping or pouring over the opakapaka by adding a capful of dry vermouth, some garlic and lemon juice to taste to a quarter pound (one stick) of melted butter.

The Sunday Star-Bulletin & Advertiser Honolulu, June 10, 1984 A-9

for opakapaka, worry about future

Advertiser drawing by Greg Taylor

Unlike others who fish, Gabaylo does not believe that overfishing has created a shortage of opakapaka. He believes that the numbers of fish fluctuate naturally from year to year.

Paul Bartram, a staff member of the Western Pacific Fisheries Council, disagrees. Although state reports indicate that the opakapaka catch has remained relatively constant over the last 10 years (130,000 to 191,000 pounds), he believes there has been a significant reduction of opakapaka stocks around the main Hawaiian Islands due to the use of new electronic technology that can pinpoint exactly where the fish are.

(The reports are a combined total from the main islands and Northwest Hawaiian Islands. He said catch reports indicate an abundance of fish in the northwest islands.)

He said one indication of the drop in the number of opakapaka has been the virtual disappearance of people who specialized in catching it. There may be too few opakapaka around the main islands now for them to make a good living.

Ocean conservation: Enforc

from the sea

mike markrich

Mike Markrich, writer of The Advertiser's "From the Sea" column each Sunday, was honored last week by the Propeller Club of the U.S., Port of Honolulu Chapter.

Markrich received the 1984 John Thornton Award for outstanding coverage of the waterfront.

"I couldn't believe it," said an angry Reil Sunn. A group of Mainland divers was hauling two large canvas slingloads of coral from the waters off Makaha Beach.

"They (the divers) said, 'We're just here for a visit, we want to take a bit of Hawaii home with us,' and they said that they had information that they could take as much coral as they wanted."

Sunn didn't agree. She called the state Division of Conservation and Resources Enforcement for help. The division sent an officer to the scene — but by then, Sunn said, the people were long gone.

It was just as well, she said, because the officer told her that what the divers were doing was legal.

"He said, 'Yes, they can take sand and coral from the ocean. They can take anything from the ocean for their own purposes.' I said, 'No, they can't.'"

Although the officer was technically correct — for, according to state law, one may take an unlimited amount of coral for home use — the law was never intended to be used for the wholesale taking of coral. Sunn and others worry that state ocean conservation laws are unclear and almost never enforced.

The U.S. Census estimates that there are 240,000 persons over the age of 16 who fish regularly for business and recreation in Hawaii. But in 1982, in the entire state, there were only 204 tickets given in the field for fishing violations.

(In the same year, Washington state — with about four times Hawaii's population — gave out 8,000 fishing tickets, 40 times as many as Hawaii.)

Honolulu District Court records for 1982 show that of the 152 Oahu fishing citations that went to court, 19 were dismissed. Fines ranging from $15 to $100 were paid on the others, with the average being $25.

"There is no enforcement of game laws in Hawaii and that's our biggest problem," said Henry Pelekai, a Waianae akule fisherman. "They (the state) are understaffed and when they do get a complaint, it takes them a couple of hours to respond. By the time they get there the people are long gone. There is no way they can even give out a ticket."

State enforcement chief Maurice Matsuzaki says his officers respond as fast as possible and have responded quickly to calls on numerous occasions.

But enforcement officer Jimmy Kikuchi said citations and arrests "are way down" partly because most officers in Honolulu have to spend the majority of their time issuing parking tickets on state park lands such as Magic Island. (In 1982, the division gave out 4,010 parking tickets.)

Pelekai said the taking of coral is common and eventually will limit the areas that fish can go for shelter and food. He added that illegal netting of undersized fish severely depletes fish stocks.

Other critics complain that the enforcement division, part of the state Department of Land and Natural Resources, does nothing about the wide-scale commercial use of reef-damaging chemicals, such as chlorine, to catch fish.

One land department official who asked not to be named said that for all practical purposes, enforcement of marine laws, bag limits and other fish conservation measures is practically "non-existent."

Matsuzaki and others said budget restrictions have limited the enforcement division's ability to deal with problems.

Some have suggested that one way to increase revenue would be to emulate other states by selling recreational fishing licenses to raise money for enforcement and use the fines collected for the same purpose. Revenues could amount to $1.2 million if everybody paid $5 for an annual license.

The irony is that the enforcement division was created in 1979 to make enforcement of wildlife laws more comprehensive. Before that, each section of the then Fish and Game Division from forestry to fisheries did its own enforcement. In addition, all of the field biologists were deputized as voluntary officers.

It was thought that putting all the game wardens in one division and installing a 24-hour telephone hot line would improve coordination and make enforcement more cost-efficient.

Enforcement chief Matsuzaki acknowledged that there were numerous criticisms of his division. He said he was aware of "a lack of trust about confidentiality" that kept people from calling in with information about lawbreakers. But he

cement problems run deep

Enforcement officer Jimmy Kikuchi explains regulations to two fishermen at the Wahiawa Reservoir.

Advertiser photo by Carl Viti

added that sometimes the division goes for days without calls and has to do the best it can with limited resources.

Last year the budget for the enforcement division was $1.7 million. It had 48 field officers then (and is now in the process of hiring eight more). The 48 are charged statewide with checking thousands of acres of state lands and ocean areas for fishing, hunting, state parks and forestry violations and protecting wildlife sanctuaries, conservation districts and natural area reserves.

At the same time, they issue various kinds of permits, give parking tickets and enforce county ordinances. As a result they can spend only a fraction of their time responding to fishing violations.

"We're 15 guys (on Oahu) with 50 things to do," said one frustrated enforcement officer.

Another complained that because there are so few agents, their faces and movements are well known and it is difficult to catch people in the act of breaking the law.

Hawaii's Seagoing Processor of Shrimp Unique in Industry

By Helen Altonn
Star-Bulletin Writer

In 2½ years, Gary "Skip" Naftel has climbed out of debt and into an executive suite with the largest commercial-fishing operation in the state and possibly the only one of its kind in the world.

He is chief operating officer of the Hawaiian Shrimp Co., formed last August to catch, process and market a Hawaiian product known officially as Heterocarpus laevigatus.

It is red Hawaiian sea shrimp, described as a cross between lobster tail and shrimp with "delicate white meat...tender but firm." The shrimp are found about half a mile below the ocean's surface from the Big Island to Kure, the last of the Northwestern Hawaiian Islands.

The shrimp company is landing about 100,000 pounds a month of the product for local markets and restaurants and exports to the Mainland and Japan. It is especially popular in sushi bars for sashimi.

"We're pioneering with modern technology," Naftel said in a recent interview in his office on the 29th floor of Grosvenor Center in downtown Honolulu.

"Hawaiian shrimp are processed while still alive to ensure quality and they are ready for the consumer when they get off the boat."

HE DEVELOPED a "custom" fishing system that includes three catcher vessels, Easy Rider, Mokihana and Hawaii Makai, and a mother ship, Easy Rider Too, which is equipped to flash-freeze and package the shrimp at sea.

It's the only seagoing processing system under an American flag and it may be the only one in the world that's processing shrimp at the fishing grounds, Naftel said. Gulf Coast fishing boats keep their shrimp on ice while they are at sea and they are processed in a plant on shore.

Officers of Hawaiian Shrimp Co. include Glen W. Bell Jr., founder of Taco Bell restaurants, and Elliott B. Broidy, manager director of Bell Enterprises, which manages Bell's financial holdings.

Naftel said about $10 million has been invested in the shrimp

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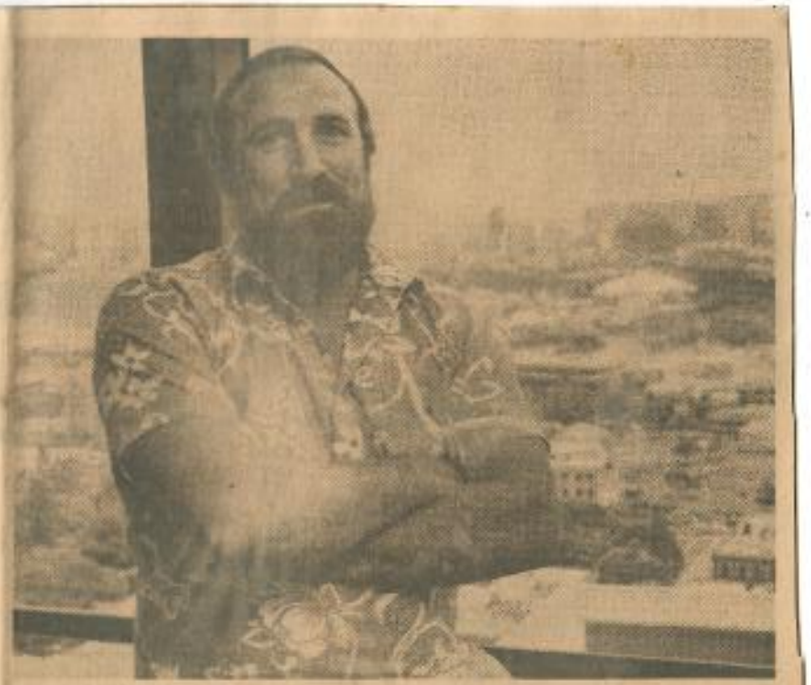


FISHERIES PIONEER—Gary "Skip" Naftel, chief operating officer of Hawaiian Shrimp Co., turned the Hawaiian sea shrimp into big business. —Star-Bulletin Photo by Craig T. Kojima.

Hawaii

Continued from Page One

operation, which has more than 50 employees and is growing with the demand.

"I'm really proud it's working out the way we hoped it would. Hawaii's fisheries needed this shot in the arm to make it viable. It is a substantial fishery for the state and the whole Pacific Basin," he said.

Naftel has been involved in research and development of fisheries in the Northwestern Hawaiian Islands for about eight years. He had Easy Rider Too built with processing capabilities because he believed that was the only economical way to utilize resources in the leeward fishing grounds.

HE WORKED with lobsters and other commercial species after the $2.5 million ship arrived four years ago and then decided to concentrate on shrimp.

"When I first discovered them, I had biologists tell me there was no such thing," he said. "People said you can't fish that deep and you can't ensure quality...I had to overcome all those hurdles."

He had cash flow problems because of the financial burden of the fishery development, which involved considerable work on the biology of the shrimp and technology involved in catching and processing them.

"I was begging, borrowing...I never got any subsidy — not one dime from the federal or state government."

He pulled out of the situation with "a lot of hard work, some real good people and some luck." None of his creditors foreclosed. "They had choices but they believed in the cause, they believed in the fishery and they believed in me," he said.

"It's a community development in that so many people are behind it. Despite what Forbes Magazine says (about Hawaii's anti-business environment), we have attracted support from many people for our fishery."

ADM INC. IS handling the marketing program for the shrimp, and Rose Wolfhope, president, and John S. Kay, Jr., board chairman, are as enthusiastic about the product as Naftel. They see it as a filet mignon from the sea

Shrimp System Unique

SEAGOING PLANT—Easy Rider Too, with freezing and processing facilities, was built for Gary "Skip" Naftel four years ago to tap fishery resources in Hawaii's northwestern waters. — Star-Bulletin Photo by Craig T. Kojima.

because of its "tender and sweet" natural taste.

"It's an eating experience," said Kay, who has had help from some of the best chefs in town with shrimp recipies.

"I see it as macadamia nuts were a few years ago," Kay said. "It's the first truly different all-Hawaiian product to be introduced in the Islands in the last few years. Best of all, we can ship it all around the world because it is frozen."

"To me it's really neat because there are not too many things we get to do in life that nobody else has done," Naftel said. "My group feels the same. They take pride in their product and in their production because we're the only ones in the world doing it...

"LOOK OUT there," he said, gesturing to the view toward Diamond Head from his office window. "You don't get the right perspective until you get to the 29th floor. Where's the little farm out there? You can only build so much concrete. We need new industry. We've got to turn to the ocean and we've got to turn to the area off the continental shelf."

Naftel takes a conservationist's approach to fisheries development because he doesn't want the resources over-harvested. But he said the Hawaiian shrimp stocks can support four or five more operations and he believes the local product can replace about half of the 3 to 4 million pounds of shrimp imported here annually.

State fisheries biologists estimate the potential annual yield of deep-sea shrimp at 1 to 2 million pounds, which is about 10 percent of the resource.

"My only concern is seeing that an inferior product doesn't get into the marketplace that would hurt the Hawaiian sea shrimp," Naftel said.

County Role Suggested for Northwestern Islands

By Harry Whitten
Star-Bulletin Writer

The tiny Northwestern Hawaiian Islands, which dot the ocean between Niihau and Midway, are part of the City-County of Honolulu, although the city-county's role concerning them is minimal.

The county, however, should consider planning as a protection for the islands' pristine environment, according to Councilman Leigh-Wai Doo and Jan Naoe Sullivan, both attorneys.

In a paper presented recently at the joint session of the Pacific Congress on Marine Technology and the East-West Center's Workshop on Marine Resource Economics, they discussed Honolulu county's role in planning for the islands. Doo is chairman of the City Council's Planning and Zoning Committee.

The paper's authors refer to the state's proposal for a fishery base in the islands and future resource developments in waters adjacent to the islands.

At present the U.S. Fish and Wildlife Service manages the islands as a wildlife refuge. A second federal agency, the National Marine Fisheries Service, has the dual responsibility of developing fisheries and conserving the endangered monk seal and threatened green sea turtle. The Western Pacific Fisheries Management Council, a regional agency, has the responsibility of regulating fisheries within the 197-mile fishery conservation zone adjacent to the territorial sea surrounding the islands.

"THE RESPONSIBILITIES of these agencies overlap in areas and further coincide with state agencies involved in managing resources" in the islands, the authors say.

They say that two state agencies are also involved in managing the refuge–the Department of Land and Natural Resources through its Division of Aquatic Resources and the Department of Planning and Economic Development through its role in implementing Hawaii's Coastal Zone Management Program.

State statute and county charter place the islands under jurisdiction of the City-County of Honolulu.

"The county does not presently assert a role in resource management and does not participate in administration of the refuge," the authors say. They say that the county has a significant part in the land use regulatory process, minimal now but which could be major if activities other than the present conservation uses were to take place.

The land use regulations would apply if a fisheries base or support station were to be constructed on state land. The DLNR has in the past asked use of Tern Island, French Frigate Shoals, as a fisheries base but its request was denied by the U. S. Fish and Wildlife Service. The DLNR is drafting another request to be resubmitted.

The authors raise the possibility of the county designating a shoreline management area around the shorelines or perhaps the entire land masses of the islets. If such an area were established, a shoreline management area permit would be required for a fisheries base, they say.

They also say that manganese nodule mining, polymetallic sulfide mining, ocean thermal energy conversion plants, or other ocean-related activities in the future could affect the coastal zone management area.

"By adopting a general plan, development plan and shoreline management area for the Northwestern Hawaiian Islands, the City and County of Honolulu could ensure that extensive public input and county legislative mandae would be required before any changes that were proposed for the islands could be effectuated," they say.

"County planning at this point in time is not premature and would present a concrete safeguard to protect the pristine environment of the Northwestern Hawaiian Islands."

Honolulu Star-Bulletin March 20, 1984 A-10

Monk Seal Spotted at Kaena Point

By Robbie Dingeman
Star-Bulletin Writer

A rare Hawaiian monk seal was spotted basking on the beach near Kaena Point over the weekend, according to the National Marine Fisheries Service.

William Gilmartin, biologist for the service, said yesterday that sightings of the endangered animals have increased over the past few months to about one a month on Oahu and more on Molokai and Kauai.

Most of the Oahu sightings have been on the North Shore in the area from Kaena Point to Kahuku, although two seals were seen at Kewalo Basin, Gilmartin said.

He said it is hard to tell if the same seal has been sighted several times or if each sighting is a different animal. He said he thinks that the same animal probably has been spotted several times on Molokai.

The Hawaiian monk seal has been on the endangered species list since 1976 and is one of Hawaii's two native mammals. The animals are found mostly in the uninhabited Northwestern Hawaiian Islands, which extend from Nihoa to Kure atoll.

The seals are spotted fairly often by boats at sea around all the major Hawaiian Islands, but generally stay away from people and only come ashore in isolated areas.

Gilmartin encourages those who spot the animals to stay away from them, but to report the time, day and place of the sighting and whether the animal is injured, tagged or has any distinguishing scars.

"IT SEEMS that a lot of people who have seen them have wound up chasing them in the water," he said. "It is against the law to harass the animals."

Waikiki Aquarium director Leighton Taylor said people sometimes try to startle the animals because "when the seals are on the beach, they're usually asleep and they look dead."

Gilmartin also urges people to report sightings of sea turtles — dead or alive. Those who see either of the animals, should call 943-1221 or 955-8831.

Anchovies Lost to El Nino

WASHINGTON (AP) — Last year's unusual El Nino phenomenon in the Pacific Ocean has brought bad news for some lovers of pizza and Salade Nicoise — lack of anchovies.

The United States anchovy catch dropped to 22.3 million pounds in 1983, down from 103.3 million pounds the year before.

Officials of the National Marine Fisheries Service attributed the drop to the El Nino, an unusual warming of the temperature of parts of the Pacific Ocean which played havoc with many fish species.

Scientists do not know what caused this ocean warming, but report that it occurs periodically, severely damaging the fish harvest along the west coast of South America and as far north as the United States.

While overall U.S. fishing was up last year, king crab landings were also off, dropping to 25.6 million pounds, the lowest level since 1959.

The crab fisheries are too far north to be affected by the El Nino warming, officials said, and attributed that decline to a variety of causes, including overfishing.

On the positive side of the ledger, a record 44.2 million pounds of American lobster was landed, valued at $106.8 million. That topped the previous high of 39.4 million pounds set in 1982.

There was also a record catch of menhaden, a fish caught for oil used in industrial processes. Fishermen took 3 billion pounds of menhaden, topping the 2.8 billion of 1982.

Overall, the 1983 catch for American fishermen was 6.4 billion pounds, up 71 million pounds from the year before, although short of the all-time record of 6.5 billion pounds set in 1980.

The 1983 catch was valued at $2.4 billion. Although the total catch was larger than in 1982, the value declined by about $34.5 million.

On average, fishermen got about a penny a pound less for their catch in 1983 than the year before.

Besides the record landings of lobster and menhaden, the Commerce Department agency also reported good catches of clams, cod, flounder, salmon and tuna.

April 19, 1984 HSB A25

Mauna Loa Volcano: Pro

By Albert Sehlstedt Jr.
Baltimore Sun

BALTIMORE — Every million years or so, hot plumes apparently rise from the interior of the Earth and form a volcanic island, such as Hawaii where mighty Mauna Loa erupted for 22 days recently.

Over geologic periods of time, scientists believe, these subterranean "burps" have produced chains of evenly spaced volcanic islands across the Pacific, extending from the Hawaiian Islands up to the Aleutians.

This periodic upwelling of plumes from the Earth's core is a current hypothesis in geophysics, though not yet a proven fact, according to Dr. Peter L. Olson, a Johns Hopkins University scientist.

Olson, working with viscous liquids representing the Earth's mantle (middle layer), is conducting experiments in his laboratory on the University's Homewood campus in Baltimore to understand more about the apparent ascent of these plumes through the mantle, and the resulting formation of volcanoes.

"At this stage I'm trying to understand the mechanics of the plumes and hot spot formation," he said.

He defined hot spot as a generic name for a "long-lasting, persistent volcanic center" that rests on the top of the plumes.

"I'm trying to learn how fast the plumes rise through the mantle and what they would look like."

HIS SPECIALTY in geophysics is the deep interior of the Earth.

Hawaii, he continued, is part of a group of topographical formations that includes not only the "Hawaiian Islands," such as Oahu, Molokai and the "Big Island" of Hawaii, but a much longer chain of volcanic sites that encompasses a submerged formation called the Emperor Sea Mounts.

They all run northwestward in a straight line, except for one dog-leg turn along the way.

"There appears to be, somewhere in the interior of the Earth, a heat source that has generated volcanic activity at these island sites for a long period of time - 70 to 80 million years," Olson said.

"In the case of Hawaii, the heat source has been there at least 70 million years."

The volcanoes in that area are "the tip of an iceberg," he said. They rest on a submerged topographic feature called a sea-floor swell, which might be compared to a giant blister - about a mile high and 400 miles long.

Presumably, the blister is formed from heat that originates at the boundary between the Earth's iron core and the mantle.

The mantle is a 2,000-mile-thick layer under the Earth's crust, and the crust is about 30 miles deep.

THE HOT SPOT itself is apparently formed by a torrid, buoyant plume rising from the depths of the mantle, Olson said.

The plume hypothesis was first advanced in 1972 by Dr. Jason Morgan, a geophysicist at Princeton University, he pointed out.

"It's always been a very controversial subject," Olson said of the Morgan hypothesis. "It sounds a little fantastic."

Nevertheless, the idea dovetails with other geophysical observations which, in turn, are closely tied to the theory of plate tectonics, a concept that emerged in the 1960s and is now a widely accepted theory among geophysicists.

Plate tectonics is based on the theory that the outermost spherical shell of the Earth is divided into 10 or 12 enormous, rocky plates, each about 60 miles deep, that slowly move in various directions.

California's famous San Andreas Fault marks the eastern boundary of the so-called Pacific Plate, which presumably is sliding northward along the western edge of the North American Plate.

Japan is at the eastern edge of the Pacific Plate, which is by far the largest of the plates. It covers about 40 percent of the Earth, Olson said.

Scientists estimate that the plates move about 11 centimeters (four to five inches) a year.

"Take 11 centimeters and multiply that by a million years and you get the approximate distance between the volcanic centers in the Hawaiian chain," Olson said.

THAT DISTANCE is on the order of 60 or 70 miles.

At first glance, the volcanic chain theory seems faulty, because the Pacific chain of islands, of which the Hawaiian Islands are a part, does not stretch in a straight line across the ocean but makes that dog-leg turn en route.

How come?

"Because 40 million years ago, the Pacific Plate changed direction," the Hopkins scientist replied.

The plate had been moving in a more northerly direction 40 million years ago and now its heading along a more westerly course, according to recent scientific studies of the ocean floor.

Olson explains the relationship between tectonic plate movement and the line of Pacific volcanoes by supposing that he is passing his bare arm over a candle flame.

The flame represents a hot spot and his arm is the moving plate.

"The candle flame produces a track of welts," he said. And the welts represent the volcanoes.

THE BIGGEST welt of all is 13,680-foot Mauna Loa, the world's largest volcano.

In the past 100 years, the federal agency said, it has been estimated that something on the order of 1.5 billion cubic yards of lava have flowed from the volcano.

duct of 70 Million Years

PREDATOR FILE

University of Hawaii
Sea Grant College
Program

"Toward the Sea"

MAKAI

Vol. 6, No. 4
April
1984

FEEDING RELATIONSHIPS: A WEB OF COMPLEXITY

by Susan Pirsch

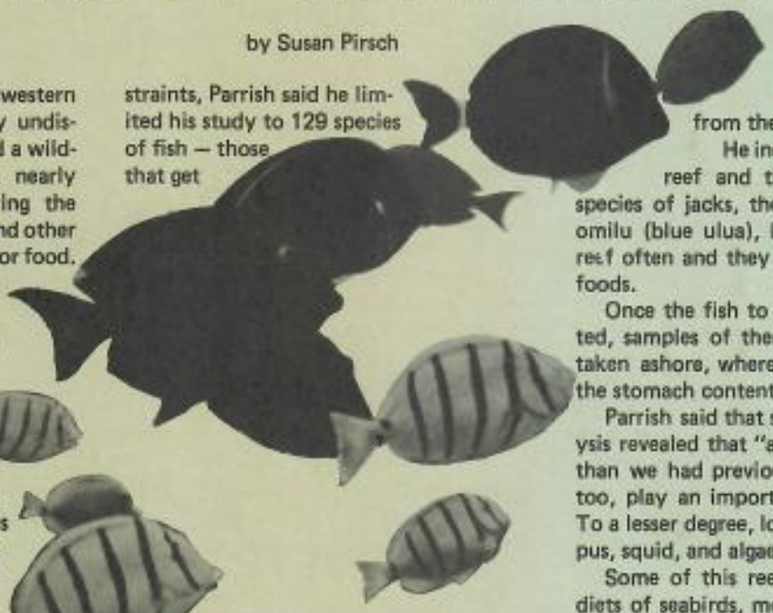
Coral reefs in the Northwestern Hawaiian Islands (NWHI), largely undisturbed since the area was declared a wildlife refuge in 1909, provide a nearly perfect research area for studying the feeding relationships among fish and other animals that rely on reef systems for food.

Understanding the structure of these feeding relationships is important, said Dr. James Parrish, leader of the Hawaii Cooperative Fishery Research Unit located at the University of Hawaii at Manoa in Honolulu. This is especially so if man enters the picture as another competitor for reef resources. With this knowledge researchers may be able to create scenarios to predict what happens to feeding relationships when predators are introduced or removed from coral reefs.

For example, which animals will have fewer predators if commercially important fish such as aweoweo (bigeye), ulua (jack fish), and goatfish are removed from reefs? How, if at all, will wide ranging predators like sharks, ulua, seabirds, and monk seals be affected by increased competition from man for prey?

Parrish said that after 4 years of studying feeding relationships in reef communities, "we are now in a better position to predict what's going to happen to some part of the system if we disturb another part of the system." However, he added, it is unlikely that the intricacy of the entire food web will be fully understood soon.

Because there are so many species of fish in the sea and because of time constraints, Parrish said he limited his study to 129 species of fish — those that get much of their food from the reef.



A diver nets samples of taape (blueline snapper). Researchers used a similar method for netting fish in the NWHI for stomach content analysis.

—Dennis Ode photo

He included galapagos, grey reef and tiger sharks, and two species of jacks, the white ulua and the omilu (blue ulua), because they visit the reef often and they eat a wide variety of foods.

Once the fish to be studied were selected, samples of them were collected and taken ashore, where researchers analyzed the stomach contents.

Parrish said that stomach content analysis revealed that "a lot more fish eat fish than we had previously thought." Crabs, too, play an important role in fish diets. To a lesser degree, lobsters, shrimps, octopus, squid, and algae do too.

Some of this reef food is also in the diets of seabirds, monk seals, and sea turtles — all of which make some use of the reef for feeding, he said.

While Parrish was conducting his study on reef fish, other researchers were gathering data on seabirds, monk seals, and sea turtles in the NWHI. The data these researchers collected, when compared with Parrish's, may provide a better understanding of the NWHI food web, he said.

The researchers investigated the living resources of the NWHI as part of a 5-year study sponsored by the National Marine Fisheries Service, the U.S. Fish and Wildlife Service, the Ocean Resources Office of the Hawaii Department of Planning and Economic Development, the Hawaii Department of Land and Natural Resources, and the University of Hawaii Sea Grant College Program.

(Continued on page 4)

A Head Start for Monk Seals

by Susan Pirsch

A Hawaiian monk seal pup (*Monachus schauinlandi*) wakes up to find its mother gone. Another attempts to swim after its mother, but returns to the shore when she reached deep water. These pups, at just 5 weeks of age, are now "officially" weaned and survival, in part, depends on avoiding sharks, adult male monk seals, and, to some extent, humans. Unless, of course, the pup happens to have been born female and on Kure Atoll, the location of the National Marine Fisheries Service (NMFS) monk seal head start program, begun in 1981.

According to John R. Henderson, a NMFS researcher working with monk seals, the program was started to curb the decline of the Kure Atoll monk seal population. Henderson, along with William G. Gilmartin, another NMFS researcher, sets up the program each summer on Kure. The U.S. Coast Guard, Henderson said, provides transportation and other logistical support.

Kure Atoll was chosen as the site of the monk seal head start program, he said, because the population there has become unstable. Researchers were afraid that a low rate of survival for monk seal pups would eventually result in an old seal population. This could mean trouble for the seals, he said, because "if you don't have the kids coming up, your population is going to crash."

"We felt that Kure was the place that most warranted having a head start program. There is just a remnant of the original monk seal population there. Only eight female adults were counted on the beach in 1983," he said.

In general, monk seal populations have declined throughout the Hawaiian Islands. Beach counts, which only assess seals on the beach and not the seals in the water, have shown a dramatic decline in the Kure seal population.

Henderson said in 1957, an average of 128 monk seals was counted on Kure Atoll. By 1982, the average was 24.

Adult male monk seals, shark predation, and to some extent, human disturbances have affected the seal population, he said. Male monk seals occasionally mistake a newly weaned pup's search for its mother as sexual receptivity. Such encounters usually take place in the water, he said, and pups may come away from them with deep teeth marks on their necks. These wounds may become infected and weaken the pup making them easy shark prey. Sometimes, the infection alone is enough to kill a pup, Henderson said.

Although lately, human disturbances may play a lesser role in the declining monk seal population, there was a time when vehicles were driven on Kure's beaches and dogs were allowed to run free.

Such disturbances may have driven pregnant females to nearby Sand Island to give birth, he said. Although Sand Island, Shark Island, and Green Island all comprise what is called Kure Atoll, Green Island is the most suitable for pupping because it offers the most protection.

Now that it is illegal for vehicles to drive on Kure's beaches and dogs have been banned, the monk seal population has a better chance at recouping. This is the goal of the NMFS monk seal head start program.

A monk seal pup gets its mourishment from its

Henderson said protecting female pups during their first summer, which appears to be the most critical time for them, may eventually stabilize Kure's seal population.

The head start program begins, he said, when a newly weaned pup is spotted sitting alone on the beach. This usually occurs in late March or in early April. When a pup is seen alone, it is netted, weighed, sexed, and tagged. Female pups are then placed in a 400-ft by 200-ft enclosure which is partially in the water and partially on the beach. Male pups are tagged and released.

Female pups, Henderson said, are kept in the enclosure until September. During their stay they are allowed to forage for food, but the bulk of their diets consists of locally trapped fish fed to the pups by the researchers.

Feeding pups locally caught fish serves two purposes, Henderson said. It gives researchers a better idea of what monk seals eat naturally and it helps researchers determine if something in the monk seal diet is responsible for the population decline. "If we were feeding them hot fish, we'd know it," he said, "but we had no problems with any of the animals."

There was some concern, however, that after being hand fed for an entire summer, monk seal pups would have a difficult time adapting to life outside of the enclosure, he said. But the success of the program has eliminated this concern.

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mother for about the first five weeks of its life.
—U.S. Fish and Wildlife Service photo

In 1981, for example, five female pups spent the summer in the enclosure on Kure Atoll. Of these, four are still being seen there. In 1982, three pups were "head started" and all three are still being seen, he said. In contrast, seven male pups were born during 1981 and 1982, and of these, just three are still being seen.

Male pups are not head started, Henderson said, because males can impregnate more than one female at a time. In fact, because only males were born on Kure during 1983, the head start program did not operate that year.

Head starting female pups will continue until the NMFS permit to do so expires in 1987, he said, as long as the Hawaii Department of Land and Natural Resources, which has jurisdiction on Kure Atoll because it is a state bird sanctuary, continues to grant its approval. □

Safe Boat Battery Installation

[Editor's note: The following information is taken from Boating Safety Circular 56 *(October 1983), published by the U.S. Coast Guard.]*

At a 1983 meeting of the National Boating Safety Advisory Council, one member described some serious fires and explosions that have occurred on boats equipped with side terminal batteries and portable fuel tanks. New batteries no longer have the terminals on opposite corners on the top. Now the terminals are located next to each other near the top on the same side.

If one of these new batteries is not properly insulated and secured in a battery box, it can, during sharp turns of the boat, slide across the deck bringing the terminals into contact with the side of the fuel tank and causing a spark and then an explosion.

Such an accident can be prevented by securing the battery tightly and insulating the positive terminal as is required by the Electrical Systems Standard.

The standard calls for restraint of each battery in both horizontal and vertical directions. Inboard boat manufacturers are required to install batteries in such a way that they will not move more than 1 inch in three directions — vertical, horizontal (fore and aft), and horizontal (port and starboard) — when subjected to a 90-pound test force for 1 minute. Battery installers would be wise to try to meet these same requirements.

The typical commercial plastic battery box, in addition to being resistant to the electrolyte (usually sulphuric acid), protects the battery terminals and will prevent the maximum 1-inch movement. The box must be securely fastened and spacing material resistant to the electrolyte must be placed inside it to restrict battery movement.

The regulations prohibit boat manufacturers from installing a battery directly above or below a fuel tank, fuel filter, or fitting in a fuel line. Leaking fuel could damage the casing of a battery installed beneath a fuel system component. And, leaking electrolyte from a battery installed above a fuel system component could create leaks in the fuel system. □

This monk seal was apparently the victim of a shark attack.
—D.B. Marshall photo

This fence enclosure on Kure Atoll protects female monk seal pups from predators and other dangers during their first summer. The pool in the center of the pen has now been removed because the pups seem to have no use for it.
—Rob Morrow photo

FEEDING RELATIONSHIPS *(Continued from page 1)*

The turtle shells and the lower half of a shark seen here were taken from the stomach of the shark lying on the boat deck.

—Leighton Taylor photo

Although all of the field work is now finished, much of the data collected in the various research projects are not yet ready to be compared directly with Parrish's data. When they are ready to be compared, he will have a better idea of the competition in existence for reef resources.

"There is some potential for competition between seabirds and demersal (reef) fish," he said, "because seabirds eat fish and fish eat fish." Seabirds, he added, probably eat a lot of fish because they burn so much energy. How much of their food comes from reef communities, however, is still not fully known.

Parrish said U.S. Fish and Wildlife researchers who studied seabirds told him that seabirds primarily eat a lot of silvery, surface-swimming fish — fish that were not a major part of Parrish's study. Some seabirds do take juvenile fish that appear to be important to the reef community, and they probably compete with reef fish for octopus and squid, he said.

Since monk seals "are pretty catholic in their tastes," and eat a wide variety of foods, Parrish said they probably compete with reef fish for reef resources.

Unfortunately, little is known about the natural diets of monk seals because it is illegal and unreasonable to kill a monk seal or to extract its stomach contents for analysis, he said.

Diet data that do exist for monk seals were collected by researchers for the National Marine Fisheries Service (NMFS) through a female monk seal pup head start program and through analysis of scats (fecal wastes), Parrish said.

The monk seal head start program has begun to put a "kink" in the food chain by protecting female pups from shark predation. It also helped researchers collect data on monk seal diets that" is infinitely better than we had before," he said.

Scats that were collected were analyzed by researchers and identifiable substances such as fish bones and other parts were compared with a collection of fish parts Parrish had previously identified.

Even though some data about monk seal diets does exist, Parrish said that until his data is compared with the NMFS researchers' data, no firm conclusions can be made about competition between monk seals and reef fish.

Sea turtles are also protected by law because of their small population. Consequently, like monk seals, there is very limited information about their diet, he said.

"It's my impression," Parrish said, "that sea turtles like large fleshy algae, the ones that look like grapes and grow like vines along the ocean bottom, for example. Although some fish like these algae, too, it wouldn't surprise me if we found that the bulk of the turtle diet is not the same as the bulk of the demersal (reef) fish diet."

The same is not true for sharks and jacks because "they really integrate the resources out there," he said. The tiger shark, for example," is really just a swimming garbage can. It is also the only shark known to eat other sharks."

Because sharks and jacks eat a wide variety of food from just as wide a variety of places, he said they probably compete with many fish species for food at many levels of the food chain.

This is why studying shark and jack diets can give researchers a better understanding of the prey-predator relationships in the NWHI, he said.

For sharks, and to some extent for jacks, this feeding relationship is now better understood, said Parrish. Stomach contents from sharks and jacks were analyzed and an estimate of their population was made. The amount of food they eat and the amount of energy they burn were estimated, too. These data can then be used to estimate the amount of food currently being taken by the sharks and by the jacks.

Parrish said, if this system could be applied to all of the fish species in the NWHI reef communities and to other wide-ranging predators, researchers could determine who is eating whom and, to some degree, how much is being eaten.

Because there are so many species of fish in the NWHI, he said, it is unlikely that data on all of them will ever be very precise. Instead, researchers will "work from the top down, starting with sharks and jacks to estimate how much prey was eaten by each predator at each level of the food chain.

Within a year or so, Parrish said he hopes to sit down with other NWHI researchers who have collected dietary data so he can better understand the nature of the competition for food among animals on coral reefs. He can also examine the effects that removing fish from reefs could have on other animals dependent on reefs for food. □

FEDERAL-STATE OCEAN MINING TASK FORCE ANNOUNCED

Governor George R. Ariyoshi of Hawaii and Secretary of the Interior William Clark on February 6 announced the formation of a Joint Federal-State Task Force to consider the economic potential and environmental impacts of ocean mining for the recovery of cobalt-rich manganese crusts in the 200-mile Exclusive Economic Zone (EEZ) surrounding the Hawaiian Archipelago.

"We are pleased," said Secretary Clark, "to have Hawaii join us in this cooperative effort and look forward to establishing this procedure with other states on similar projects."

"It is a great step forward," said Governor Ariyoshi, "to have the state and federal authorities working so closely together to assess these ocean resources within the Hawaiian Archipelago for the benefit of all the people of Hawaii and our nation."

The task force will evaluate opportunities created by the Presidential Proclamation of March 10, 1983, which established the U.S. EEZ, and will also consider ways of implementing the Interior Department's responsibilities for authorizing the exploration and development of mineral resources within the EEZ under the Outer Continental Shelf Lands Act of 1953.

The goal of the task force is to establish a close working relationship between state and federal authorities which would permit the potential leasing, exploration, and development activities to be carried out under terms which meet the environmental requirements and economic aspirations of both the State of Hawaii and the federal government.

The manganese crusts are from 1 to 7 cm thick, are found on seamounts of depths of 800 to 2,400 m, and may contain in excess of 1 percent cobalt. In comparison, onshore deposits usually are found with only .25 of 1 percent of cobalt. In addition to cobalt, the crusts contain potentially economic deposits of nickel and manganese. These metals are widely used in specialty steel alloys. For example, cobalt, gives steel greatly enhanced resistance to high temperatures and pressures, and is used for jet aircraft engines. The U.S. is almost totally dependent on foreign sources for these critical minerals.

The initial assignments of the task force are to delineate the primary areas of interests for exploration and to define those environmental concerns which must be taken into consideration in a draft environmental impact statement.

Co-chairmen of the Joint Federal-State Task Force are Dr. Michael J. Cruickshank, mining engineer with the Interior Department's Minerals Management Service, and Dr. John C. Wiltshire, manager of the Ocean Resources Office, Hawaii Department of Planning and Economic Development. The chairmen were chosen to lead this critical environmental and economic evaluation because of their extensive experience in ocean mining, marine geology, and environmental research. □

This yellow-bellied sea snake was found dead off Hilo. They are easily beached because of a rudder-like structure that runs along their bellies (inset).

—Waikiki Aquarium photo

Sea Snakes Make Visit

by Carolyn Iezza

Fishermen are urged to beware of venomous yellow-bellied sea snakes in an advisory released earlier this year by the Waikiki Aquarium.

The aquarium has confirmed five sightings of this deadly reptile in Hawaiian waters during the past 2 years and advises anyone who encounters a sea snake to avoid it. People who stay close to shore have little chance of seeing one, but people like fishermen who go offshore — especially at night — might see one.

Sea snakes are generally not aggressive. They usually do not bite unless provoked, and because their venom is used primarily for defensive purposes, they rarely inject venom when they bite. However, their venom is even more deadly than a cobra's: one drop is enough to kill three people. And, sea snakes can inject up to eight drops in a single bite.

The yellow-belly is a surface feeder that floats along with ocean currents. It swims with its head and tail hanging slightly downward, waiting to prey on small fish.

The sea snake is about 3 ft long, has scales, and has a flattened body. Its back is jet black and its underside is yellow, the colors sharply contrasting along the sides. The tail is spotted.

How sea snakes get to Hawaii is uncertain, but they may float from waters off Central America where they live in large numbers. It is also unknown whether the snakes have established breeding grounds in Hawaiian waters, but aquarium authorities doubt that this has occurred.

It is the most widely distributed of about 50 species of sea snakes and is the only one found in the Eastern Pacific.

If an emergency arises, the Waikiki Aquarium has anti-venom and telephone numbers of physicians knowledgeable in treating sea snake bites. Call the aquarium at (808) 923-9741. □

MARINE MISCELLANY

1983 STATE DATA BOOK AVAILABLE

The State of Hawaii Data Book 1983 is now available from the Hawaii Department of Planning and Economic Development (DPED). Copies may be ordered at $5 each ($10 postpaid to out-of-state addresses) from the DPED Information Office, 250 S. King St., 7th Floor, Honolulu, HI 96813. Checks, money orders, or purchase orders should be made out to the "State DPED."

The data book is the standard official summary of statistics on the social, economic, and political organization of the state. It contains 24 subject sections with narrative summaries, 620 statistical tables, and an extensive index. Although it is the largest edition published, many statistical series have been suspended or terminated largely because of federal budget reductions. Following are examples of data in the new volume.

- Hawaii's de facto population (includes visitors but excludes residents temporarily out of state) was 1,119,000 in mid-1983.
- Puu Kukui, Maui had 634 inches of rainfall in 1982, surpassing by 10 inches the record set on Waialeale, Kauai in 1947-48.
- Overnight-and-longer visitors reached 4,243,000 in 1982, nearly twice the 1972 count. Visitor-related spending in 1982 reached $4.235 billion and accounted for $448 million in tax revenues.
- In 1980, 57.8 percent of all females 16 years old and older were in the labor force, the fourth highest ratio in the nation.
- The average wage rose from $7,989 in 1972 to $15,367 in 1982. After adjusting for inflation the average wage declined by 23 percent in the ten-year period.
- Of 21,264 businesses in 1981, 10,969 has fewer than five employees. Seventeen had more than 1,000 employees each.
- Pineapple acreage fell from 58,100 in 1972 to 36,000 in 1982. The value of pineapple sales (fresh equivalent) rose from $43.9 million to $99.5 million.

EARTH LECTURES AT UH-MANOA

A series of five lectures on the planet Earth begins on Wednesday, April 4 in the Campus Center Ballroom at the University of Hawaii-Manoa in Honolulu. The lectures are "The Earth Among the Planets," "Earth the Water World," "Observing the Planets from Mauna Kea," "Volcanoes in the Sea," and "Comparative Planetology."

Tickets may be purchased for the series or for individual lectures. For information call 948-8623.

BIG ISLAND ESTUARINE PLAN TO BE DEVELOPED

The Hawaii Department of Planning and Economic Development has awarded a $22,000 contract to Decision Analysts Hawaii, Inc. for development of a Waimanu Estuarine Sanctuary Management Plan. Waimanu Valley is located on the northeastern coast of the island of Hawaii and encompasses 3,700 acres of unspoiled forest and wetlands. At one time inhabited, this remote area has reassumed the character of a pristine stream and valley ecosystem.

The management plan will provide information on the valley's history and physical and biological features; identify current uses, conflicts, and problems occurring in the valley; and develop a management strategy to protect and promote its natural processes and systems as a site for research and educational activities. □

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HAWAIIAN ISLANDS NATIONAL WILDLIFE REFUGE

PLANNING UPDATE

No. 1

July, 1983

ALOHA

The U.S. Fish and Wildlife Service recently announced the start of a master planning effort for the Hawaiian Islands National Wildlife Refuge (NWR). The planning staff for this project would like your input. Throughout the planning process we intend to communicate with citizens, agencies and organizations through correspondence such as this Planning Update.

Enclosed you will find background material pertaining to the Hawaiian Islands NWR and the master planning process, as well as a short response form. So that we may better understand your interests and concerns relating to management of this refuge, we hope that you will take the time to fill out the form and return it to us by August 10, 1983.

If you would like more information or have additional comments, please feel free to contact any of the following individuals:

Refuge Manager
Hawaiian Islands NWR
P.O. Box 50167
Honolulu, Hawaii 96850
(808) 546-5608

Pacific Islands Administrator
U.S. Fish and Wildlife Service
P. O. Box 50167
Honolulu, Hawaii 96850
(808) 546-5608

Planning Coordinator
U.S. Fish and Wildlife Service
Division of Engineering
500 N.E. Multnomah St.
Suite 1500
Portland, Oregon 97232
(503) 231-6145

Chief, Branch of Planning
U.S. Fish and Wildlife Service
Division of Refuges
Interior Building
18th and C Street
Washington, D.C. 20240

Sincerely,

Robert Shallenberger

Robert Shallenberger
Refuge Manager

REFUGE MASTER PLANNING. WHAT IS IT?

A DEFINITION

Master planning is a comprehensive system of land-use planning that provides long-range guidance for the management, utilization, growth and development of land and water areas managed by the Fish and Wildlife Service (FWS). Master planning forecasts important changes, additions and extensions of the management and development of a refuge which are likely to become desirable and practicable in the future. This affords the opportunity to coordinate present and future patterns of land use.

THE NEED

Master planning is conducted by the FWS in order to provide continuity and efficiency in management, to resolve conflicts between wildlife needs and other resource demands, and to obtain valuable public input to FWS decision-making.

REFUGE MASTER PLANNING OBJECTIVES

- Ensure that national FWS policy is incorporated in the management of individual refuges.
- Determine the capability of refuges to assist in meeting FWS goals, objectives and long-range plans.
- Provide guidance to refuge managers in the formulation of management and development plans for specific programs.

Great Frigatebird With Chick

THE PROCESS

The master planning process consists of an Inventory Phase in which data is collected, resource information is mapped and priorities are tentatively set; an Analysis Phase in which the refuge capability is determined for existing and potential uses; and a Synthesis Phase in which objectives are set and the final plan developed. In the case of the Hawaiian Islands NWR, draft and final Environmental Impact Statements will also be prepared and circulated. We estimate the planning process will be completed in September 1984.

HAWAIIAN ISLANDS NWR - MASTER PLANNING RESPONSE FORM #1

1. Please rank in priority order (1=high, 5=low) what you perceive to be the issues or concerns that should be considered in the master planning process. Use the blank lines for additional issues or concerns that are not included on this list.

___cultural resource research
___cultural rsource protection
___religious freedom rights
___terrestrial ecosystem research
___terrestrial ecosystem management
___monk seal/turtle research
___monk seal/turtle management
___monk seal critical habitat
___green turtle critical habitat
___endangered land bird research
___endangered land bird management
___seabird research
___seabird habitat management
___reef ecosystem research
___reef ecosystem management
___introduced exotic species
___regulation enforcement
___recreational fishing opportunity
___commercial fishing opportunity
___recreational diving opportunity
___fishery support facilities
___Tern Island management
___on-site education programs
___other public-use impacts
___nature tour opportunity
___risk of vessel grounding
___oil/hazardous chemical spill
___wilderness area status
___other management options
___interagency coordination
___refuge boundary questions
___research natural area
___unique ecosystem recognition
___ _____
___ _____
___ _____
___ _____
___ _____
___ _____
___ _____

2. Please provide any suggestions or ideas you may have to ensure adequate public involvement in the master planning process.

3. Do you wish your name removed from the mailing list? ___Yes ___No

4. My address should be changed to: NAME: _____
STREET: _____
CITY/STATE/ZIP _____

5. (Optional) I represent: ___Self, ___Federal Agency, ___State Agency, ___Local Agency, ___Public Interest Group, ___Business, ___Other (list)_____, _____

6. (Optional) My name is: _____

7. Please suggest others who you feel should be on the master plan mailing list:

8. Please provide additional comments if you wish (use additional sheets if necessary).

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6. (Optional) My name is: _____

7. Please suggest others who you feel should be on the master plan mailing list:

8. Please provide additional comments if you wish (use additional sheets if necessary).

PUBLIC INVOLVEMENT

As a concerned citizen, interest group or agency, your role will be to aid the planning staff by identifying your personal interests and concerns about the refuge and by providing input and feedback on priorities, objectives and plan alternatives.

THE RESULT

The end result of the process will be a long-range strategy for resource management and public use of the refuge.

Tern Island

HAWAIIAN ISLANDS NWR: BACKGROUND INFORMATION

The Hawaiian Islands NWR has its origin in the Hawaiian Islands Reservation, created by President Roosevelt in 1909. The Executive Order which created the Reservation was issued to prevent the continuing slaughter of seabirds, which had been exploited for their eggs, feathers and guano. Commercial exploitation, and its lingering after-effects, nearly eliminated the Hawaiian monk seal and eventually led to the extinction of three unique land bird species on Laysan Island. The designation of the Reservation was changed to the Hawaiian Islands National Wildlife Refuge by Presidential Proclamation in 1940. By formal agreement, the emergent lands of the NWR were also designated as a Territorial Wildlife Refuge in 1951. Because of its unique value for research, the NWR was also recognized as a Research Natural Area in 1967.

The Hawaiian Islands NWR, as defined by the FWS, includes nearly 1800 acres of emergent land and approximately 254,000 acres of nearshore waters, principally within atoll lagoons. Most of the nearshore waters included in the NWR are less than 10 fathoms in depth. Terrestrial habitat includes the rocky islands such as Nihoa and Necker, low sandy islets within major atolls and the larger (up to 2 square miles) flat Laysan and Lisianski Islands. Tern Island, at French Frigate Shoals, is the only extensively altered island in the NWR, having been enlarged from 11 to 37 acres in 1942. The Service currently operates a field station at Tern Island.

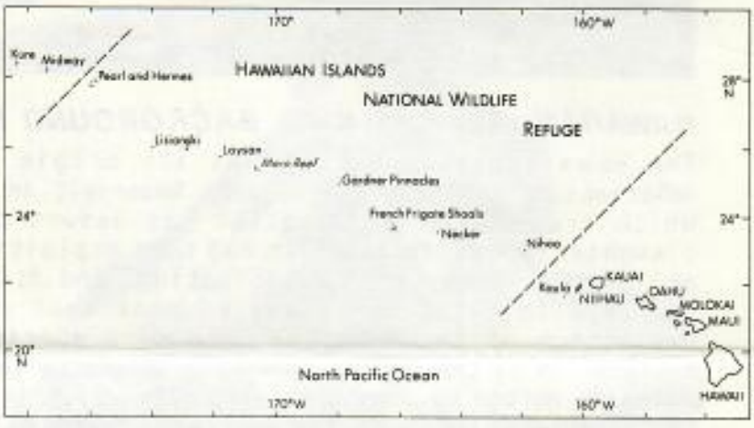
BACKGROUND INFORMATION (Continued)

Fish and Wildlife resources on the Refuge are diverse and abundant. An estimated 12 million seabirds of 18 species find breeding habitat on Refuge islands and feed in both nearshore and offshore waters. Several endemic species of plants, mollosks and arthropods share the terrestrial habitat with four unique, endangered land bird species. The principal breeding habitat for endangered Hawaiian monk seals and threatgened green sea turtles is found within the Refuge, although these species range well beyond Refuge boundaries. Lagoons and nearshore waters support a rich assemblage of fishes and invertebrates, including some species of commercial value.

The fish and wildlife resources of the Northwestern Hawaiian Islands and waters out to 200 miles were the focus of a recently completed 5-year multidisciplinary research project. The Tripartite Study involved the cooperative effort of the National Marine Fisheries Service, the Fish and Wildlife Service, the State of Hawaii Division of Aquatic Resources and the University of Hawaii's Sea Grant Program. A major focus of this study was an assessment of the commercial fishery potential of the Northwestern Hawaiian Islands and the potential effects of expanded fishery development on other fish and wildlife of the Refuge.

PLANNING INITIATIVES

A major objective of the Tripartite Study was to gather data to be used in resource management planning for the Northwestern Hawaiian Islands. The Hawaiian Islands NWR Master Planning project will draw heavily on this important source of information. It will also draw upon the large body of related planning efforts which took place prior to and during the Study. Among the most pertinent of these are the State of Hawaii's Fishery Development Plan, the FWS's Tern Island Study, the critical habitat proposal for the monk seal, recovery plans for the endangered monk seal and land birds, fishery management plans for various commercial resources and cooperative planning studies for fishery support facilities at Midway and Tern Islands. The FWS's Regional Resource Plan, completed in 1982, establishes management priorities for fish and wildlife resources in the Central Pacific. These priorities will be considered throughout the development of the master plan.



HAWAIIAN ISLANDS NWR

HAWAIIAN ISLANDS NATIONAL WILDLIFE REFUGE

PLANNING UPDATE

No. 2
October, 1983

GREETINGS:

This is the second in a series of newsletters concerning the U. S. Fish and Wildlife Service (FWS) Master Planning effort for the Hawaiian Islands National Wildlife Refuge (NWR). This Planning Update is intended to keep you informed about Master Planning activities and to seek your continuing input on important planning issues. We again ask you to use the enclosed postage-free response form to share your thoughts and suggestions with us.

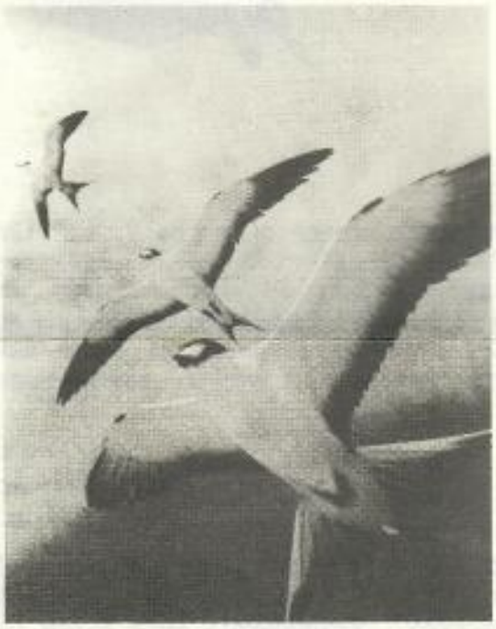
WHERE WE'VE COME FROM . . .

In the first newsletter, we discussed the master planning process and provided some background information on the refuge. The enclosed response form identified issues and concerns. Respondents were asked to indicate the importance of issues and concerns by ranking them. We also asked for suggestions regarding our public involvement program and additional names to be added to our mailing list. As a result of this request our mailing list grew by an impressive 27%.

The first newsletter was sent to 357 individuals, agencies and organizations of which 98 had responded as of September 15. Tabulating and summarizing the results of the ranking procedure provided some interesting insights into the respondents' views. Although some respondents expressed confusion about the request to rank issues and concerns relating to the Hawaiian Islands NWR, we found the public input to be informative and useful in our planning process. We attempted to make the initial mailing list comprehensive in scope, with at least some representation from all those individuals, agencies and groups who had demonstrated an interest in management of the Northwestern Hawaiian Islands. Yet the list was not equally representative of the varied and, in some cases, opposing interests so one must be cautious in evaluating the results of an issue ranking process.

In general, respondents considered regulation enforcement and resource management issues, particularly those relating to threatened and endangered species, to be of very high priority in master planning. Refuge boundary questions and interagency cooperation were also highly ranked. Religious freedom rights and public use issues were ranked at the low end of the scale. However, commercial fishing opportunity ranked near the top of the varied public use issues.

Respondents supplied us with a wide variety of additional issues and concerns not on our original list. These included: marine sanctuary status, fisheries research and management, disease prevention and research, off-site educational programs and the effects of military activities on the refuge.



We also received many suggestions and ideas regarding public involvement and its place in the master planning process. Many suggestions related to the need for public meetings or workshops. It was also suggested that the Service approach special interest groups and take advantage of the opportunity to attend their meetings to discuss master planning and gather input. Use of the media to publicize the master planning process was also recommended. We appreciate all suggestions and ideas received to date. Several recommendations, such as personally meeting with interest groups, are being implemented now. Other suggestions will be considered in subsequent steps of the planning process.

WHERE WE'RE HEADED . . .

This newsletter will address the existing and potential outputs for this refuge. Outputs are the various things the refuge can produce. You'll be asked to consider a proposed list and provide your thoughts and suggestions to improve the list. Using your input, we'll begin to evaluate the potential for the refuge to produce these outputs, where they can be produced and where they might conflict with each other. Research data gathered during recent Tripartite studies will play an important role in this evaluation. This will lead to the development and evaluation of various resource management options, each designed to produce a different mix or level of outputs. Our next newsletter will address these preliminary management options and provide an opportunity for you to contribute your suggestions.

REFUGE OUTPUTS

National Wildlife Refuges are established to produce and provide a wide range of "things." We refer to these "things" as outputs. For example, producing young turtles in the Hawaiian Islands NWR is an output. Providing an opportunity to conduct research or to take fishery resources are also potential outputs of the refuge. Some outputs have higher priority than others, based upon legal mandates and national or regional policies. As you can see from the list on the next page, resource outputs are of higher priority than public use outputs.

As part of the master planning effort, we have drafted a prioritized list of outputs that the Hawaiian Islands NWR is capable of producing. Whether or not any particular output is economically or biologically feasible or even environmentally acceptable is a question that must be answered later in the planning process through the development and evaluation of various management options for the refuge.

DEFINITIONS OF OUTPUTS - RESOURCE MANAGEMENT

A brief definition of each of the various outputs on the Hawaiian Islands NWR list will enhance your understanding of the planning process and provide a basis for comments and suggestions.

1) Endangered Species Production/Maintenance: "Endangered species" resident in the Hawaiian Islands NWR include the Hawaiian monk seal, Laysan duck, Laysan finch, Nihoa finch and Nihoa millerbird. "Production" refers to the actual result of successful breeding (e.g. young produced). "Maintenance" refers to the support of wildlife populations independent of breeding activity and is measured in "use-days" (e.g. the number in the population multiplied by the number of days spent on the refuge).

Endangered Seal

Threatened Turtle

2) Threatened Species Production/Maintenance: The only wildlife species listed as "threatened" in the Hawaiian Islands NWR is the green sea turtle.

HAWAIIAN ISLANDS NWR MASTER PLAN OUTPUT LIST

The following list represents all outputs that are currently produced at the refuge or possibly may be produced at the refuge. This list is tentative and based on best professional judgement and information available at this time. The final list of outputs to be planned for at the Hawaiian Islands NWR will depend on a detailed analysis of resources and additional public input.

I. RESOURCE MANAGEMENT

A. THREATENED AND ENDANGERED SPECIES

1. Endangered Species Production/Maintenance
2. Threatened Species Production/Maintenance

B. SENSITIVE SPECIES

1. Sensitive Species Production/Maintenance

C. ENVIRONMENT

1. Wilderness Areas
2. Natural Areas
3. Scientific Sites
4. Other Protective Status

D. MIGRATORY BIRDS AND OTHER FISH AND WILDLIFE

1. Other Migratory Bird Production/Maintenance
2. Marine/Reef Species Maintenance
3. Terrestrial Endemic/Native Species Maintenance
4. Species Transplanted

E. SCIENTIFIC AND PROFESSIONAL SERVICES

II. PUBLIC USE MANAGEMENT

A. EDUCATION

1. Environmental Education
2. Interpretation

B. WILDLIFE AND WILDLANDS RECREATION

1. Non-consumptive Recreation
2. Consumptive Recreation

C. COMMERCIAL USE

1. Non-consumptive Commercial Use
2. Consumptive Commercial Use

HAWAIIAN ISLANDS NWR - MASTER PLANNING RESPONSE FORM #2

Please respond by ***November 12, 1983***

1. After reviewing the Preliminary Output List and definitions of outputs, please provide below any suggestions or ideas you may have concerning additions or modifications to the list.

2. Please indicate below any comments or suggestions you may have concerning the affected environment of the Hawaiian Islands NWR.

3. If you represent a public interest group and desire more information concerning our master planning effort or wish to provide more input to us, please provide below the name and phone mumber of a representative we may contact to arrange a meeting or attend one of your scheduled meetings.

4. Do you wish your name removed from the mailing list?___Yes ___No

5. My address should be changed to: NAME_____

   STREET_____

   CITY/STATE/ZIP_____

6. (Optional) I represent: ___Self, ___Federal Agency, ___State Agency, ___Local Agency, ___Public Interest Group, ___Business, ___Other (Please indicate)

7. (Optional) My name is:_____

8. Please suggest others who you feel should be on the master plan mailing list:

9. Please provide additional comments if you wish (use additional sheets if necessary).

** TAPE OR STAPLE **

----------FOLD----------

From: _____

_____

_____

POSTAGE AND FEES PAID
U.S. DEPARTMENT OF THE INTERIOR
INT-423

To: Refuge Manager
Hawaiian Islands NWR
PO Box 50167
Honolulu, Hawaii 96850

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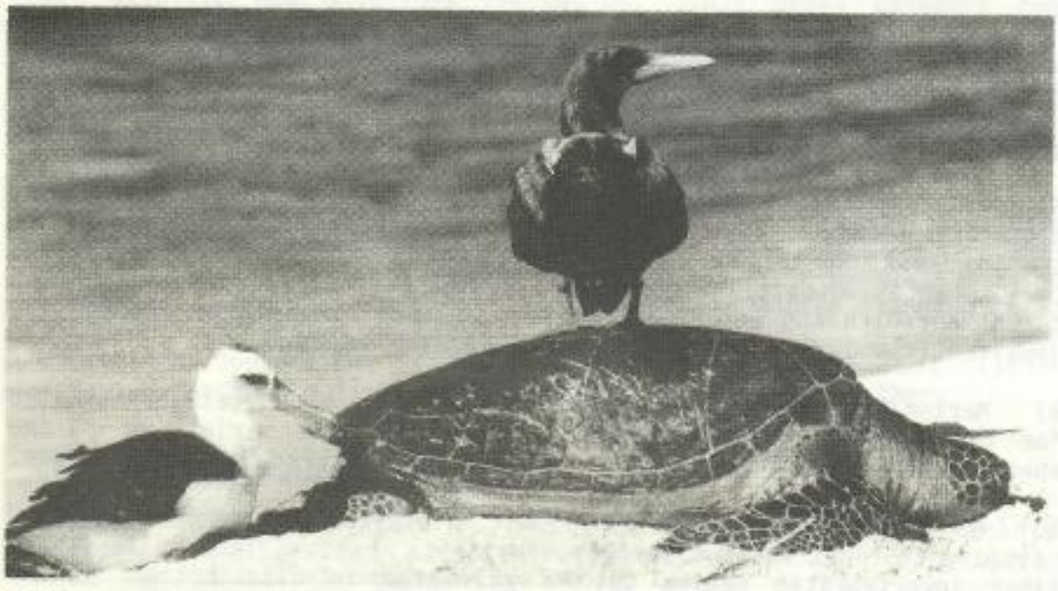


3) Sensitive Species Production/Maintenance: By Service definition, sensitive species (or subspecies/populations) are vulnerable enough that they could become listed as endangered or threatened in the foreseeable future. Sensitive species identification draws attention to these species and focuses management attention to avoid the need for future listing. To date, only one species in the Hawaiian Islands NWR (sooty storm petrel) has been formally identified as "sensitive."

4) Wilderness Areas: Of the four environment categories, "wilderness area" refers to any area of land and/or water that qualifies for formal designation in accordance with the Wilderness Act of 1964. Portions of the Hawaiian Islands NWR have been proposed by the FWS for wilderness status within the last decade.

5) Natural Areas: A Research Natural Area (RNA) is a formally designated geographic area which is recognized for its intrinsic value to research and education. Natural processes are generally permitted to operate without human intervention within an RNA. The lands and waters of the Hawaiian Islands NWR were designated by the FWS as an RNA in 1967.

6) Scientific Sites: These are areas identified and formally designated for the preservation and enhancement of cultural values significant to human and natural history. This could include historical, geological, archaeological and other scientific sites.

7) Other Protective Status: We have added this additional broad category to include other types of protective status that may be appropriate for refuge lands and waters. This could include marine sanctuaries, critical habitat, world heritage sites, unique ecosystems or other similar status.

8) Other Migratory Bird Production/Maintenance: Of 22 species of migratory seabirds known to breed in the Hawaiian archipelago, 18 species nest on islands in the Hawaiian Islands NWR. In addition, "maintenance" outputs are generated for these species and more than two dozen shorebird and waterfowl species that migrate into or through the Hawaiian Islands NWR during their non-breeding season.

9) Marine/Reef Species Maintenance: This is a broad category created for the Hawaiian Islands NWR to include the wide variety of marine species that inhabit the lagoons and nearshore waters within the refuge.

10) Terrestrial Endemic/Native Species Maintenance: This equally broad category includes various species of plants, insects, land molluscs and other invertebrates native to or restricted in distribution to the terrestrial environment of refuge islands.

11) Species Transplanted: This category includes "surplus" live animals taken from the refuge for transplanting at other refuges or at off-refuge sites for purposes of restocking, display (e.g. at zoos or oceanaria) and research.

12) Scientific and Professional Services: This category includes a variety of human activities within a NWR that are designed to gather and disseminate biological data on refuge species. Examples include ecological monitoring studies (by refuge staff and others), banding studies and other specific research focusing on refuge species and their habitat. Outputs may be measured in terms of the number of studies and publications that result.

DEFINITION OF OUTPUTS - PUBLIC USE MANAGEMENT

1) Environmental Education: This category refers to the use of Service lands and waters for structured environmental studies, usually involving teacher-led groups. These activities are generally part of a formal course of study involving "hands on" field work.

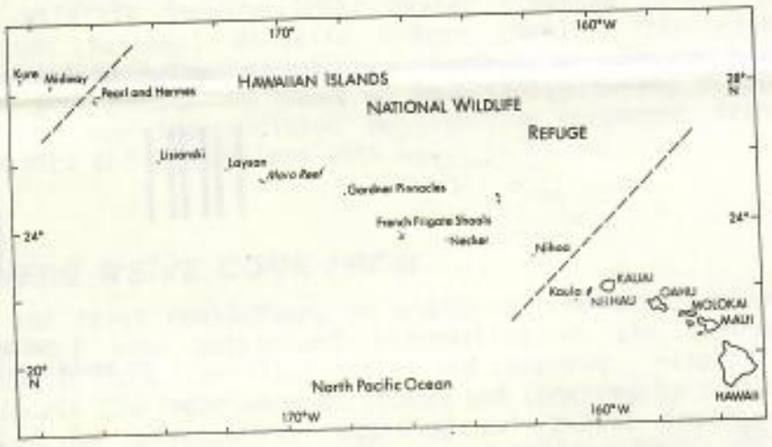
2) Interpretation: By Service definition, interpretation is an educational activity aimed at revealing relationships, examining systems and exploring the relationship between the natural world and human activities. The goal is to stimulate additional interest and action. Conducted interpretation involves the use of trained staff or volunteers. Interpretation may also be self-guided (e. g. nature trails). Interpretation may also occur off the refuge when inaccessibility or other conflicts with wildlife make on-site interpretation inappropriate or impossible.

3) Wildlife and Wildlands Recreation: This broad category could include a wide range of wildlife related activities. Examples of non-consumptive activities are bird-watching, hiking and nature photography. Consumptive recreational activities on mainland refuges typically include hunting and fishing. While hunting would not be an appropriate output in the Hawaiian Islands NWR, recreational fishing and spearfishing may be.

4) Commercial Use: The potential for commercial utilization of refuge resources is dependent upon the compatibility of the particular activity with fish and wildlife management objectives. Among the various commercial activities that will be evaluated in master planning for the Hawaiian Islands NWR are nature tours, scuba tours, photography/journalism, commercial fishing, charter boat fishing, aquarium specimen collecting, glass ball collecting and others.

THE AFFECTED ENVIRONMENT

Refuge planning guidelines require that we define the area that may affect or be affected by proposed refuge actions. Said another way, we must look beyond the boundaries of the refuge to identify potential opportunities and constraints to refuge development and management.



In its broadest sense, the Hawaiian Islands NWR's affected area extends throughout the entire North Pacific ocean and beyond, where the seabirds that nest on refuge islands migrate during their non-breeding season. Even seals and turtles venture well beyond the limits of refuge lagoons. Conversely, the wildlife and their habitats in the refuge are affected by environmental conditions and human activities outside the refuge boundaries. Natural events that affect ocean productivity in turn impact the reproduction of refuge species that depend upon the ocean for food. Human activities outside the refuge, such as commercial fishing, also have the potential to affect the well being of wildlife that congregates on the few square miles of emergent land in the Hawaiian Islands NWR.

THE AFFECTED ENVIRONMENT (CONT.)

The affected environment outside the refuge also includes the social and economic conditions that are, in one way or another, altered by the presence of the refuge and the management programs administered by the FWS and cooperating agencies. These conditions extend well beyond the local Hawaiian community as well. As a component of a system of 414 national wildlife refuges, the Hawaiian Islands NWR is a resource that affects and is affected by the entire US population. The mandates that govern the management of the refuge system address national needs and priorities yet, at the same time, should be responsive to the local community.

From:

UNITED STATES
DEPARTMENT OF THE INTERIOR
FISH AND WILDLIFE SERVICE
LLOYD 500 BUILDING, SUITE 1692
500 N.E. MULTNOMAH STREET
PORTLAND, OREGON 97232

OFFICIAL BUSINESS
PENALTY FOR PRIVATE USE, $300

U.S.MAIL

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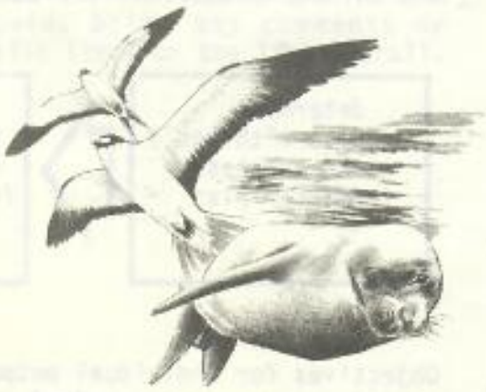
To:

Mr. George Balazs
HI Inst. of Marine Biology
P. O. Box 1346
Coconut Island
Kaneohe, Hawaii 96744

HAWAIIAN ISLANDS NATIONAL WILDLIFE REFUGE

PLANNING UPDATE



No. 3

March, 1984

GREETINGS:

This is the third in a series of Planning Updates concerning the development of a master plan for the Hawaiian Islands National Wildlife Refuge (HINWR). The purposes of this, the most important public involvement activity to date, are to: 1) share with you the highlights of previous public involvement efforts; 2) present objectives for wildlife resources and public use activities on the HINWR; 3) present alternatives for the management, development and use of the Refuge; 4) inform you of a workshop we have planned to gather additional public input; and 5) request written comments and suggestions on materials presented in this newsletter.

RECENT PUBLIC INPUT

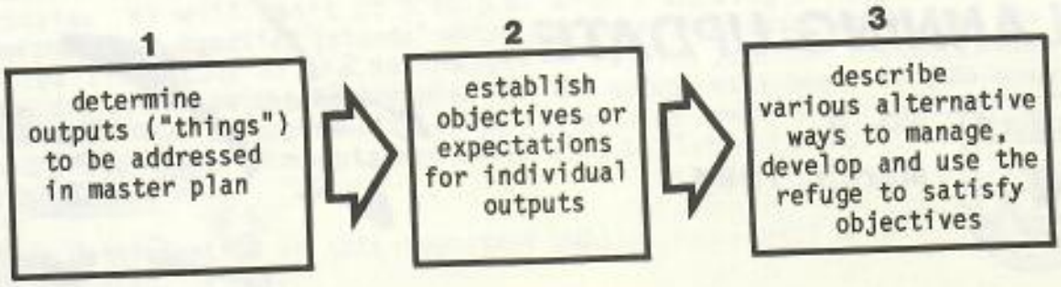
In our last Planning Update which was distributed in October of 1983, we asked for your comments and suggestions regarding a Preliminary Output List. As you may recall, that list included all of the outputs ("things" produced on a refuge) to be considered in the master plan. The outputs on the list were ranked in priority order. A total of 498 copies of Planning Update No. 2 were mailed out during October. Fifty-three response forms were returned to our office. Of those responses, which included comments on the Output List, most were supportive of the priorities and content of the list.

Since last October we have also met with various interest groups and agency representatives to gather additional information. Both the meetings and the written responses to the Planning Update provided useful ideas and suggestions which have been incorporated into the master planning process. This input was particularly useful to us in the refinement of our Output List and in the development of objectives for each output.

5. Please remove my name from mailing list.

OBJECTIVES

Having established a list of outputs to be considered in master planning the HINWR we then proceeded to the next step in the process: developing objectives* for each individual output. These objectives when grouped together provide a long-range goal for the management, development and use of the Refuge. This planning step is illustrated below as #2.



Objectives for individual outputs are based on a variety of authorities, policies and guidelines including:

-Executive Order 1019 which established the Refuge in 1909.

-Endangered Species Act of 1973 which provides for the conservation of threatened and endangered species of fish, wildlife and plants.

-The Marine Mammal Protection Act of 1972 which provides protection for important marine mammals.

-Numerous other Federal and State statutes.

-National Wildlife Refuge System Goals.

-Various national and regional Fish and Wildlife Service policy.

Also analyzed in the objective setting step are potential conflicts among outputs. Certain combinations of outputs have high potential for conflict, while others do not. To ensure our plans are realistic we identified areas of potential conflict and formulated objectives in a way to avoid conflict to the greatest extent possible.

Authorities, policies, guidelines, the analysis of conflict, and many other factors not mentioned here provide the rationale for the objectives. Listed on the following pages, in the priority order of our revised Output List are brief narrative objectives for wildlife resources and public use at the HINWR.

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*Objectives are defined here as narrative statements of expectations for wildlife resources or public uses at HINWR.

HAWAIIAN ISLANDS NWR -MASTER PLANNING RESPONSE FORM #3

Use this form and additional sheets if necessary to provide comments or suggestions on information provided in this Planning Update. Please respond by March 31, 1984. No postage necessary.

1. After reviewing the list of objectives for individual species and public use activities, please provide below any comments or suggestions you have concerning specific items or the list overall.

☐ No comments or suggestions; list O.K. as is.

2. Regarding the alternatives for management, development and use of the HINWR, indicate the alternative you prefer and why; suggest modifications to alternatives; and provide other comments and ideas concerning the alternatives.

☐ No comments or suggestions; alternatives O.K. as is.

4. Additional comments or comments continued from #1 or #2 above.

5. Please remove my name from mailing list _____. (Fill in below)

6. Please correct my name/address _____.

Name _____

Street _____

City/State/Zip _____

7. (Optional) I represent: _____Self, _____Federal Agency, _____State Agency, _____ Local Agency, _____ Public Interest Group, _____ Business, _____ Other (Please indicate: _____).

8. (Optional) My name is : _____

9. Please suggest others who you feel should be on the master plan mailing list:

----------FOLD----------

From: (Optional) _____

_____

_____

U.S.MAIL

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INT-423

To: Refuge Manager
Hawaiian Islands NWR
PO Box 50167
Honolulu, Hawaii 96850

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** TAPE OR STAPLE **

LIST OF OBJECTIVES IN PRIORITY ORDER

ENDANGERED AND THREATENED SPECIES

1) Monk Seal Production and Maintenance: Maintain populations at French Frigate Shoals, Necker and Nihoa. Recover populations at Laysan, Lisianski and Pearl and Hermes to midcentury levels.

2) Laysan Duck Production and Maintenance: Maintain current population levels and captive breeding stock. Prevent ecological disturbances on Laysan Island.

3) Endemic Finches and Millerbird Production and Maintenance: Maintain current populations and natural habitats.

4) Sea Turtle Production and Maintenance: Maintain aquatic habitat for endangered species of sea turtles including Hawksbill, Loggerhead and Leatherback. Maintain existing nesting and basking populations of green sea turtles at French Frigate Shoals, Necker and Nihoa. Increase nesting populations at Laysan, Lisianski Islands and Pearl and Hermes Reef to midcentury levels.

SENSITIVE SPECIES

5) Sensitive Species Production and Maintenance: Identify, maintain and/or restore viable populations of sensitive species in the NWHI.

ENVIRONMENT

6) Cultural Resource Protection: Complete cultural resource study, nominate eligible sites to State/National Registers and protect all identified sites from adverse impacts.

7) Wilderness: Manage all emergent lands as de facto wilderness.

8) Research Natural Area: Manage HINWR consistent with Research Natural Area designation.

9) Other Protective Status: Seek appropriate protective status overlays, i.e., World Heritage Sites, Marine Sanctuaries, Natural Landmarks, Critical Habitat, Midway Overlay, Boundary Review, etc.

OTHER FISH AND WILDLIFE

10) Marine Bird Production and Maintenance: Maintain populations, distribution and diversity of nesting seabirds in NWHI.

11) Other Migratory Bird Production: Maintain existing terrestrial and marine habitats for migrating marine birds, shore birds, wading birds and waterfowl.

12) Marine Reef Species Maintenance: Maintain current abundance, distribution and diversity in reef ecosystem.

OBJECTIVES LIST (Continued)

13) Terrestrial Endemic/Native Species Maintenance: Maintain and restore natural diversity of terrestrial ecosystems.

SCIENTIFIC AND PROFESSIONAL SERVICES

14) Ecological Monitoring: Conduct and facilitate studies to gather scientific data on refuge resources and environmental impacts of public use.

EDUCATION

15) Environmental Education: Encourage off-site EE activities at more accessible locations. Facilitate where feasible, limited on-site EE experience for both teachers and students.

16) Interpretation: Increase opportunities for off-site interpretive activities. Provide, where feasible, limited on-site, supervised interpretive opportunities.

OTHER NON-CONSUMPTIVE USES

17) Photography/Journalism/Art: Increase opportunities for off-site photography/journalism/art activities; provide where feasible, limited on-site, supervised opportunity for photography/journalism/art.

18) Non-Wildlife Oriented Recreation: Provide limited recreational opportunity in designated areas for authorized personnel.

Necker Island

Green Sea Turtle

CONSUMPTIVE USES

19) Commercial fishing: Provide logistical support for NWHI commercial fishing industry. Provide no commercial harvest of fishery resources within refuge boundaries.

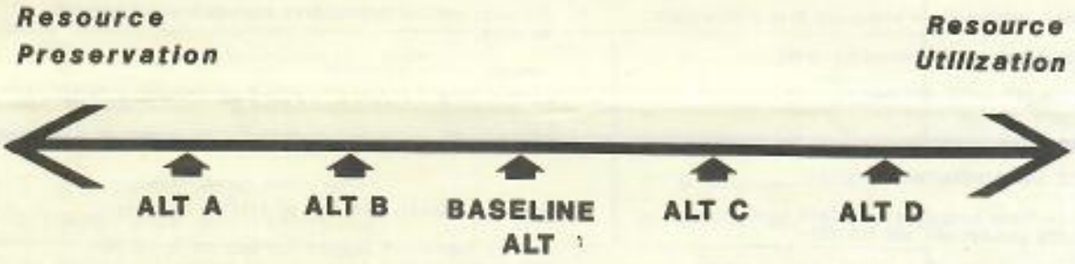
20) Recreational Fishing: Provide limited recreational fishing opportunities in designated areas around French Frigate Shoals for authorized personnel.

21) Other Consumptive Uses: Provide no opportunities for other consumptive uses.

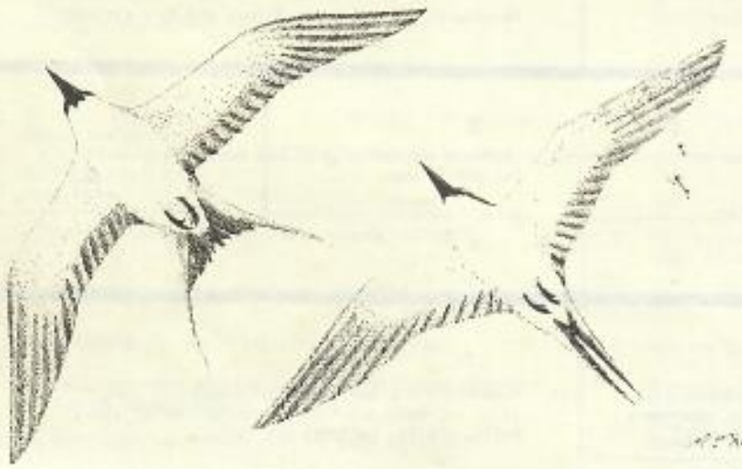
ALTERNATIVES

Having set objectives for all of the outputs to be produced on the Refuge, the next step in the master planning process is to prepare alternative approaches for the management, development and use of Refuge. We have determined that for each output there are a number of individual strategies that must be implemented to minimally address the objective for that output. Collectively, all of these "minimal" strategies make up a BASELINE ALTERNATIVE which must be implemented if the U.S. Fish and Wildlife Service is to be responsive to applicable statutes and policies. Most of these strategies are currently being implemented.

Building upon the BASELINE ALTERNATIVE are additional strategies which could be implemented to further address the objectives for each output. We have chosen to evaluate various mixes of strategies. Each mix of strategies represents a point on a continuum that ranges from one that strongly emphasizes resource preservation to one that emphasizes resource utilization. Keep in mind that each of the four alternative reviewed here build upon the BASELINE ALTERNATIVE and, in so doing, at least minimally satisfy relevant statutory requirements. The diagram below illustrates the relationship between the BASELINE and the other four alternatives reviewed here.



The Baseline Alternative and four other alternatives that build on the Baseline Alternative are described on the next two pages.



Sooty Terns

BASELINE ALTERNATIVE- A SET OF STRATEGIES WHICH THE U. S. FISH AND WILDLIFE SERVICE CONSIDERS THE MINIMUM NECESSARY TO MEET THE OBJECTIVES ON PAGES **3** AND **4** .

ENDANGERED/THREATENED/SENSITIVE SPECIES:

1. Restrict access to islands/atolls.
2. Implement high priority research tasks in recovery plans.
3. Monitor populations and habitats.
4. Monitor/control harmful exotics.
5. Restrict vessel traffic in atolls.
6. Enhance public awareness.

ENVIRONMENT:

1. Study/nominate eligible archaeological sites to state/national registers.
2. Develop interpretive cultural resource display at Kilauea Pt.
3. Preserve wilderness character of emergent lands.
4. Maintain natural diversity of marine and terrestrial ecosystems.
5. Nominate emergent lands for wilderness status.
6. Evaluate Marine Sanctuary options for HINWR lands/waters.
7. Maintain/enhance research values of HINWR.
8. Seek legal resolution of boundary dispute.

OTHER FISH AND WILDLIFE:

1. Monitor seabird/other migratory bird populations.
2. Restrict access to seabird colonies.
3. Develop oil spill contingency plan.
4. Prevent, monitor and control introduction of harmful exotics.
5. Enhance public awareness.

SCIENTIFIC AND PROFESSIONAL SERVICES:

1. Utilize field camps/boat charters to monitor wildlife populations and habitat.
2. Produce/distribute publications about HINWR resources.
3. Monitor activities/effects of fishing industry.
4. Provide logistical support for monitoring at Tern Island.

EDUCATION:

1. Develop teacher training and interpretive programs at Kilauea Pt.
2. Encourage publication of HINWR resource information.
3. Develop environmental education (EE) and interpretive materials for public/school system.
4. Develop EE materials for Midway and Kure personnel.

OTHER NON-CONSUMPTIVE USES:

1. Encourage photography, journalism, and art (P/J/A) activities at Kilauea Pt.
2. Provide recreational opportunities for authorized personnel at Tern Island.
3. Increase availability of FWS audio-visual materials for public use.

CONSUMPTIVE USES:

1. Provide logistical support for HINWR commercial fishing industry (radio communication, emergency flights, limited transport of parts/people).
2. Monitor logistical support activities for effects on fish and wildlife.
3. Prohibit all other forms of consumptive uses (e.g. recreational fishing, collection of glass balls, shells, cultural artifacts).

EACH OF THE ALTERNATIVES A, B, C, AND D INCORPORATE (AT A MINIMUM) ALL OF THE STRATEGIES LISTED FOR THE BASELINE ALTERNATIVE (SEE OPPOSITE PAGE). LISTED BELOW ARE THE ADDITIONAL STRATEGIES THAT MAKE EACH ALTERNATIVE DIFFERENT IN PROVIDING A PARTICULAR EMPHASIS TOWARD PRESERVATION OR UTILIZATION OF THE HINWR RESOURCES.

	ALTERNATIVE A RESOURCE PRESERVATION ALTERNATIVE	**ALTERNATIVE B** INTERMEDIATE PRESERVATION ALTERNATIVE	**ALTERNATIVE C** INTERMEDIATE UTILIZATION ALTERNATIVE	**ALTERNATIVE D** RESOURCE UTILIZATION ALTERNATIVE
	1. Regulate/monitor nearshore vessel traffic. 2. Conduct lower priority research in recovery plans. 3. Propagate/transplant Nihoa birds and green sea turtle.		1. Monitor traffic only. 2. Conduct limited additional research.	2. Monitor fishery only.
	1. Conduct historical site survey/nominate sites to register. 2. Nominate HINWR as World Heritage Site/Natural Landmark. 3. Pursue Overlay NWR status for Midway Atoll.			
	4. Nominate HINWR lands/waters as wilderness.		4. Nominate emergent lands only.	4. Emergent lands only.
	5. Permit no religious access to cultural sites.		5. Permit limited, supervised access.	
	6. Support Critical Habitat (CH) status for monk seal (3 mi.).	6. Support CH status to 20 fathoms.	6. Support CH status to 10 fathoms.	
	1. Monitor distribution/abundance of native terrestrial species. 2. Monitor/control disease in migratory birds.			
	3. Regulate/monitor nearshore vessel traffic. 4. Map/ground truth marine and terrestrial ecosystems.		3. Monitor traffic only.	3. Monitor only.
	1. Conduct annual aerial photo survey. 2. Conduct annual boat charter survey.		1. Biannual photo survey. 2. Biannual boat charter survey.	
	3. Conduct comparative monitoring studies on Midway/Kure.			
	1. No EE/interpretive program at Midway.	1. Conduct limited EE program and interpretive (nature) tours at Midway. Assist in development of interpretive exhibits at Midway/Kure.		
	2. No tours at Tern Island. 3. Develop off-refuge interpretive exhibits.		2. Conduct limited nature tour program at Tern Is. (4-8 flights per year).	
	1. No P/J/A visits to Midway and Kure. 2. No P/J/A visits to Tern Is.	1. Coordinate with other agencies to facilitate P/J/A visits to Midway and Kure. 2. Facilitate limited, supervised P/J/A visits to Tern Island.		
	3. No P/J/A visits to other HINWR islands and atolls.		3. Facilitate limited, supervised P/J/A visits to other HINWR islands.	
	1. Track nearshore vessel activity by satellite. 2. Install emergency mooring buoy outside refuge boundary at French Frigate Shoals (FFS). 3. No multi-species fishery mooring buoy at FFS. 4. Provide no additional on-island fishery support at Tern Island.		1. Monitor by radio reporting only. 2. Emergency mooring/anchorage within boundary at FFS. 3. Provide limited storage space/recreation opportunity at Tern Island.	
			4. Allow multi-species fishery buoy at boundary of FFS.	4. Allow multi-species fishery buoy inside boundary of FFS.

WORKSHOP PLANNED

We have scheduled a workshop for Tuesday March 20, 1984, in Honolulu at the McCoy Pavilion in Ala Moana Park, at 6:30 p.m. The purpose of the workshop is to obtain comments and suggestions from the public concerning the objectives and alternatives described in this Planning Update. We will start at 6:30 p.m. with a showing of the film "The Northwestern Hawaiian Islands" which was created in association with the Tripartite study of the Northwestern Hawaiian Islands. Presentations and discussion on the master plan for the Refuge will begin at 7:00 p.m. You will have an opportunity to participate in small group discussions and present your comments and ideas to U. S. Fish and Wildlife Service representatives.

Your participation in this important public involvement effort will be appreciated. Aloha.

FROM:

UNITED STATES
DEPARTMENT OF THE INTERIOR
Fish and Wildlife Service
Pacific Islands Office
300 Ala Moana Blvd.
Room 5302
Honolulu, Hi. 96850

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TO:

Mullet fishing at

from the sea

mike markrich

It is 11:15 on a Thursday morning at Haleiwa Harbor and a slight rain is falling on Jitsuo Kaneshige. But the 69-year-old fisherman sitting on the dock with a fishing pole and a plastic bucket full of wet bread makes no attempt to run for cover.

Fishing for mullet is a sport that takes time and Kaneshige is not in a hurry to go anywhere.

But if new legislation proposed by Rep. Joseph Leong is passed, people like Kaneshige will soon find themselves fishing for something else this time of year.

Leong's bill seeks to close a loophole in state fishing laws. The laws allow people with fishing poles to take "any fish" at "any time" from certain designated places such as Haleiwa. Those same laws prohibit taking mullet "by any means" throughout the entire state during the mullet's December through February spawning (egg-laying) season.

Leong wants the depleted mullet population to "have a chance to multiply," so he wants everyone to stop fishing for it during this period.

The 68-year-old freshman legislator acknowledged that the measure would be unpopular. This kind of fishing takes patience and most of those who do it are elderly.

"I really feel a lot of compassion for senior citizens because I'm one of them myself. But if we don't have this law the population of the mullet could be greatly disturbed. We have to preserve it for future generations. I'm just asking them to fish for something else for three months," explained Leong.

Henry Sakuda, director of the state Division of Aquatic Resources, said he was reluctant to endorse legislation to ban fishing for mullet until there is firm evidence that current activity is affecting the mullet population. (As with almost all fish species in Hawaii, there is no real information available about how large or healthy the mullet population is.)

"It's not right," responded 67-year-old Dennis Miyake as he stood with a group of friends in

spawning time: a population threat?

the harbor parking lot. "He (Leong) is trying to do away with one of the few pleasures in a senior citizen's life. They should go after the guys with the nets, not us."

Longtime fisherman Ernest Steiner said Leong's bill was much ado about nothing. The elderly who fish with poles, Steiner said, could not possibly affect the mullet population as much as the destruction, through pollutants and landfill, of the mullet's dominant natural spawning grounds in Pearl Harbor and Kaneohe Bay.

Steiner estimated that as much as 80 percent of all the mullet on Oahu used to originate at Pearl Harbor. When he was growing up, he said, many fishermen believed that the mullet would leave the harbor every winter, turn left, and head around Oahu, ending up back at Pearl Harbor for the next season.

Steiner said he believes construction in Hawaii Kai and other subdivisions, as well as pollutants, has ruined other pockets around the island where the mullets congregated to spawn.

Mullet females lay the eggs on the bottom sand in relatively shallow places. The male comes along after her and fertilizes the eggs. Steiner believes this process requires certain water conditions that are being changed by urbanization.

Fisherman Dan "Junior" Ho'okala, who works at the Haleiwa ice house, disagrees.

"There're plenty of other fish to catch. Why can't they let the mullet go — give the mullet time to spawn? They come in here (during the spawning season) because it's a sanctuary; we shouldn't take them."

Ho'okala said during this time "a dozen-and-a-half to two dozen people" a day can be found fishing at Haleiwa. "Say they're each catching six fish. Well, multiply that by three months and it adds up."

But Akio Araki, 59, who describes mullet fishing as "a kind of science," said that while some very skilled people may catch as many as eight in a day, most are "lucky to catch one or two a week."

He explained that mullet fishing techniques involve the use of bread for bait.

According to Araki, white bread is dried until it is hard and then soaked in water until it takes on the consistency of dough. Then it is rolled into a tight ball that is sunk slowly to the bottom in a fishing area.

Mike Markrich photo

Jitsuo Kaneshige waiting for a mullet to bite at Haleiwa Harbor.

It takes a certain amount of knowledge to gauge the proper depth for dropping the baited hook in the sometimes murky water. (Mullet are bottom feeders and hooks must be 4 to 6 inches off the bottom to be effective). But the hardest part, according to Araki, is wrapping bread on the small (MC12) hook without having it crumble off as it's lowered in the water.

Kaneshige sat on the dock, rolling a piece of dough between his fingers as I asked him what he thought of the proposed legislation. He said a rule like that probably wouldn't make much difference in the number of fish as long as aku (tuna) boats like the one he had seen that morning could still come into the harbors for bait and sweep them clean with their big nets.

Fitting the pisces together

bob krauss

A drive among ocean enthusiasts to pick Hawaii's state fish gained momentum in the Legislature yesterday.

Leighton Taylor, director of the Waikiki Aquarium, said many people on Kauai are pushing for the o'opu, a squiggly little fish found in streams.

(He admitted privately that there has been some campaigning against the manini because it might reflect the pay raises government workers have just negotiated.)

The drive became official when two House committees voted unanimously to endorse a resolution asking that a state fish be chosen.

Political implications arose immediately.

Rep. Richard Matsuura, chairman of the Ocean and Marine Resources Committee, stated: "I want to make it absolutely clear that the unagi will not be a candidate for state fish."

Unagi is the voracious Japanese eel. Matsuura favors its introduction to Hawaii as a food source.

Susumu Ono, chairman of the Board of Land and Natural Resources, suggested that Hawaii's students be involved in picking the fish.

Taylor supports choosing a state fish because "it is important for people who live in Hawaii and also our visitors to be reminded of the importance of the ocean to our state." Taylor came out against the Pacific marlin, a large sport fish, because it is hard to display and one-dimensional, being important only in sports fishing.

"In Hawaii, fish have many uses," he said. "Fish are important for food as well as folklore. It would be good to include as many elements as possible."

At this point, Rep. Virginia Isbell demurred. She is elected by the voters of Kona, home of the Billfish Tournament.

"I think we need to get others involved — fishermen, for example," she said. "How would the fish be chosen, by multiple choice?"

Matsuura said it might be done like a beauty contest.

"It will be hard for the candidates to campaign," Taylor said. "And I realize that there are rules against political activity at the Aquarium. But we would be happy to give voters an opportunity to meet with the candidates."

Rep. Mike Crozier said they

The Honolulu Advertiser Friday, March 2, 1984 A-9

— for a new state symbol

might be playing with political dynamite.

"I know this sounds like a motherhood issue — but no matter which fish is chosen, everybody else is going to be upset," he said. "Ask anybody who has judged the Carnation Baby Contest. You cannot win."

The committee voted enthusiastically to choose a state fish. It named Sherwood Maynard, director of the marine options program at the University of Hawaii, and Taylor to head a selection process.

Later, Maynard said: "Leighton and I will come up with a plan for a fairly extensive public opinion poll. We'll ask the help of newspapers and television, fishing stores.

"We'll probably have students do research beforehand into the best candidates for a state fish and we'll work through the Department of Education. I would envision a blue-ribbon committee to review the results and choose a top candidate and several runners-up."

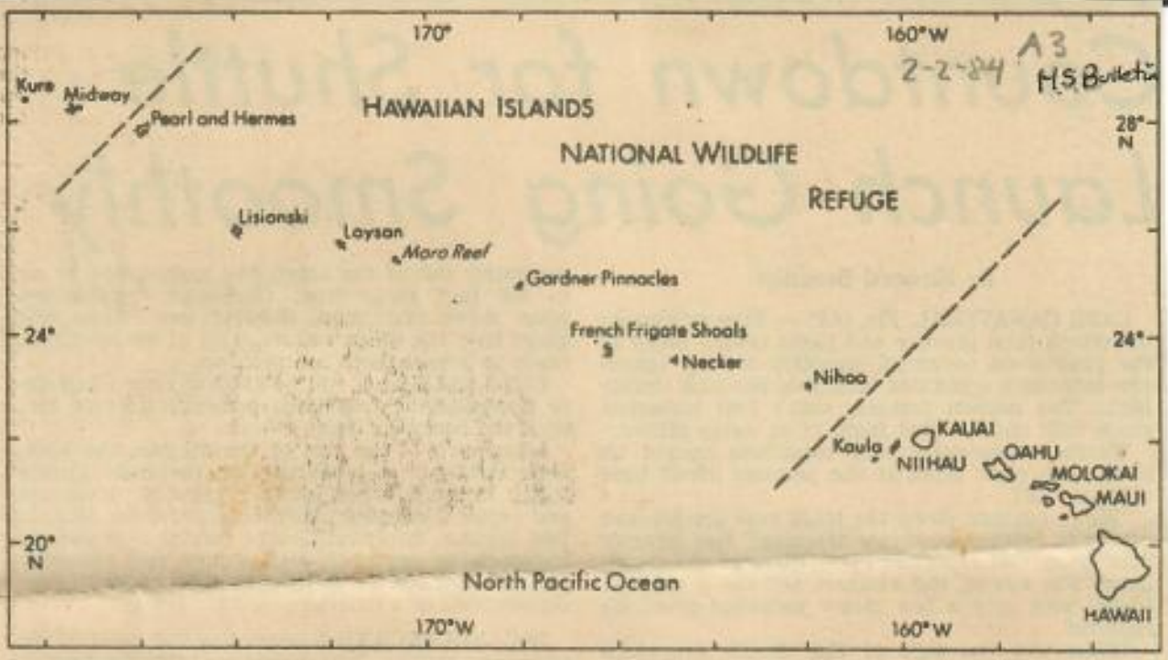
Maynard said The Advertiser's marine columnist, Mike Markrich, originated the idea and Rep. Peter Apo introduced it in the Legislature.

Sixteen other states already have state fish as well as state flowers, trees, birds and songs. Tennessee has five state songs.

California has a state reptile, stone, mineral, animal, insect, marine mammal and fossil. Florida has a state beverage, orange juice. Oklahoma has a state poem, "Howdy Folks." Pennsylvania has a state dog, and several states have horses.

Texas has a dish, chili.

Maynard said Hawaii has a marine mammal, the humpback whale, but somebody forgot to list it.



FAR-FLUNG ISLANDS—This map shows the far-flung islands that form the Hawaiian Islands National Wildlife Refuge, established 75 years ago.

Hawaiian Isle Bird Refuge Established 75 Years Ago

By Harry Whitten
Star-Bulletin Writer

The feather hunters were slaughtering the sea birds, with more than a million birds being killed on the tiny islands in the central Pacific.

So it was that 75 years ago tomorrow Theodore Roosevelt, the "conservationist president," issued an executive order designating the Hawaiian Islands Reservation for the protection of native birds.

The order, signed Feb. 3, 1909, made it "unlawful for any person to hunt, trap, capture, wilfully disturb or kill any bird of any kind whatever, or take the eggs of such birds. . . ."

The name was changed to the Hawaiian Islands National Wildlife Refuge in 1940 but the objective of protecting the birds remains the same. No one is allowed to land on the islands without a permit, according to Robert L. Shallenberger, refuge manager, Hawaiian and Pacific Islands National Wildlife Refuges, U.S. Fish and Wildlife Services.

It is legal for ships to pass by the Islands but not for them to enter the lagoons.

Over the years there has been much scientific research in the islands, of which the most intensive was the five-year effort started in 1978 with the signing of a Tripartite Agreement between the Fish and Wildlife Service, the National Marine Fisheries Service and the state of Hawaii.

THE SMALL islands and reefs in the refuge have only 1,800 acres of dry land and 250,000 acres of submerged land, Shallenberger said. The islands are Nihoa, 125 miles northwest of Niihau, Necker, French Frigate Shoals, Gardner Pinnacles, Moro Reef, Laysan, Lisianski, and Pearl and Hermes Reef.

At first Kure Atoll, the last of the Northwestern Hawaiian Islands, was in the refuge but was put under Navy jurisdiction in 1936 and transferred in 1952 to what was then the Territory of Hawaii. Today Kure is the outermost part of the City-County of Honolulu. It is 1,200 miles from Nihoa to Kure. Midway Atoll was never in the refuge.

Some of the islands had been discovered by early Polynesians, who built garden terraces, house sites and heiaus on Nihoa and Necker. In the years after Capt. James Cook's discovery of the Hawaiian Islands various English, French and Russian captains chanced upon the islands now in the refuge and some ships were wrecked on them.

Groundings by ships remain a concern, Shallenberger said, since such groundings could result in introduction of rats or exotic plant species. Since Shallenberger became refuge manager in April 1980 there have been three groundings of fishing vessels and one large freighter.

At present all islands are rat-free, except for Kure and Midway, which are not in the refuge, and biologists don't want rats introduced to harm the birds. There have been enough other problems over the years.

IN 1910, THE year after the refuge was established, Japanese feather gatherers were arrested on Laysan. Records indicated they had harvested more than 300,000 bird wings.

Rabbits were introduced to Laysan in 1902 to furnish food for persons mining guano, the fertilizer deposited by the hundreds of thousands of sea birds. Within a few years the rabbits virtually denuded the island of vegetation. As a result, three bird species, the Laysan millerbird, Laysan rail, and Laysan apapane all became extinct.

After the last of the rabbits were exterminated by the Tanager expedition in 1923, the vegetation made a remarkable recovery.

Laysan rails had been brought to Midway in 1891, where they thrived at first but became extinct by 1944 because of predation by rats.

"What we have learned over several decades of research in the refuge is both encouraging and alarming," Shallenberger said. "On the positive side, the sea bird population of the Northwestern Hawaiian Islands includes 18 species, now numbering in excess of 12 million birds.

"Green sea turtles breed successfully on refuge islands and, as a result of recent protective status, are showing initial signs of recovery from the effects of more than a century of harvest. Refuge islands and reefs continue to provide unique opportunities for study in relatively pristine ecosystems.

"ON THE negative side, we've witnessed the extinction of three unique bird species in the refuge and four more remain vulnerable. Furthermore, the monk seal population has declined more than 50 percent since mid-century and, despite an aggressive research program, we still lack the knowledge necessary to reverse the trend."

The Fish and Wildlife Service recently started work on a master plan for the refuge, with local staff members such as Shallenberger, Stewart Fefer, Mark Kauzon, and Peter Stine involved and with help of the service's planning staff at its regional office in Portland, Ore.

The planning process will evaluate resource management options in order to select the alternative which best addresses key wildlife objectives while permitting compatible public use.

There has been increased interest in commercial fishing and the intention is to work closely with the fishing industry in developing the master plan, Shallenberger said. Input from the public is wanted in the planning process, he said.

The planning is part of a national process involving the nationwide system of more than 400 refuges. Shallenberger thinks the timing is especially appropriate since this is the 75th anniversary of the Hawaiian Islands National Wildlife Refuge.

FISH AND WILDLIFE SERVICE

REGION ONE

news release

LLOYD 500 BUILDING, SUITE 1692 500 N.E. MULTNOMAH STREET PORTLAND, OREGON 97232

84-4

Refer: Rob Shallenberger - 808/546-5608

January 24, 1984

HAWAIIAN ISLANDS NATIONAL WILDLIFE REFUGE MARKS 75th ANNIVERSARY

February 3, 1984 marks the 75th anniversary of Executive Order 1019 by which President Theodore Roosevelt established the Hawaiian Islands Reservation. It set aside the islands and reefs extending from Nihoa to Kure, excepting Midway Atoll, "for the use of the Department of Agriculture as a preserve and breeding ground for native birds." This order made it "unlawful for any person to hunt, trap, capture, wilfully disturb or kill any bird of any kind whatever, or take the eggs of such birds..." Kure was placed under Navy jurisdiction in 1936 and transferred to the Territory of Hawaii in 1952. Administration of the Hawaiian Islands Reservation was transferred to the Secretary of the Interior in 1939 and its name was changed to the Hawaiian Islands National Wildlife Refuge in 1940. This action placed the unique string of islands and reefs into a nationwide system of refuges which now numbers over 400, includes more than 90 million acres of land and water and is represented in 49 states and five territories.

Human interest in the Leeward or Northwestern Hawaiian Islands (NWHI) extends back more than 700 years. Early polynesian visitors built garden terraces, house sites and primitive temples on Nihoa and Necker islands. The first record of European visitors was in 1786, less than a decade after Capt. James Cook discovered the main Hawaiian Islands. Over the next century, dozens of sailing ships visited the NWHI, several of which were never to return, claimed by the treacherous reefs and shoals. Not surprisingly, it was the commercial potential of various resources that attracted most of the early interest. Fish, monk seals, turtles, pearl oysters, sea cucumbers and other marine species became a source of revenue. It was ultimately interest in the rich seabird resource and its byproducts, particularly guano, that changed the course of biological and political history in the NWHI.

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In 1890, the North Pacific Phosphate and Fertilizer Company was granted a 20 year permit from the Hawaiian Kingdom to mine guano deposits on Laysan and Lisianski islands for a royalty fee of 50 cents per ton. The first shipment of 80 tons was removed from Laysan in April, 1891. The first intensive scientific collecting expedition to these Islands took place in the same year, under the sponsorship of Walter Rothschild. A founder of the Hawaiian Audubon Society, George C. Munro, was a field assistant to Henry C. Palmer on that expedition.

Guano mining on Laysan ceased in 1910 but not before rabbits released for food in 1902 had begun to leave their mark on the fragile ecology of this island. Within a few short years, rabbits virtually denuded the island of vegetation. Ultimately, three species of birds unique to this two square mile island would go extinct as a result of this event. Yet, it was the uncontrolled harvest of the rich seabird resources in the NWHI that brought the attention of the American public and led to the establishment of the Hawaiian Islands Reservation in 1909. In the following year, Japanese feather gatherers were arrested on Laysan. Records indicated that they had harvested and processed more than 300,000 bird wings.

Scientific interest in the Northwestern Hawaiian Islands grew steadily throughout the first half of this century. Military interest was growing as well, eventually leading to the construction of facilities at Kure, Midway and French Frigate Shoals. At the latter site, Tern Island became a Coast Guard navigational facility in 1952. The Fish and Wildlife Service established a field station at Tern Island in 1979.

The Department of the Interior entered into an agreement with the Territory of Hawaii in 1951 that resulted in a series of cooperative expeditions into the refuge. To facilitate management, the area was also designated a Territorial wildlife refuge in the following year. The first refuge manager, Eugene Kridler, was stationed in Hawaii in 1964. In 1967, the refuge was designated a Research Natural Area. Hitching rides on Coast Guard vessles, Kridler and other cooperating researchers increased the frequency of wildlife surveys in the refuge. Smithsonian Institution biologists gathered extensive data on the refuge's biological resources in the mid-1960's. The most intensive study of NWHI resources began in 1978, with the signing of a Tripartite Agreement between the Fish and Wildlife Service, the State of Hawaii and the National Marine Fisheries Service. The results of the 5-year Tripartite project were presented at a symposium in May, 1983.

What we have learned over several decades of research in the refuge is both encouraging and alarming. On the positive side, the seabird population of the Northwestern Hawaiian Islands includes 18 species, now numbering in excess of 12 million birds. Green sea turtles breed successfully on refuge islands and, as a result of recent protective status, are showing initial signs of recovery from the effects of more than a century of harvest. Refuge islands and reefs continue to provide unique opportunities for study in relatively pristine ecosystems. On the negative side, we've witnessed the extinction of three unique bird species in the refuge and four more remain vulnerable. Furthermore, the NWHI monk seal population has declined more than 50% since mid-century and, despite an aggressive research program, we still lack the knowledge necessary to reverse the trend.

Utilizing the research data generated by decades of study in the NWHI, and with continuing input of other agencies and the public, the Fish and Wildlife Service recently initiated a master planning process for the Hawaiian Islands NWR. The plan will address growing public interest in the Refuge, including a resurgence of interest in commercial fishery resources of the NWHI. The planning process will result in the development and evaluation of an array of resource management options, ultimately resulting in the selection of the alternative which best addresses key wildlife objectives while accomodating appropriate compatible public use.

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FEB 1 9 1984

Hawaii seen as important stepping

Because one of its large nets ripped, Capt. Fernando Avilas' purse seiner, the Elizabeth C.J., came in to Honolulu with about 200 tons of tuna less than its usual catch. But that was OK; if they had filled the holds to their 1,600-ton capacity, said Arne Isachsen, the ship's port engineer, the ship "would be here forever to unload."

The problem is the lack of cooling space at the cannery. Ships like the 262-foot San Diego-based Elizabeth C.J. that come to Hawaii to sell their fish, pick up provisions and refuel, must wait until the facilities at the Hawaiian Tuna Packers cannery are able to handle them.

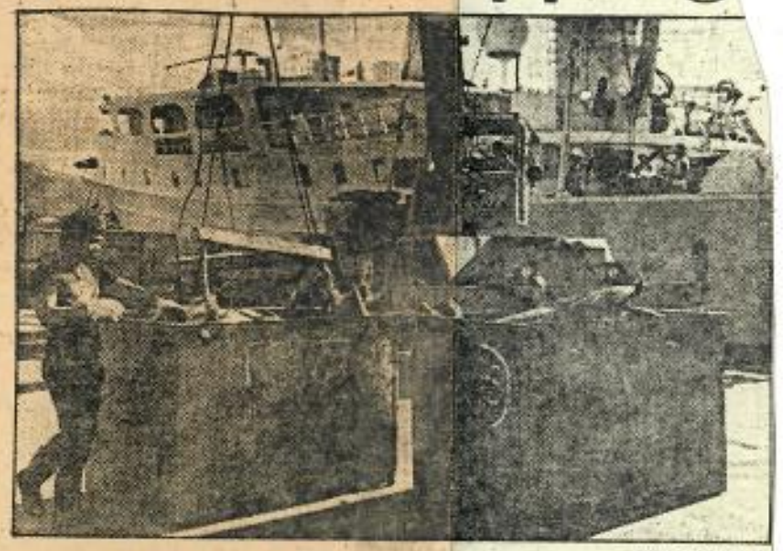
The companies that own these ships are willing for them to make the trip to Hawaii — despite the wait and the distance from the fishing grounds — for a number of reasons. Those ships under contract to a prodessing company such as Bumble Bee, which is packed at Hawaiian Tuna Packers, owned by Castle & Cooke, come here at the direction of the company. Other purse seiners contracted to other brands come here because they can go into dry dock or get parts for their sophisticated electronic equipment without having to order from the Mainland.

The cannery cannot accommodate the new ship traffic because it was never designed to handle that kind of volume. Most local fishing boats do not catch more than 3 tons at a time and prices for tuna have been so low that there was even talk at one point in the late 1970s of dismantling the cannery altogether.

Few could have foreseen that in 1981 large schools of tuna would be found less than 3,000 miles away and attract tuna boats from all over the West Coast.

In fact, according to Howard Silva, Hawaiian Tuna Packers general manager, a 2,000-ton pre-fabricated storage refrigerator was brought over to Hawaii several years ago but was never installed because Castle & Cooke could not find an economically feasible place to put it. It now sits in a Dole warehouse.

August Felando, president of the San Diego-based American Tuna Boat Association, said more purse seiners would call here if storage and trans-shipment facilities could be improved.



Advertiser photo

Unloading crates of ahi from the Elizabeth C.J. at Kewalo Basin.

What makes Hawaii attractive as a stopover for the tuna fleet is not only its position between the Mainland markets and the fishing grounds but the realities of American shipping, Felando explained.

He said the high cost of using longshoremen to unload ships on the Mainland makes it cheaper for U.S. tuna companies to send their fish from the Western Pacific through the Panama Canal to Puerto Rico via foreign flag vessels than it is to take them to California.

Territories such as Puerto Rico and Guam are exempt from the Jones Act which prohibits foreign ships from trading between U.S. ports. The tuna companies are thus able to take advantage of less expensive shipping and wages. In

stone for tuna fleet

from the sea

mike markrich

addition, Felando said there are no U.S.-flag refrigerated cargo vessels.

Hawaii could be a competitive stopover point, he said, if the frozen tuna were packed in refrigerated containers here and then trans-shipped to the West Coast. Hawaiian Tuna Packers has developed an efficient way of doing this which lowers Hawaii stevedoring costs.

In addition, he said, there would be further savings because the containers can be unpacked in California by cannery workers instead of high-paid longshoremen.

Boosters of the idea say Matson ships which now go back to the West Coast three-quarters empty could carry the tuna containers. The increase in ship traffic would provide new jobs and opportunities for waterfront companies.

Silva said a single purse seiner spends $300,000-$400,000 here reprovisioning for another trip.

Rep. Mike Crozier, who has introduced legislation seeking to increase the number of purse seiners calling in Honolulu, says: "We want them to come here and unload . . . We have always talked about the idea of the ocean as being a bread basket that we are going to use to feed our people and provide jobs. Well, now we got a chance to do it."

But not everyone on the waterfront agrees.

"Those are our fish they're taking," says charter boat Capt. Bob Pipinich, who worries that the large purse-seiner ships with nets, helicopters and satellite technology would deplete the large schools of tuna on which the local fishery depends and drive the market price of fish so low that local boats could not compete.

Harold Medina, chairman of the board of the American Tuna Boat Association and a fisherman for 35 years, understands why local fishermen using poles might resent the big purse seiners but said the idea they would take all the fish is a "fallacy".

He said purse seiners cannot really fish near shallow areas for fear of catching their nets. Despite electronic fishing gear, he said, purse seiners sometimes miss fish that are visible from small boats. He added that most purse seiners do not like to work inshore near the Hawaiian Islands because the clarity of the water here makes it easy for the fish to avoid nets.

Crozier, who used to work as an aku fisherman, said purse seiners would not threaten the local industry because they are bringing in frozen fish unsuitable for sashimi — the mainstay of the local industy. He acknowledges that money would have to be spent for better harbor facilities and canneries, but expects a payoff in more jobs.

We cannot just go on making babies, he said. "We have an obligation to find something for them to do."

Tropical and Island Ecosystems

Harry Whitten

The new Hawaii administrator for the U.S. Fish and Wildlife Service.

ALLAN MARMELSTEIN first saw Hawaii in 1966 when he arrived to join an oceanographic cruise from here to the Aleutians. In 1969 he taught a graduate course in marine biology for one semester at the University of Hawaii.

Today he's delighted to be back here as the new Pacific Islands administrator of the U.S. Fish and Wildlife Service, with responsibility for programs in Hawaii, Guam, American Samoa and U.S. possessions and trust territories in the Pacific.

During the years since 1969 he was involved in many projects on the Mainland, in Venezuela and Iran dealing with aircraft and remote sensing systems in natural resource management and with automated information systems.

Over the years he maintained his interest in tropical and island ecosystems and put in his application for the Pacific administrator's position when it became open last summer.

Sitting in his office in the Prince Kuhio Federal Building, he said, "We have a unique heritage here because we are dealing with a natural system. Our challenge is to see that as much as possible of that uniqueness is maintained for future generations."

Since assuming his position in December, he has visited the service's wildlife refuges on Oahu, Kauai and Maui. "Our existing refuges will continue to be important for the recovery and long-time survival of Hawaiian waterbirds," he said.

HE ALSO HAS BEEN to Midway and Kure Atolls in the Northwestern Hawaiian Islands, where he was impressed by the albatross colonies. Next month he plans to visit Guam, Saipan and Ponape and later will visit American Samoa and the other Northwestern Pacific islands.

He received his doctorate in biological oceanography from Oregon State University in 1969. Earlier he had received a master's degree in oceanography from Texas A&M University and a bachelor's in biology from the University of Maryland.

He taught at Humboldt State University in California, spent five years with the Earth Satellite Corp. in Washington, D.C., and joined the Fish and Wildlife Service in 1975 as a remote sensing coordinator. In 1982 he became chief of the service's branch of information technology, dealing with automated information systems.

He said that spacecraft remote sensing systems can be of much value in the future to monitor changes in ecosystems but sees no immediate use for them in the smaller Pacific islands. However, satellites with capability for higher resolution may make data applicable in the future to island problems, he said.

Aerial photography has been used to monitor the Hawaiian monk seal population, he said.

Allan Marmelstein

Outings

SEVERAL OUTINGS are scheduled during the coming two months by the Lyon Arboretum and Lyon Arboretum Association. They include:

- Chinatown tour, led by Beatrice Krauss, 9 a.m. Feb. 22 and March 20.
- Ethnic markets, Beatrice Krauss, 9 a.m., March 7.
- Koko Crater hike, Thelma Greig, 9 a.m. March 14.

There are fees. Information may be obtained by calling 988-7378.

Arctic

HAWAII WILL BE allowed to submit two to four finalists for consideration of positions in an Arctic expedition July 28-Aug. 20 to Mt. Raleigh on Baffin Island, according to Kenneth R. Kupchak, chairman of the local selection committee for Operation Raleigh.

The operation, announced last month, is a British-American program of scientific expeditions to be undertaken in the next four years with trips to Antarctica, Central America, Africa, Australia, Indonesia and India.

Twenty Islanders between the ages of 17 and 24 will be chosen during the program's four years. The ascent of Mt. Raleigh, discovered and named by the explorer John Davis in his expedition of 1585-87, will be the first trip of Operation Raleigh. Col. John Blashford-Snell of the British Army heads the operation and George V. B. Cochran, president of the Explorers Club, New York, will lead the Mt. Raleigh trip.

Persons wishing to apply for the program should send a self-addressed, stamped envelope to: Operation Raleigh, P.O. Box 3020, Honolulu, Hawaii 96802.

A bad year for Big Island fishing

from page I-1

it would be difficult to make a connection between the change in fishing conditions and the lack of rainfall.

National Marine Fisheries Biologist Richard Uchida said there was a lack of knowledge of the fish population on the Big Island because scientists were discouraged from doing studies there on the ika and ahi populations by people who did not want them to interfere with the ahi fishery.

He said there were confrontations with local people who fish who objected to the study and political pressure was exerted to block a visit to the Big Island by a Japanese research vessel with National Marine Fisheries Service and University of Hawaii researchers aboard. He said some individuals were concerned that such research might result in increased competition from Japan for Big Island squid and ahi.

Although there are some people in Kona who are worried enough to suggest that the state set size limits on ahi, biologists argue that solutions to the problem might not be so easy. They say that size restrictions might be useless because ahi is a migratory species that travels long distances in the ocean and is harvested by people from many different countries.

Division of Aquatic Resources Director Henry Sakuda said size regulations would be difficult to enforce because "if a person spends money and gasoline to go fishing, even if it's small he's going to keep it . . . if you don't take a shot at it, then some foreign fisherman is going to get it and you're wasting your time."

One fisherman at the auction put it another way. I asked him why he went out and caught these small fish that nobody seemed to want.

"Why shouldn't I?" he replied. "There's no law against it."

Catching small ahi call

section I

The Sunday Star-Bulletin & Advertiser

Honolulu, January 15, 1984

from the sea

mike markrich

HILO — Auctioneer Samuel Kumukahi at Suisan fish market waited several minutes after he opened the bidding on the long pallets of small silver ahi that sat on the auction house floor.

It was just before New Year's when demand for ahi was at its peak but there were no takers, so Kumukahi had to order the fish put back in the cooler for sale somewhere else.

This is one of the worst years for Big Island fishing that he can remember and Kumukahi is afraid that catching and selling such small, 1- and 2-pound ahi might be part of a larger problem that could affect fishing there for years.

The small fish are being caught because the people who fish can't catch bigger ones.

"In all my years of fishing, I don't think I've ever seen it like this before . . . They're going out there and slaughtering all these ahi that don't even weigh a pound apiece and then we can't even sell it. It sure doesn't make much sense."

Kumukahi is afraid that if too many such small fish are taken it will cut down on the number of fish that grow old enough to breed. "The old Hawaiians and the old Japanese understood this. But the rest of these guys don't know what's going on."

Fishing in the usually rich fishing grounds near Hilo is reported to be light. Almost no yellowfin tuna or other fish were caught at South Point this year. There's been practically no ahi caught off Kona for the past two years and there's a shortage of opelu, the all-important bait fish, all over.

Robert Leslie, 66, whose family has fished in the Kona area for generations, can remember only one time this bad. (That was 1950 when Mauna Loa volcano erupted for 23 days, poured three lava flows into the ocean on the Kona side and "scared the fish for nine years," said Leslie.)

He says he believes the fish will come back because they always have. But if the fishing does not get much better in the coming year he will begin to worry.

There is no one explanation for the shortage.

Some people, such as Kumukahi, believe the fishing buoys, placed in the water to attract fish, are at least partly responsible because they have changed traditional fishing patterns. Others believe the changes may have more to do with "El Nino," the wide-ranging ocean temperature change that has been affecting the movement of fish populations all over the world.

But University of Hawaii physical oceanographer Klaus Wyrtki, one of the world's foremost authorities on the El Nino effect, says there is no way for scientists to be certain it is affecting fishing here.

"El Nino (which ended in October) had its main effects on the western and eastern Pacific," he said. "In the central Pacific, its effects were restricted to the zone along the equatorial line — from Fanning Island to Tahiti. On and around Hawaii, it did not have that much effect."

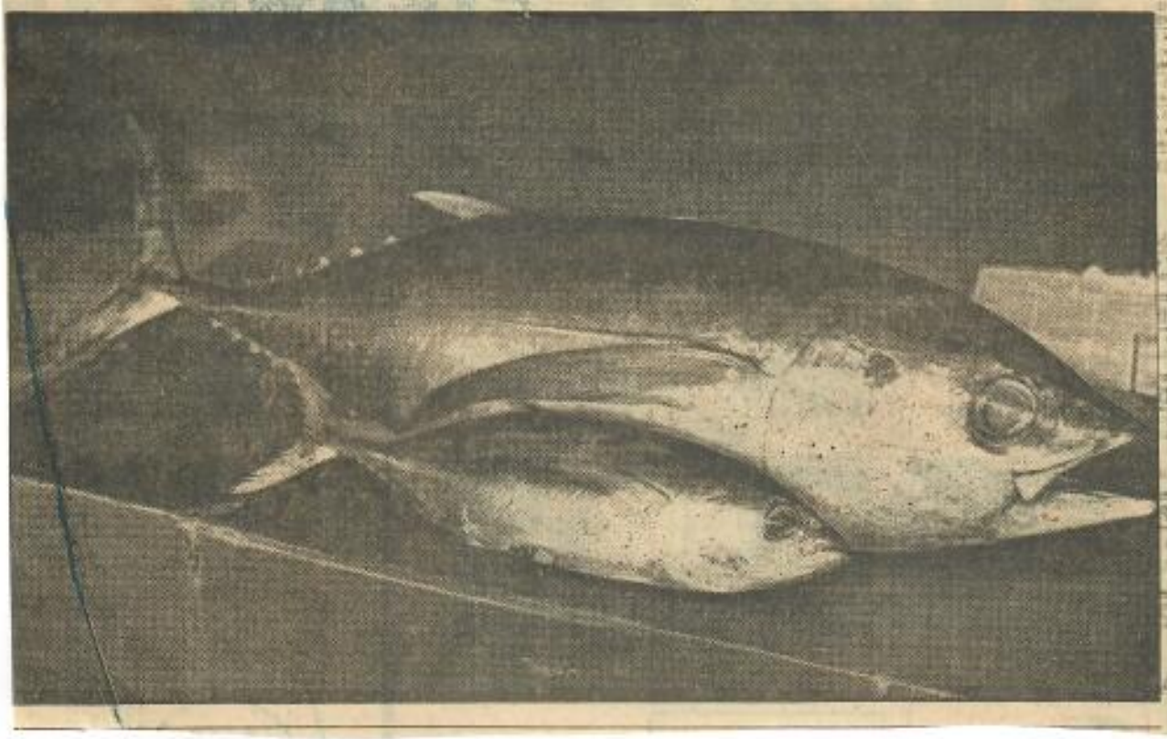
Wyrtki did say that El Nino affected the climate in Hawaii by bringing drier air masses over the Islands. But he added

See A bad on Page I-3

A 2-pound ahi rests on an auction block next to a larger, and more popular, 18-pounder.

Advertiser photo by David Yamada

ed threat to the future

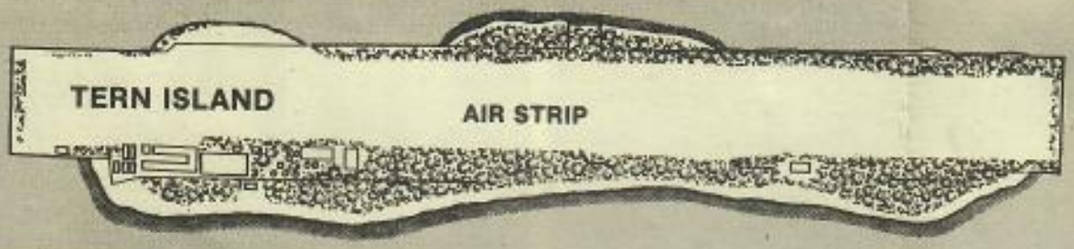


Sept 1983 Vol 8 No 8

Tern Island & NWR Boundaries

Who controls submerged lands and lagoon waters of the Hawaiian Islands National Wildlife Refuge?

Will dispute over ownership of Tern Island complicate management plans?



There exists a dispute between the U.S. Fish and Wildlife Service and the State of Hawai'i as to jurisdiction over Tern Island, which is the largest of the various islands constituting the atolls of French Frigate Shoals and an island which the state is interested in for commercial fishing purposes. The basis of the dispute is closely linked to the island's interesting but controversial history.

As with most of the other islands and atolls of the Leeward Islands, Tern Island became a part of the Hawaiian Islands Reservation in 1909, in accordance with Executive Order 1019, issued by Pres. Theodore Roosevelt. This designation was changed to the Hawaiian Islands National Wildlife Refuge (HINWR) in 1940, at which time administration of the Refuge was placed in the hands of the U.S. Fish and Wildlife Service.

During World War II, the U.S. Navy occupied Tern Island and, by dredging neighboring waters and placing steel pilings, converted it from an 11-acre sand islet to a 57-acre flat island. Additionally, the Navy built an airstrip on the island, constructed barracks, water tanks and storage facilities, and dredged a channel through the lagoon for ship access. This was done without any formal or informal right or authority, according to a report published in the 1982 U.H. Law Review.

In 1948, the Navy, no longer needing the outpost, turned the island over to the Territory of Hawai'i. The Territory was then, as the State is now, interested in utilizing the island for commercial fishing purposes.

In 1952, the Territory issued to the U.S. Coast Guard a use permit that allowed establishment of a LORAN transmitting station on the island. The LORAN station at Tern Island operated until 1979, at which time the Coast Guard terminated operations there. Subsequently, FWS personnel inhabited the island. Currently, the FWS maintains a field station there.

In 1979, the Hawai'i State Legislature adopted resolutions requesting the Governor to take action toward the acquisition and return of Tern Island and its facilities to the State. The federal government's position is that the Navy never had title to convey Tern Island to the Territory of Hawai'i and, therefore, the federal government retains jurisdiction over the island pursuant to

Executive Order 1019.

A second ownership dispute between the state and federal governments in the NWHI concerns the boundaries of the HINWR.

By definition the boundaries of the Wildlife Refuge are the same as those of the former Bird Reservation. The problem here is that when Roosevelt defined the area of the Reservation he merely named the islands and atolls and provided a map showing their location. In interpreting this, the FWS says that the boundaries of the Reservation/Refuge are from the mean lower low water at Nihoa, Necker, Gardner Pennacles and Lisianski; the outside reef at the edge of the lagoon at Pearl and Hermes Reef and the French Frigate Shoals (and where there are no reefs, from headland to headland); the outer edge of the adjacent reef at Laysan Island; and the outside reef of Maro Reef (which is a submerged reef for the most part) — according to Robert Shallenberger, FWS refuge manager. The State, on the other hand, contends that the boundaries are the lower low water mark of the islands and emergent lands, said Shallenberger. To put it simply, the controversy is over the lagoons and the submerged lands within the lagoons — are they, or are they not, part of the Refuge?

History shows that in the past the federal government has acquiescenced to territorial and later state control and management of the islands' internal waters. Hence, the State seems to have a strong case for jurisdiction over these internal waters.

The disputes about the ownership of Tern Island and of the waters and submerged lands of the HINWR will probably go to court before they are settled.

However, even if the court decides in favor of the State, the management of Tern Island and of the internal waters of the HINWR could still present problems as there are at least eight state and federal laws dealing with environment and conservation that restrict what can be done in the area. Also to be taken into consideration is the anticipated maintenance cost of an outpost on Tern Island. According to a 1979 FWS study, simple maintenance costs for a minimum outpost are anticipated at $190,000 per year, not including the cost of channel dredging and activities designed to prevent structural deterioration of the island itself.

. . . **Sylvia**

Ono now

from the sea

mike markrich

HAWI, Hawaii — Five years ago, fisherman Joe Kaoo and others in this North Kohala town didn't bother much about catching ono. They didn't eat it and for 10 cents a pound they didn't want to bother with a fish that can be 6 feet long and so vicious it has to be tied from head to tail every time it is brought aboard.

But as ono became a popular restaurant fish and prices rose from 10 cents to more than $3.50 per pound, Kaoo and others who fish for a living began to change their mind.

The ono, which scientists place in the same family with tuna and mackerels, once was caught incidentally as people fished for what they considered more valuable.

Its white meat was considered too bland and dry for local tastes; it was seldom served in restaurants, which preferred more popular fish such as opakapaka.

But as prices increased and other fish became harder to come by, restaurants experimented with ono as a lower-priced substitute.

Ono soon was found to be very popular among tourists and became one of the leading commercial moneymakers. Since 1975, the size of the Hawaii catch of ono has tripled and its value has increased from $67,626 to $454,063.

Large albacore boats now make special trips to the Northwest Hawaiian Islands to meet the demand.

Some fishery scientists say so much ono is being taken from places such as Kaula Rock off Kauai and South Point on the Big Island that the size of available ono is decreasing.

In certain areas it was once common to catch ono that were 40 pounds or larger, they say, but the average weight is now about 20 pounds.

Kaoo says the largest ono he caught was 61 pounds and he usually can find ono at depths of 90 to thought to be afraid of people.

Kaoo says ono do not usually fight much when they are caught but struggle and try to bite once brought on board.

He says he is particularly careful of any ono with stripes on its sides. He calls it a "devil" and says it "jumps all over and he'll do anything, even attack the boat." (Scientists say these stripes are common among fish and appear whenever they feed or find themselves under stress.)

Kaoo says that when he and his crew catch an ono, they are careful to leave the hook in the fish's mouth and run a line from the swivel above the hook and wrap it several times around the tail so the

110 feet in an area near Waipio Valley where the water is "choppy".

Calvin Kelekolio, who lives and fishes in Honaunau on the other side of the Big Island, has other ideas. He describes the ono "as a shoreline fish" and says it is possible to find ono wherever schools of opelu and mahimahi are present.

Like others who fish for ono, Kelekolio and Kaoo troll with colorful squid-shaped lures. Kelekolio uses red or yellow lures mixed with white because "those are the colors that they like." Chris Emeliano Jr. use pink, blue or yellow.

Emeliano and his father, Christopher Emeliano Sr., troll for ono with 130-pound test line about 2 miles out to sea. Chris Emeliano says that while ono do not fight as much as much as other fish such as mahimahi, the ono's teeth are so sharp that they sometimes either cut through the line or bite off part of the lure.

That's why Emeliano and others sometimes use pieces of wire at the front of their lines — called leaders — to prevent the fish from biting through.

The ono is known as an extremely aggressive fish that will turn and attack when speared or threatened. It is one of the few fishes not

Live sashimi — a real challenge for sushi makers

from the sea

mike markrich

People who order lobster sashimi at the Suntory restaurant do not have to worry that the finely sliced tail pieces they eat with chopsticks are fresh.

The lobster before them is still moving slowly on their plate.

Its antennae may be tied back with a red ribbon but the eyes still respond to changes in light and the thin pieces of tail meat still have the slightly clinging feel of living tissue.

Those who can afford to eat it at $20 per pound and know how it is carefully prepared consider it to be one of the finest examples of the Japanese fish cutters art. They know it has taken great skill to carve the lobster so it can be served and eaten before it dies.

In Japan, people who work in sushi bars must not only spend 10 years learning how to cut and prepare fish, they must learn the part that a sushi bar owner and fish cutter plays in a tradition that goes back hundreds of years.

Toshiaki Okada, chief chef at Suntory restaurant, speaking through interpreter Tsugumi Iwasaki, says there is more to working a sushi bar than cutting fish. He says that a fish cutter should have the feeling that a sushi bar is a kind of oasis where people can order something to eat away from the pressures of everyday life.

Okada, who has been in the business 27 years, says it takes at least 10 years for a person to learn how to prepare sushi.

But, he said, it sometimes takes even longer to know how to understand the "human relationships" that are essential for a sushi bar to establish if it is to survive and prosper.

This means that the moment a customer walks through the door it is part of his job to make that person feel at ease. Okada looks at the faces and tries to anticipate what kind of day people have had. If it looks as if the day has not been a good one he tries to make something "delicious!"

At least, says Okada, "if it does not solve their problems, it allows them to temporarily forget them."

The preparation of such sushi takes great skill. The fish must be cut so that it takes the proper form. This was demonstrated by Murayama Sadayuki of Sada Restaurant.

Sadayuki has a special 10-inch knife sharpened only on one side so he can shape the fish as he cuts it. According to Japanese tradition, he said, there are only two basic ways to cut raw fish.

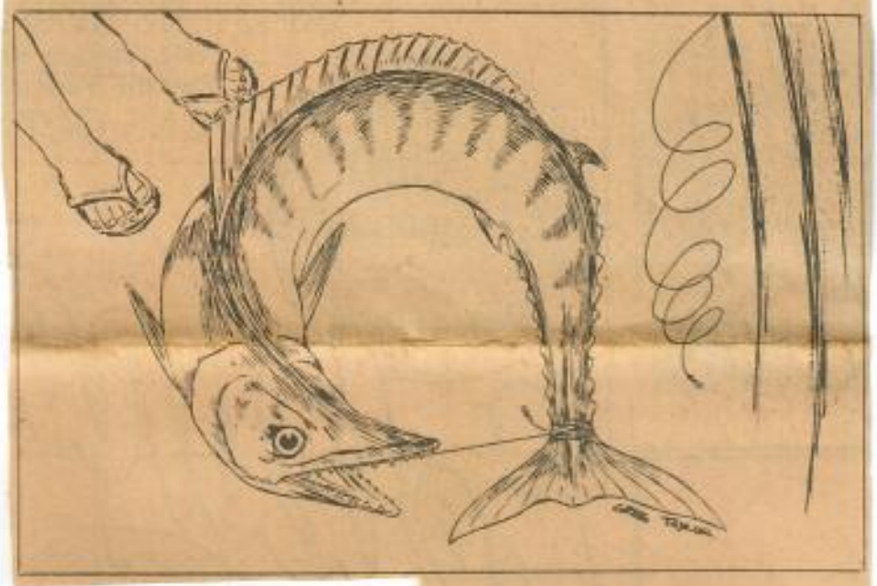
Fish for sushi, which come thinly sliced on top of seasone rice, must be cut in a smoot lengthwise motion along wh he called the fish's natur grain.

But sashimi, which is serve without rice, must be cut in short pulling motion so that comes out in a small wedg There is a certain way, accor ing to Japanese tradition, th each slice should look. There also an incentive, with whol sale fish prices that sometim approach $16.50 per pound, n to make any mistakes.

Sadayuki said one of the mo challenging ways of prepari fish is "ikizukuri," or live sas

Star-Bulletin & Advertiser

matches its name



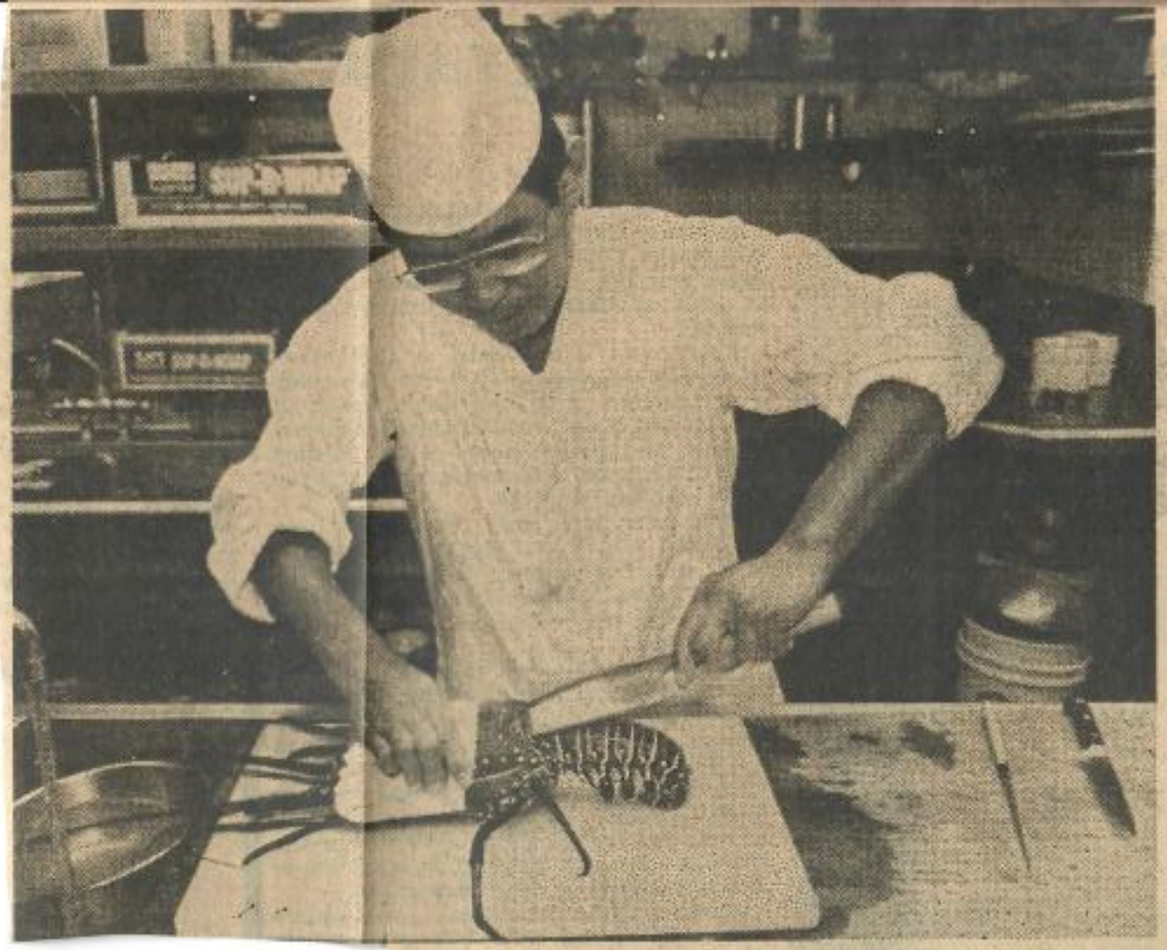
fish does not thrash wildly on deck.

But many accept the danger of getting hurt by thrashing fish as part of the job. As one Big Island fisherman said, "I don't care what they do just so long as they bite."

Eddy Fernandez' ono recipe

Make a butter sauce: Melt 8 ounces of whipped butter. Add to the butter four crushed garlic cloves, a tablespoon of chopped parsley, a dash of tabasco and a dash of worcestershire sauce, a teaspoon of salt and ¼ teaspoon of MSG. Simmer a few minutes and add sliced mushrooms to taste.

Clean and filet an ono. Cut the meat into 4-ounce pieces and dust with flour. Fry both sides in a tablespoon of oil for 1 minute. Then pour butter sauce over the fish.



Toshiaki Okada, chief chef at Suntory restaurant, slices a live lobster as he prepares ikizukuri.

Advertiser photo
by Gregory Yamamoto

mi. He said a special cut is made on the back of a carp's spine rendering it temporarily still. Then the side of the fish is opened and the meat removed from bone.

This is done in such a way that the thin membrane covering the fish's vital organs remains intact. The meat is sliced neatly and put back in place under the scales. The fish is then revived with another tap on the spine and is served gasping, eyes rolling, to a customer.

"If the fish dies before the customer finishes eating, then I have failed," says Sadayuki.

Few local restaurants serve such living food on their menus. Most of the fish arrives on ice in approximately equal thirds from Hawaii, California and Japan. As fish prices rise, there is also an increasing use of artificial fish meal substitutes.

Haruo Nakayama of Yanagi Sushi said he understands why restaurants use such products — the price of some fish has tripled in the past 10 years. But he uses only a limited amount of such artificial substitutes because "a restaurant is known by the quality of its fish."

He said the high cost of the fish has been offset by the increasing numbers of non-Japanese people who now eat sushi and a skilled sushi person can make 50 percent on every piece of sushi he sells. There are problems, however, when tourists come in and order the sushi off the colorful picture menu because they think they are "cookies" and then return them when they realize it is raw fish.

But such small misunderstandings are part of the business and many of the sushi chefs are philosophical about their work.

Does Okada ever feel any guilt about cutting up the lobster alive.

"No", he replies through the interpreter, "because I know that he is happy to be prepared in such a manner. It is his destiny."

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Victoria Custer Elaine Stroup
HONOLULU STAR BULLETIN
AND ADVERTISER
JUN 3 1984

Protecting our fish

For residents of the nation's only island state the need to protect our ocean resources is obvious. To that end, the state has dozens of laws and regulations that govern fishing — and 48 officers in the Department of Land and Natural Resources to enforce them.

Those officers — 15 on Oahu — are also charged with enforcing rules on hunting, conservation districts, historic parks and sites and wildlife areas. So it is no wonder that, as Mike Markrich noted in his "From the Sea" column last Sunday, there is concern about the adequacy of protection for our marine resources.

TO THOSE familiar with Hawaiian waters, the near-shore population of fish and other creatures has clearly dwindled over the years. Some of this may be due to deterioration of Hawaii's reefs caused by silt runoff, pollution and coral mining.

In large measure, however, it is simply because more people are fishing and using improved equipment and different techniques. Some of the latter, such as use of chlorine, not only are blatantly illegal but also seriously damage the reef environment.

So DLNR's ability to protect the remaining aquatic life has become that much more critical. Questions have been raised because Division of Conservation and Resources Enforcement (DOCARE) officers issued only 204 fishing-violation citations but 4,010 parking tickets on state park lands in 1982.

In light of that, there may be a need to re-assess the priorities of the division. It was created in 1979 because of the expansion of DLNR's role as a streamlining, cost-saving measure. The idea was to avoid the duplication of having a game warden checking fishermen and someone else issuing parking and camping citations at the same state park.

But the efforts of a single, multi-role officer must be balanced. Under chief Maurice Matsuzaki, many innovations have been made to stretch the staff. And given its wide range of responsibilities, the division's budget may also warrant review.

MOST IMPORTANT is the need for community awareness of the statutes and rules. Granted, there are many: different bag limits for nehu and moi, for example, different minimum legal sizes for aholehole and tako. Lobsters may be taken only between September and May. There is a different season when mullet may be caught.

DOCARE officers routinely hand out charts that outline these regulations. They hold educational sessions with community groups and youth organizations. A hotline to report violations has been set up.

Ultimately, however, each person who takes from the sea, whether for business, recreation or subsistence, is responsible for and has a stake in maintaining those precious resources.

Report

The Honolulu Advertiser
★★ Monday, August 29, 1983 A-3

Baitfish only first ripple in aquaculture project

By Edwin Tanji
Advertiser Maui County Bureau

MAALAEA, Maui — It's still commonly called the Maui County baitfish project, but it's gotten to be a lot more than that.

The research effort now also includes ducks, white amur carp, mullet and tilapia in a set of experiments aimed at demonstrating the potential for commercial aquaculture. The primary goal still is the same: development of an easily raised baitfish that can be used in commercial fishing throughout the state.

For that, the project is raising topminnows, which already have been used with mixed results in fishing for aku and in other commercial and recreational fishing. For aku, at least, the topminnow still is only a fallback bait to be used if the supply of natural bait — nehu and iao — should fall short.

Bob Agres, the county's aquaculture specialist, said it already is clear the topminnow is not the preferred bait of the Island fishing industry. But if it were available, it would be used.

Thus, the program has expanded to look for other products that could be developed in the process of raising the topminnows. Agres said the county research effort is hardly new. "This has been done for ages and ages. This is based on ancient Chinese cultural practices," he said.

The topminnow project is focused on an experimental pond in which the baitfish are being raised with mullet, the white amur or grass carp, silver carp, and a flock of 100 white Pekin ducks. For comparison, there is a second pond stocked just with topminnows.

With the polyculture system, the ducks are fed grain. Their pen is placed above a fenced-off section of the pond. All of the duck manure goes directly into the water, fertilizing the pond. That promotes growth of algae, phytoplankton, protozoa and bacterial slime, Agres said.

Each of the fish introduced to the pond has a role, he said. The silver carp and grass carp eat phytoplankton and vegetation, digesting it and fertilizing the water for the protozoa and bacteria eaten by the topminnows. The mullet stir up the muck on the bottom of the pond to keep it from turning anaerobic, or without oxygen, in which case all of the fish would die.

Advertiser photo by Edwin Tabu

Feeding the ducks that share the topminnow pond.

Agres said the duck pond and the control baitfish pond were equally stocked at the beginning of summer. By the end of September, he expects to be able to compare the number of baitfish in each pond to determine the effects of having a polyculture system with ducks and other fish.

The indications so far are promising, he said. For one, he said, while it has normally taken about four months for the topminnows to grow to bait size, the polyculture system has developed good-sized baitfish within three months.

The costs are about the same in terms of feed. But with the polyculture system, the feed is used more efficiently, he said. Since the topminnows were selected for their tendency to remain at the surface of the water, feed that falls to the bottom of the pond is usually wasted.

But there is more to the idea than just baitfish. If he could get the ducks to lay, there would be a potential for selling eggs and ducklings, he noted. The white amur carp and mullet also have been used as food fish, although Agres noted that the conditions under which they are raised would affect how well they would sell.

"If we were going to sell the carp and mullet, we might have problems with using duck manure," he said. "If we were in a business situation, that (use of duck manure) would be disgusting."

Conversely, Agres said, there is a high potential for use of fish as a processed food. He noted the appearance in various markets of imitation crab and shrimp which is nothing but fish with crab and shrimp flavoring.

On another front, researcher Wayne Okamura has been working on a hybrid tilapia. The hybrid is reddish gold and already has been used by Chinese restaurants under the disguise of "golden perch."

Okamura said his work has taken him to other parts of the world where raising of tilapia is a big industry. He reported, for instance, on a fish farmer in Idaho who has developed a healthy market for tilapia — the same black/gray fish caught in sugar plantation irrigation reservoirs — in West Coast restaurants and markets.

"It's been done in other parts of the world, but in Hawaii, we have to show it can be done here with the kind of feed that is available," Okamura said. He also acknowledged there is a problem with acceptance of tilapia as a food fish among most residents, who associate the fish with muddy ditches.

But Okamura said acceptance of tilapia is subject .o regional differences.

The project is jointly supported by a federal grant, state funds and county "in-kind" services and money. It is budgeted this year for $81,000 with four technicians and researchers on contract with the county.

'Juicing': livelihood or overkill?

from the sea

mike markrich

They say they have to do it. They say that to make their payments and feed their children they have to use chemicals to stun fish and force them from the coral into the open.

The process is called "blasting" or "juicing a hole." It is not a new concept in fishing. For hundreds of years, people in Hawaii have used plants such as awa to stun fish and catch them. The trouble is that it has never been done so ruthlessly or so well.

Finely powdered white chlorine of the kind that is used to clean swimming pools is tied inside a waterproof plastic bag. Holes are punched in the side of the bag and, because the pressure in the water is the same inside the bag and out, the bag does not collapse. The diver puts it at the end of a spear, sticks it inside a "hole" or coral head where fish live, and shakes the bag. The chlorine is released; the fish panic and go into convulsions. As they do, they are speared or caught in a net. The divers then move on to the next hole.

like little crabs. It just doesn't look alive. It's like walking into a house without furniture."

University of Hawaii zoologist James Parrish said that little is known about the long-term effects of using chemicals such as chlorine. He said chlorine is a "strong toxin that kills non-specifically." While some studies have shown that the coral does grow back eventually, Parrish said, no one knows "how much can be tolerated and still have any reef left."

common than many people would like to think because the potential for profit is high and the risk of getting caught is low.

In 1980-81, the state Department of Land and Natural Resources cited one person for having a Clorox bottle on his boat.

Noah Pekelo, the department's chief of support services, said state agents are aware of the problem and make routine checks at boat ramps to see if people are carrying chemicals. But Pekelo said it is difficult to catch people actually doing it.

Walter Paulo, Hawaiian fishing expert and international consultant, said "a real fisherman who has skill and knows the culture doesn't blow holes or use Clorox . . . It is shameful. If you do that, you're just hurting the grounds."

Marine biologists and fishing people worry about "juicing" because the bottom fish that are the targets of the technique are only able to live in reef holes that provide food and protection. The chlorine used to catch them also can kill everything in the area from the coral to small crabs that the fish feed on. If too much juicing destroys these habitats, it is difficult for the fish to return.

"All the good spots used to be bubbling with menpache," says fisherman Paul Masuda of Waianae. "Now I see the holes empty. They never come back in the same numbers."

Masuda said that he has seen divers catch free-swimming fish such as taape with chemicals but that most people who use "juicing" use it to catch high-priced fish such as menpache, which are hard to get out of their hiding places in the coral.

One diver who asked not to be identified said he had watched a friend juice a hole and described it like this:

"After you shake the bag of chlorine in the hole, it takes five minutes before the fish start shooting out. He put a gill net over the hole and caught the ones he wanted. The others went into convulsions and died. The worst thing was the way that the young invertebrates and crabs on the cave walls just fall off. It's just sickening."

Frank Farm, president of the Hawaii Council of Divers, says he can tell where chemicals have been used on a reef area "from the deadness that surrounds the hole. There is a lack of activity of small organisms

It is illegal under state law to use explosives, electric fishing devices or poisonous substances in state waters without special permits. Although the use of substances is condemned by groups such as the Hawaii Council of Divers, it is a commonly accepted way for some people to catch fish. As one man said, "It's the only way you can get fish out of holes and make any money."

Roger Nakasu, one of Hawaii's most experienced divers, said he and most divers that he knows juiced holes at some period of their lives. He said that "money was the catalyst because you're not going to do it just for fun." Nakasu said he no longer does it "because it upsets nature's balance," allowing divers to catch too many fish. But he also said, "The fish always come back. You can wipe out a hole but the next day, if any are left, they are back."

Nakasu said that the reason people do not see as many fish as they used to may be because people are taking too many fish and not allowing them to reproduce — not because chemicals are being used.

Divers differ in their opinions as to how widespread the use of chemicals is in Hawaii. Scott Bowman says the few divers that use this method are "outlaws" not respected by other divers. Others say it is far more

Lobster Tale Has Happy

By Pat Guy
Star-Bulletin Writer

Failing to find evidence of a sale within the state, a District Court judge yesterday acquitted commercial fisherman Bruce Mounier of a charge of not having a proper license to sell lobster tails.

District Judge Melvin Soong also ordered the state to return the 9,200 pounds of frozen lobster tails — worth about $100,000 — it impounded March 15 when Mounier was charged with the offense and four other petty misdemeanors that were later dropped by the state.

"I am just a fisherman and I want to go out and fish," said Mounier after the ruling. He said that as a consequence of the state's action in bringing the charges he is broke and had to borrow money. He could have made up to $3,000 a day fishing on his boat, Magic Dragon, he said.

Mounier said he intends to ship the 17,445 frozen lobster tails to California on the next available ship. The catch is now at the Matson container yard on Sand Island.

Mounier, a fisherman for 20

A-18 Honolulu Star-Bulletin Thursday, June 2, 1983

Kahala Burglar

By Lee Catterall
Star-Bulletin Writer

A man suspected of absconding with women's panties from Kahala homes during a two-year period was sentenced by a state judge yesterday to a 10-year prison term for four recent convictions.

Circuit Judge Bertram Kanbara

three weeks with a woman on the Mainland in 1980 and has had other extramarital affairs.

"I don't feel like I have any abnormalities, any sexual abnormalities whatsoever," Mew said. According to prosecutor's remarks and news accounts, he complained, "It seems like I'm some sort of a sick person crawling out of the woodwork."

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HONOLULU STAR BULLETIN
JUN 23 1983

Council to Extend Plans Jurisdiction

Orders Development Guide for Atolls, Islets

By Pat Guy
Star-Bulletin Writer

It's only been two months since all eight of the city's development plans have been in place, but the City Council appears eager to add a ninth plan covering the northwestern Hawaiian islands.

The Council's Planning and Zoning Committee yesterday unanimously approved a resolution directing the city's chief planning officer to draw up a development plan and amend the general plan to include the string of atolls extending some 1,500 miles northwest of Kauai as well as certain islands offshore not within the jurisdiction of other counties.

Committee Chairman Leigh-Wai Doo presented a memo to the committee outlining the legal basis for Honolulu's jurisdiction over the islands, which are managed either by the U.S. Fish and Wildlife Service or the state Department of Land and Natural Resources.

Doo's memo said the northwestern islands — which comprise less than six square miles and are the home for 14 million birds and 18 people (according to the latest census) — fall within Council member Welcome Fawcett's district.

"AS THE Council member representing the district, I want to propose we adopt the resolution," Fawcett said smiling.

She said later that none of the 18 people are registered voters here, but that if they wanted to vote, they would have to do so at Blanche Pope Elementary School in Waimanalo or request an absentee ballot.

Related story on A-9

Council member Rudy Pacarro wondered whether the city Department of General Planning would need more money to draw up the plan and Councilwoman Marilyn Bornhorst questioned whether the islands were legally under city control.

Bornhorst thought the idea was "very responsible."

Willard Chow, the chief planning officer who has the task of drawing up the plan, said later that he thought it was a good idea but wondered "how important is it compared to the other (plans) . . .We have other things we're supposed to do. . .We have to weigh the costs and benefits. We can't do everything."

The offshore islands to be included in the plan are Kaohikaipu, Manana, Makulua Popoia, Mokolea, Moku Manu, Coconut (Moku O Lo'e), Kapapa, Kekepa, Chinaman's Hat (Mokoli'i) and Goat (Moku'auia).

THE NORTHWESTERN islands are Kalua, Nihoa, Necker, French Frigate Shoals, Gardner Pinnacles, Maro Reef, Laysan, Lisianski, Pearl and Hermes Reef, Kure Atoll and Tern.

According to Doo's memo, both state law and the City Charter give the city jurisdiction over the islands, but the resolution appears to acknowledge the overlapping jurisdiction with other agencies and governments.

The resolution will be sent to the Department of Land and Natural Resources, Department Planning and Economic Development, Sea Grant Program, Western Pacific Council of Fish Conservation Management Agency, National Oceanographic Agency and the U.S. Interior Department's Fish and Wildlife Service.

The resolution also refers to adjacent waters, an issue in dispute between the state and federal governments. Henry Sakuda of the DNLR's fisheries branch, said the boundaries of the refuge areas also have been in dispute ever since their establishment by President Theodore Roosevelt.

Leigh-Wai Doo
Wants a 9th plan

The Honolulu Advertiser June 2, 1983

A tail of cold justice

By Ken Kobayashi
Advertiser Staff Writer

Skipper Bruce Mounier will get his lobsters back. Finally.

For 2½ months, some 9,200 pounds of lobster tails worth $100,000 have been languishing on ice, waiting to be thawed, sauteed and popped down some seafood fancier's gullet.

The morsels soon will be off the block and onto a menu, but the experience has left the fisherman frustrated and on the brink of bankruptcy.

Mounier, 41, caught the shellfish off the Northwestern Hawaiian Islands in his 92-foot vessel Magic Dragon. He returned March 9 and unloaded the lobsters into a Matson ship bound for a cold-storage facility in Los Angeles.

But state officials seized the container and held it at the yard at Sand Island. They contended Mounier violated state laws by catching the lobsters in Hawaiian waters and by trying to sell them here without obtaining a commercial marine license — petty misdemeanors.

Last week, the state dropped the four counts involving catching the lobsters, and yesterday District Judge Melvin Soong acquitted Mounier of the fifth and final charge.

Mounier praised Soong as "very fair," but said he had to borrow money to avoid bankruptcy from the months the Magic Dragon lay idle.

Defense attorney Michael Weight contended that the lobsters were caught beyond the territorial 3-mile boundary. The state apparently dropped the charges in an attempt to avoid a lengthy legal battle over the interpretation of how far Hawaiian waters extend, but pursued the fifth count — selling or offering to sell here without a license.

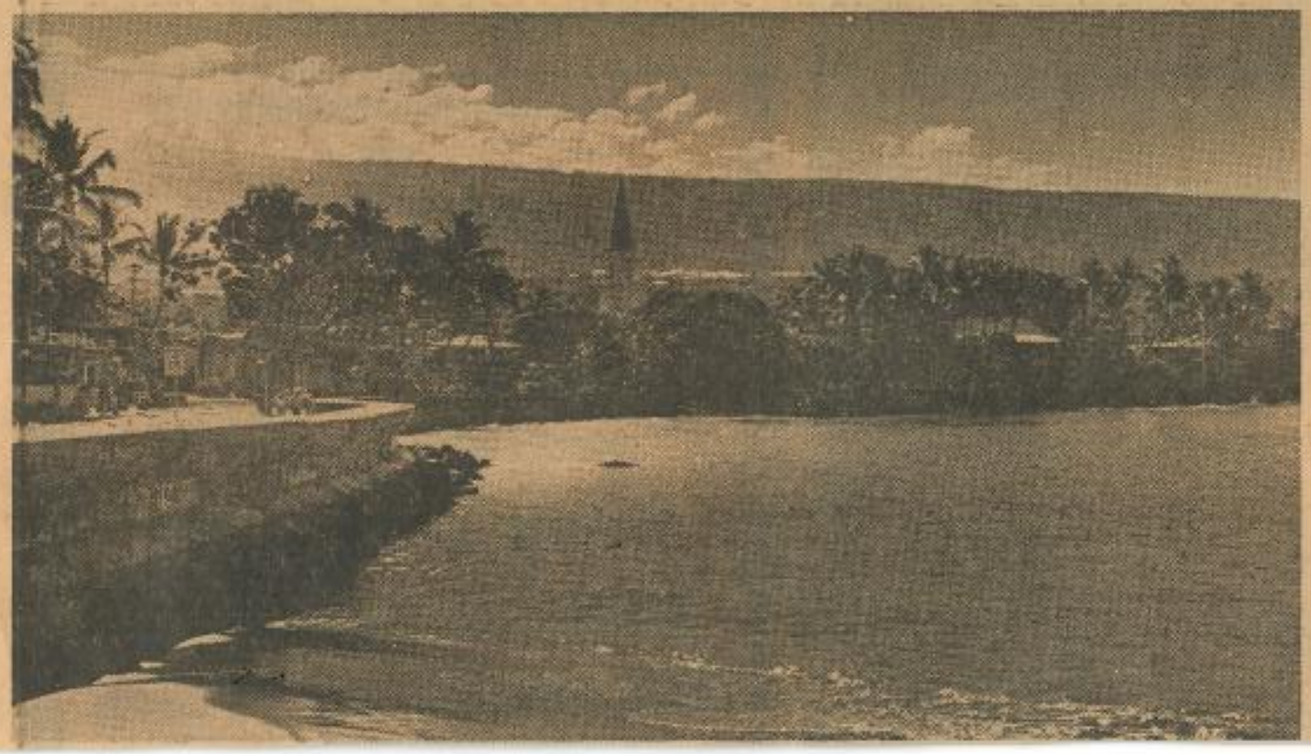
Deputy Attorney General Edwin Watson argued yesterday that the unloading of the lobsters into a container bound for Los Angeles was part of an "offer to sell."

"It doesn't make a difference that the ultimate consumer is in California," he said.

Soong ruled there was no sale or offer.

He also pointed out that Mounier actually did obtain a license the day after he arrived here on March 11, four days before the seizure. And he wondered aloud why the state issued such a license if it thought Mounier's violation was serious.

Said the judge, "Maybe it's a question of the right hand not knowing what the left hand is doing."



from the sea

mike markrich

At scenic Kailua Bay on the Big Island, those who fish from the sea wall and those who use surround nets find themselves fighting over the baby akule, called halalu.

Beef on big-net fishing prompts bill

KAILUA-KONA — The elderly people who take their poles and their plastic jars full of split mackerel down to the sea wall on Kailua Bay don't ask for much more than a pleasant afternoon in the sun and a few fish.

They don't ask for special favors from the commercial people fishing with nets nearby and they don't ask for trouble.

But the trouble exists.

Each year large silver schools of baby akule, which are known as halalu, swim into the harbor. The people on the sea wall spread their bits of mackerel so that the fish will come in closer to where they are. But often the schools of fish never reach them. They are taken by small commercial fishing canoes that use surround nets to capture the fish and drive away the ones they don't catch.

This year Lani Rivera collected 500 signatures on a petition to prohibit net fishing in Kailua Bay. The petition grew into a bill, sponsored by state Rep. Herb Segawa, that has been approved by the Legislature and is now awaiting the governor's signature. The bill would authorize the state land department to restrict commercial fishing within Kailua Bay to certain areas.

Rivera said the bill developed from a problem that has been going on for a number of years. Elderly people and families fish from the sea wall because it is close to where they live and considered safe for small children. But some say they are unable to catch anything because of commercial operators who use huge nets to surround and catch entire schools.

Rivera complained that sometimes those with nets take so many fish that they have to give the fish away or dump them in the ocean because they have no market value.

Others say surround-netting is not the only problem.

One man, who declined to give his name, said some of the people in the bay "net with disdain" and throw their nets directly in front of where other people are fishing. He said that many object, but are afraid of getting hurt if they speak out.

"The old Japanese guys won't say anything. They just sit there and grit their teeth. The other guys grab the fish and laugh," the man said.

It is illegal to throw net for halalu because they are small.

But commercial boater Danny Camacho says that such criticism is unfair and misplaced. He said there is a difference between the people who use surround nets and those who cause problems with throw nets. He said that he and his crew use surround nets for akule rather than halalu.

Camacho said: "It's the other people on the sea wall who use nets to surround the halalu. But we get the blame."

The problem, he said, is not one-sided. Sometimes large numbers of people with poles apppear on the sea wall using casting reels and illegal three-pronged hooks, Camacho said.

He said that sometimes the hooks endanger the people fishing in their canoes and that the people doing it "use the elderly and the very young" to justify what they do. He said if the state bans net fishing in Kailua Bay, it should ban pole fishing as well because "if they're going to kill Hawaii they might as well go all the way."

Rivera acknowledged there are people who use three-pronged hooks, but said they don't take nearly as many fish as the people who use surround nets. She said that within two weeks of the appearance of the halalu last November, "there was not a fish in that bay."

Danny Ejercito, who uses nets 100 feet long, said he and others who fish with nets "don't catch everything." He also said the petition does not take into consideration the problems people have in making a living through commercial fishing.

His crewman, Eric Gorloff, said of the people on the sea wall: "They're not fishing for a living. They are just moving in on someone else."

Lei Collins, chief curator of Hulihee Palace near the sea wall, has watched the situation with misgivings. She said she loved to watch the children, the old people and the tourists enjoy themselves and remembered a time in Kona when people enjoyed such simple pleasures and showed each other respect and "aloha." It bothers her that things have changed. "It is," said Collins, "a sad farewell."

Fish Consumption Nearly Triples in Seven Years

By Kathleen O'Dell
Gannett News Service

Americans are eating more fish than ever, opening up a $375 million annual domestic market for fish farming that's good news for farmers, rural towns and the economy.

By the end of 1983, domestic fish production is projected to be 375 million pounds, nearly triple that of 1976. "And we expect to double again this decade," says Bille Hougart of the Agriculture Department.

Other countries still lead in the field of aquaculture — the controlled raising and harvesting of fish. Annual worldwide production is 21 billion pounds, "but we're moving right to the cutting edge," says Hougart.

The reason: Per-capita consumption of fish and shellfish rose from 10 pounds in 1960 to 13½ pounds in 1980, and with every percentage point gain, another 240 million pounds of fish is required.

Since domestic fishermen can't catch much more, Hougart says, we can either import more or farm our own.

The biggest moneymakers are catfish, raised in the warm-water farms of the Mississippi Delta, and trout, from the clear, cold-water farms of Idaho, the East Coast, Appalachia and California.

FISH FARMING'S benefits:

—It creates stability, allowing marginal farmers to stay on land that has enough water.

—It creates jobs. A new catfish processing plant in Inverness, Miss., created 196 jobs — projected 350 by December. Trout farming in Magic Valley, Idaho, created about 1,000 jobs.

—It has stimulated related industries: feed, materials and services.

"I don't know of any industry within U.S. agriculture that's growing quite as fast," Hougart says. The industry is so new and scattered that no one knows the exact number of fish farmers. Hougart guesses 4,000 to 9,000.

Farm sizes vary from one-acre ponds to multiple ponds of 20 acres to 30 acres or clusters of tanks or commercial farms with several ponds of 20 acres to 30 acres each.

B-6 Honolulu Star-Bulletin Thursday, April 28, 1983

Monday, May 16, 1983 Honolulu Star-Bulletin A-15

Research on Nihoa Island

NIHOA ISLAND, 125 miles northwest of Niihau, is a very small island that is very rich in life — of the non-human kind.

Fifty or more species were added to the insect list as a result of a recent visit there by Wayne Gagne, Bishop Museum entomologist, who made his first trip there. The hundreds of thousands of seabirds are still there, according to Sheila Conant, University of Hawaii biologist, who made her fourth trip there.

There are also some rare plants plus Hawaiian monk seals who like to bask on the shore.

Gagne and Conant were transported to Nihoa by the fishing vessel Easy Rider, washed up on shore from a zodiac boat, while some of the vessel's crew helped them get equipment ashore. The

Results of a recent visit to Nihoa.

crew also assisted in the departure, with help of a rigging attached to shore so that buckets could be passed through the surf.

"We didn't want to be in the water long because there were sharks," Gagne said.

He said that the situation on Nihoa is not truly pristine but it is unique and valuable for scientific study. Judging from the vegetation, the island had received good rains lately, more than the main Hawaiian islands, he said.

In 1966 the entomologist John Beardsley drew up a list of 123 species of insects on Nihoa, including those he had collected and those collected by the Tanager expedition of 1923. Of these, at least 35 species were endemic only to Nihoa, Beardsley said.

GAGNE ADDED more than 50 species to the list and estimated that at least half of them will turn out to be indigenous or endemic to Nihoa. His collection is still being studied.

He attempted to collect in places unreached by previous entomologists, doing much collecting at night, using ultraviolet light with a headlamp, and setting little bait traps or pitfall

Harry Whitten

traps in the ground.

Most spectacular of his finds was a new species of cricket, one of the largest crickets in the Islands. He also collected a large katydid and a very large earwig, believed to be a new species.

There was plenty of food for the insects, the result of bird droppings, dead birds and chicks and infertile eggs. The amount of guano resulted in lush vegetation, although the number of plant species are few.

He collected big-eyed hunting spiders, very large trapdoor spiders, two groups of beetles, interesting ticks, several families of flies, and a fungus gnat, among other finds. He found eight species of insects not collected since the Tanager expedition.

Some of the insects were exotic, not native to Nihoa, such as ants and cockroaches that apparently result from unknown activities in the past. Gagne said that some exotics flourish for a time and then become extinct, noting that Beardsley's list contained several species he could not find, although he found eight that had not been collected since the Tanager expedition.

CONANT'S SPECIAL interest is in two endangered and very rare landbirds, the Nihoa millerbird and Nihoa finch. She found some of the same millerbirds she had banded three years ago, thus getting information that will help determine the life span.

She also found indications the millerbirds mate for life and that they keep the same territory year after year after establishing it, while young birds move away to start their own nests. Her observations of the finches indicate the females do all the incubating, while the males fetch the food.

She saw one red cardinal, a male apparently blown there from one of the main Hawaiian islands.

Gagne said he will draw up recommendations for future monitoring of Nihoa by botanists, ornithologists and entomologists.

Thursday, May 26, 1983 Honolulu Star-Bulletin A-23

Meeting to Focus on Northwest Hawaiian Isles Issues

The Northwestern Hawaiian Islands — a 1,150-mile chain of uninhabited islands northwest of Kauai — are the focus of a three-day symposium continuing through tomorrow at the University of Hawaii-Manoa.

The symposium summarizes major research activities that have been conducted on the islands since 1977 — including studies on endangered wildlife such as the Hawaiian monk seal, green turtle and certain birds — as well as species that have potential commercial value.

The latter includes lobsters, precious coral and various kinds of fish.

Inherent in that discussion is the development versus preservation conflicts that will arise in trying to preserve certain species while pursuing the commercial potentials of the islands.

MOST OF THE islands are part of the Hawaiian Islands National Wildlife Refuge created by President Theodore Roosevelt in 1909, as well as part of the State Wildlife Refuge.

Management and jurisdiction over the chain is thus jointly shared by the U.S. Fish and Wildlife Service and the state Department of Land and Natural Resources (DLNR).

The symposium was set up to provide a forum for discussing the issues, rather than in resolving management planning and jurisdictional questions.

For example, there is a dispute over whether the wildlife refuge should include just the dry lands or also the lagoons, shoals, reefs and near-shore waters of the chain.

THE SYMPOSIUM concludes tomorrow with a morning panel discussion on the "optimum use scenarios" for the islands and an afternoon panel reacting to the visions for the future. The public will be allowed to contribute to the discussion during this portion of the program.

The event is sponsored by the UH Sea Grant College Program, the National Marine Fisheries Service, DLNR and the U.S. Fish and Wildlife Service.

All papers presented at the meeting, as well as the panel discussions, will be published by the Sea Grant program.

Potential Is There, Officials Say

Fishing Industry Gets a Pep Talk

By June Watanabe
Star-Bulletin Writer

The potential for developing the fishing industry in Hawaii and other Pacific islands is great, but it's mainly up to the industry to go after the untapped millions of dollars waiting to be plucked out of the Pacific Ocean.

So say William Gordon, head of the National Marine Fisheries Service, and former state Sen. Wadsworth Yee, chairman of the Western Pacific Regional Fishery Management Council.

The two men were among the participants in the council's 40th meeting, which ended today at the Ala Moana Americana Hotel. Also participating were representatives of the governments of Hawaii, Guam, American Samoa and the Northern Marianas, as well as the U.S. Coast Guard and the U.S. State Department.

The role of the federal government is to serve as a catalyst, focusing attention on problem areas and encouraging local governments to address the issues, Gordon said in an interview during a recess yesterday.

But the industry can't look to the federal government for major financial aid, he said.

"THE IDEOLOGY coming out of this (the Reagan) administration — and I suspect one which will continue regardless of what party is in control — is to balance the federal budget and to reduce the regulatory burden," Gordon said. "In terms of balancing the budget, the administration will be looking at (cutting) marginal programs."

Right now, the fishing industry in Hawaii, Guam, American Samoa and the Northern Marianas is relatively small and has a relatively minor potential for meeting the demands of the rest of the world, Gordon said.

But it can be important to the overall economics of the islands, in terms of providing food, reducing the need for imports, providing jobs, etc., he said.

The Pacific islands "can take more advantage of (the sea) than they have in the past, which means they have to change their way of running business and develop a much higher technology," Gordon said.

WHILE THE potential for growth "is there, there's got to be a certain amount of interdependence," Yee added. "It can't be the same as before. We have to replace independence with interdependence and I see much more of that spirit of interdependence these days."

Yee says the future of the industry is tied to joint ventures, in which domestic commercial fishermen join forces with foreign entrepreneurs. He says that kind of relationship already has proven successful, pointing to an American-Russian venture in which American fishermen sell their catch directly to a Russian processing ship at sea, Yee said. Another commercial fishing venture involves Alaskans and Koreans, he said.

In Hawaii alone, "total fisheries," including the harvesting of lobsters and precious corals, could amount to $200 million a year, Yee said. The industry now generates about $30 million to $40 million a year.

William Gordon
Fishing industry has to help itself

When it comes from the sea

mike markrich

At 30 feet below the surface, the sound of an aluminum spear scraping against coral registers through the murky blue water as a slight metallic ping. Scuba diver Randy Fernley uses his spear as a herdsman would, moving it from side to side to drive the brightly colored fish before him into the long, almost invisible net he has set on the reef.

His motions are smooth. He moves as the fish move, in a slow methodical semicircle. The sounds of the spear are at once beside the fish and behind them. The small group of fish do not show signs of panic until they are suddenly confronted with the fine nylon mesh. There is a moment of indecision, then all but one swim over the net. The bright yellow tang which does not is caught in Fernley's hand net and gently placed in his collection bucket.

Fernley repeats the process until he has driven all the fish he can into his net. Then he moves the net and sets it again. He works at one end of the reef while his diving partner Joe Strona, who is barely visible 50 yards away, works the other. They work alone because tropical fish collecting is piece work — each diver is paid for what he brings in. On a good day, diver-fish dealer Fernley, who runs a company called Coral Fish Hawaii, will catch 60 or 70 fish worth about $80. On a bad day, he will barely be able to pay for his gas.

Tropical fish collecting and dealing in Hawaii is a $1.5 million business that employs more than 70 divers and involves shipping tropical fish around the world. The demand for Hawaii fish is strong because they are considered healthier than fish caught in other places. In some other tropical places, chemicals are used to catch the fish. One Mainland dealer estimated that Hawaii fish make up nearly 15 percent of the $25 million Mainland salt water tropical market.

Unfortunately for the divers, the prices they get for their fish fall far short of their eventual aquarium price. A telephone survey of four pet stores in New York revealed that the yellow tang that Fernley caught off Waianae and for which he will get $1 may sell for as much as $24 at a pet store in Manhattan.

But for most of the divers who register with the state for a special permit to catch aquarium fish, collecting is not a way to get rich — it is just a way to make a little money while diving.

Tropical fish collection does not require much in the way of equipment besides scuba gear — just fine ¾-inch mesh nets and a willingness to spend hours in the water. The people

to tropical fish — we're No. 1

who do it full time use dive boats to work particular ocean reefs. They are prohibited by state law from using chemicals to drug the fish and must obtain a permit to use fine mesh nets.

They are, in fact, among the most restricted tropical fish collectors in the world. As one diver at Ala Wai Boat Harbor noted, "If we try act like Jacques Cousteau we go to jail."

The fish are only found in places where they can find food and shelter such as in holes or beside rock ledges, but divers keep the spots closely guarded trade secrets, as more collectors are taking to the reefs.

Waikiki Aquarium director Leighton Taylor said that studies of fish collection show it presents no danger to the survival of the species involved. He said living space for fish on the reef is limited and collecting may actually help the fish populations by making more reef space available.

But some divers such as Roger Nakasu remain unconvinced. Making more room for fish to live isn't an important factor, he said. "Hell, they didn't have any problem before we came." Nakasu disapproves of the collecting because he feels that it is very wasteful. The fish are not eaten and according to Nakasu, and live an average of only three months after being caught. Nakasu's view was supported by diver and ex-tropical fish dealer Keith Turner who said that he left the business after a Mainland dealer said "the tropical fish industry is based on the fact that the fish are going to die. Somebody buys an aquarium and two or three fish for $10 to $15 each, the fish die, they buy two more fish until they give up and sell their aquarium to somebody else and the process is repeated."

Diver Randy Fernley collects tropical fish.

Several local and Mainland fish dealers disagreed. They contended most of the fish in aquariums can live for years if proper care is taken. The tropical fish from Hawaii bring a lot of pleasure to people, they added, and with new technology their losses are continuously decreasing.

Fernley said that he and most of the others who've been collecting for a while are careful about the fish they catch not only because they are concerned about the ocean but also because it is good business.

"After all," he said, "Hawaii is truly known for the quality of its fish and if you take them all they don't grow back."

* * *

A panel of three will be reading the entries for the favorite ocean-related story that will run in this space May 22.

The Sunday Star-Bulletin & Advertiser Honolulu, May 1, 1983 A-7

Japanese reverence for carp rooted in survival of family

from the sea

mike markrich

The people who take their carp to special fish doctors in Niigata, Japan, for operations and cosmetic surgery are willing to pay for the best possible medical care for their prize koi. These multi-colored fish — the products of special breeding — are considered to be one of Japan's most important status symbols — so important that recently one prize koi sold for $130,000.

But the koi banners that Japanese families fly on Boy's Day, May 5, have a different purpose than showing a family's wealth.

In a tradition that goes back many centuries, koi banners are flown on a boy's first birthday to symbolize those qualities of courage, virility, strength, longevity and luck that each family wishes for its sons. The black koi at the top of the pole represents the father and the red ones beneath it represent each son. The banners fly against the wind to symbolize a carp's willingness to swim against the current and the strength needed to make one's way through life.

Traditional Japanese thought of the carp as having samurai-like courage because it was one of the few fish that could be cut with a knife while it was alive and not jump or move around. But, the koi was also known for its gentleness because of its ability to get along in a fish pond without fighting, for its swiftness and for the good luck it brought its owners.

There are no registration papers for koi but that people pay for bloodlines in the way that other animal owners pay for pedigrees.

A single koi will produce more than 10,000 eggs but sometimes they will not produce a single fish of championship caliber.

The champion fish are rated on the basis of their body shape, their color intensity and the clarity of their color patterns. But such qualities do not come easily.

Ushijima said that although he chooses the fish he wants to breed very carefully and places them in tanks, they do not always cooperate. "Sometimes they are so stubborn and the females say, 'I have a headache tonight,' males chase them and they don't do anything until a week later when I put them back in the pond and they dump eggs all over the place."

Breeders such as Ushijima are careful to match their fish so they get the proper patterns and colors. "Metallic" or bright shiny fish are never mixed with those that have different color combinations. Once the eggs hatch, the breeders go carefully through them examining them for color and shape. Breeder Bryan Sencio said "You have to develop a knack (for culling them) for it. Because when they are less than an inch long you have to know what you are culling and it's a constant battle for space and food."

Advertiser photo

Rev. Egen Yoshikami and Lani Tsuneishi feed the carp at the Byodo-In Temple in Kahaluu.

Rev. Egen Yoshikami of the Byodo In temple in Kahaluu said that the koi had important meaning in Japanese Culture because of the need to continue the family line. He explained that because of the difficulty of life in those days that families would do everything possible to make sure that their infant sons survived, including asking for spiritual help.

"For people of the samurai class the main thing was health. If you are from this class you must have a son. If you don't, you adopt. That is the tradition."

On Boy's Day people asked not only that their sons survive but that, like the koi, they lead a long and prosperous life.

Many koi have been known to live 60 years or more. Bruce Ushijima said that two years ago a koi died in Japan that was believed to be approximately 226 years old.

The long life of the koi and its ability to reproduce many times has permitted the most famous breeders to experiment with different fish combinations and establish bloodlines. Ushijima explained that there

H.T. Hayashi, the creator of the koi pond, at the Pagoda restaurant and a longtime carp breeder said that "out of 1,000 fish you might get one or two good ones." The baby koi are raised carefully and fed a special diet of trout food and algae. The breeders watch them carefully for any sign of disease and often treat them with the same medicines that are used for land animals. It is a lot of work.

Hawaii breeders sell and ship their fish to places as far away as Germany, but most of the breeders said that they did not raise fish for the money alone. They said that breeding koi was something they found both interesting and relaxing.

Although most breeders say that it is easy to get information about how to raise koi some of their techniques are closely guarded secrets.

But Hayashi who has raised many fish said that one of the most important things about breeding koi is not a secret at all.

"You have to have a knack, he said, "for loving fish."

* * *

(Next Saturday, the Hawaii Goldfish and Carp Association are having an exhibition at Ward Warehouse, the public is invited.)

* * *

The Advertiser's "From the Sea" column is still accepting sea stories from its readers. Entries must be postmarked by Friday, May 6, to be eligible. The best story or stories will be printed in this space. Entries are limited to 2½ pages of double-spaced typing or 650 words. Send them to "From the Sea" Column, P.O. Box 3110, Honolulu 96802.

A-34 Honolulu, May 1, 1983 The Sunday Star-Bulletin & Advertiser

Surplus salmon, tuna for needy

By Chris Chrystal
United Press International

WASHINGTON — The Agriculture Department announced yesterday it plans to buy millions of dollars worth of surplus Alaska canned salmon and West Coast tuna to feed the needy in charitable institutions across the country.

Eddie Kimbrell, an official in the Agriculture Department's food surplus program, said the $4.6 billion jobs bill provides $75 million to buy surplus food for distribution to areas of high unemployment.

"We will buy millions of dollars worth of salmon and tuna, depending on prices and quantities offered," Kimbrell said. "If it's too expensive, we won't buy as much." The program will help reduce an Alaska surplus of more than 28 million pounds of frozen salmon, Rep. Don Young, R-Alaska, said.

The salmon and tuna are expected to be available for consumption by mid-summer, Kimbrell said.

Only fish processed in the United States will be bought in keeping with the provisions of the Buy America Act.

The government will buy the fish from the lowest bidders, Kimbrell said. The states will distribute the product to charitable institutions with on-site feeding programs for the needy.

The fish will be prepared and served as part of a meal, not given away in cans to individuals. The states cannot charge for the fish, but can assess storage and distribution fees.

Kimbrell said bids will be sought on salmon that was packed last year, and salmon to be packed this season, beginning in June.

"We'll probably buy mostly pink salmon, which is cheaper than red salmon," he said.

Young said if some of his state's frozen salmon is not taken out of inventory, "we face severe problems during the fishing season. The world demand for salmon is not large and the world supply is tremendous. We need to stabilize the salmon industry to ensure the economic well-being of Alaska."

The old man in the sea —hook, line and sinker

from the sea

This is the second of two stories selected for publication from the entries sent to The Advertiser's From the Sea column. This is the tale of an incident that happened about 60 years ago on Kauai. The author, interested in protecting old feelings and friendships, changed the name of one character and used only the initials of the other. Therefore, "Mr. Sakata" is a pseudonym. Mike Markrich, the regular From the Sea columnist, will return next week

By Hirofumi Ota
Special to The Advertiser

Tonight was not much different from many previous nights except that he realized he was just a wee bit tired. And it's no wonder: Old J.E. was semi-retired now and well past 60 years. He has been doing this same thing for well over 30 years.

Walking slowly along the shore where the small waves lapped over the sand, he cast blind with his trusty net for small fishes. He usually came after midnight when everything was quiet and most folks were asleep.

Taking his last puff he buried his cigarette stub in the sand with his feet. To flip it into the ocean would be bad luck and he needed good luck soon or go home with an empty bag.

Halfway back toward the landing he stopped so suddenly he stumbled forward on his hands and knees, the net rolling off his shoulder. There was a white fishing line across his path running from the dry sand further up and leading straight into the sea. It wasn't there when he walked past here earlier. He knew it was also bad luck to step over a fishing line. Quietly, he followed the line toward a dimly lit storm lantern that was placed alongside a man sleeping upon a narrow straw mat. His fishing gear was placed neatly beside him in a small khaki bag. His right index finger was entwined with the white fishing line which lay straight upon the sand and disappeared into the ocean.

J.E. recognized him; it was Mr. Sakata, his friend, all right, who lived across the railroad tracks not very far from his home. He deposited his net and bag a few feet away, removed his shirt and followed the fishing line into the dark water. He waded waist deep into the water and slowly lifted up the baited hook and sinker with his bare toes. When he held these firmly in his right hand he slowly immersed himself in the water right up to his chin, exposing only his dark lean face and his head of long white hair.

present what had happened a few nights ago. (I happened to be in the store when J.E. related this story and that's how I came to be telling it to you.) J.E. suspected that Mr. Sakata's illness could be the result of that incident so he set forth immediately for his friend's home. Upon his arrival, he explained the whole incident to Mr. Sakata but he was still skeptical until J.E. produced the lantern, bag and the rest of the things he left behind in such a hurry. Being pretty good friends, they finally laughed over the incident and after a few beers together J.E. went home.

From an undeniable source we heard that Mr. Sakata's illness vanished miraculously soon thereafter. What do you think — puni puni?


GREG TAYLOR

Hawaii's Total Area

HAWAII STILL ranks No. 47 in size, but it's a little bit larger than indicated by previous statistics.

This is the word from the Geography Division of the U.S. Bureau of the Census, which has communicated its findings to Robert C. Schmitt, state statistician.

Remeasurements of the land and water area of the state, recently completed by the division, indicate that Hawaii's total area is 6,471 square miles, about 21 more than were estimated in 1967 and 421 more than were thought to exist in 1825. The new total includes 6,425 square miles of land and 46 of inland water.

The land area estimate is almost identical to the 1967 figure but the estimated water area has almost doubled. "Inland water" includes Pearl Harbor, much of Kaneohe Bay, Halalii and Halulu Lakes on Niihau, and fishponds along the shore of Molokai.

The new estimate of Hawaii's total area is 21 square miles larger.

At least a dozen separate efforts have been made to measure the area of the Hawaiian Islands during the past 160 years, as improvements in mapping have permitted progressively more accurate estimates, Schmitt said.

Oahu, for example, was initially thought to have only 520 square miles, but the area was put at 600 by 1878 and 618 in the most recent study, he said. Niihau was listed as having an area of 109 square miles in 1875 but the most recent study puts its area at 71.

"FOR THE 1980 census, the total area of every state and county total was remeasured," Robert W. Marx, chief of the Census Bureau's geography division, said in a letter to Schmitt.

"No new measurements were made to separate land and water areas; rather, the data were taken from secondary sources, generally the Soil Conservation Service or where available, state sources, as in New Jersey and Hawaii.

"The merging of these secondary sources with the newly derived total areas was accomplished by the process of estimating. As a result, the total area figures are the best we have ever produced: the land and water figures are of unknown reliability."

The new estimates for each island:

Big Island, 4,035.2 square miles; Maui, 734.5; Kahoolawe, 45.9; Lanai, 141.2; Molokai, 263.7; Oahu, 617.6; Kauai, 558.2; Niihau and Lehua, 71.1; Kaula, 0.4; Northwestern Hawaiian Islands, 2.91.

The above estimates are totals, land and inland water. Oahu is listed as having 24 square miles of inland water, Kauai 8.8, Maui 5.9, and Molokai 2.8, with lesser amounts for the other islands.

The three states smaller than Hawaii are Rhode Island, with 1,214 square miles; Delaware, with 2,057; and Connecticut, with 5,009. Alaska has 586,412 square miles and Texas has 267,338. These are the figures given in reference books; remeasurements may also change them slightly.

At first, he gave a slight jerk on the line and followed with several stronger ones to simulate those from a hooked papio, oio or a barracuda, while keeping up the tension. On the shore, sleepy Mr. Sakata responded instinctively by giving a hefty jerk with his right hand and then sat up. He clutched the line with his left hand and stood up — both hands were on the line now. Pulling in the line steadily he walked slowly towards the edge of the sand and peered into the dark water.

Meanwhile, old J.E. stretched out on his belly now, floated toward the shore holding onto the hook and sinker. What happened to Mr. Sakata next could have happened to many of us under the circumstances but the end result might have turned out to be different.

Listen, what Mr. Sakata saw was this "thing", about 6 feet long, black and with long white hair floating about the head coming toward him. Old J.E. suddenly stood right up and lunged towards Mr. Sakata. Mr. Sakata jumped back and yelled "Obake ja" (ghost) and dropped his line, turned toward the slope and disappeared in the darkness. J.E. called after him to stop him but he was laughing so hard his voice wouldn't come out. He wanted to say that it was just old J.E. playing a joke on him. J.E. gathered his fishing gear and also Mr. Sakata's lantern, line, gear and mat and trudged home thinking he would go and see Mr. Sakata later that morning. He promptly forget about the incident until several days later when he was at a grocery store he heard that Mr. Sakata was at home and in bed very, very ill. Then old J.E. suddenly recalled the incident that occurred a few days ago and began to think perhaps, maybe, I wonder, I hope not, etc.

Right there and then he told those

Sea Life Park offering classes on marine life

Sea Life Park is offering a variety of courses this summer to the public.

"Tidepool Discovery" will teach children to identify common forms of marine life. There will be informal lectures, field trips and sessions on seaweed pressing and fish printing.

There is a $35 fee and the class is open to children 10 to 12 years old. Sessions will be held from 9 a.m. to noon July 11-15 and 9 a.m. to noon Aug. 8-13.

For children 10 to 14 years old, "Marine Education Through Art" will include pencil drawings, watercolors, sculptures, origami and more. The fee is $40. The class will be held from 2 to 4 p.m. Mondays and Wednesdays, June 20-29.

The park also is offering a photography class for adults on "Marine Animal Photography."

Japan Owners of Boat to Pay U.S. $80,000

A-14 Honolulu Star-Bulletin Wednesday, April 13, 1983

The owner of a Japanese fishing boat seized last month inside the 200-mile U.S. fishery conservation zone has agreed to pay the government $80,000, an attorney for the owner said this morning.

The Shinei Maru No. 21 has been in custody since it was seized March 25 near Kure Island and the owner decided it would be better to settle with the U.S. government than to wage an expensive court battle.

Gerald Sumida, attorney for the boat owner, said that according to boat records, the vessel was not inside the fishing zone. The Coast Guard, however, claims the boat was 23 miles inside the boundary.

"Our position is that the navigation logs on the ship indicate that they were close to, but outside the fisheries conservation zone boundary line," Sumida said.

Because of the court costs and the amount of income that would be lost while the boat is impounded, the owner decided to pay the fine, Sumida said.

The amount is not the highest paid for such violations, but it is substantial.

The owner of a Taiwanese coral dredging ship stopped inside the boundary in 1981 paid a fine of $90,000. The owner of Japanese tuna boat seized in January paid only $25,000.

Owner of Japanese boat pays penalty

The owner of a Japanese fishing boat seized by the Coast Guard on March 25 has agreed to pay the U.S. government $80,000.

The boat, Shinei Maru No. 21, was taken into custody for allegedly fishing without a permit within the 200-mile U.S. fishery conservation zone.

The Coast Guard claimed that the boat was about 23 miles within the zone northwest of Kure Island.

The Shinei Maru No. 21 is a Japanese gill net fishing boat. It uses 10 nets, suspended from the ocean surface, each of which is 2 miles in length.

The Coast Guard claimed that the boat was retrieving its nets while in the 200-mile zone, and seized the boat for that reason. The Coast Guard then ordered the boat to proceed to Honolulu.

The settlement was reached yesterday, and the boat will be released from U.S. custody.

The U.S. Fishery Conservation and Management Act of 1976 established the 200-mile zone around the United States and its territories. Within this zone, foreign fishing vessels may fish only if they obtain permits issued by the U.S. government. The law does allow foreign fishing for tuna within the zone without a permit, since the United States considers that fish a "highly migratory species."

The Honolulu Advertiser Wednesday, April 13, 1983 A-5

G-4 Honolulu Star-Bulletin Wednesday, April 13, 1983

State's Smaller Ones Almost Empty

No Overcrowding on the

By Harry Whitten
Star-Bulletin Writer

One of the inhabited islands in the state has only four people and another has five, compared with the 761,925 (1980 census) on Oahu.

Robert C. Schmitt, state statistician, identified French Frigate Shoals as having four people, according to the 1980 census, and Laysan as having five. He said there are 137 islands with names in the state and that 15 of them are inhabited.

Eight of the islands are classified as major, but one of these — Kahoolawe — has no permanent inhabitants. The U.S. Bureau of the Census lists it as having one inhabitant in 1940 and none since. Members of the military forces, guests of Protect Kahoolawe Ohana, and fishermen occasionally visit the island but don't stay long enough to be counted in the census.

Schmitt, who is a geographer and historian as well as statistician, took a look at facts concerning several of the state's smaller islands. Of the named minor islands, 96 are offshore of the major islands and 33 are in the Northwestern Hawaiian Islands. Twenty-eight of the 33 are part of the State of Hawaii, but the five Midway islands are not.

Outer Hawaiian Islands

THERE IS AN ENORMOUS divergence in land area between major and minor islands. The state's land area of 6,427 square miles includes 6,419.4 square miles in the eight major islands. The 96 named minor islands offshore of the major islands encompass only 2.6 square miles, while the Northwestern Hawaiian Islands consist of 4.9 square miles, with Midway consisting of 2 square miles and the tiny islands that are part of the state having only 2.9 square miles.

Midway had 468 inhabitants counted in the 1980 census. Kure Atoll, with 22 inhabitants, was the only Northwestern Hawaiian island other than Laysan and French Frigate Shoals, with people. Other Northwestern Hawaiian islands, uninhabited, are Nihoa, Necker, Gardner Pinnacles, Maro Reef, Lisianski, and Pearl and Hermes Atoll.

Inhabited islands offshore from Oahu are Sand Island, with 60 people; Mokauea Island, in Keehi Lagoon, with 11 people; Ford Island, with 522; and Moku o Loe (Coconut Island) in Kaneohe Bay, with 16.

Populations of the major islands are Big Island, 92,053; Maui, 62,823; Lanai, 2,119; Molokai, 6,049; Oahu (including offshore islands) 762,534; Kauai, 38,856; and Niihau, 226.

Fishery Study Data to Be Aired

Richard W. Grigg
Conference chairman

By Harry Whitten
Star-Bulletin Writer

Major results of five years of research on resources of the Northwestern Hawaiian Islands will be discussed at a symposium May 25-27 in the Campus Center Ballroom, University of Hawaii-Manoa.

The research, which cost $5 million, involved four agencies and more than 100 people from federal, state and university units as well as commercial fishermen, according to Richard W. Grigg, conference chairman.

Grigg, of the university's Hawaii Institute of Marine Biology, also was the coordinator for the university's Sea Grant College Program in its work with the three agencies that started the research in 1977 as a result of the Tripartite Agreement. They are the National Marine Fisheries Service, U.S. Fish and Wildlife Service and state Department of Land and Natural Resources.

Research topics to be discussed at the symposium include sea and land birds, the Hawaiian monk seal, green sea turtle, reef fish, bottom fish, open ocean species, shrimp, spiny lobsters, fish poisoning, precious coral and management plans.

JOHN Byrne, administrator of the National Oceanic and Atmospheric Administration (NOAA), will be luncheon speaker May 25 and G. Ray Arnett, assistant secretary of the Interior, luncheon speaker May 26. Robert A. Jantzen, director of the U.S. Fish and Wildlife Service, will be among the 200 to 250 people expected to attend, Grigg said.

He outlined some of the implications of the research on management decisions. One concerns the potential impact of commercial fisheries on the Hawaiian monk seal, an endangered species, and on the green sea turtle, a threatened species, as well as on species of sea birds.

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Another serious potential impact could be the taking of bait fish from lagoons for aku (skipjack tuna) fishing, since many species of birds depend on the bait fish for food.

A POTENTIAL area of conflict concerns lobster fishing and monk seals. The seals feed on lobsters and seals, especially pups, could be entangled in lobster traps and drown. Harvesting of ulua (jacks) could be beneficial to both lobsters and seals, however, since the ulua feed on lobsters.

"We are trying to work out management plans that result in optimum use of the resources by man and also protect the resources," Grigg said. "Underlying the entire discussions will be the constant theme of protecting the wildlife."

Commercial fishermen helped by providing catch data, by leasing vessels to researchers, and advising researchers how to design the studies, he said.

A lobster management plan has been completed and is now federal law, he said, and management plans for bottom fish, snappers and groupers, billfish, and precious coral are in preparation.

Registration deadline is April 1. Persons interested in attending may write for further information to the University of Hawaii Sea Grant College Program, 1000 Pope Road, MSB 220, Honolulu, HI 96822.

Akule fisherman

from the sea

mike markrich

Walter Suenaga makes several passes in a small airplane over the calm waters off Ewa beach before he spots the large school of silver akule a quarter mile from shore.

He radios Shannon Hill, skipper of the Mary Ellen B, to turn his boat to the right, in position to lay the gill net at the edge of the school. The net must be layed far enough from the school that it does not scare the fish but close enough so that the fish can be worked into the net by the boat.

It is a process that takes time, patience, skill and luck. Hill knows that he must catch enough fish to at least pay his expenses. This is the third try of the morning.

At an age where other people spend their time surfing and searching for a direction in life, the 20-year-old Hill is responsible for the Mary Ellen B's three-man crew. He is the skipper in charge when their boss "Akule Joe" Bryant is not there.

The average age of the crew is 22, the youngest member of the crew, Sean Mercado, is 18. Hill must make all of the decisions.

He jokingly scolds the pilot for directing us toward an akule school too close to the rifle range, directs the crew in picking up the 1,000-pound net boat and supervises the laying of the net.

Gill netting is one of several methods of akule fishing. Akule is small silver jack that is considered by many to be the "hamburger" of Honolulu fish because it is a relatively inexpensive fish that is eaten by almost all Hawaii's different ethnic groups.

People in the fishing business like to catch it because it is a relatively abundent fish which, due to strong demand, holds its price well (approximately $1 a pound). There is only limited information available about akule but University of Hawaii zoology professor James Parrish described it as a "short-lived species with lots of reproduction."

Bryant is one of the best known of Oahu's akule fishers. Although he and his crew catch other kinds of fish such as ulua and opo, he earned his nickname "Akule Joe" from his ability to make consistently large catches of the fish.

He is also known for his willingness to hire young people and give them jobs in the fishing business.

Hill has been fishing with Bryant since he was 17 and is grateful to Bryant for giving him the opportunity to learn from him. He said he has experienced many things since he started, including once being swamped with a a full load of fish in a heavy sea. The experience has taught him "when you're in the ocean you have to be serious. You can't mess around because it's so easy for someone to get hurt out here."

Hill's attitude is shared by the other members of the crew. The gear on board is carefully stowed and then restowed after using. Everyone works quietly at his assigned job. The 1,000-pound net boat is lifted out of the Boston whaler so that Hill can row the net into position. Mercado then takes the helm and follows Hill while Garwin

Yamaguchi-style akule sashimi

2 cups uncooked rice
2 cups water
1 tablespoon finely chopped ginger
6 small akule
¼ cup rice vinegar mixed with:
1tablespoon sugar
½ teaspoon salt

Cook the rice in the water. Set aside. Clean and scale the akule, starting at the tail, filet it and clean and split the head in half. Remove the fine bones; pull off the transparent skin from flesh and sprinkle with salt. Let stand 10 to 20 minutes. Soak in vinegar mix for a half hour. Then press the rice together to form a one-inch thick layer; sprinkle finely chopped ginger over it; place the fileted akule on top, cut into pieces and serve.

a skipper at age 20

Got a sea story to share? Tiser would like to hear it

Each Sunday, the Honolulu Advertiser's From the Sea column provides stories about the ocean. We'd like to hear from you, and the best story or stories will be published in this space.

Any facet of the ocean and how it affects your life — fishing, fish, religion, art, food, science — can be covered in the story.

If you've got a sea tale, write it down and send it to us. Keep it short — 650 words or about 2½ pages of double-spaced typing. If yours is selected, we reserve the right to edit and trim it for space.

Entries must be postmarked no later than May 1, 1983.

A panel of writers and community ocean specialists will judge the stories.

Souza and Joe Leong carefully lay the blue tarp on deck.

The net is layed and then brought in with only a few fish. The net is carefully cleaned and then layed once more at a different point.

Hill tells me that the amount crew members get paid depends both on how much they catch and the size of the crew. He said some days they can catch large amounts of fish and make good money but on other days they can work 10 hours and make $20. But Souza said pay is not the main consideration. "It's the lifestyle; it's not the money."

Souza said that he and the others find the work interesting and exciting and are happy to have their jobs.

Hill started the engine again and, using directions from the pilot, began to move the boat back and forth within the 2,000 feet of net area. The key to gill netting is to "break the pile," or force the fish in the school to panic and swim into the two-inch mesh. He drives the boat back around to the marker buoy and begins to haul in the net. The crew is silent as the first 20 feet come aboard with only a scattering of fish. Then more fish appear and Mercado begins to shout, "Uta! We got some fish." (Uta, pronounced ootah, means "right on" or very good.)

The others are soon pulling in the net and saying the same thing. Souza ices down the fish and Hill signals the pilot they have enough. It is time to go back.

As we return, I notice the surf is breaking beautifully. I am reminded of something Hill said earlier when I asked him if he ever had the urge to go surfing instead of working. "Yes," he told me, "sometimes we see the surf and we go nuts, but we have a job to do."

Reagan Claims 200-Mile

By Lawrence L. Knutson

WASHINGTON (AP) — President Reagan, underscoring U.S. opposition to the Law of the Sea Treaty, is laying claim to mineral and fishing rights inside a 200-mile zone bordering both U.S. coasts.

The administration's 200-mile claim also extends to waters around U.S.-controlled islands in the Pacific and Caribbean.

Reagan yesterday signed a proclamation creating an Exclusive Economic Zone, giving the United States the sole right to conduct mining and fishing operations in about four million square nautical miles of sea. A nautical mile is 6,076 feet, while a regular mile is 5,280 feet.

U.S. control would extend to production of energy from currents and winds.

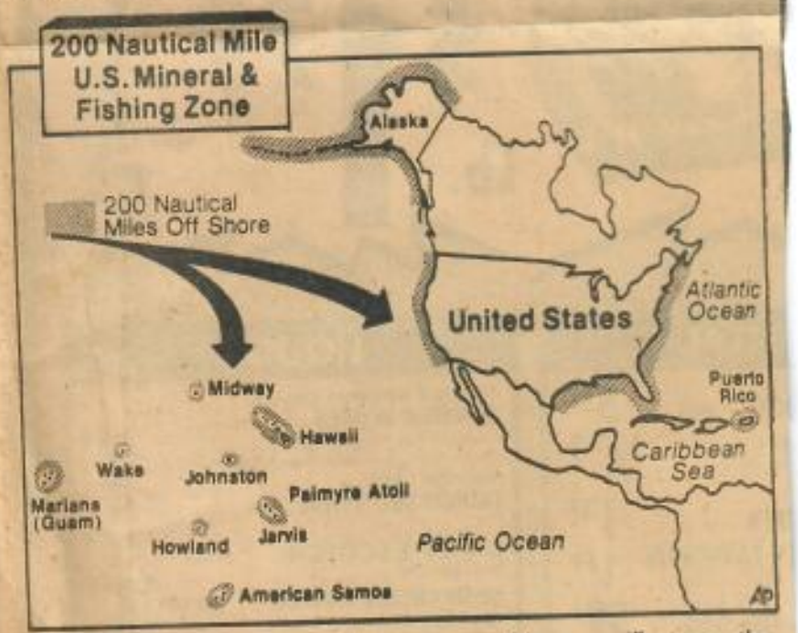
U.S. officials said the creation of the zone would not affect the passage of ships or planes, the laying of cables or pipelines, or change existing policies on marine mammals, fisheries or the continental shelf.

THE PROCLAMATION took effect immediately and Sen. Ted Stevens, R-Alaska, and Rep. John Breaux, D-La., introduced legislation in both houses of Congress to implement it.

The treaty, which the United States refused to sign last year, would set internationally recognized standards for navigation, marine research, fisheries, as well as for mining operations on the deep seabed.

U.S. officials said last July they did not believe the treaty would protect American interests, especially in the area of mineral rights.

The official said yesterday that the administration's objections to the treaty focused on how deep



CLAIM STAKED—The dark areas on this map illustrate the 200-mile coastal and shore areas claimed by President Reagan yesterday as an exclusive U.S. economic zone. —AP Photo.

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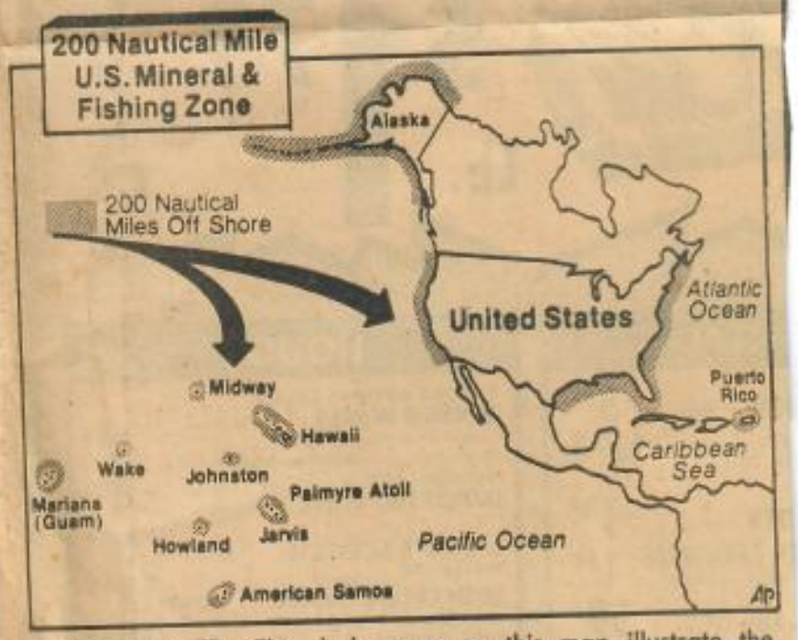


CLAIM STAKED—The dark areas on this map illustrate the 200-mile coastal and shore areas claimed by President Reagan yesterday as an exclusive U.S. economic zone. —AP Photo.

Friday, March 11, 1983 Honolulu Star-Bulletin A-5

Offshore Economic Zone

seabed mining in international waters would be conducted, an issue not addressed in the economic zone proclamation.

THE U.S. POSITION is that all nations have a right to conduct mining operations in international waters outside of the new U.S. economic zone.

Some experts in the field say the Reagan administration is attempting to show by its action that a nation can control seabed and other resources outside of the treaty.

Some treaty signers have indicated they believe the terms of the declaration creating the economic zone are inconsistent with the treaty.

Lee Kimball, executive director of Citizens for Ocean Law, which maintains that the treaty can be changed to meet U.S. objections, said earlier this week that any inconsistency between the proclamation and provisions of the treaty could provoke other nations to make claims harmful to U.S. interests.

The U.S. official said there has been a "some what variable response from other countries although overall it is quite moderate."

He said countries that opposed the U.S. decision not to sign the treaty have expressed the most concern.

Signers include some 120 nations including such major U.S. allies as Canada and Japan.

Caverns and blind fish in Moiliili underground

from the sea

mike markrich

The corner of University Avenue and King Street may not seem like the kind of place where someone could catch a lot of fish. But when the floor of the Moiliili Department Store dropped into a huge undergound cavern in 1952, people came from all over the island to see and catch the blind mullet and black carp that live below the ground.

Bob Nagato of the Board of Water Supply recalls going out for a drink with friends at Kuhio Grill on King Street and, as a lark, dropping a line from the fishing pole he kept in the back of his car into the hole in the street. Much to his amazement, he caught a fair-sized mullet, which he gave to the restaurant to cook for him.

Nagato's experience was not unique. Although none of the fish that live in the limestone caverns that are said to stretch from Manoa Valley to Diamond Head has ever been scientifically collected and documented, many people have seen or heard of them.

The ancient Hawaiians had a legend about a shark that swam through underwater caves into Manoa Valley to listen in on the plans of fishermen and then swam back and waited for them.

The Ena family kept a boat in the cave beneath University and King during the the 1890s and used it to go net-fishing for mullet. In a 1935 Star Bulletin article, Tom Ena was quoted as saying he learned to "row and swim in that pool" and that "so many fishermen used to hop into it at night that father was forced to build a door at the cave's entrance and keep it locked securely."

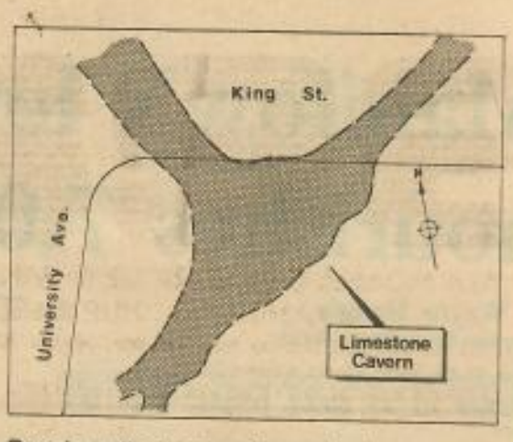
uncommon for fish that lived in similar limestone caves in Florida to survive by feeding off the nutrients from plants and trees.

Okada said that numerous sewer lines have broken over the years and that this also provided a source of nutrients.

The caves are of limestone hollowed out over the years by the rain water flowing down from Manoa. The limestone is evolved from the original coral reef that was covered with lava when Oahu was created. The fresh water seeping down through the rock gradually erodes the the top and sides of the rock until a cavern is created. Sometimes the roof of the cavern gets so thin that it gives way. (Some people have cautioned that a similar collapse may one day take place below King Street.)

Bishop Museum cave biologist Frank Howarth said such caverns sometimes provide safe habitats for fish. The fish do not need eyesight under ground to escape predators and as a result are able to live and reproduce. Howarth said blind fish have other senses that become developed. Fish collector Glenn Takeshita observed that all of the blind or nearly blind mosquito fish that he caught from the King Street site were able to instinctively avoid any obstacles that he put in his tank.

Photo courtesy of Austin Tsutsumi & Associates Inc.



People gather around to get a look at the cavern, left, and its waters after the Moiliili Department Store's collapse in 1952. Map, above, shows the limestone cavern that sits below University Pharmacy and part of King Street.

He said that the fish in the cave were "fine sea mullet, although the water was icy cold and fresh. And as they took no notice of our lights, we surmised that they were blind."

Sonny Okada remembers seeing such mullet when his company was laying pipes below King Street. He said he knew the mullet were blind because "the eyes are completely white."

Leroy Rathburn, assistant manager of the Board of Water Supply, has seen many such mullet and says that they have a distinctive look. "They look like hell, they swim funny and instead of being nice round mullet, they have big heads and skinny bodies."

Rathburn said he thought the fish had such a strange appearance because of the lack of food to eat below ground. He said it amazed him that the fish could survive at all because the water in which they lived seemed so clear it was almost "sterile."

But the writer who went on the 1935 trip into the caves reported that it was possible to see not only tree roots growing through the ground but also the bottom of posts. It is also interesting to note in photographs after the collapse of the department store that the caverns were less than three feet below the surface.

James Parrish of the University of Hawaii zoology department said it was not

There are said to be other kinds of marine life living below ground as well, such as blind shrimp, catfish and black carp.

One elderly Japanese resident of Moiliili recalled that one of his neighbors caught several black carp from the underground pit. Rathburn described the carp as looking like "big goldfish" and said Hawaiians used to refer to them as "hauna" or smelly. He said when he was a boy, people would draw one teaspoon of blood from behind these carps' necks as a magic cure for heart trouble. There are also reports that Japanese people valued the blood as a medicine for women weakened by childbirth.

In 1979, Howarth was the last person known to go down into the cave when a law school building collapsed into the cave. He saw two fish but was unable to catch them.

City engineers know the Moiliili cave system both as a water reserve for the city of Honolulu and as an important part of the city's drainage system.

Others know of the fish and the old stories about the Kapaakea spring, which is today under the Willows Restaurant and was a natural outlet for the cavern.

Fish-wildlife official against eel bill

By Sandra S. Oshiro
Advertiser Government Bureau

There are "substantial, undesirable and avoidable risks" in importing eels into the state, according to the U.S. Fish and Wildlife Service.

Dale Coggeshall, the service's Pacific islands administrator, told lawmakers in a letter that his agency is concerned about bills pending in the Legislature that would allow freshwater eels to be brought here for experiments. He said importing eels would involve specific risks, including:

- Introducing diseases that could threaten aquatic species.
- Interrupting aquaculture programs or damaging native aquatic ecosystems if the eels escape and prey on other species.
- Endangering water birds in wetland habitats if the eels escape.

The latest effort to legalize the importation of eels is being led by Rep. Richard Matsuura, chairman of the House Ocean and Marine Resources Committee. He and others want to bring in two species — the Anguilla rostrata and the Anguilla anguilla — for experimentation.

But, said Coggershall in his letter dated Feb. 9, "Our research and discussions with knowledgeable scientists and resource managers lead us to believe that the importation of either species will not enhance the well-being of Hawaii's aquaculture industry.

"My staff and I concluded that the importation of Anguilla rostrata or Anguilla anguilla for experimental or any other purpose carries substantial, undesirable and avoidable risks."

Last year, the House passed a bill to allow experimental eels into the state, but the Senate killed the measure.

The Hawaii Sierra Club and other opponents appeared at one House hearing this session and warned of possible environmental risks if the eels are imported.

But it was the Fish and Wildlife Service letter that convinced at least one representative, Rep. Virginia Isbell, that the bill should be shelved.

Matsuura said he had not read Coggershall's letter and an accompanying report on the subject but added that the objections are familiar to him.

"I'm not trying to bring in the unagi (eel) to release it in the wild," he said. "The bill only brings in the eels for experimental purposes, to see if we can grow them here."

Matsuura said he is not saying that there are no risks but that any potential dangers are minimal. He said that each time the state imported non-indigenous species — including marine shrimp and Malaysian prawns — there were risks.

The question is how the potential risks stack up against potential benefits, he said.

He said that if the U.S. agency's report had been written by people who have worked with eels, he might believe its conclusions.

"What I'm trying to do is base (the debate) on facts," he said. "It would be helpful if we stick with the facts — and then make decisions based on those facts."

Matsuura said he expects his committee to meet at least one more time to gather information about the eels and to possibly examine specimens.

One way to catch a'ama

"You just tickle their eyes," says fisherman Charles Dudoit of Waianae, describing a traditional method of catching a'ama crabs.

These small, black, hard-shell crabs have movable tentacle-like eyes that stick out from their shell to warn them of the approach of danger. Because they are fast and move quickly among the big rocks along the shore, people have had to think up special ways to catch them.

Dudoit's method is to take a long pole with a loop of fine line at the end and lower it so the line sits just behind a crab's eye. Responding to the irritation, the crab drops its eyes to its sides and the line gets pinched between one of the eyes and the shell. The pole is picked up and the crab is caught.

A'ama are among the most common and popular of Hawaii's 150 species of crab. They are caught by people of all ages throughout the state. Children sometimes catch them by making a hangman's noose out of the spine of a palm leaf and lowering it over a crab in an effort to catch it both by the claw and the eye.

Masaru Oshiro, caretaker of the Pokai Bay Park, catches them by putting a piece of bait at end of a fishing pole and waiting for the crab to grab hold. He then taps the pole with his forefinger, flips the crab over on its side, grabs it and puts it in a bucket.

Another method is to take a sardine and put it at the bottom of a can with slick sides so that the crab can get in but cannot escape. Oshiro says that the best place to put a bucket like this is on the rocks where the crabs live.

But long-time crab catcher Bob Flores thinks such methods are too slow. "You have to outsmart them because they are so fast," he says.

Flores goes out on the rocks at night with a head lamp and catches them by hand. The bright light stuns the crabs momentarily, giving Flores a chance to grab them.

He said it's important to understand the cycles in a crab's life and that the best time to catch them is sometime after midnight because that is when crabs feed. He said that they get "lazy" after they eat and slow down, making them easier to catch.

Flores explained that when he grabs one he squeezes the underside of the crab slightly to "paralyze it" because if "you just put them in a bucket, they start crawling all over the place."

from the sea

mike markrich

Flores said that using this method he could catch 187 pounds of crab in one night (approximately 10 to 12 crabs to a pound). Once during a strike he supported his family of 12 children for four months just by catching and selling crabs.

The a'ama crab was highly valued by ancient Hawaiians and was said to have been gathered and eaten extensively when seas were rough and it was difficult to go fishing. It was a sacred food for certain priests and was sometimes offered in sacrifices to encourage the gods to grant a request.

Biologists know the a'ama as *Grapsus grapsus tenuicrustatus*, one of 24 species of grapsus crabs that live along the rocky shores of all the Hawaiian Islands. They have special gill structures that permit

crab: tickle their eyes

them to live in and out of the water and are said to communicate among each other with sound. Although each female will release thousands of larvae or baby crabs in the water, relatively few survive to grow into full-sized crabs.

No one has done a study on the size of the a'ama crab population and they are rarely seen for sale in local markets. They are usually caught in large numbers only by people preparing for special luaus or weddings, but some people who fish think that the increased fishing pressure over the past several years has caused their numbers to decrease.

Waianae fisherman Joe Kuon thinks the crabs have become scarcer partly because of changes in the attitudes of people who fish. "There are more people here than there used to be and they just take everything, even the small ones. They only think about today; they don't think about tomorrow."

But for some, crab catching is an important survival skill and Oshiro hopes that the state soon repairs the damage to the sea wall at Pokai Bay Park so that he and his friends can go crabbing on the rocks again.

"When things are rough and jobs are tough, I go out and crab," Flores said.

Pursuing the 'Big One'—

By Helen Altonn
Star-Bulletin Writer

The long discussed possibility of a significant Hawaii fishing industry is not just another fishing yarn about the "big one" that got away, according to state officials.

They say significant strides are being made in fisheries development, with expansion in the Hawaiian fleet, a growing appetite for fish among Island consumers and tourists and a jump in the value of raw fishery products from $3.5 million in 1970 to nearly $10 million in 1980.

The state is still pursuing the elusive "big one" — the development of a highly lucrative albacore tuna fishery in the Midway area — but officials believe it's in sight.

"There was a downward trend as far as commercial fishing activities in Hawaii," said Susumu Ono, chairman of the state Board of Land and Natural Resources. "But in recent years, the trend has leveled off and has started to go back up."

Ono is in the thick of numerous state, federal and county activities to bolster the fishing industry, not only as the state land board chairman, but as chairman of the Hawaii Fisheries Coordinating Council and the Pacific Tuna Development Foundation.

And he says the state administration's optimism about commercial fisheries moving into a key economic role here is "justifiable."

THIS WOULD COME AS good news to state senators, who expressed concern about the possible closing of Hawaiian Tuna Packers during a recent Senate Economic Development Committee hearing on fisheries legislation.

"Everything we're talking about here (to build up the industry) hinges on that cannery," said Sen. Richard Henderson, Big Island Republican.

"I'm afraid the Del Monte thing is going to happen — boom, all of a sudden," he said, referring to Del Monte Corp.'s announcement in November that it was closing its pineapple operations and cannery in Hawaii.

Henderson said "some meaningful discussions" should be held with Castle & Cooke Inc., the parent company of Tuna Packers.

Hideto Kono, director of the state Department of Planning and Economic Development, said he met with Castle & Cooke executives at the governor's request last year and told them:

"Hawaii has the best chance of getting the albacore — the white meat that has the best price. Castle & Cooke has a good advantage if they keep this cannery, and the state . . . is making it possible to bring that albacore catch to Hawaii."

Instead of closing Tuna Packers, Castle & Cooke shut down its San Diego cannery last June and reduced production in Puerto Rico by 50percent, Kono said.

KEWALO CANNERY—State officials are working with Castle & Cooke's Hawaiian Tuna Packers, canners of Bumble Bee brand tuna, to maintain its cannery as the linchpin to Hawaii's growing tuna industry. —Star-Bulletin Photo by Dean Sensui.

"WE'RE NOT WORKING out any kind of deal but looking at opportunities and possible cooperation."

Kono said he also fears a "Del Monte situation" with the cannery, which has 385 employees and absorbs much of the local catch. However, he said, "The assumption that withdrawal of Castle & Cooke would be the automatic demise of the cannery is not correct."

He said he has met with people who might possi-

- Midway Tuna

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bly purchase the cannery as "an ongoing manufacturing facility" if it were to close and he is also looking at other options.

"If they withdraw, we want them to sell it to a company that will maintain the cannery as it is or improve upon it," Kono said. "We would expect them to let us know in sufficient time."

Castle & Cooke spokesman Emil A. Schneider said he believes chances of continuing Tuna Packers "are a lot better than before," since the choice was made to close the San Diego cannery. "On the other hand, no one can predict economic conditions of the future."

He said the San Diego cannery was closed rather than the local operation because a bigger cutback in production could be accomplished. "But we definitely wanted to continue to have a facility to handle fish caught in the Pacific."

ALL TUNA CANNERIES have been in trouble because of a glut in the "light" variety of tuna, which includes yellowfin (ahi) and skipjack (aku). But there is never enough of the white-meat alba-

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State Officials Hope to Reel In 'Big One'

Continued from Page C-1

core, which is "really the Cadillac of the industry," Schneider said.

Castle & Cooke "has had a leadership role with the Bumble Bee brand of albacore for many, many years in the U.S. market," he said.

The cannery has a production capacity of 75 tons a day on a one-shift basis, Schneider said, and it could put on a second shift "if it had the right kind of fish — which is albacore in our minds."

With the potential Midway development, he said the company is exploring the possibility of acquiring more state land at Kewalo Basin to expand its freezer capacity.

He cautions, however, that "it's not just a matter of delivering sufficient quantitites of albacore here. It's a matter of the price being right." And the price is set under an agreement between all fishermen and packers with the Western Fishing Boat Owners Association, he explained.

He said Castle & Cooke "has a far better chance on an average of marketing albacore at a profit than light-meat tuna, but depending what the price gets to, we, as well as others, might say we can't hack it. . . ."

ONO SAID THE DLNR, DPED and state Transportation Department are working together to help Tuna Packers and solve other fisheries problems, including adequate harbor facilities for fishing vessels.

Transportation Director Ryokichi Higashionna said his department has been negotiating with Castle & Cooke for two years to reestablish its lease rent for the state-owned Kewalo site.

"We are still negotiating it, trying to satisfy their needs. At the same time, we can't be a giveaway program," he said. "We have to recover enough money for operational costs and maintenance."

Plans call for Kewalo to be the commercial fisheries base with some improvements in Honolulu Harbor to accommodate the growing local fleet and transient albacore trollers from the West Coast.

But the major spur to the industry would be the Midway base, with a barge or mother ship to haul the albacore back to Hawaii. This would save the vessels travel time and the high costs of fuel involved in making return trips here to deliver fish.

Ono said the Navy has been "very cooperative" about the use of Midway and his department is just about ready to select a consultant for a feasibility study of needed facilities.

THE STATE LAUNCHED the Midway project in 1979 with Tuna Packers sending 20 trollers and a mother ship to the fishing grounds, but the company pulled out the following year, saying it wasn't economical.

Even without a mother ship, state Aquatic Resources chief Henry Sakuda said 70 trollers went to Midway last year, including 10 from Hawaii, and 13 boats from the West Coast have remained here to continue trolling and shrimping.

He said the Hawaiian fleet has nearly doubled since 1970, from 80 large commercial vessels to about 140. Fish markets also are reporting more local demand for fish and they are exporting more locally caught fish than before, Sakuda said.

Sakuda said he thinks the value of the commercial fishing industry is underestimated because of the difficulty of obtaining complete catch records. He said the figures kept by his office "don't match the number of guys driving around in new trucks and buying new boats."

The surge of interest in the fishing business is reflected in the number of state loans approved for fishing vessels in the past eight years — 37 for large vessels and 52 for small boats, Sakuda noted.

Legislation is pending this session to beef up the loan funds to handle a waiting list of applicants.

About 40 to 50 albacore trollers also passed through Hawaii last year to Midway and stayed about a week, with no repetition of problems that occurred several years ago when the boats complained about their treatment by the harbors division, Sakuda said.

HE SAID JAMES McCormick, DOT deputy director for ports, "did a terrific job" in providing berthing facilities. New harbors also were developed in Waianae and Haleiwa for the "mosquito fleet," hauling in fish from offshore buoys designed to attract fish. The fish-aggregating buoy project is one of the state's most successful efforts to develop the fisheries, with the devices scattered throughout Hawaiian waters.

Local vessels also are venturing to untapped fishing grounds in the Northwestern Hawaiian Islands and are beginning to develop a market for frozen lobster and other species, Sakuda said.

Despite all the headway, fishermen are still plagued with a shortage of nehu, the favored tuna bait, and years of research have failed to find a substitute that's just as appealing.

NHI FILE

Lots of Open Space

Your Aug. 23 article describing "statistical aggression" on the part of the federal government may have left some readers with the erroneous impression that the Fish and Wildlife Service has somehow taken over a vast segment of ocean in our Northwestern Hawaiian Islands during the last year or two.

This is simply not the case. The federal government's claim to certain lagoon waters in the Northwestern chain dates back to 1909 when President Theodore Roosevelt first established a sanctuary for native seabirds.

The ocean waters claimed as part of what has now come to be known as the Hawaiian Islands National Wildlife Refuge basically only involve three sites—French Frigate Shoals, Maro Reef, and Pearl and Hermes Reef.

When quoted out of context, 258,000 acres sounds like a substantial area. However, in proper perspective, they only constitute about 8 percent of the marine habitat within the 100-fathom curve contained in the 1,100 miles of our Northwestern chain. The Hawaiian Islands National Wildlife Refuge can therefore be accurately viewed as mere specks spread over a huge ocean area.

The vast majority of this ocean area is readily available for the expansion of Hawaii's fishery industry, should such ventures prove to be economically feasible.

Barbara J. Johnsen
Corresponding Secretary
Hawaii Audubon Society

Saturday, September 26, 1981 Honolulu Star-Bulletin A-9

FORUM

the Readers' Page

Los Angeles Times

FISH: Thailand Discovers Dark

Continued from First Page

of the herbicides atrazine and paraquat. The latter is probably best known to Americans as the chemical that caused a scare among marijuana users a few years ago when it was sprayed on Latin American fields.

Public health authorities said they suspect that the herbicides lowered the fish's resistance to the deadly bacteria, as well as reduced the oxygen content of the water.

The epidemic, which threatens to be the worst man-caused ecological disaster ever to strike this tropical kingdom, underscores a growing realization in developing nations that there is a dark side to the chemicals that farmers have come to rely on to produce seemingly magical increases in crop yields.

The industrialized West long ago began learning the dangers, as well as the advantages, of herbicides, pesticides and fertilizers. Many Third World farmers, however, have continued to lavish on their fields—often carelessly and needlessly—a wide variety of chemicals designed to kill weeds and bugs and stimulate plant growth.

"Many chemicals banned in your country are sold cheaply here," said Nuansri Tayaputch, a toxic substances expert with the Thai Agriculture Department. "In some areas, people use chemicals which are formulated by local distributors and don't even have labels. They just mix two or three together like a cocktail. They just know one is to kill insects and another is to kill weeds, but they don't know which insects or weeds or how much the dosage should be."

Not only do farmlands get drenched with poisons, often so do farmers and their families. Nuansri said little effort is made to shield ponds, canals, livestock and even children from the potentially harmful substances when they are being applied to crops.

Thailand has few restrictions on the use of toxic chemicals.

The Thai studies found that half of all marine life tested contained some DDT. Although the levels of DDT might be within the safety standards of some countries, Dr. Prayoon Deema, head of the Agriculture Department's toxic substances division, warned, "For Thai people, who eat these aquatic animals as a principal food, it is quite dangerous to their health."

In the Philippines and Indonesia—nations that have recently become self-sufficient in rice, thanks to new, high-yield strains requiring heavy chemical treatment—a common sight is a farm worker shrouded in an insecticide mist created by a hand-held fogger. Because of the heat and humidity of the tropics, operators of these sprayers often shun uncomfortable protective gear.

In Thailand, there is considerable evidence that chemicals are getting into the food chain. Prayoon told a seminar last year that a department study had found numerous samples of rice, beans, fruit, vegetables, milk, eggs and meat laced with pesticide residues, frequently at levels well above safety standards set by the World Health Organization. Chemicals detected in the studies included a witch's brew of substances including heptachlor, dieldrin, aldrin, lindane, DDT and endrin, most of which have either been banned or severely restricted in many industrialized nations.

As an illustration of this country's heavy reliance on chemicals for agriculture, Thailand's pesticide imports more than tripled in the 1970s, according to Agriculture Department figures. By 1980, the nation was spending more than $53 million a year on pesticides, mostly from companies in the United States, Europe, Japan and Australia. Frequently these were products that the companies could no longer sell at home.

Like most developing countries,

Side of Herbicide, Pesticide Use

Thailand has few restrictions on the use of toxic chemicals. According to a study printed in the English-language Bangkok Post, one of the rare controls imposed in recent years was ordered only because excessive levels of the chemical endrin were found in beans exported to the United States.

Although ignoring government regulations is almost a national pastime here, the fish scare has prompted a chorus of calls for tight controls on the sale and importation of toxic chemicals.

"We have no such thing as safety limits in Thailand," a consumer activist, Chotchuang Chutination, said. "Consumers have no way of knowing how much residue of these insecticides they are exposed to when they eat."

For the time being, at least, Thais are not risking exposure to chemicals in fish, because most of them have stopped eating fish. Vendors have trouble selling fish even at giveaway prices.

More than 20 fish sellers are normally found in stalls at the main market in Suphanburi, a bustling provincial capital in the fertile central plains region about 100 miles northwest of Bangkok. On a recent day, however, only four vendors were offering fish, and it was not moving well.

Wanee Tootong, 51, said she often used to be able to sell 90 pounds of pla chon a day. Now, she is lucky if she can sell two fish.

"I have six children," she said with a sigh. "I am going to die if this continues."

Another exasperated vendor, Mee Lim, 53, had been reduced to a sales pitch that was less than tantalizing.

"These are good fish from the field," he cried. "There's nothing wrong with them."

Meanwhile, business was booming at the meat and poultry stalls.

'Only a few fish are left,' the official said, 'and they will die soon.'

The price of pork was up by about the equivalent of 9 cents a pound in a week; chicken prices rose from 49 cents a pound to 59 cents.

Suphanburi is a center for the nation's fish-breeding industry, which is now in economic chaos. Officials have identified at least 15 species of fresh-water fish that have been affected by the epidemic, but pla chon, the most popular of the varieties, appears to be worst hit.

The extent of the damage is still being assessed, but Pirom Boonyoprakorn, the chief fisheries official for the province, estimated the loss in his district alone at more than $21 million.

"Almost all the fish have died," Pirom said. "Only a few are left, and they will die soon."

Fish breeder Wichai lamented, "I'm finished."

That may be a premature assessment, however, because the other day Wichai was draining his ponds and preparing to store the millions of fish—good and bad—in salt that would preserve them until prices for salted pla chon come back up. Other breeders reportedly acknowledge placing their fish in cold storage or selling them to factories that will grind them into meal for animal feed or turn them into fish sauce, a popular condiment.

To deter such practices, the government has offered to buy diseased fish for about 8 cents a pound, but that is only one-tenth the normal price. About $2 million has been set aside to help raisers restock their ponds.

Nuansri Tayaputch, the toxic substances specialist, said small-scale die-offs have occurred frequently throughout the country in the last three years. However, she said, this is the first time the deaths have moved out of isolated ponds and into irrigation canals and rivers that receive runoff from the ponds and fields sprayed with toxic substances.

Millions of Fish Dying

Thais Discover Dark Side of Chemicals to Aid Crops

By BOB SECTER, *Times Staff Writer*

SUPHANBURI, Thailand—Wichai Duangchan first noticed something terribly wrong with the fish in mid-December.

The mud fish called *pla chon* that Wichai raises in large ponds on his farm here started bobbing to the surface as if gasping for air. Many had ugly red blotches and gaping holes in their flesh.

It was the same in other nearby ponds and waterways. The pla chon and other breeds of fresh-water fish began dying by the hundreds, then the thousands, then the millions.

By mid-January, when word of the mass die-off was splashed across the nation by the Bangkok news media, the disease had spread to about one-third of Thailand's 71 provinces. Now, more than half the provinces are affected. Sales of fish—even fish unaffected by the problem—plummeted as many Thais began to avoid this staple of their diet.

Technically, investigators blame the problem on a bacteria called aeromonas. However, the real culprit, officials say, is chemical poisoning.

Preliminary tests on pond water samples from Suphanburi province, where the outbreak has been most severe, indicate high concentrations

Please see FISH, Page 7

Idle tuna boats testifying to pitfalls of the industry

By Robert Montemayor
Los Angeles Times Service

SAN DIEGO — At the embarcadero here, six tuna clippers are tied side-by-side in two rows. Each is outfitted with a helicopter landing pad and all of the latest tuna-detecting technology.

But despite the fact they are among the largest tuna seiners on the West Coast, they are idly gathering rust — more than $35 million worth of boats, with no crews or sailing plans for the upcoming fishing season.

The six vessels, which can each carry a cargo of 1,000 tons of fish, have been put up for sale by the Van Camp Sea Food Co. They represent, as much as anything, the economic perils which strapped many tuna fishermen in 1982.

Ask tuna fishermen about the 1982 season, and you are likely to get dark stares, agonized winces or profanity.

Prices for tuna were down about a third because of flagging demand, and on top of that, fishing was poor, a trend that has beset the industry for four or five years. According to the American Tunaboat Association, only 95,000 tons of tuna had been brought to port in San Diego by the end of November, about 30 percent less than in 1981.

There is optimism for 1983, but unlike past years, it is being voiced haltingly, guardedly. Most are hoping against hope. Some tuna boat skippers say even those who do make money in 1983 are not going to be out of the woods by this time next year.

After what happened to the tuna industry during 1982, fishermen figure things cannot get much worse. At least they hope they cannot.

"I can't recall it being this bad ever," said Mario Crivello, captain of the Venturous, docked next to the tuna boats up for sale.

Crivello said it is particularly depressing to him to be moored next to the Van Camp boats because they are glaring reminders of just how competitive and risky fishing has become.

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Honolulu, January 30, 1983

"What do you tell them? I don't know. I've been fishing 15 years, and it's as bad as I've ever seen it," Blocker said.

Pointing to several small tuna boats docked near his vessel, Blocker said, "Those guys are already out of business. They just docked them, locked them up and walked off to other jobs."

Neves said the only bright spot in 1982 was the big loads of tuna caught in the Southwest Pacific, around New Zealand and Australia.

About 25 tuna boats from San Diego fished that region in 1982, and reports from those crews generally were favorable.

"They were unloading in Samoa and Guam and then transhipping their cargo back here," Neves said. "They did well. Sometimes you just have to go where the fish are. And that's where they say the fish are."

"They are a bad sign, a sign of the times and how bad they can get."

In any other year, the Venturous would have made three trips to sea, Crivello said. But in 1982, it went only twice.

The one lost trip cost owner Pete Castagnola one-third of his gross. Worse, Castagnola said, the average price for a ton of fish fell by about $400 from $1,200.

The same fate befell practically all of the estimated 125 tuna boats active in 1982, according to a spokesman for the American Tunaboat Association.

Manuel Neves, fleet coordinator for the association, said a combination of things adversely affected the 1982 season. In addition to the drop in fish prices, canneries forced many tuna boats to sit in port with their catches for as long as two months before unloading them.

"The demand was down for tuna, so canneries just let the boats sit there," Neves said. "So boats that usually make five trips went out only four times. Those who go out four went out only three times, and so on."

Tuna boat operators, used to making a quick turnaround, sat frustrated in port while the national economy worsened. "A lot of them felt like they had their hands tied," Neves said.

"Fishing isn't what it used to be," said Greg Correia, captain of the Pisces, which made only three trips instead of its usual four. "There's been a gradual decline in the last three to five years.

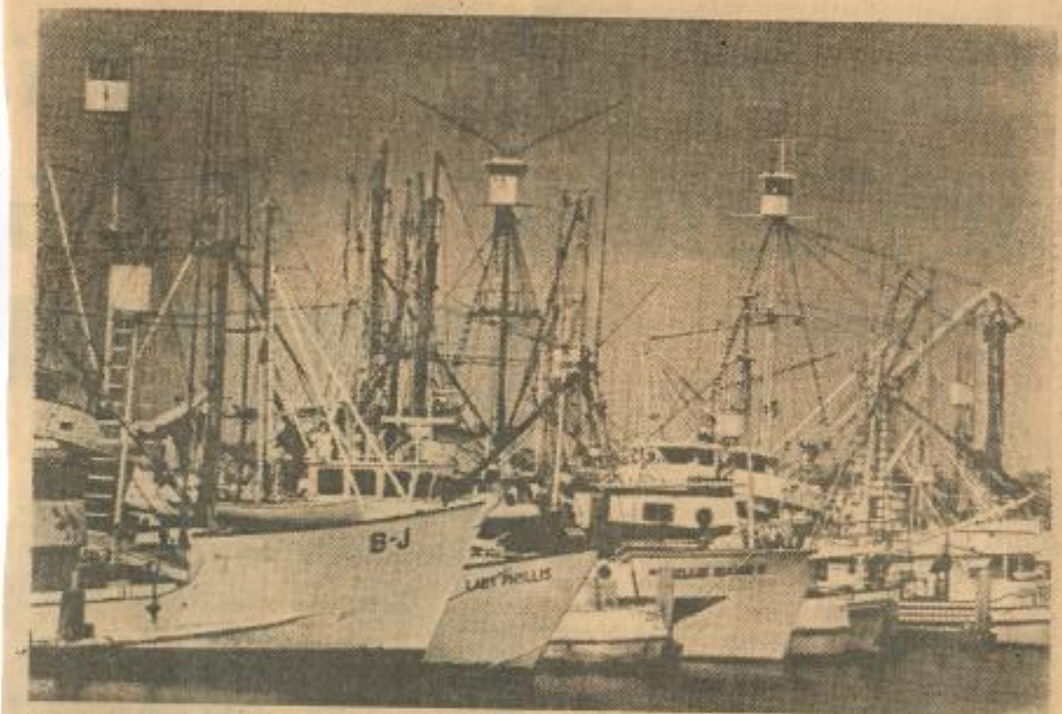
"The fish we saw during the 1982 season seemed to be a little smaller than we've seen in the past. The canneries won't buy the small stuff. It was just a bad year all around."

Many agreed those hit hardest in 1982 were those who bought boats within the last three years.

"I can't see how those guys are dragging those large mortgages and making any money," Correia said. "They probably aren't. Yeah, I'd say those guys are the ones that are really hurting."

Correia and Castagnola also pointed out that foreign-caught tuna cut into fishermen's earnings in 1982. "It was odd," Correia said, "because the demand was down, and prices also went down. Yet, we (the canneries) were still importing Japanese fish.

"We're importing fish from all these other countries, and we're forgetting about the American people here."



Los Angeles Times Service

Tuna boats in San Diego Harbor have one thing in common — trouble. The industry is depressed and crews are singing the blues.

Castagnola said he and other fishermen can accept the fact that fishing, in general, has been on the decline recently. "You have to expect it. The weather, the harvests, the ups and downs, all that has been going on since St. Peter first threw a net," he said.

But Neves said times are so bad economically that he is hearing more and more talk of fishermen quitting and looking for other work.

"These times remind me of the 1950s, which were just as bad if not worse," Neves said. "We lost a lot of fishermen during those years. A lot of them quit fishing and went off and did something else.

"The difference is that there were other jobs available in the 1950s. With unemployment being what it is today, a lot of fishermen are locked in.

"A lot of them would quit if they could, but they can't because there's nothing else.

"We're in a trough now, and it all depends on the economy. It shouldn't go too much lower. But many guys won't be able to rise from the depths of that trough."

Bob Blocker, captain of the Marti B, which made only three of its planned eight trips in 1982, said, "Most of us would just like to be able to work without any setbacks from the canneries or any politics from other countries."

Under current conditions, Blocker said, it is getting increasingly difficult to keep crews, which sometimes must go on a voyage without having been paid for the last haul.

Old days live on at fish market

from the sea

mike markrich

The parking lots began to fill on Thursday as people went to the fish counters to buy traditional Japanese foods for the New Year.

It was a time for red fish for luck and *kazunoko* (herring roe) for "plenty kids." *Kanten* gelatin was sold in bright holiday colors along with *yokan*, a Japanese sweet cake made of *azuki* beans.

At this time of year, the fish counter people who normally work from 4 in the morning to 5 in the afternoon must work even longer hours to sell the fish and dispense the advice that makes certain their customers have everything they need for the New Year.

Some of the people pay the price marked on the fish. Others insist that they can get it cheaper somewhere else. The old stalls at Oahu Market are packed and as the demand increases so do the jokes. An older woman could be seen bargaining for two bags of fish and then reaching into her underwear for two $20-bills to pay for them.

The people standing behind her in line smile but nobody is particularly surprised because the fish market, as Jowette Nishimura says, is "a place you can be yourself."

Nishimura, the owner of a fish counter, is the second generation of her family to work at Oahu Market.

Many of the new fish counter owners, like Nishimura, are people in their early 30s who are the sons, daughters or relatives of people long in the fish business.

They have taken over a business and a life that requires most of them to work seven days a week from early in the morning to late at night. Nishimura concedes that working so much makes it difficult for her to spend time with her family, but adds, "It's getting so hard to be independent, and this business is unique. There's nobody looking over your shoulder, you can work as much as you want or you can slack off."

Carol Shinsato, the niece of well-known local fisherman Bill Shinsato, runs Carol's fish market a few stands away from Nishimura's. She also grew up with the fish business, and her market is like many of the others — a family operation.

Lots of people think "that fish markets are easy and you make a lot of money," she said, "but they don't know what goes on behind the scenes."

On an average day, Shinsato said she wakes up at 3:30 a.m. and spends the first part of the morning buying her fish and getting her counter ready for customers. Some of the fish come from the fish auction and others are bought directly from fishing boats. The prices that she pays depend on the weather (if the weather is bad, fewer boats go out and there is less fish) and demand.

She works until 4:30 p.m. except Sunday, when she gets off at noon.

Masao Gibo, proprietor of Take's fish counter behind Shinsato's, said, "I really enjoy the work, the price changes every day and it's real exciting. For me, it's better than sitting in an office."

Gibo, a native of Nagoya, Japan, is one of the few newcomers to the fish business. He started working in the fish business part-time while going to the University of Hawaii. Soon after he got his degree, the people he worked for retired and asked him if wanted to take over the business.

His family couldn't understand why a college graduate would want to work behind a fish counter when he could get a job in a bank. But he believed in what he was doing and now runs a successful sashimi business.

Gibo's experience is not unique. There is a sense of community and interest among people in the fish business that causes some of them to continue working long after they supposedly have retired.

Nishimura said her mother still comes in to help her at 7:30 every morning even though she gave up the stand to her daughter several years ago.

Adverliser photo by Charles Okamura

Miyono Ezawa, a saleswoman with Nishimura Fish Market, helps customers with their fish orders.

There is also a story of one couple who retired and sold their business to relatives and then felt so lonely without their friends and customers that the next year they opened a new stand across the street.

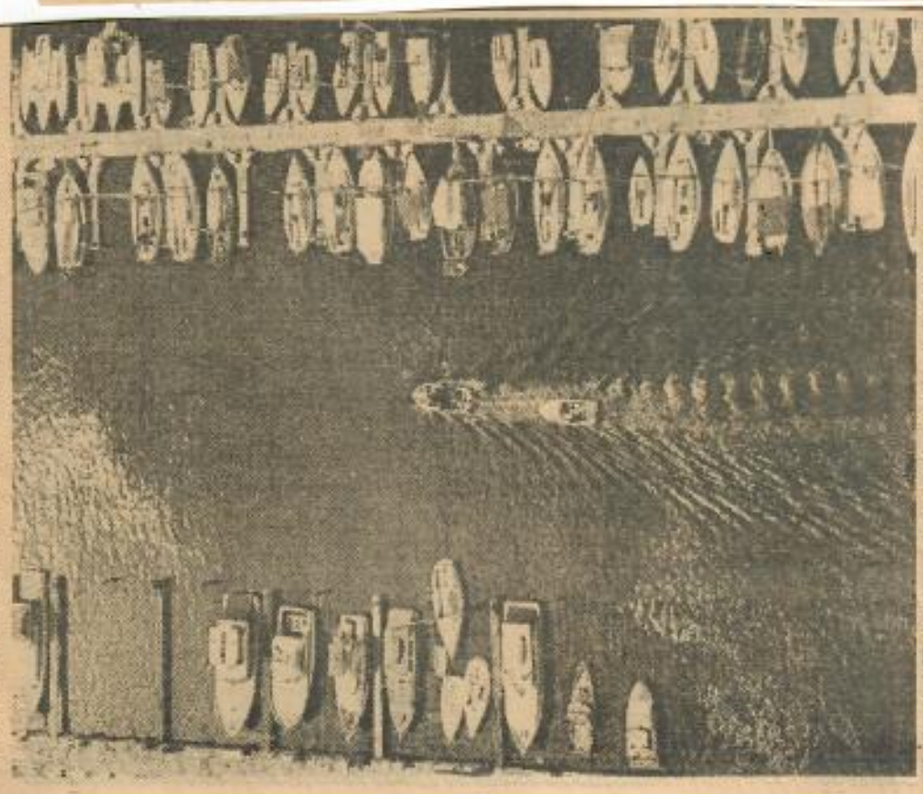
There are, however, some differences between the old and new generation of fish dealers. Nishimura said in the old days, everybody knew everybody else and many contracts were verbal, but today things are more complicated and often involve written agreements.

There is something else that has changed, Nishimura said.

"The idea at the auction used to be to get together and keep the market price to where everybody had a share. Now it's either you outbid the other person or you don't get anything."

But somehow in an age of talking cash registers and plastic wrap, the fish counters survive. Kenneth Horimoto of Horimoto's in Farmers Market thinks he understands why. "It's like the old days, people like to talk and they like service."

A-36 Honolulu, December 12, 1982 The Sunday Star-Bulletin & Advertiser



Some 1,100 people are on the waiting list to get a mooring at Ala Wai Harbor.

The 'mosquito fleet' —fishing to live or to meet expenses?

from the sea

mike markrich

"Fishing," says Wilfred Maeda, "is not just for fun anymore." Maeda, a local fish dealer, was referring to the problems faced by people who fish part-time in small boats.

They are known locally as the "mosquito fleet" because, as Maeda says, they are small and fish in packs. The fleet is made up largely of people who have other jobs and who sell fish to pay for the costs of recreational fishing.

For many years, these people who fished for sport did not worry about how many fish they were able to sell. Many were satisfied to meet the costs of gasoline and beer.

As sports fisherman Welby Taylor explained: "Fishing wasn't so difficult 10 or 15 years ago when you could get gas for next to nothing."

But today gasoline costs can run $100 a day, and it has become increasingly important for people who fish for sport to sell part of their catch to pay the cost of a day's fishing. This has become so common that it has been estimated by one fish dealer that as much as 30 percent of all the fish sold on Oahu is caught by folks who fish part-time.

Thus, the line between people who fish to pay their expenses and those who fish for a living becomes harder to define. Owners of boats that are registered as recreational vessels but are used part-time for commercial purposes have some complicated legal problems.

These and other fishery-related issues are being dealt with by the Hawaii Fishing Coalition, a new political action group made up of several hundred recreational and commercial fishing people.

Coalition President Glenn Nishihara said members are concerned with state harbor conditions. He said members are aware of the economic problems that might limit the construction of new facilities but that many think existing structures could be improved.

Both Parsons and Toguchi said it is unlikely that new harbor facilities will be built in the near future.

Nishihara said Florida boaters were largely responsible for the new harbors and facilities in that state and thinks the same thing could be done in Hawaii if fishing interests "spoke with a single voice."

Toguchi questioned whether a diverse group of shorecasters, trollers and others could work together effectively to improve conditions for all fishing interests in the state. But, says Toguchi, "If they can agree on any issue, that issue will go."

More information about the Hawaii Fishing Coalition can be obtained by writing H.F.C., P.O. Box 743, Pearl City, Hawaii 96782.

full-time commercial fishing boats to qualify for the state loan program. "We don't want to provide loans for recreational purposes so we face the same question: Are they really recreational or are they professional?"

On the tax side, owners of recreational fishing boats cannot write off depreciation unless they can prove to the Internal Revenue Service that they make a profit for two out of five years. A boat owner who is audited by the IRS and determined to be non-commercial has to pay back the amount deducted, with interest.

An IRS spokeswoman said the intent of the rule is to make sure that people who fish are really working at it and are not recreational boat owners taking advantage of the system.

David Parsons of the state Harbors Division said that the state classifies a vessel as commercial if its owners fish more than 51 percent of the time, but accepts the fact that recreational boat owners do part-time commercial fishing.

Says Parsons, "We accept that because we know that the purpose of the boat is for pleasure."

Commercial boats get taxed differently than recreational ones. They can write off such things as fuel and boat depreciation and qualify for special boat loans. In addition, commercial boats can be written off as business expenses. Recreational vessels cannot.

Recreational boats do not get tax breaks but have an advantage in finding a mooring. Space in Oahu harbors is limited, and a boat that loses its recreational status because its owners sell too many fish risks losing its mooring as well.

On an island where there are 4,000 people on the waiting list to get a boat into Ala Wai Harbor alone, finding another mooring is not an easy task.

Sen. Charles Toguchi of Kaneohe, who chaired the House Ocean and Marine Resources Committee for four years, said he thought the problem was unique to Hawaii. "It's not a market where you have ups and downs and a processing plant to absorb poundage. Basically, it's part of culture. People go out for recreation. They catch fish to pay their costs and anything above that they keep."

Toguchi said the state is interested in encouraging the fishing industry but that applicants must prove that theirs are

Savas Mojarrad's Latin American Style Raw Fish Recipe

Rinse off the seeds of the red pepper and put pepper in a garlic press and use to taste.

Combine ingredients in a glass bowl and mix with small pieces of filleted snapper. Let it sit for three to four hours in a refrigerator and serve with lettuce.

½ cup fresh lemon juice
2 cloves garlic
1 tablespoons grated ginger
2 tablespoons finely grated onions
3 tablespoons light vegetable oil
1 medium-size red pepper
1 pinch dill weed
2 tablespoons grated Parmesan cheese.

12-11-82 B4 Honolulu Star-Bulletin

HERE FOR REPAIRS—Workers prepare to remove a storm-damaged boat from the deck of the Easy Rider Too at Pier 39 this morning. The Easy Rider arrived from Kauai with one power boat and three sailing craft which were severely damaged last month by Hurricane Iwa. —Star-Bulletin Photo by Ken Sakamoto.

Nov. 13 1945.

Loran, USCG Device, Let B-29s Increase Bombloads To Japan

By GEORGE WELLER
Chicago Daily News Foreign Service

GUAM, Nov. 13.—Veteran B-29 pilots have beckoned the United States coast guard to take a big bow for its part in their destruction of Japan's heavy industry.

The coast guard installed location device Loran—until recently on the secret list—was more responsible than any other single improvement for doubling the B-29's bombload within an approximate six-month period.

Loran is a kind of country cousin to radar. The name is short for long range navigation.

The principle is the same in that electric impulses are sent forth from shore stations and bounce off the object which requires locating and return.

\# \# \#

The difference between loran and radar is that, in radar, the impulses return to the same station where they started, but, in loran, they get lateral passed to another station.

\# \# \#

Big bombers regularly use radar to determine where they are with regard to nearby landmasses.

But, in great distance overwater hops, radar is ineffective and until loran was introduced the bomber had to depend on celestial navigation or dead reckoning.

Tricky elements, like allowing for side winds, made calculation difficult.

With loran, anyone who knows elementary arithmetic can pinpoint his position in 30 seconds work, with storm winds at full intensity and visibility nil.

\# \# \#

It was the coast guard stations that made it possible for the B-29 to cut down sharply on its gas load and increase its bombload.

The stations were built by the coast guard's own seabees in as little as 15 days after a beachhead was secured.

\# \# \#

Before loran was installed, bombers carried a two hour supply of extra gasoline to allow for getting lost.

Now loran's long arm reaches out 700 miles by day and as much as 1,500 by night and gives the pilot absolute position any time, making it possible for him to cut down his extra gas to a one hour supply, replaceable with bombs.

\# \# \#

Lorn also changed close-in tactics over Tokyo. Making bombing runs pilots sometimes had upper altitude winds as high as 140 miles an hour, which is more than typhoon strength.

If they went up wind their actual speed was cut to about 100 miles and hour. The planes thus became easy prey to flak, because slow runs lasted as long as 19 minutes.

But, if they ran down wind, with the ground speed further increased 2 per cent for every 1,000 feet of altitude due to the curvature of the earth, the bombers whipped past the target at more than 500 miles an hour. Bombardiers could not synchronize their navigation aids.

\# \# \#

But, when loran came in they were able to go downwind at any speed and still be sure they would pass directly over the target when planned.

Thanks partly to the coast guard's loran, the B-29 cut down the gasload from 51,000 to 39,000 pounds while increasing bombs from three tons at first, to eight and one half tons at the end of their operations.

Loran, invented at the Massachusetts Institute of Technology, also served in the recent Japan to Washington, D. C., record run.

Loran also made possible bad weather Himalayan hump flying, with as many as 30 transports, invisible to one another, pursuing different loran lines.

Loran stations around Kunming, China, and Ledo, India, are army built.

Weather Forecast

Weather Bureau Office, Honolulu
November 13 1945

Forecast for Honolulu and vicinity — Partly cloudy tonight and Wednesday with light southeasterly winds except cloudy with few light showers during early evening.

Local Weather Data

For the 24 hours ending at 8 a. m. —Total precipitation, 0; maximum temperature, 81; minimum temperature, 73. At 8 a. m., relative humidity, 82 per cent; wind, calm.

University of Hawaii
Sea Grant College
Program

"Toward the Sea"

MAKAI

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Seabirds, Seafood, and Fishermen

by Desmond Twigg-Smith

Scientists are better able to assess the effect that expanding the fishing industry will have on seabirds in the Northwestern Hawaiian Islands (NWHI) because of two recently completed studies.

One study, conducted by Dr. Ted N. Pettit and Dr. Hugh I. Ellis, and headed by Dr. G. Causey Whittow, was aimed at finding out how much food seabirds eat. The study was funded by the National Science Foundation and the University of Hawaii Sea Grant College Program.

It is impossible to measure how much seabirds eat when feeding at sea by observing them directly, Whittow said, but it is possible to estimate their food consumption. If the amount of energy that seabirds use up and what they do eat are known, some "back reasoning" can be used to estimate how much the birds have to eat to meet their energy needs, he said.

During the 2-year study, the researchers measured the energy needs of several species of seabirds selected to represent the different orders and sizes of seabirds in NWHI. From the resulting estimate of the energy that seabirds expend, they were able to calculate that the entire Hawaiian seabird population eats about 520 metric tons of food every day.

Other studies, at high latitudes, have shown that seabirds can eat about one quarter of the fish produced in areas where they feed, Whittow said.

Regarding fishing, the relationship between fishermen and seabirds is "two-fold," Whittow said. Some species of seabirds flock over schools of fish, and fishermen use them as guides to finding fish. When a flock of seabirds is spotted, fishermen know there are fish there, as well as what kind of fish to expect if they know the eating habits of the various seabirds.

"The other aspect of the relationship is that seabirds eat the fish and, therefore, are in direct competition with the fishermen for some fish species. The relationship can be negative, but most of the time the birds are eating species that the fishermen aren't interested in. On the whole, the effect of seabirds on the fisheries is a positive one," Whittow said.

This research complemented a 6-year study on the kinds of fish, squid, and

(Continued on page 5)

Craig Harrison (right) and Rick Coleman mark a sooty tern on Manana Island as part of an effort to determine the origins of feeding flocks of birds at sea.

—Robert Shallenberger photo

SMOKELESS GRILLED FISH

by Susan Pirsch

A juicy steak sizzles on the grill. Smoke wafts, fills the air with aroma. The sound and smell whet the appetite. The sound and smell may also signal trouble.

According to the report, "Diet, Nutrition, and Cancer," prepared by the National Research Council and published by the Washington National Academy Press in 1982, researchers have found that fats dripping onto hot coals generate smoke which passes high levels of polyaromatic hydrocarbons (PAHs) to meat or fish. PAHs are thought to be harmful because, when injected into bacteria, they alter DNA molecules. Researchers believe that substances capable of altering DNA may be potential cancer causing agents.

Reducing the amount of smoke reaching food on a grill is one way of reducing the level of PAHs affecting that food. Another way to reduce PAH levels is to cook foods low in fat, such as fish.

An easy way to do both is to wrap the fish to be grilled in ti leaves that are split in half at both ends to make tying the ends together easier. The leaves help to keep smoke from directly contacting the fish and help retain natural juices for moist and tender fish.

To prepare, simply season the fish as desired. Place a serving of fish on one ti leaf and tie the ends together to make a small package. Place the packages on a clean, well-oiled grill that is hot enough to mark a piece of unwrapped fish when it touches the grill.

Place large pieces of fish away from the coals so the inside cooks before the outside burns. Small pieces of fish can be placed closer to the heat. Cook about 5 minutes on each side or until the fish flakes easily with a fork and loses its transparency. □

GOOD GRILLING FISH

Ahi (bigeye tuna)
Ono (wahoo)
Ulua (jack crevally)
Mahimahi (dolphin)
Hapuupuu (sea bass)
Mullet
Moi (thread fin)
Uhu (parrotfish)
Opakapaka (pink snapper)
Pualu (surgeonfish)
Weke (goatfish)
U'u (squirrelfish)

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Seaweed Farm Gets Underway on Oahu's North Shore

by Peter J. Rappa,
Information Specialist

Hawaiian Marine Farms is using already existing technology for growing ogo. The edible seaweed is a favorite ingredient in many local recipes.

Ogo is probably the most widely used edible seaweed in Hawaii today. Since its introduction into Hawaiian waters around 1900, the popular seaweed has found its way into many local recipes. Its current availability, however, to Hawaii's consumers has been limited because of scarce natural supplies and increased consumer demand for it.

All this may change for the better thanks to a new aquaculture venture recently started on Oahu's north shore. The new venture is Hawaiian Marine Farms, located in Kahuku. Their primary crop: *Gracillaria bursapastoris,* or limu ogo as it is more widely known in Hawaii.

The farm was designed and built and is operated by two former University of Hawaii graduate students in oceanography, Richard Spencer and Fred Mencher. The two formed a partnership four years ago called Aquaculture Associates, a consulting firm. They originally became interested in seaweeds while working on a project for Hawaiian Electric Company.

Later, the pair became involved in a research project funded by the University of Hawaii Sea Grant College Program to use the cold water from the OTEC (ocean thermal energy conversion) facility at Keahole Point on the island of Hawaii to grow nori, a seaweed grown in Japan and used to wrap sushi. When local interest in nori culture waned, Spencer and Mencher decided to set up their aquaculture venture.

The commercial aquaculture of local seaweeds has a lot going for it, according to Spencer. Ogo has wide consumer acceptance and demand for it is high, especially on the island of Hawaii, where it is scarce. Since ogo is already established in Hawaii, the duo did not have to worry about adapting it to local conditions. Finally, the technology for culturing seaweed already exists. The last point is particularly important because it can take years of research to design and prove a new technology before it can be used profitably in commercial operations.

The partners broke ground for their farm on March 1, 1983. The farm consists of eight semicircular tanks with plastic liners. At present three of the eight tanks are in operation, and another three are expected to be brought on line soon.

Each tank is filled with filtered seawater drawn from a well and has an air line running down the center of the tank at its deepest point. The air agitates the water, creating a strong circulation pattern to keep the algae suspended and assuring sufficient light and nutrients for all the plants.

Nutrients are provided by commercial fertilizer and small added amounts of carbon dioxide (CO_2) to aid photosynthesis. Total water surface area of the eight tanks equals about .125 acre. The partners obtained ogo seed stock from several sources, including local fish markets.

As with any new venture, Spencer and Mencher have had their share of start-up problems. Shortly after they began commercial harvesting, the normally healthy stalks of ogo began breaking into small

At this writing, Spencer and Mencher have three of their eight tanks

pieces. Then, production, which had been 5 to 15 pounds a tank a day, fell to zero.

They regained normal production levels by adjusting the photo period (the number of hours light is available for photosynthesis) by supplementing lower amounts of winter sunlight with artificial lights. By doing so, they added about 4 hours of daylight to the winter-shortened days.

Next came an equipment failure. Their generator/air blower broke down, requiring tanks to be shut down for several days. They bought a new generator, allowing them to restore present production levels and to add at least three more tanks to the operation.

These problems led, not surprisingly, to a financial pinch. Originally the partners had raised enough money to build the farm and operate it for several months. Now Spencer and Mencher are talking with several investors for additional money to overcome cash flow problems.

The outlook, inspite of problems, is encouraging. Several retailers on the island of Hawaii are interested in buying the aquacultured ogo and could probably retail 200 to 300 pounds a week. Opportunities also exist for getting their product into markets on Oahu.

Since they can deliver a steady supply of ogo year-round, retailers are finding their product attractive. The pair's only competition is from limu (seaweed) pickers who harvest wild stocks, which can be over harvested or destroyed by natural events such as storms. □

in commercial operation.

Application Deadlines For Fisheries Loans Coming Up

The federal Fisheries Loan Fund has $3 million in emergency loans at 3 percent interest available for fishermen owning vessels weighing 5 tons or more to help them avoid defaulting on fishing vessel mortgages, according to the National Oceanic and Atmospheric Administration. Eligible mortgages are those used for vessel building, rebuilding, or reconditioning.

Of this amount, $1 million is earmarked for fishermen whose mortgages are financed through the Federal Obligation Guarantee Program. Fishermen eligible for these funds may apply for them until June 1, 1984, but are encouraged to do so as soon as possible. The remaining $2 million is available for fishermen whose vessels are financed through other creditors. Applications for these loans will be accepted until March 31, 1984.

Loan applications will be considered on a first come basis. Extra consideration, however, will be given to applications if mortgage holders or trade creditors are willing to make concessions that complement the fisheries loan being applied for. In any case, early applicants are expected to have a better chance of receiving loans because of the limited funds available.

Before applying for loans, fishermen in Hawaii, American Samoa, the Commonwealth of the Northern Marianas, and Guam are asked to write or call the following office:

Fisheries Service Branch
Southwest Region
National Marine Fisheries Service
300 S. Ferry Street, Rm. 2016
Terminal Island, CA 90731
Telephone: (213) 548-2478

Fishermen in Hawaii may also call the Honolulu office of the National Marine Fisheries Service at 955-8831. □

CRAVEN APPOINTED TO FUTURES COMMITTEE

Dr. John Craven, director of the University of Hawaii Law of the Sea Institute, along with several other local community leaders, have been appointed by Governor George Ariyoshi to the Governor's Committee on Hawaii's Economic Future.

At the committee's first meeting in January, the governor asked the members to examine various possible futures for Hawaii's economy, to analyze what resources will be needed to realize that future, and to offer suggestions as to where efforts to develop Hawaii's economy might be focused.

The other committee members are:

- R. Brian Tsujimura, Amfac, Inc.
- Dwane Brenneman, Nissan Motor Corp.
- Elroy Chun, Building Industry of Hawaii
- Paul Chung, Professor, UH College of Business Administration
- Donald Dawson, Dawson International, Inc.
- Richard Dumancas, Sheet Metal Workers Union
- Kane Fernandez, E.K. Fernandez Shows
- Guy Fujimura, ILWU
- Leland Gray, Gray Distributing, Inc.
- Alice Guild, retail management
- Warren Haight, Castle and Cooke, Inc.
- Neil Hannahs, Bishop Estate/Kamehameha Schools
- Mark Hastert, Helber, Hastert, Van Horn & Kimura, Planners
- Stanley Hong, Theo H. Davies, Inc.
- Mildred Kosaki, education and government affairs
- James Mak, Professor, UH Department of Economics
- Francis Oda, Group 70 Architects
- Russell Okata, HGEA
- Ruth Ono, Queen's Medical Center
- Dennis Oshiro, International Business Resources, Inc.
- Joseph Pelletier, Pacific Resources, Inc.
- Diane Plotts, Mark Christopher, Ltd.
- Wayne Richardson, III, ABA International
- Ronald Terry, Hawaii Farm Bureau Federation
- Dennis Toyomura, Dennis T. Toyomura, Architect
- Fred Trotter, Estate of James Campbell
- Laurence Vogel, Duty Free Shoppers Group, Ltd.
- David Watson, AFL-CIO COPE
- Harwood "Dan" Williamson, Hawaiian Electric Co., and
- Sylvia Yuen, Professor, UH College of Tropical Agriculture and Human Resources

R. Brian Tsujimura will serve as chairman of the committee. □

SEABIRDS (Continued from page 1)

crustaceans that seabirds eat, which was conducted by Craig Harrison of the U.S. Fish and Wildlife Service and Tom Hida and Mike Seki of the National Marine Fisheries Service. These agencies also funded the study.

Harrison said combining the results of the two studies would allow models to be made that would show which birds to monitor when a certain type of fish is be being harvested.

Seabirds that eat the small fish and squid that jump out of the water when chased by tuna would be affected by increased tuna fishing, Harrison said. "The management questions really are not ones of yes or no, but more of questions of how much fish is taken out. Then you get into questions of economics . . . . It may be that the only way somebody is going to build a million dollar fishing boat and make a profit is to take so many fish that there would be a problem with wildlife."

On Lisianski Island Harrison tries to make a great frigatebird regurgitate to produce a food sample. Such a procedure eliminated the need to kill and disembowel birds to do the food study.

—Mark Ravzon photo

Harrison places a flyingfish regurgitated from a red-footed booby bird on Eastern Island, Midway into a jar filled with formaldehyde for later laboratory analysis (above).

—Daniel Stoneburner photo

A parent frigate bird watches over its young one on East Island, French Frigate Shoals (below).

—G. Causey Whittow photo

A fishing industry in NWHI would certainly increase the competition between the seabirds and fishermen for some species of fish. It may occur to the extent, Whittow said, that it would be disruptive to the feeding and the breeding of the seabirds.

"Any human activity that results in species of animals becoming severely depleted should be curtailed," Whittow said. "The danger with extending the fisheries in the Northwestern Hawaiian Islands is that this might result in the depletion of the fishery resources to the extent that the fishery collapses, and in the process of doing this, they (fishermen) would have also severly depleted the seabirds as well."

"There are so many things involved in whether or not a fishery is feasible," Harrison said. "There are definitely a lot of fish up there (in NWHI) . . . . As far as how the fisheries would impact on the wildlife is still a little bit conjectural on everybody's part, although we now know a lot more about it than we did five years ago."

"There's a lot of squid out there that could be exploited," Harrison said, and also some "incredibly large" gillnet squid fisheries that the Taiwanese, Koreans, and the Japanese are starting hundreds of miles north of the NWHI.

In his study, Harrison also tested for the presence of organochlorine pesticides and other pollutants and surprisingly found traces of them in seabirds in the Northwestern Hawaiian Islands. □

MARINE MISCELLANY

MTS CONFERENCE ON TAP

The Pacific Congress on Marine Technology will be held from April 24 to 27 at the Princess Kaiulani Hotel in Honolulu. The event is being sponsored by the Marine Technology Society and several other public and private organizations.

The conference will focus on key issues of marine technology as related to the ocean's economic potential for Pacific Island nations and the larger rim countries. Sessions planned will address such topics as ocean energy, fisheries, marine transportation, technology transfer, and tsunami detection.

Registration fee is $160 before March 15 and $180 thereafter. Student registration fee is $15 per day or $40 for the entire conference. For more information write to PACON 84, Center for Engineering Research, University of Hawaii, Honolulu, HI 96822. ☐

SHRIMP MARICULTURE INFORMATION

"Shrimp Mariculture: State of the Art," an information sheet now available from the Sea Grant College Program of Texas A&M University, provides technical data on current research in shrimp mariculture. It also includes detailed economic analyses, which may interest those considering entering into commercial shrimp mariculture.

Single copies may be obtained free by writing to Sea Grant College Program, Texas A&M University, College Station, Texas 77843-4115. ☐

STATE PERMIT COUNTER OPEN AT DPED

The Planning Division of the Hawaii Department of Planning and Economic Development (DPED) is now operating a State Permit Information Counter. The purpose of the counter is to provide preliminary information and guidance to potential applicants for state permits and approvals. The counters also display, and, in some cases, distribute permit forms.

The counter is located in Room 610, Kamamalu Building, 250 S. King Street, Honolulu (telephone 548-8467). ☐

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Dave Donn

JAMESON'S pub downtown comes under new ownership Sunday. **Ed Greene**, who is holding on to the Waikiki Jameson's, the Merchant Square Oyster Bar and is opening Jameson's by the Sea in Haleiwa, sold the downtown pub to two Mainland couples who decided to go into the restaurant and bar business in Honolulu . . . Which brings us to **Tom Horton's** article in the August issue of *Honolulu* magazine called "Running Away to Join the Restaurant Business." He profiles ex-Arthur Murray dance instructor **Ron Daughterty** (O'Toole's); **Mickey** and **Kathee Hummer**, ex-boxer and Vegas showgirl respectively (Dickens Pub); former theatrical producer **Paul Stoudt** (Texas Paniolo Cafe), and **Sen. Andy Anderson** (John Dominis) who says he *hates* fish. Writer Horton himself quit newspapering to go into the restaurant business in 1976, but quickly returned to writing . . .

INTERESTING to note that the marketing department of Pizza Hut is made up of **Dave Franks** and **Jan Bacon**. Would I lie to you? . . . Attorney **Dave Schutter** carries around unhappy memories of *his* entree into the restaurant business. The license plate on his Bentley reads "FACES," the name he gave to Rex's when he took it over and dropped a bundle. On the other hand, the car *is* a Bentley, so Schutter can't have lost everything . . . **Ernie White**, husband of designer **Baba Kea**, is wearing a cast on his hand and gets just a touch red-faced when he admits he broke two fingers during an aerobic dancing class at the Honolulu Club . . . When India's **Indira Gandhi** is here next week to make the official presentation of **Mari**, the Zoo's new Indian elephant, Mari is going to get a special present from florist **Barbara Meheula**. She is making her an edible lei out of Hawaiian fruits—ohelo berries, sugar cane, bananas, starfruit etc. That's one lei that won't slowly die in the fridge . . .

Meheula

OH, yes, and the Zoo Hui hopes the HVB remembers to note in its annual report for 1982 that even an elephant traveled to Hawaii this year . . . The Salvation Army's 36-member New York Staff Band Chorus, stopping off here on a 'round-the-world concert tour, had just one day to sightsee and chose to make the trip to the

elly's Hawaii

Arizona Memorial. When they reached the inner gallery where the names of the dead Arizona crew are inscribed in granite, the chorus was so moved that they spontaneously broke into an unscheduled rendition of "Rock of Ages." It was a moving experience not only for the chorus, but for other tour groups which happened to be there . . . Among the gifts sent to baby **Prince William** is a copy of **Dr. Genevieve Painter's** book, "Teach Your Baby." The Honolulu author, whose hardcover issue of the book has sold more than 100,000 copies, sent the present to **Prince Charles** and **Diana**, princess of Wales, to assist in "bringing up baby." . . .

THERE was quite a scene at the airport the other day when a Philippine general, apparently miffed at having to wait his turn to be interviewed at an immigration booth, started shouting and then angrily kicked a Philippine Airlines worker in the thigh, sending him to the ground. Immigration officials were ready to deny him entry into the U.S. but he was on a diplomatic passport so he got through . . . After 14 years with TV's "Checkers and Pogo" show, which has been discontinued, **Morgan "Pogo Poge" White** is making a farewell appearance Aug. 14 at Ward Warehouse and then moving to Salt Lake City. Not everyone knows I was Poge's partner for a year some 15 years ago—he's a gentle man who loves kids and helped entertain and educate thousands of kids through television and personal apperances . . .

THE just completed HIATT (Hawaiian Invitational Allison Tuna Tournament) was, unhappily, the least productive in the event's nine-year history with only six tuna and 15 marlin caught. At the awards banquet, **Dr. Richard Shomura**, who spends much of his time with the National Marine Fisheries Service tracking schools of migrating fish, was given the Aloha Airlines trophy which goes to the person who has "done most for sports fishing during the past year." That prompted one wag to quip, "Where was Dr. Shomura during the HIATT?" . . .

Cooray

Willows exec chef **Kusuma Cooray** is putting the finishing touches on menus to launch lunch service at the restaurant's Kamaaina Suite in a couple of weeks. In the meantime, she's sharing some of her Cordon Bleu wizardry in a demonstration Tuesday at Lyon Arboretum in Manoa . . . New gimmick at the "Summer Jam" Sunday at Aloha Stadium—free sunscreen will be given to the first 10,000 people there and showers will be provided for folks who get hot during the all-day, outdoor event . . .

Tricky dolphins livelihood of some

from the sea

mike markrich

Dolphins may seem unusual targets for people with lever action .30-.30 rifles. But for those whose livelihood is threatened by dolphins stealing their bait or taking the fish off their hooks, there is little love lost for these most beloved of marine creatures.

The dolphins can stalk fishing boats and wait until the fish are on the line before moving in swiftly to grab the fish and swim away. One dolphin has been known to steal the fish off several boats at the same time, swimming hundreds of yards at high speed between them.

The problem exists statewide from Kona to Kaena Point and is said to have cost the fishing industry thousands of dollars in lost revenue. Some fear that the dolphins may drive them out of business and that there is nothing they can do about it since the dolphins are protected by federal law.

A few take their frustrations out in gunfire, trying to kill or drive the dolphins away. But dolphins are hard to hit from the pitching deck of a small boat and some of the bullets are more of a danger to humans as they ricochet when they hit the water. Those who fish at night for opelu in Waianae worry that if the dolphins don't drive them out of the business, the stray gunfire might.

Opelu are small silvery fish that bring high prices — $1.79 per pound last week. People such as John Rivera of Waianae fish for them by going out at night in small boats and beaming a high-intensity lamp into the water. Rivera's light attracts what he calls "bugs," small marine animals, tiny sea horses and octopus. In two or three hours, a school that numbers "in the millions" will appear and Rivera — anticipating a good catch — drops his hand line in the water and waits.

The trouble is that the dolphins are waiting too.

When the opelu are hooked, they grab the fish off the line and eat them.

Rivera said that the dolphins sometimes hide just outside his light and become irritated when he beats them to the fish. He said that when they become angry they either break his line, jump up high and splash him or rock his boat by pulling at his anchor line. He said that when they start taking off his propeller, he is going to give up fishing for good.

Rivera and Dave Hayashi said that the problem is relatively new. Hayashi said that five years ago he and some others averaged 100 pounds of opelu in a night. Today, because of the dolphins, he says that they are lucky to bring in 25 pounds.

There is a popular belief in Waianae that the dolphins are led by Pua and Kea, the two Atlantic bottlenose dolphins stolen from the University of Hawaii's Kewalo Basin research center in 1977 and released in Yokohama Bay.

However, Louis Herman, director of the Kewalo Basin research center, said the problem existed "long before Pua and Kea were released" and that a study of the problem was done in Kona as long ago as 1970.

Herman believes that the problem may stem from overfishing that depletes existing fishery stocks.

Other marine specialists and people who fish speculate that the dolphins pursue this kind of behavior because it is easier to get fish that are already hooked than to catch them themselves.

Although some people in the fishing industry complain that the state has done nothing about the problem, Division of Aquatic Resources Director Henry Sakuda said that the federally protected animals are beyond the jurisdiction of his department.

Gene Nitta of the National Marine Fisheries Service said that people having difficulties with dolphins while fishing can apply for a certificate of inclusion which permits the driving away of dolphins from fishing

threaten

e anglers

areas and the use of special waterproof firecrackers. It does not, however, permit people to shoot or hurt dolphins. Nitta can be reached at 955-8831.

Hayashi and Rivera say they are unsure of what can be done and worry about staying in business.

Hayashi said: "Some people may read this and think it's a funny story, but it's our livelihood that's at stake."

Against a backdrop of boats, this dolphin leaps high in the air. Dolphins are known to stalk fishing boats and wait until the fish are on the line before moving in swiftly to grab the fish and swim away.

HS-B 25NOV82

Navy Wants Drydock, but Silent on Reason

SAN FRANCISCO (AP) — The world's first fully submersible drydock, built as part of a CIA plan to raise a sunken Soviet sub, is being claimed by the Navy for a new secret project, the San Francisco Chronicle has reported.

Navy officials admitted they have asked the National Park Service to turn over the Hughes Mining Barge-1, which is docked at Todd Shipyards in San Francisco.

They plan to move it to Redwood City for use in a Lockheed Missiles and Space Co. project "in which the Navy has an interest," said Lt. Commander Tom Jurkowsky, a Navy spokesman. He declined to elaborate.

THE DRYDOCK, built in San Deigo in 1971-1972, was used along with Howard Hughes' Glomar Explorer for a 1974 expedition to a Pacific location about 750 miles northwest of Hawaii where a Soviet sub sank in 1968.

The newspaper said that the drydock, with a work area the size of a football field and 70-foot-high sides, was maneuvered beneath the Explorer, and a grappling system was lowered to the submarine. But the outcome of the expedition hasn't been revealed.

Sex life of Malaysian key to success for

"Hawaii is the foremost Malaysian prawn research center in the world," says Shao-wen Ling, considered by many to be the world's foremost authority on the Malaysian prawn.

Ling, the first to get prawns to live through their post-larval or baby stage in captivity, spoke at the University of Hawaii and explained why he had difficulties with prawn research.

"It was because I was naive," he said. "I was thinking as a scientist and not as a prawn.

"There is a certain psychology in being a prawn, just as there is in being a human being," he said.

Ling, who now lives in Miami, was doing research in Malaysia in the early 1960s, but his attempts at breeding the fresh-water Malaysian prawns were unsuccessful until one day in 1961 when he accidentally placed a molting female in the same tank with a male. "I thought she would be torn apart . . . But I came back with my net, and the male was protecting her until she grew a new coat. That was the signal." She was ready to breed; until she molts, the male sperm cannot fertilize the female prawn's eggs.

But after overcoming the breeding hurdle, Ling had been unable to get the newly hatched prawns to live beyond eight days.

For more than eight months he experimented with water quality, trying to find the unknown component that made it possible for the newborn prawns to grow. In a moment of frustration he dipped a piece of shoyu-pork from his lunch into the tank. The prawns thrived.

"Every high school biology teacher learns that all crustacea must have a period in salt water," he said ruefully.

Asked how Hawaiian prawn farms could compete with those of developing countries with low labor costs, Ling replied that the biggest market is for live prawns.

"Prawns deteriorate very fast when they die and there is a significant loss of quality in frozen prawns," Ling said. "There should be enough local demand for the industry to grow."

The Hawaii prawn industry is considered by many to be going through a period of transition. Two of the largest companies to enter the prawn business, C. Brewer and more recently Amfac, have pulled out, citing technical difficulties and lack of sufficient return on their investment.

Kendrick Lee of the state aquaculture office thinks that although the pullout of these large firms from prawn production might be seen by some as a setback for the industry, the consequences of their actions must be seen in perspective.

Lee said, "Look at the companies that went out of the business. They're into diversified stuff. They went out because the return wasn't what they wanted.

"They could make a greater return doing something else. But the companies like Lowe farms who are specializing in prawns are still doing it and expanding." Lowe Aquafarm of Kahuku recently put 30 more acres into production.

Critics of the state's prawn development program charge there is neither adequate land nor water available for additional prawn production on Oahu. They consider the state hatchery program wasteful and think that the state's emphasis on Malaysian prawns which are grown cheaper in developing countries hampers research on species that might be grown more profitably in Hawaii such as salt water shrimp.

Charles Greenwald of Aquatic Farms disagrees with the state's policy of raising post-larvae (another name for baby prawns) at Anuenue hatchery. As Greenwald explains, "It costs them more to produce them than anybody else. The state doesn't write its own textbooks, does it? No, they buy them from suppliers. I don't see why they don't do the same thing with prawns."

John Corbin, manager of the state's aquaculture program, defended the state's policy. He acknowledged that there had been

prawns researcher

from the sea

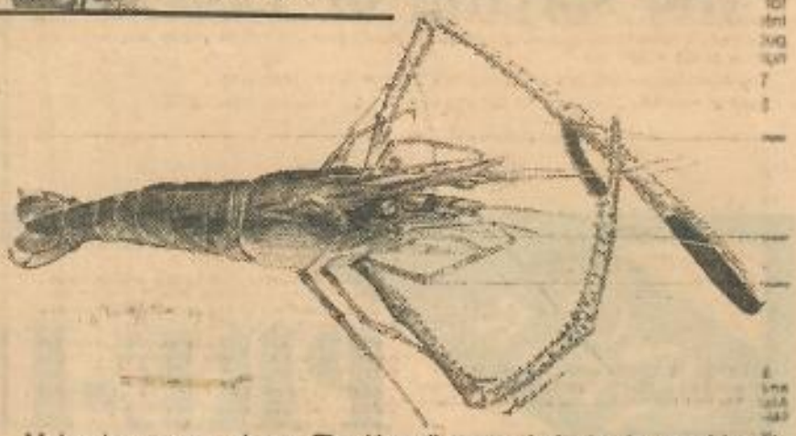
mike markrich

problems. But he said that there is land available for prawn production and that as sugar is de-emphasized, water should be less of a problem.

Corbin said the state's hatchery program is necessary for the industry. The state produces and distributes baby prawns free to farmers in exchange for data on growth rates.

There are approximately 10 prawn farms of significant size in Hawaii and 11 of one acre or less. And although the growth of the industry has not proceeded at the pace its promoters would have liked, they are still optimistic.

As Ling explained, "It will be at least 20 years before we know what impact aquaculture has on the world food supply. We have to be patient."



Malaysian prawn, above. The Hawaii prawn industry is considered by many to be going through a period of transition. Two of the largest companies to enter the prawn business, C. Brewer and more recently Amfac, have pulled out, citing technical difficulties and lack of sufficient return on their investment.

Opihi

Aquaculture could lessen the dangers

By Robert Hollis
Advertiser Staff Writer

In ancient times, the once ubiquitous opihi was called the "fish of death" by the Hawaiians.

It wasn't that the tasty limpets — considered a rare delicacy these days — were dangerous to eat. It was just that collecting them from wave-washed rocks along each island's intertidal zone was hazardous to one's health.

Judging from a review of news stories published since the beginning of 1979 by the Honolulu dailies, opihi remains the most dangerous fish to hunt in Hawaii. Because of overfishing, indications are that it may become more so in the future.

The trend could be reversed, however, if current University of Hawaii experiments into opihi farming lead to a new aquaculture industry.

Since January 1979, newspaper records show that at least 16 people have been swept or fallen to their deaths while hunting opihi.

At least five others were rescued, usually with fire department helicopters, from the roiling surf or from nearly inaccessible rocks along the state's most rugged coastlines.

Kay displays an assortment of opihi shells.

As such, drownings related to the shellfish picking account for almost half of the 35 fatalities connected with some sort of fishing, according to newspaper records. Two of the others who drowned were picking limu (seaweed).

Unlike most forms of fishing where you stand on shore and drop a hook on a line into the ocean, opihi pickers must pry the shellfish from black basalt cliffs and rocks that are usually awash with seawater.

This is because the shellfish thrive only along those stretches of shore where the surf carries limu, their only source of food, to them.

It is a fact of life for opihi hunters that the best pickings are in the least accessible places. As more people fish for the dwindling stocks around the Islands, finding even legally harvestable opihi requires going ever further into cracks and crevices at or below the waterline.

One of the basic rules of ocean fishing in Hawaii is never to turn your back on the surf. Yet it is almost impossible to watch for incoming breakers and at the same time pry the limpets from their rocky perches.

"I've been rolled lots of times by waves," said E. Alison Kay, a University of Hawaii zoologist who has done research on opihi for a number of years.

"I now wear a wetsuit and a life vest whenever I go picking. I decided my knees and elbows are more important that the opihi."

All three species found in Hawaii thrive on the windward coasts where wave action is the greatest, Kay said.

The most easily collected is the so-called black foot opihi, known in Hawaiian as maka'la'uli. It is also called "lazy man's opihi" because of its relative accessibility.

The more highly prized yellow foot variety, known as alina'alina in Hawaiian, inhabits a lower part of the tidal zone and is consequently harder to collect.

The largest species, called ko'ele in Hawaiian, lives at even deeper levels, up to 30 feet below the waterline.

While the yellow and black foot species are considered adults when they reach sizes of 1½ to 2 inches in diameter, the ko'ele often reaches 3 to 4 inches in size, Kay said.

The state Department of Land and Natural Resources rules prohibit the picking of opihi smaller than 1¼ inches across the shell at its longest point. But according to Kay's research, the law is neither observed nor enforced.

Pressure on existing opihi stocks on all islands is evident because the size of those harvested has been consistently dropping, Kay said. In some island markets, nearly half of the catch falls

The relative size of opihi compared with a dime.

Advertiser photos by David Yamada

below the state minimum size, she added.

According to turn-of-the-century records, about 150,000 pounds of opihi sold yearly in Honolulu fish markets at a price of 15 cents a pound. Currently, Kay said between 15,000 and 18,000 pounds are marketed in Hawaii annually at a price of upwards of $3 a pound.

The UH zoologist is currently completing her second state-funded study of opihi for the Department of Land and Natural Resources. In it, she concludes that the shellfish can be raised commercially.

"It's been done in a beaker. The next stage is to do it on a bigger scale," she said.

An opihi industry would probably reduce the number of fatalities in Hawaii but probably not eliminate them since many collect it as a form of recreation.

Not surprisingly, opihi pickers who have survived brushes with death say they were swept from the rocky hunting grounds by unexpectedly big waves. Others fell into the surf after losing their footing on slippery surfaces.

Unless they are able to get clear of the surf smashing against rocks or cliffs, they immediately run the risk of being crushed or knocked unconscious by the surging seawater.

One lucky survivor, Randy Silva, who was 20 when he was swept from rocks at Paauhau Landing on the Big Island two years ago, kept his cool and treaded water for an hour before being rescued by a helicopter.

All but one of the victims since the beginning of 1979 have been men. Their ages ranged from 20 to 84; a majority were in their 30s.

Based on the names of the dead and injured, most appeared to be island residents. Only one of the dead was identified as a Mainland tourist.

Nearly all the deaths and rescues occurred on the Neighbor Islands, particularly the Big Island. Oahu recorded only one death, probably because of the almost total elimination of opihi because of overfishing.

Similarly, eight of the non-opihi-related drownings occurred on the Big Island. Kay suggested that the high number of Big Island drownings is related to the large percentage of that island's residents who depend on fishing to supplement their diets.

from the sea

mike markrich

Bill Shinsato, left, captain of the 84-foot haole sampan Taihei Maru, has been fishing for bottom fish such as opakapaka in the the Leeward Hawaiian Islands since the 1930s. Shinsato is credited with being the first local fishing captain to use sonar to hunt bottom fish.

Off the Leeward Islands

from the sea

mike markrich

Bill Shinsato, left, captain of the 84-foot haole sampan Taihei Maru, has been fishing for bottom fish such as opakapaka in the the Leeward Hawaiian Islands since the 1930s. Shinsato is credited with being the first local fishing captain to use sonar to hunt bottom fish.

Off the Leeward Islands

Plenty of fish, but not

Fishing, says Capt. Bill Shinsato, is no way to make a living.

Shinsato should know. The captain of the 87-foot haole sampan (Japanese-style wooden fishing boat) Taihei Maru has been fishing in the Leeward Hawaiian Islands since the 1930s.

The Leeward Islands lie northwest of Kauai and stretch more than 1,300 miles. They are low-lying islands and atolls set in an area of turbulent seas where people like Shinsato make their living by dropping lines to depths ranging from 50 to 1,200 feet and fishing for species that bring high prices.

The crews of the five boats that regularly take the two-day journey north find themselves in a dilemma. Fish are plentiful in the Leewards but fuel prices are high. Boat owners know that, if they return to Honolulu with more than five tons of fish at a time, prices at the fish market will fall and they will lose money.

It is not a new problem. Fishing boats have been going up to the Leewards for a long time and Shinsato remembers that "before the war, boats would go up there by sail and come back with power. All they had was a square sail and could only go with the wind."

The bottom fish they sought were the opakapaka, ulus and onaga that they knew to be popular in Honolulu.

The technique in those days was simple. They would take soundings by dropping a 10- or 16-pound weight attached to a long line and record the depths on the line with rubber bands. Bottom fish are found at different depths so it is possible to fish for a particular species.

Once a decision was made as to what species they wanted, a makidog (pronounced mah-key-dog) was dropped over the side to attract the fish they wanted.

A makidog is an avocado-shaped bundle of fishing line, coiled leader (thin steel line that connects hooks to fishing line), baited hooks and lead weights wrapped in a piece of cloth. A pile of chum (small pieces of loose bait used to attract fish) is placed in the center. Fishing line is wrapped around the top of the bundle. A slip knot is then tied attaching the makidog to the fishing line.

The tight packing of the makidog permits it to fall quickly to the desired depths.

Once the makidog falls to the right place, the line is pulled. The knot releases, the bundle opens and the line falls straight down forming a vertical kaka line. (A kaka line is one with more than one hook.)

The loose bait or chum would attract fish and then the rest of the crew would drop their lines over the side, wait until they felt tension on the line, then bring up the long lines by hand. It was a tedious and sometimes painful process.

The boats would drift with as many lines over the side as the crew could handle without getting them tangled.

Today the fishing technique is similar, except that the makidog has largely been replaced by electronic fish finders and motorized winches are used to haul in the catch.

Shinsato is credited with being the first local fishing captain to use sonar to hunt bottom fish.

There has been an increase in demand for expensive bottom fish such as opakapaka in the past few years. According to Paul Bartram of the Western Pacific Fisheries Council, "it's become a restaurant fish and once they put it on their menu they are committed and have to pay the price. Before, it was just a traditional red fish."

Opakapaka is now the highest priced ($6.25 a pound to the fishermen as of Friday) fish in Honolulu and the bottom fishery is estimated to have a value of $1.1 million a year. That success has prompted many fisher-

men from here and the Mainland to try it, but not all of them are successful.

Wilfred Maeda of the Maeda Fish Market says: "It's not feasible for greenhorns. The guys from the Mainland try it but they get wiped out."

Skipper Charlie Yamamoto spends 10 months a year in the Leeward Islands aboard the Wicked Wahine, a modern 65-foot fiberglass boat equipped with electronic fish finders, motorized winches and special deep water anchoring gear.

As Yamamoto explains, "you have to target the species. White ulua and hapapu (sea bass) hold up a little longer so you get those first. Then you go back and get the other species and fill up the hold."

According to former state senator Wadsworth Yee, owner of the Wicked Wahine,

profits

Yamamoto must bring back a large enough percentage of high-priced fish to pay the $5,000 fuel cost of going to the Leewards and back.

Yamamoto says that the problem is marketing. "We have fixed costs and they (consumers) can't consume all the fresh fish and there is no processing plant, so if you bring in 20 tons of fish or five tons, it's the same payroll."

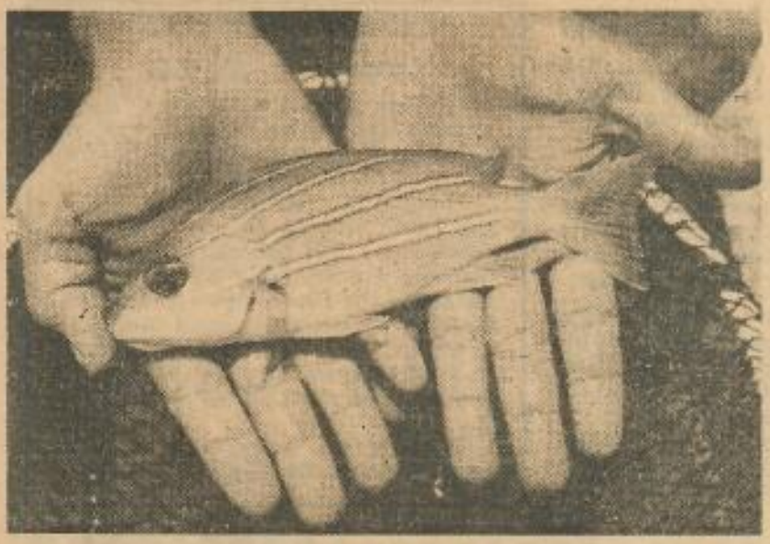
Yamamoto says that he needs to make at least $1 per pound on all of his fish to make money but he is rarely able to do so.

He would like to see greater government assistance for frozen fish marketing and research. He is also interested in the development of a fast-freezing processing technique that would permit bottom fishing boats to increase their catches.

Shinsato says the increase in competition in the Leewards has caused him to fish farther and farther north to Laysan and Lisianski.

It can be a long and dangerous journey. He has found himself fighting 50-foot waves and has even thought of giving up fishing. "But then I think, 'What are you going to do next?' . . .

"Fishing," Shinsato says, is "something you gotta like."



The Sunday Star-Bulletin & Advertiser
Honolulu,
October 24, 1982
section H
Prepared by the staff of
The Honolulu Advertiser

Taape are yellow with blue stripes and, when moving, look like flashes of gold.

Taape golden to some — but troublesome to others

from the sea

mike markrich

Nobody ever thought taape would be a problem when the first 12 fish were dropped into Hawaiian waters in 1955 as part of an effort to increase the number of game fish in the Islands.

The Tahitian import has adapted well to Hawaiian waters — so well in fact that local fishers and marine biologists fear that its success may be at the expense of fish native to Hawaii.

Ernest Steiner, a longtime Waimanalo fisherman, says that there is a "superabundance" of taape and that in some places such as the west coast of Molokai "the whole bottom is gold." The taape are yellow with blue stripes and when moving look like flashes of gold.

Steiner believes that the taape (pronounced ta-ah-pay) have been a big factor in the decline of good local fishing grounds.

"I think the opakapaka fishing has been spoiled due to that fish," he says. "They eat the young opakapaka and the eggs. Off Rabbit Island we used to have a good place; now the opakapaka is all but gone."

Dr. James Parrish of the Department of Zoology at the University of Hawaii has been doing extensive research on taape behavior. He does not think it is possible yet to tell exactly what fish they eat.

Parrish collects taape for study. He says that when he opens the stomachs he finds relatively few fish eggs but many tiny fish that he is usually unable to identify.

Although Parrish cannot draw conclusions yet, he notes that the taape diet is "seasonal" and is mainly fish and crabs. He says more fish are eaten by taape during the summer than during the rest of the year.

According to Bishop Museum biologist Jack Randall, the idea to introduce taape into Hawaiian waters was formulated by the late Vernon Brock, then director of fish and game.

"He noticed there was a lack of groupers and snappers. In most islands of the Pacific there are 10 or 15 species. They are prime food so the idea was to bring them in," Randall said.

One reason for choosing taape was that, being a small fish, it did not carry the risk of the ciguatera poisoning more common in the larger groupers. Randall opposed the introduction of taape "mainly because of its small size. I figured that if you were going to bring something in, you might as well bring in game fish or food fish. Taape was neither."

According to Randall, the first taape were introduced before he sent his research report. After the initial introduction of 12 taape in 1955, over 2,400 were brought in from the Marquesas in 1956 and 728 were brought in from Moorea in 1961.

Once introduced, they moved rapidly through the Islands. According to Parrish, "One month after they were introduced in Kaneohe Bay some were found off Kahe Point" on the Waianae Coast.

Taape can now be found throughout all the high or major islands and is beginning to make its presence felt in the Leeward Islands.

Biologists believe that the taape have been able to travel so far because their eggs are carried by the current and they do not have the same predators they face in their native Tahiti.

Divers such as Roger Nakasu report that the taape live and feed in the same kind of sandy bottom area that the kumu does. "Where we used to find kumu and weke it's all taape now. The fish don't come in there to spawn."

Nakasu, like many others, does not fish for taape because the price is too low and because he thinks the marketable fish of 8 inches in size or more can now only be found at depths of 90 to 100 feet.

Some think that taape has not been more popular because many people in Hawaii are accustomed to red fish such as menpachi and are reluctant to try the yellow taape.

But about $41,000 worth of taape was sold last year and the market share is thought to be growing. Scott Henderson, a Hilo-born fisherman who fishes specifically for taape, says, "I've eaten everything from hinalea to mahi mahi and I think taape has got to be one of the better fish in both flavor and texture."

Scott Henderson's Taape Recipe

2 pounds taape, butterflied
½ cube butter or margarine
2 tablespoons lemon juice
1 tablespoon shoyu
½ teaspoon of Worcestershire sauce
¼ teaspoon garlic salt
⅛ teaspoon powdered ginger

Gut the taape, remove the head, and butterfly. Mix the above ingredients in a pan, heat to a low boil for two minutes. Pour it over the fish and let it sit for 10 to 15 minutes. Then barbecue to taste.

Tuna Boat Crews Balk at Bid to Reduce Prices

1/8/1982

By TED VOLLMER, *Times Staff Writer*

SAN DIEGO—Unionized tuna boat crews, nervous about a growing glut of tuna on the world market, are refusing to man the nets in protest of an offer from two large canneries that would pay them less for their catch.

The crews also are seeking an end to a practice in which canners may turn away some tuna if they don't need it at the time.

Home for Largest

San Diego is the home base of the U.S. tuna fleet, the world's largest. Scores of small and large seiners have been idled in recent days as the canneries, represented by the American Tuna Sales Assn., huddle with boat owners to work out a settlement.

The U.S. fleet has been working without a price contract since May, although the canneries have agreed to continue paying the contract price of $1,200 per ton, which has been in effect since November, 1979, until a new agreement is reached.

The Fishermen's Union represents about half of the approximately 2,000 tuna fishermen working in San Diego.

On Tuesday, two of the four largest canneries, Van Camp and Pan Pacific, offered boat owners $1,140 per ton for yellowfin tuna, the most popular type—down $60 from the last contract. Their competitors, including Starkist, the nation's largest cannery, and Bumble Bee, the third largest, have not yet made their offer, and the work stoppage this week was seen, in part, as putting pressure on them to improve on the Van Camp-Pan Pacific price offer.

In their offer Van Camp and Pan Pacific further agreed to pay the current $1,200 per ton price, but only if the catches are brought in from the sea packed loosely to prevent smashing of the tuna and to facilitate freezing. That controversial proposal could mean a 10% drop in each catch and could, the American Tunaboat Assn. said, drive some smaller fishing operations out of business.

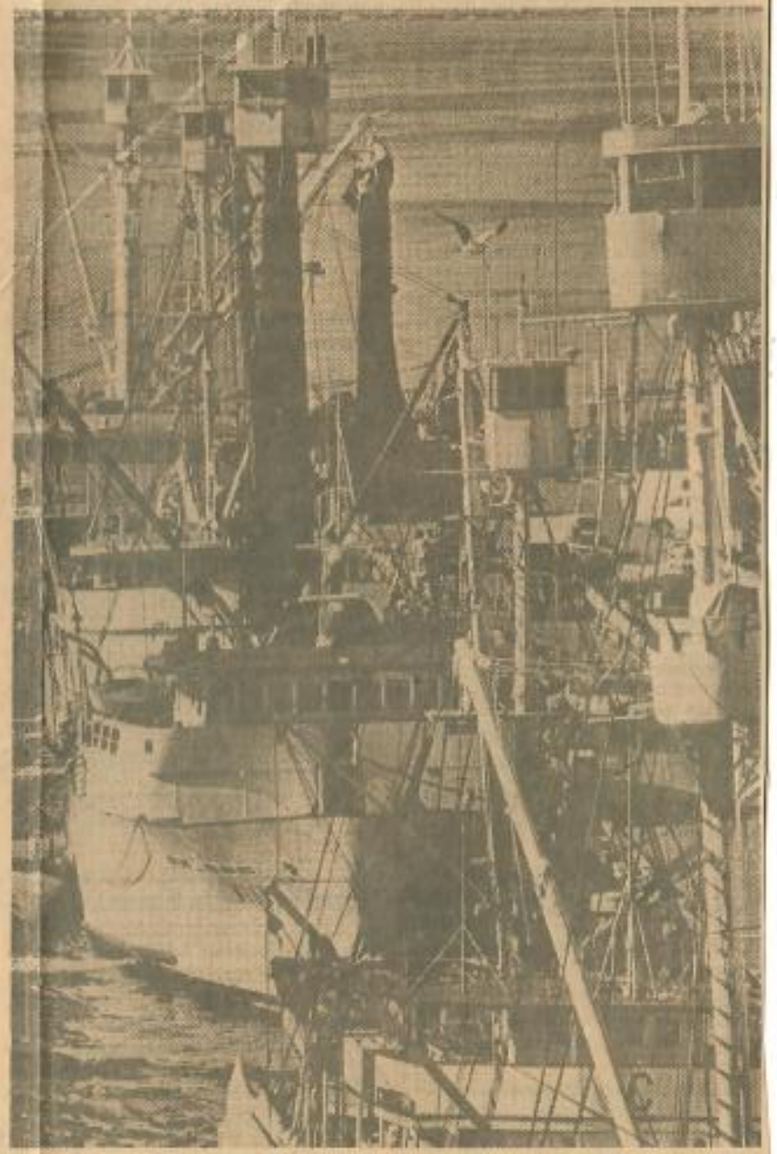
The boat owners already have been fighting low-bidding foreign competitors, as well as an increasing number of seizures by Mexico and other Latin American countries of U.S. boats that drop their nets within a disputed 200-mile territorial waters limit. The United States recognizes only a 12-mile limit.

Consumers Switching

While price negotiations were continuing Thursday, a small contingent of tuna boat owners went to Mexico City to plead with the Mexican government for restoration of 12-mile fishing licenses suspended Dec. 31 for 64 seiners.

Despite the tuna glut brought on in part by foreign competition, the retail price has not come down much and cost-conscious families have been switching to cheaper poultry and fish as a substitute.

Please see TUNA, Page 3



BARBARA MARTIN / Los Angeles Times

San Diego tuna fleet is docked because of a dispute with canneries.

TUNA: Glut on Market

Continued from First Page

In recent months, foreign competitors have threatened the domestic fleet by dumping their catches on the American canneries at sometimes half the price demanded by their U.S. counterparts. The explanation given most often is that while tuna is a popular seafood in this country, it has caught on in only a few foreign countries.

The oversupply has equally hit all four major canneries—Van Camp, Starkist, Bumble Bee and Pan Pacific (which sells under the C.H.B. brand)—and in recent months there has been little incentive by the firms to contract for catches or even pay the going rate.

Open Ticketing

The oversupply has led some boat owners to increase the practice known as "open ticketing" in which they go out to sea without a guaranteed purchase agreement with a cannery. Although most say it has not yet happened, canneries could turn away such boats if they don't need the tuna. Open ticketing was virtually unknown in the past 15 years until recent months and has increased due to the glut, owners say.

Working without a contract has led to growing concern by the fishing crews that all of their work could go for naught if too many expeditions return without any place to unload.

Independent boat owners who hire non-union crews have been willing to gamble on the canneries knowing their fishermen will be paid a flat fee regardless of their catches.

But the Fisherman's Union wages are tied directly to each haul—the unionized crew members receive a fixed share of each sale—and its leaders are arguing that it can ill afford to fish the ocean without some advance payment assurances.

Starkist officials could not be reached for comment Thursday, but there was industry speculation that the nation's largest tuna cannery may continue buying catches from "open ticket" boats for at least the time being.

One Bumble Bee official, who asked not be identified, said the company was "agonizing" over the developments and trying to analyze the effect of the Van Kamp-Pan Pacific offer before deciding whether to join the two companies' position.

Lobster an endangered

"From the Sea" by Mike Markrich debuts today as a regular feature of the Sunday Star-Bulletin & Advertiser.

"From the Sea" will look at commercial and sport fishing, as well as the issues and concerns of the policy makers, consumers, researchers and aquaculturists.

Markrich has gourmet tastes in fish, so as added spice to his column, he often will include a tempting way of preparing the particular fish he's writing about.

Markrich, 29, is a graduate of the University of Washington, and has a varied career background, ranging from television reporting and producing to fisheries research. He's done graduate work at the University of Hawaii in agricultural and resource economics, and served as a research assistant in aquaculture.

from the sea

mike markrich

The Hawaiian lobster population is being systematically overfished. So much so that if the state doesn't soon implement a lobster policy, Hawaii's lobster catch may be in serious danger — a food fish may become an endangered species in need of protection.

Changes in the lobster fishery have been dramatic. State fisheries statistics show that in 1900, the lobster catch around the main islands (primarily Oahu) was 131,000 pounds. By 1948 the annual catch was down to 48,000 pounds, and 20 years after that, a mere 5,000 pounds. Most of this commercial fishing is done with lobster nets or traps set from relatively small boats.

In the 1970s, a new lobster fishery was discovered in the Northwest Hawaiian Islands, and the fishery grew rapidly, reaching 80,000 pounds in 1978 and jumping to 300,000 pounds in 1980! This catch was worth $2 million to nine large modern commercial boats.

However, according to Craig McDonald, a University of Hawaii scientist, the amount of harvest is beyond what the environment can support.

During the last season, the catch from the Northwest Hawaiian Islands decreased and several boats have switched to other fisheries, such as shrimp. But if the lobster fishery were managed properly, it could yield in excess of $1 million a year, McDonald says. If the fishery continues to be largely unregulated, it can be expected that the lobster will be overfished until fewer and fewer boats make a profit.

With modern fishing techniques, overfishing that once took 20 years has now been accomplished in less than five.

Some of these modern boats

species? Could happen

are capable of setting up to 3,000 traps in a single night. The traps, which are attached at intervals along an anchor line, may be set up from a moving boat at speeds of up to three knots and recovered with hydraulic winches while moving at up to five knots.

Another problem involves "ghost fishing" — the loss of large numbers of traps on the lobster grounds. A single trap may detach from the string, or the whole string of traps may be lost as a storm washes away marker buoys. Lobsters enter these ghost traps and then die unharvested.

Although the state has encouraged fishermen to install "rot out" panels in their traps, the fishermen have resisted. These panels would rot and eventually allow the lobster to escape if the trap weren't recovered. It's not known how many lobsters die each year unharvested and unable to spawn because of ghost traps.

Off the main islands, the lobster problems are different, as most of the catch is by noncommercial fishermen. The state Fish and Game Division has no accurate estimate of the size of this harvest.

Although Hawaii law prohibits spearing lobsters, taking females bearing eggs or taking any lobster at all during the summer (June through August), it's common knowledge that these practices continue. Local fishermen often don't appreciate that these illegal fishing methods mean fewer lobster will be available in future years.

The enforcement branch of Fish and Game has been unable to deal with this problem because of limited staffing, funds and, according to some of the officers, unsympathetic judges.

McDonald has found that Hawaiian lobsters can live up to 40 years and are capable of reproduction at only about two years old. Unfortunately, they reach legal harvest size (3¼ inches at the carapace or where the tail begins) in about three years. In an intensely harvested lobster ground, very few adults are being left uncaught that are capable of spawning and replenishing the population.

It's possible that if there's no change in the state's policy toward lobster fishing and no action taken by fishermen to preserve the lobster grounds, the Hawaiian lobster catches may soon become a thing of the past for commercial fishermen, and the lobster available to the sport fishermen will continue to dwindle in both numbers and size.

On a lighter note, there's nothing quite like a lobster broiled over a barbecue to end a perfect summer day — except that it's illegal to catch lobster in the summer.

The best solution to this problem comes from a real pro lobster fisherman. In open season, if you catch an extra lobster, partially cook it in boiling salted water — about five minutes for a one-pounder, 10 minutes for a three-pounder. Remove the tail meat by clipping the shell top and bottom with kitchen shears. Wrap the meat in foil with a patty of real butter, wrap again in a plastic bag to avoid freezer burn.

Then when the summer taste for lobster is strong, take it from the freezer and cook it over hot charcoal until it's warmed through. Take it out of the foil, and let the coals give it that barbecued flavor — but just for a minute, no more. Serve with melted butter and garlic — ono — and legal, too.