OAHU 1980s

G.H. BALAZS FILE OF LETTERS AND ARTICLES

Huge chunk of Oahu broke off a million years ago

☐ Geologists track the path of large undersea landslides

By Rod Thompson
Big Island correspondent

HILO — Oahu used to be nearly twice as big as it is now before a massive earthquake broke off the windward side of the island and dumped it in the sea over a million years ago, scientists have discovered.

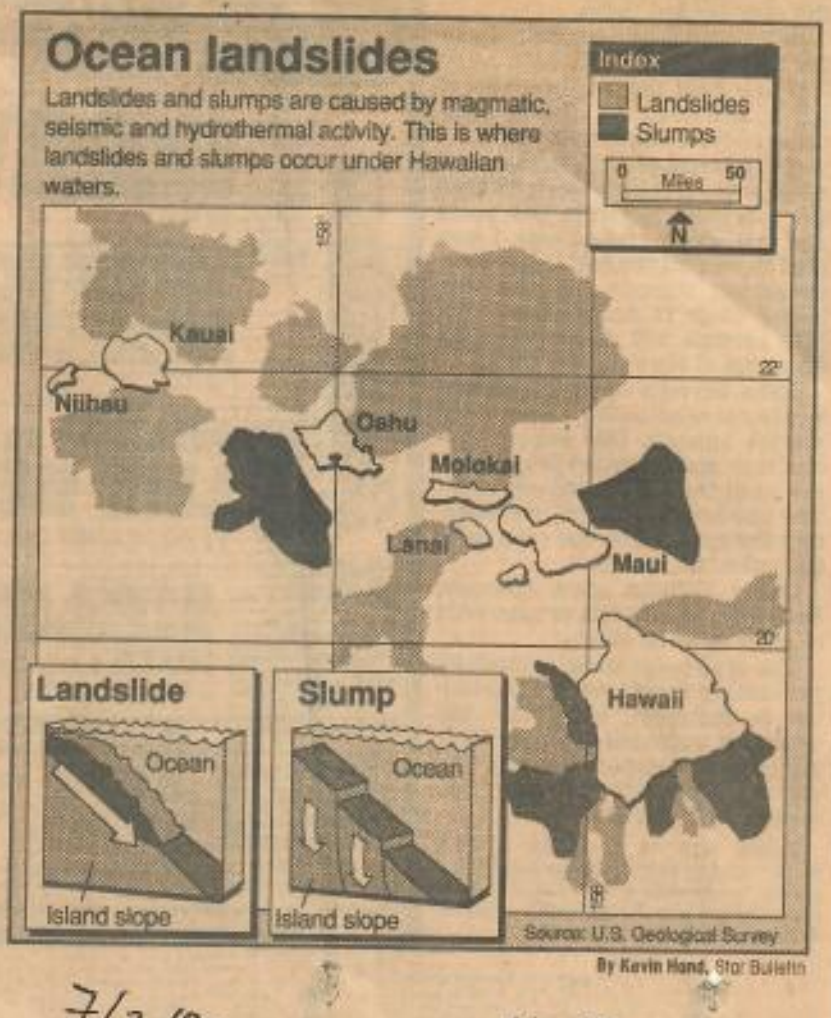
In fact, enormous pieces of all the Hawaiian Islands have broken off at least 17 times in its 5 million-year geologic history, scientists say.

The huge natural disasters produced undersea landslides that strewed thousands of cubic miles of rock over 40,000 square miles of sea floor — roughly six times the land area of the Hawaiian Islands.

These "prodigious submarine landslides," as scientists call them, were discovered in 1988 by a British survey ship carrying U.S. Geological Survey scientists and British oceanographers.

James Moore and five other scientists published their findings in the Dec. 10, 1989, edition of the

See **ROCK**, Page A-6



A1 7/2/90 HSB

ROCK: Many slides formed by volcanoes

Continued from Page A-1

Journal of Geophysical Research.

Using a special sonar, the scientists were able to map loose blocks of volcanic rock as much as 3 miles below sea level. Mapping the debris areas back to their source showed that the blocks had been gouged out of the islands.

The largest landslide, dubbed the "Nuuanu debris avalanche," extends 140 miles out to sea from Windward Oahu. In the middle of it, 60 miles northeast of Nuuanu Pali, is Tuscaloosa Seamount: 19 miles long, 11 miles wide and more than a mile thick.

This single rock, with a volume of 230 cubic miles, was once part of Oahu, Moore wrote.

These landslides occur during volcano building, Moore said. When magma rises from deep in the Earth into young, steep mountains, the mountainsides sometimes just fall into the sea.

When the piece of Oahu destined to become the Tuscaloosa Seamount broke free over a million years ago, it was just part of 1,200 cubic miles of Oahu that went with it, Moore wrote.

The mass of rock roared down the submarine slope three miles to the bottom of the trench that surrounds the islands. The new seamount got stuck there, but smaller pieces, some as big as a half-mile long, kept moving as far as 140 miles from Oahu, he said.

Hawaiian Volcano Observatory chief Tom Wright says most of the landslide discoveries by Moore and his colleagues must have happened in a single event.

"You couldn't get that far out (from Oahu), with a series of smaller events," he said.

A similar massive debris avalanche from the north shore of Molokai took place 1.4 million years ago, Moore estimated. The Nuuanu slide must be older than that because the Molokai debris rolled over the top of it, he said.

Moore suggested that massive landslides produce huge tsunamis. Seeking to explain wave-deposited gravel at 1,200 feet on Lanai, Moore and his brother George in 1984 said that a 1,000-foot-high tsunami could have carried it there.

Moore now believes the 105,000-year-old gravel was washed up by a wave from a debris avalanche originating near Milolii in South Kona. A huge undersea landslide there points directly at Lanai, scientists discovered.

Are these discoveries amazing but irrelevant to modern life, or are they cause for concern?

Geologist Wright says the huge landslides are too rare to worry about. "A quarter of a volcano sliding off is not something that can be responsibly projected as a hazard in a lifetime," Wright said.

But the slides come in medium and small sizes, too, and Wright thinks planners should take areas of demonstrated geological instability into account before approving new construction there.

He warned the state Land Use Commission recently and in September 1989 that 40 miles of the West Hawaii coast from Kealakekua to Kahuku is geologically unstable.

The commission was considering the proposed Hawaiian Riviera Resort at Kahuku. Wright warned of danger there from dozens of massive cracks, some 6 feet wide, 25 feet or more deep, and a quarter of a mile long.

He linked the 40-mile area, including the cracks, with five massive undersea landslides discovered by Moore and his colleagues off that coast.

The biggest of those features, running 55 miles from Kailua-Kona to South Point and extending 50 miles out to sea, was called the South Kona Slump.

Unlike the debris avalanches, which are fast-moving and affect only the surface of the islands, slumps are slow and jerky, and involve blocks of earth as much as six miles thick, Moore wrote.

Kealakekua, on the edge of this slump area, was the source of a major 6.8 magnitude earthquake in 1951. Volcano observatory geologist Reggie Okamura remembers feeling that quake in Hilo, on the other side of the island.

"I felt it strongly," he said. "I was on the third story of Hilo High School."

Wright said he thinks that kind of force, though far smaller than the energy released by the debris avalanches, could still cause serious problems with the giant cracks in the Riviera area.

Wright's comments at the Land Use Commission followed testimony by Riviera geologists, so those experts had no immediate opportunity to respond, says Riviera attorney Ben Tsukazaki. The hearings are expected to last many more months and Riviera geologists may be called back to respond later, he said.

Besides the West Hawaii slump, Moore linked a giant East Hawaii slump to major earthquakes in 1823, 1868, and 1975. The 1975 quake, with a 7.2 magnitude, dropped land as much as 11 feet for 40 miles along the Puna-Kau coast and moved it seaward as much as 26 feet, he said.

Two people died in that quake. The 1868 quake, estimated at magnitude 8, killed 31 people and 500 animals, according to the Atlas of Hawaii.

Hawaii Kai ferry proposal draws critics

THA

5-11-89 AP

By Stu Glauberman
Advertiser Government Bureau

East Oahu residents opposed to Hawaii Kai-to-downtown ferry service found fault with nearly every aspect of the state's plans at a City Council hearing yesterday.

Eight speakers charged that the state Department of Transportation was ignoring threats to the ocean environment and endangered marine species to begin a ferry service destined to fail.

"The people of East Honolulu have already said they do not want and will not use this ferry," said Lynn Fragas, who has lived in the area for 30 years.

Rocky Higgins, another longtime resident, said dredging a channel and beginning service would result in further "degradation" and "commercialization" of Maunalua Bay.

Civil engineer Edward G. Freeman, a 13-year resident, described as "ludicrous" the state's conclusion that the environmental impacts of dredging would be negligible.

Freeman said shoreline erosion already is a problem and if blasting is used, it will take another toll. "I believe the very first blast will eliminate our entire green turtle population," Freeman said.

But state Transportation Planning Director Edward Uchida said after the hearing that the state does not plan to do any blasting. It plans to remove "mostly sand" from the reef, he said. A new channel alignment and a reduced channel depth would lessen the effects.

Uchida said the ferry service would not begin in time to alleviate the effects of Kalanianaole Highway reconstruction later this year.

A San Diego company plans to begin the ferry service in October 1990 and it can succeed, he said. Uchida's office found 27 percent of those Hawaii Kai commuters it polled would be "very likely" or "somewhat likely" to use a ferry that cost $2.50 each way.

There will be no additional commercial activity at the terminal, he said. But ferries could disturb marine animals, he conceded.

The Council is considering an amendment to the East Honolulu development plan. If approved, a symbol for the ferry terminal would be added to the plan's public facilities map.

THE NATURE CONSERVANCY OF HAWAII

• 1116 SMITH STREET • SUITE 201 • HONOLULU, HAWAII • 96817 • (808) 537-4508 •

July 20, 1987

George H. Balazs
Zoologist
National Marine Fisheries Service
2570 Dole Street
Honolulu, Hawaii 96822-2396

Dear George:

Thanks for your list of sea turtle nesting sites. In our ongoing effort to refine priorties for acquisition, we have been attempting to improve our understanding of sites for turtles. As you know, Moomomi is our number one priority among all natural areas state-wide at this point. While acquisition negotiations for the Kalani Beach area at Moomomi are proceeding steadly, we hope we can find some way to include Kawaaloa Bay in the proposed preserve as well. You can be sure that I'll let you know if there is any way you can assist in that important effort.

Thanks again for the quick information.

Sincerely,

Alan Holt
Director of Science and Stewardship

Oahu file

from Gray Book log

Attach TO HOLT Letter

Maile Beach, Oahu

2/7/83

vest

NAVarez

OAHU FILE

U.S. DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
Southwest Fisheries Center Honolulu Laboratory
2570 Dole St. • Honolulu, Hawaii 96822-2396

July 16, 1987 F/SWC2:GHB

Mr. Alan Holt
The Nature Conservancy
1116 Smith Street, Suite 201
Honolulu, HI 96817

Dear Alan,

A few days ago one of your assistants telephoned me to ask about places in the main Hawaiian Islands where sea turtles are currently known to nest. I thought it would be best to respond by sending you the enclosed list. It was mentioned to me that the Nature Conservancy might eventually be able to purchase the land and/or management rights at such sites. The highest priority should, of course, go to the hawksbill turtle which is a critically endangered species in Hawaii. Our draft Hawaiian Sea Turtle Recovery Plan, now under preparation, emphasizes this important point.

I should mention that many of the sites listed for the green, olive ridley, and leatherback involve only a single case.

Please feel free to call me if I can be of further assistance.

Sincerely,

George H. Balazs
Zoologist

Enclosure

cc: WPPO
Recovery Team

List of sites in the main Hawaiian Islands where sea turtles are known to have nested in recent years.

Compiled by George H. Balazs
Southwest Fisheries Center Honolulu Laboratory
National Marine Fisheries Service, NOAA
2570 Dole Street
Honolulu, HI 96822-2396

July 15, 1987

Hawksbill (Eretmochelys imbricata)

Molokai
- Halawa

Hawaii
- Kawa
- Punaluu Bay and adjacent shoreline
- Kamehame Hill
- Halape
- Harry K. Brown Beach
- Orr's Beach

Oahu
- Malaekahana
- Kailua Beach

Green turtle (Chelonia mydas)

Molokai
- Moomomi (Kawaaioa)

Oahu
- Kahuku

Kauai
- Kipu Kai
- Kauapea Beach
- Mana (nest partially rescued from surf inundation)
- Wahane Beach, Koheo Point (nest destroyed by surf inundation)

Olive ridley (Lepidochelys olivacea)

Maui
- Paia (nest rescued from surf inundation)

Leatherback (Dermochelys coriacea)

Maui

Maalaea (tracks and excavations but no eggs or hatchlings documented)

Kauai

Sea cave near Princeville (based solely on verbal report)

Species unknown

Oahu

Kaneohe MCAS (tracks and excavations but no eggs or hatchlings documented)

Kauai

Lawai Kai (tracks and excavations but no eggs or hatchlings documented)

PHOTO BY GARY SCHNACKE

PHOTO BY GARY SCHNACKE

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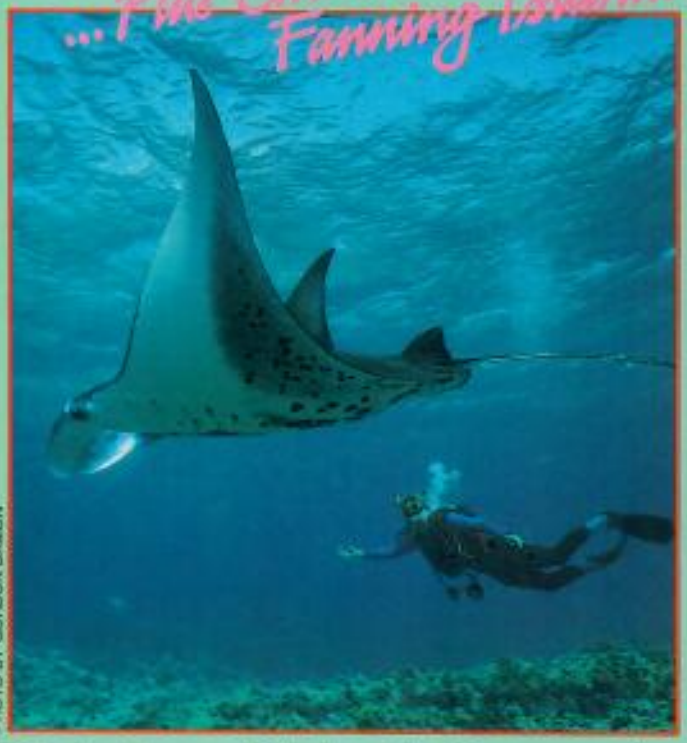

PHOTO BY GORDON DAMON

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PHOTO BY DOUG ALLEN

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"MACHIAS"'s dynamic and colorful history reads like a modern day sea roving adventure woven with intrigue and excitement through the countless islands and vast blue waters of the tropical Pacific.

Join us for some spectacular diving and funfilled days of real barefoot adventure.

PHOTO BY BILL NELSON

PHOTO BY GARY SCHNACKE

PHOTO BY GARY SCHNACKE

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ADVENTURE DIVING

PHOTO BY RODNEY BLING

THE VESSEL

The schooner *"MACHIAS"* is a U.S. Coast Guard certified ocean sailing vessel. She is a full-rigged staysail schooner of steel construction, 80 feet long, and diesel-powered. Her extensive list of equipment includes air-conditioning, SCUBA air compressors, freezer, refrigerator, Zodiacs with motors, and complete electronic, navigation and safety equipment. She exceeds U.S. Coast Guard safety regulations and is certified to carry 49 passengers. However, dive groups are limited to 22 people.

HISTORY

The schooner *"MACHIAS"* was built in 1962 in California and rebuilt (as new) in Honolulu during 1984. Since her arrival to Hawaii in 1966 she has traveled over 200,000 miles and carried about 40,000 passengers. She has visited places of enchanting beauty and weathered typhoons; she's made rescues at sea; she's done geophysical research sampling and photographing of the ocean's bottom and marine biological research on whales, sharks and coral reefs in remote corners of the Pacific with scientists from many nations.

PHOTO BY GORDON DAMON

There are no words or pictures to describe actual feelings during these experiences. To know the feeling one must experience it.

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Nights are usually spent at anchor in protected waters so divers may sleep more comfortably. Each bunk has a mattress and linen, a curtain for privacy, a light for reading, a fan, and a 110 volt outlet. To assure your comfort, sleeping areas are air-conditioned or may be naturally ventilated when preferred.

There are no private rooms. The vessel is arranged Pullman style.

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The schooner *"MACHIAS"* is a full-rigged staysail schooner and your voyage is planned to sail downwind through the islands to give you the most comfortable ride. An exhilarating experience in itself.

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SCUBA bottles, SCUBA

PHOTO BY GORDON DAMON

INSIDE SPREAD: PHOTO BY WARD GRAESSLE

PHOTO BY GARY SCHNACKE

air, food, sleeping accommodations with bedding, Zodiacs with motors, and of course, *"MACHIAS"* is fully equipped and ready for sea.

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2. Underwater light (if you night dive).
3. SCUBA certification card (required for SCUBA divers).
4. Clothes, toilet articles and personal medication.
5. Laundry bag.
6. Duffel bag (NO suitcases please).
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8. Towels.
9. Camera and plenty of film.

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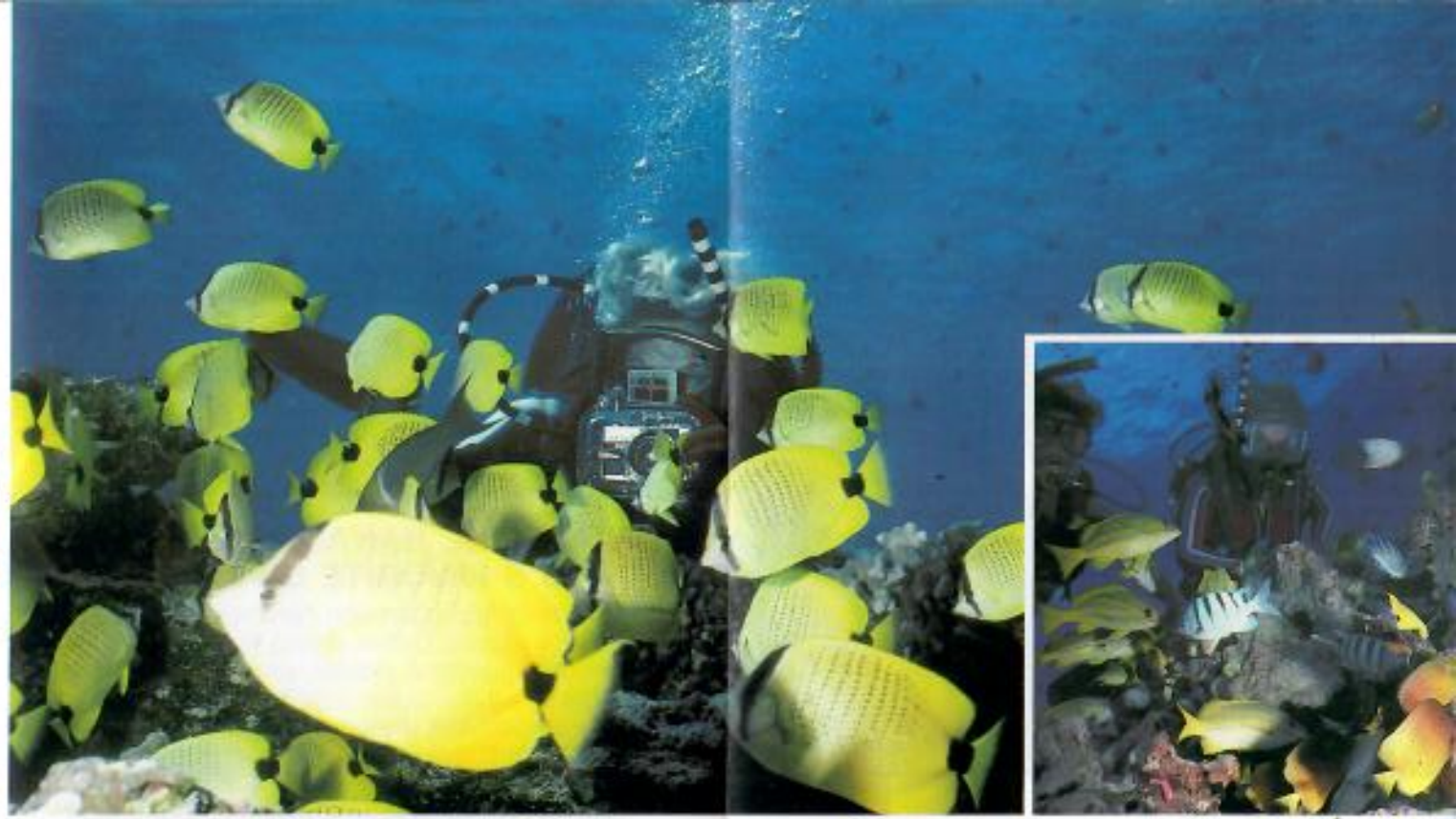

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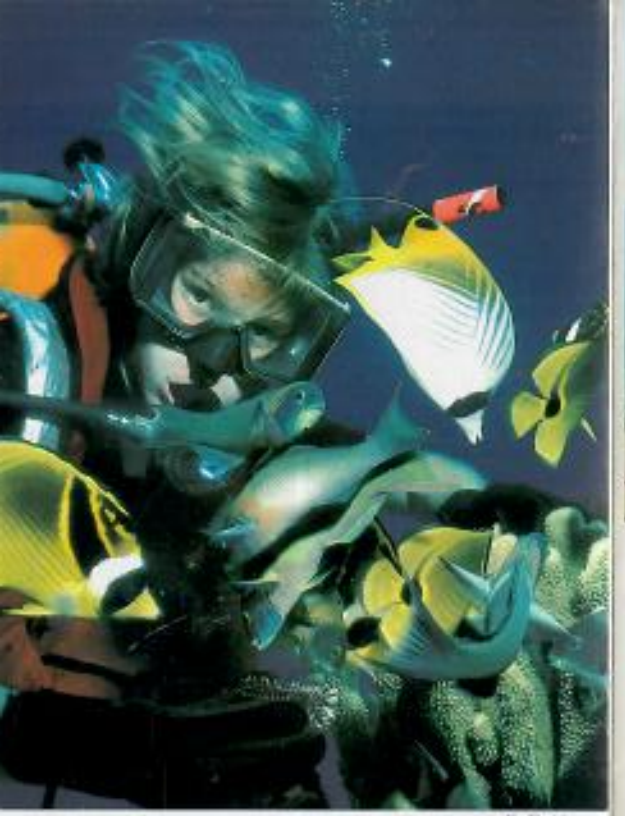

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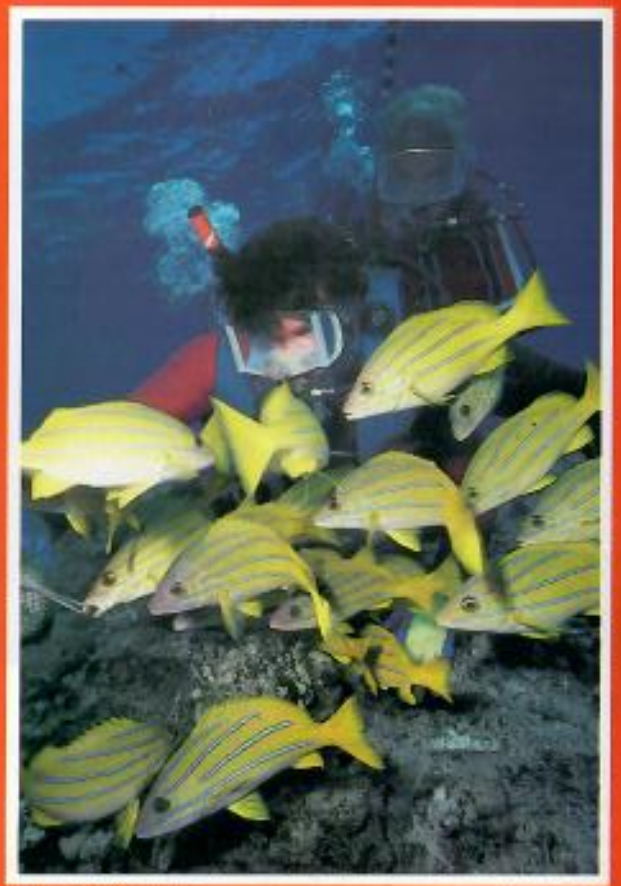

Hawaiian Watercolors — Ed Robinson

"DIVING IS FUN"
with JACKIE and her FRIENDS at

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"GATEWAY TO HANAUMA BAY"

Koko Marina • Hawaii Kai

Proposal designed to

By Gerald Kato
Advertiser Government Bureau

The City Council's decision last month to support Kuilima resort expansion has done little to quell the protest of those who believe it will open the door to unwanted and unnecessary growth on the North Shore.

A coalition of lessees at Kawela Bay and others argue that such a major resort will "ignited the fuse to generate continued development along the entire coastline of North Oahu, destroying forever the natural beauty, charm and rural character of the country."

The ongoing dispute underscores the problems in trying to reach consensus in planning the future of Oahu.

In fact, City Councilman George Akahane recently proposed a new planning idea aimed at defusing community-developer conflicts. Akahane recently circulated the proposal — called a "tri-party planning agreement" (see accompanying story) — seeking political and community support.

While the Akahane proposal is still in the talking stage, he says it could head off the kinds of conflict that surrounded the Kuilima project.

It was with the goal of heading off controversy that the developer, Kuilima Development Co., two years ago sponsored the formation of the North Shore Strategy Planning Committee, a group of community, business and political leaders, to join in planning the resort. Nonetheless, critics, under the banner of the Save Kawela Bay Association, say the company doesn't have solid community backing.

The City Council seemed comfortable enough with the situation to go along with the Kuilima project and include it on the development plan. The project proposes creation of a first-class resort to augment the existing 487-room Turtle Bay Hilton. The 20-year plan for the site includes construction of an additional 2,000 hotel rooms, 2,000 resort condominiums, two golf courses and a commercial center.

As part of an agreement with the city, the developer is supposed to provide two public beach parks and five rights-of-way with public parking to furnish access to all of the resort's beaches.

The association says picturesque Kawela Bay should be left alone and opened for public use, not for development which it predicts will be the catalyst for population growth in nearby rural communities and boost property taxes and rents beyond the reach of current residents.

And, the association adds, the hotels will be built close to the shore on one of the island's most vulnerable tsunami areas.

Norman Lum, Kuilima's project director, said recently that additional hotels on the North Shore will create the "critical mass" of activities necessary to support a major resort. Lum gave assurances that there would be complete public access to Kawela Bay and the beaches once the resort is completed.

Lum said the project will

The Key: legally

What is a Tri-Party Planning Agreement?

Akahane sees it as a series of legally binding promises in which government, land owners/developers and community groups agree beforehand on issues that often cause delay or changes to a development project:

- **The developer might promise to build more low- or moderate-income housing or construct schools, parks or other public facilities; to adhere to specific development timetables; or to comply with special design covenants of interest to an community.**
- **Government, through the City Council, might**

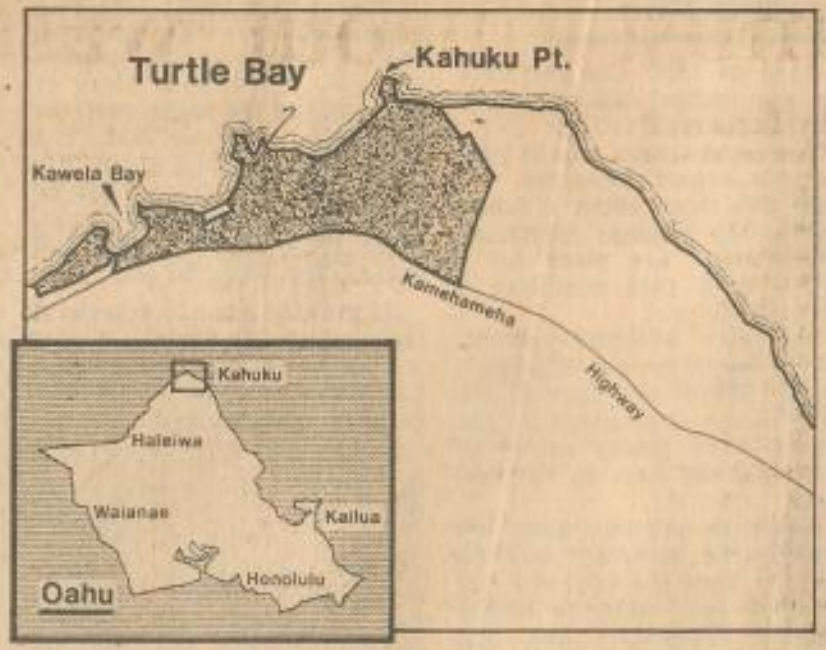
avert development squabbles

binding promises

promise, for instance, not to impose any requirement not in effect at the time of the agreement; to pay for certain public facilities such as roads or water; or to allow development "bonuses" such as increased density.

● Community groups, including Neighborhood Boards, could agree to provide "affirmative" support for the project; to promote it before government agencies and other interest groups; and to forgo demands for development changes.

Such agreements might be the key to developers and landowners getting certain development bonuses and/or concessions, Akahane said.

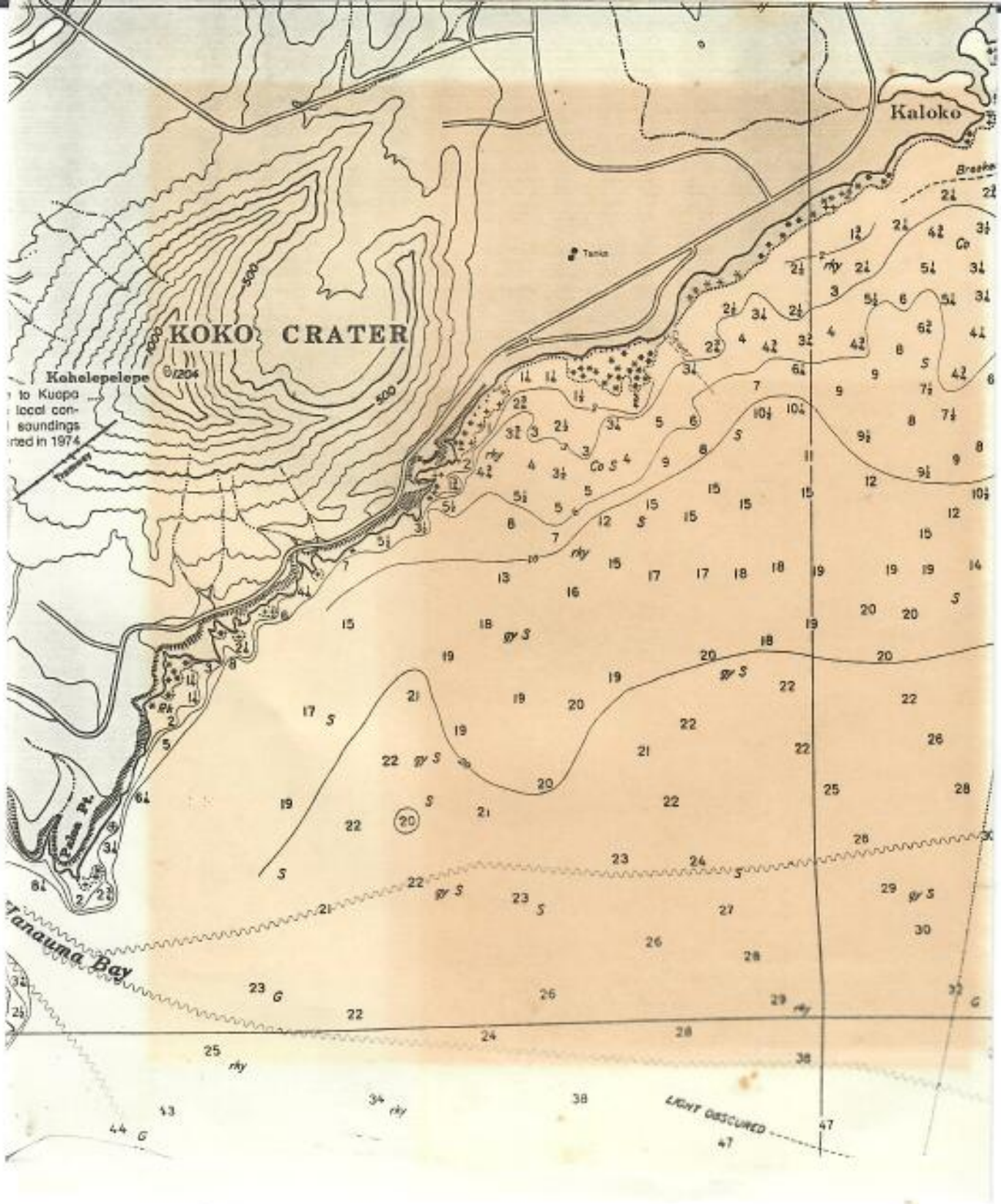


create jobs on the North Shore, which in recent years has suffered setbacks with the closing of Kahuku Plantation and problems at Waialua Plantation. Critics contend that there's no guarantee that local residents will get those jobs, but Lum said a North Shore Training Corp. is being formed to train residents so they'll qualify.

Obviously, there's a big difference of opinion. Even with the three-party mechanism he wants to set up, Akahane said there's no way of getting everyone to agree.

"I doubt very much if you can get 100 percent of the community," Akahane said. "What we're looking for is a representative group. It's for two reasons — showing there's some uniformity and showing that there's been some discussion and some agreement."

"Tri-party planning agreements advance the practice of community involvement in planning by making community organizations full partners in the formulation and development of projects," Akahane said.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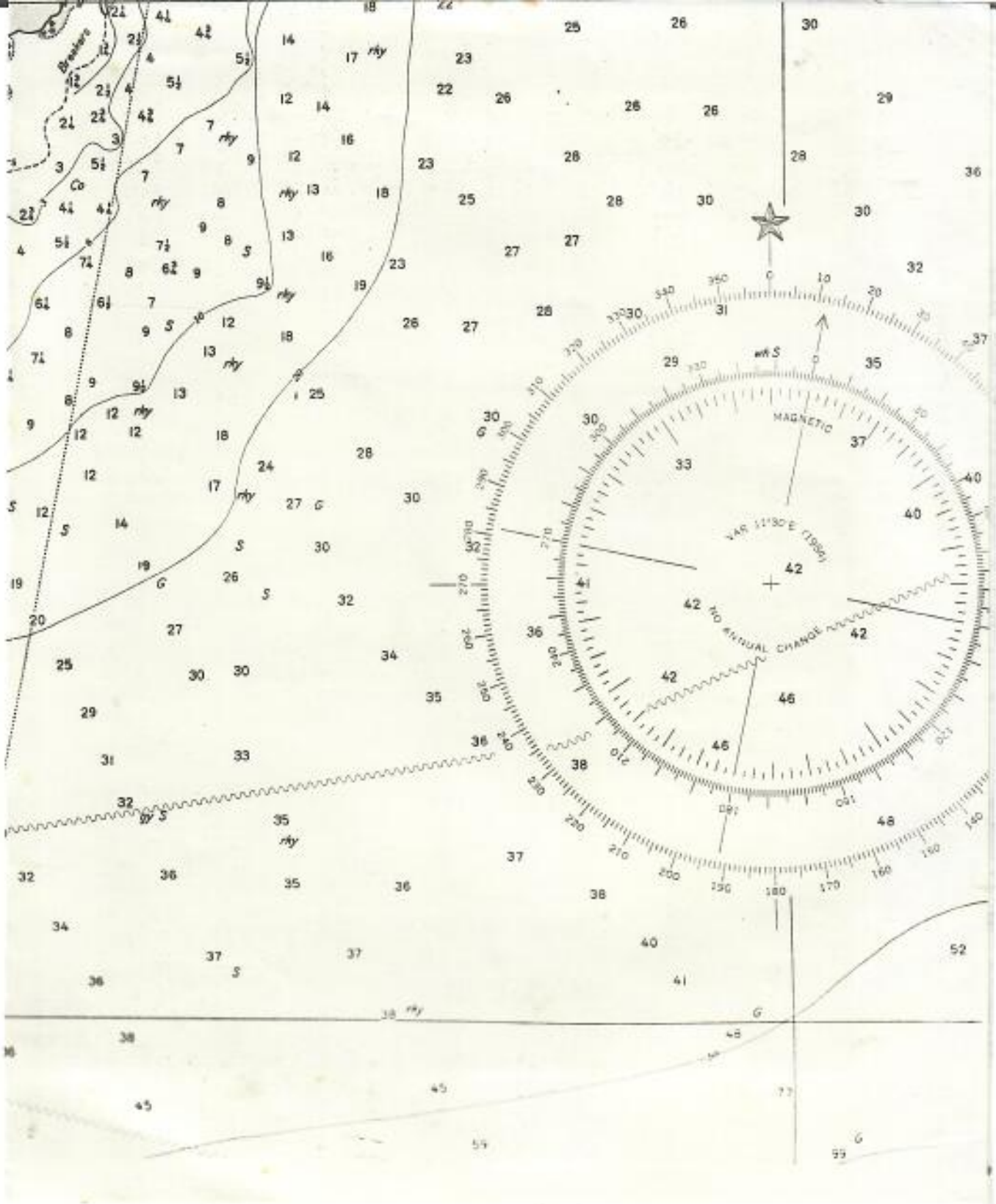
Kanauma Bay
LIGHT OBSCURED


MAGNETIC
VAR 11°30'E (1984)
NO ANNUAL CHANGE

741 N. Kalaheo Ave.
Kailua, HI 96734

July 15, 1984

Dear George:

Here are prints of the 4 pictures I took of the sea-turtle track at Kahuku May 12,'84.

These are prints made from my slides--you're welcome to keep the prints if you wish.

The actual location was on the beach opposite Jas.Campbell Refuge, about 40 meters or so toward Laie from the drainage ditch that runs to the sea near the west (toward Kuilima) edge of the Refuge grounds. Taken about 3 p.m.

I'm leaving tomorrow for a ten-day trip to the mainland--Vancouver, B.C. and Washington state. Hope all goes well with you.

Bob Pyle

5/26/84

SHE telephoned S.L.P. 5/20

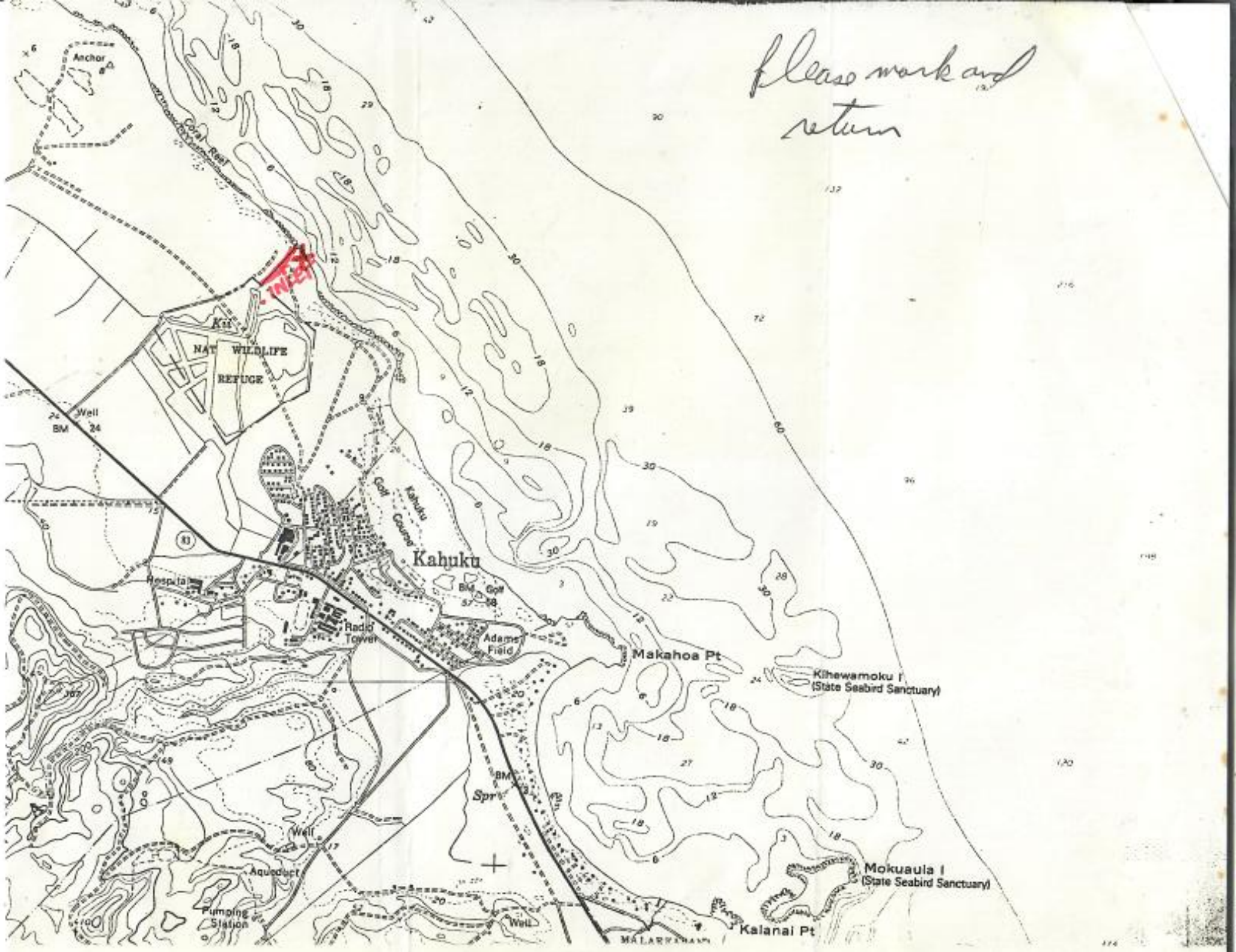
Evalyn G. Bartell
92-676 Mehani St.
Ewa Beach, Hawaii 96706

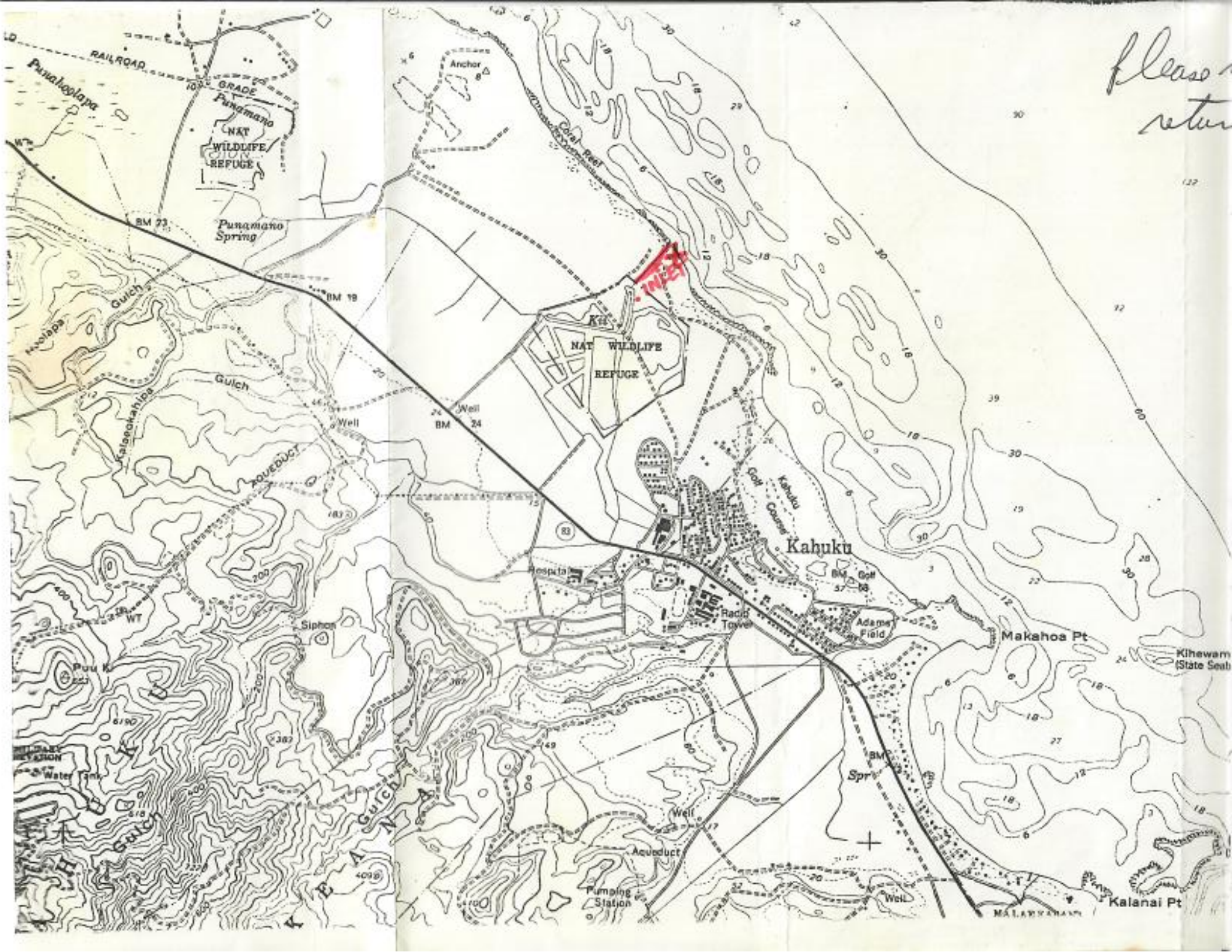
Dear George,

Thank you for all the interesting information on turtles. I enjoyed talking with you - it was great to talk with someone who knew what they were talking about and who cared.

I am going back to Laie tomorrow morning very early, sit quietly near the turtles spot and wait. Maybe she will come back to lay the rest of her eggs. I hope so that lucky. I will let you know if anything occurs.

Aloha,
Evy Bartell


please mark and return
Anchor
Coral Reef
INLET
Kii
NAT WILDLIFE REFUGE
Well
BM 24
Golf Course
Kahuku
Kahuku
Hospital
Radio Tower
Adams Field
Makahoa Pt
Kihewamoku I
(State Seabird Sanctuary)
BM
Spr
Well
Aqueduct
Pumping Station
Well
Kalanai Pt
Mokuaula I
(State Seabird Sanctuary)


RAILROAD
Punaluoloapa
GRADE
Punamano
NAT WILDLIFE REFUGE
BM 23
Punamano Spring
Coral Reef
Anchor
BM 19
Hoolapa Gulch
Kaloaokahipa Gulch
Well
BM 24
NAT WILDLIFE REFUGE
AQUEDUCT
Kahuku
Golf Course
Hospital
Radio Tower
Adams Field
Makahoa Pt
Siphon
Puu K
Water Tank
Gulch
Aqueduct
Pumping Station
Well
Kalanai Pt

BB EMBROIDERY
570 Auahi St., #36,
Honolulu, Hawaii 96813
(808) 538-1389

7/20/84

Dear George,

Enclosed is a "thanks you happy" for your interest and help with my turtle. I have learned a great deal from all the information you sent me.

It was interesting watching Bill dig up the turtle eggs. There are lots of nests and tracks in the same area. Maybe more then one turtle. Will keep watching and keep you posted.

Our company made this design for you - your shirt is one of a kind - hope it fits.

Thanks again and hope to talk with you soon.

Aloha,

Gay

No telephone book listing for this name

3/84

OAHU file

Geo.

Jack FARRANT 696-5133

Person who walks beach every day - lives at Makaha on the water. Been watching turtles last couple weeks. Turned over complaint to us last Thurs. re: fisherman who took a turtle in

their net. Dene and I met the boat coming in and searched it - not a turtle to be found ~~

Fisherman - Capt. Harris - Blue 27' Raddon, twin 200 hp. evenrudes says he tangles turtles often - fishes reef nets up Waianae Coast - uses Waianae boat harbor - 6 days a week.

BILL
STROETER

U.S. DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
Southwest Fisheries Center
Honolulu Laboratory
P. O. Box 3830
Honolulu, Hawaii 96812

NECROPSY REPORT 13 July 1984 F/SWC2:GHB

Specimen identification:	Chelonia mydas, green sea turtle
Carapace (upper shell) length:	76.7 cm (30 inches)
Source:	Confiscated by the State Division of Conservation and Resources Enforcement, 6/30/84; reportedly came from waters off Kaena Point, Oahu
Date and location of necropsy:	7/6/84 at the Waikiki Aquarium where it had been stored in a freezer since the morning of 7/1/84
Other participants:	Noah Pekelo and Mike Coelho, State Division of Conservation and Resources Enforcement; William Gilmartin, National Marine Fisheries Service

Findings:

The specimen showed almost no signs of decomposition internally or externally, indicating that it had died only several hours prior to freezing. Other than a small single puncture wound on the ventral surface of the neck, there were no other signs of external injury. The punctured area did not pass through any major blood vessels.

A thick internal layer of typical greenish fat was found to be present. The gastrointestinal tract was at least half full of food material (red and green benthic algae). These two findings suggest that the turtle had been actively feeding and was in a normal state of health.

Except for the lungs, all of the internal organs were judged to be healthy with no signs of disease, abnormality, or physical injury. The lungs alone showed massive rupture and hemorrhage. The cause could not be determined, but most likely resulted from some form of physical injury or trauma, rather than disease.

Photographs:	Two dorsal views taken prior to the necropsy.
Samples retained:	Right humerus, stomach contents, and depot fat; the excised carapace was retained for evidence by the State Divisin of Conservation and Resources Enforcement.

_____
George H. Balazs, Wildlife Biologist
Marine Mammals and Endangered Species Program

IN THE DISTRICT COURT OF THE FIRST CIRCUIT

WAHIAWA DIVISION

State of Hawaii

RUSH

RUSH

STATE OF HAWAII) _____ No _____

)

vs.) SUBPOENA

)

DANIEL JOSEPH KITE) C

)

)

)

)

)

SUBPOENA

THE STATE OF HAWAII:

To GEORGE H. BALAZS CITATION #11624LNR
WILDLIFE BIOLOGISTS
NATIONAL MARINE FISHERIES SERVICE
SOUTHWEST FISHERIES CENTER
HONOLULU LABORATORY
P.O. BOX 3830
HONOLULU, HI 96812
*BE PREPARED TO TESTIFY RE: NECROPSY OF
GREEN SEA TURTLE ON 7/6/84

----PERSONAL SERVICE----

YOU ARE HEREBY COMMANDED to appear in and before the District Court of the First Circuit,

929 CENTER ST., WAHIAWA, HI ON TUESDAY, OCTOBER 9, 1964

at 10:00 o'clock A. M., to testify on behalf of the STATE OF HAWAII in the above-entitled action.

Disobedience of this subpoena may be punished as CONTEMPT by this Court.

TO THE SHERIFF of the State of Hawaii or his Deputy, or any Police Officer in the State of Hawaii:

YOU ARE COMMANDED to subpoena the above-named and make due return of this subpoena, with your doings thereon.

Dated: Honolulu, Hawaii, 10/4/84

_____

Clerk of the above-entitled Court.

14-01-07
(11/83)

Giant Wave Hit Isles 100,000

SAN FRANCISCO (AP) — A skyscraper-high wall of water crashed into the Hawaiian Islands 100,000 years ago, stripping soil from ground 1,200 feet above sea level, says a study by the U.S. Geological Survey.

The 500-foot-tall wave probably was caused by a tremendous undersea landslide crashing from the Hawaiian submarine ridge to the seafloor below, USGS geologists and brothers George and James Moore said Monday at the American Geophysical Union's fall meeting.

"An uneven area of the seafloor about 25 miles south of Lanai ... may mark the remains of the submarine slide that caused the giant wave," the Moores said in a scientific paper. "The head of the slide had an area of about 3-by-15 miles, and the total volume of rock in the slide is more than 70 cubic miles.

"When the slide moved abruptly down into deeper water, perhaps triggered by a local earthquake, a temporary depression formed in the surface of the sea above the head of the slide," the Moores said. "Sea water then rushed in from surrounding areas to fill this void. The onrushing water gained enormous momentum ... and continued toward and up onto the islands."

The Moores said an undersea volcanic eruption or a meteorite smashing into the Pacific Ocean also could have caused the giant wave, though they favor the landslide explanation.

Whatever the cause of the gargantuan wave, "it has not happened since 100,000 years ago, so we feel it (another such wave) is not too much of a danger to people," George Moore said.

The wave probably was 500 feet tall at sea and 1,000 feet high when it broke on the south shore of Lanai, then the water sloshed so high it stripped soil from ground 1,200 feet above Lanai's beaches, Moore said.

He said the wave, which grew smaller as it traveled, sent water 800 feet up the south side of Kahoolawe, 260 feet up the northwest edge of Hawaii, 210 feet up the south side of Maui

Wednesday, December 5, 1984 Honolulu Star-Bulletin A-31

Years Ago, Report Says

and 180 feet up the southeast tip of Oahu.

Moore and his brother James, a former scientist in charge of the Hawaiian Volcano Observatory, emphasized the chance of such a wave occurring today is remote.

"A person spending a lifetime at the coast of Hawaii would have less than one chance in a thousand of being affected by such a high wave," the paper said. "Lower waves (triggered) from distant earthquakes pose a more frequent threat, but time is generally available with them to give ample warning for evacuation."

The brothers reached their conclusions about the wave after studying gravel deposits of lava boulders mixed with blocks of coral found on the slopes of Lanai, Oahu, Molokai, Maui and Hawaii.

They found the gravel represented a single geologic event. Geologists previously believed the gravels represented changing coral-rich shorelines as sea levels or island heights varied over time.

Geochemist Barney Szabo in Denver determined the age of the coral was about 100,000 years, providing the Moores with the date for the huge wave.

OEQC 4-23-85 OAHU FILE

REGISTER OF SHORELINE PROTECTION ACT DOCUMENTS

The projects listed in this section have been filed with County agencies pursuant to Chapter 205A, HRS as amended, relating to the Special Management Area of each county. For additional information, please call the pertinent county agency:

Hawaii Planning Dept. 961-8288;
Hnl. Dept. of Land Utilization 523-4077;
Kauai Planning Dept. 245-3919;
Maui Planning Dept. 244-7735.

REVISED ENVIRONMENTAL IMPACT STATEMENT (EIS) FOR THE VENTURE VEHICLES PROJECT WITHIN THE SPECIAL MANAGEMENT AREA AT KAHUKU, OAHU, Venture Vehicles/City and County of Honolulu Dept. of Land Utilization

Revised Environmental Impact Statement

The applicant proposes to establish an outdoor recreational facility centered around the rental of Off-Road Vehicles (ORVs) at Kahuku, Oahu, TMK: 5-6-3:10. Consideration has been given to including controlled camping on the site, although no formal plans for this activity have been developed. Use of the site for controlled camping would not be compatible with present or proposed ORV operations, and would therefore require substantial alteration in the project design as presented in this Revised EIS. The project site consists of dunelands extending from limestone outcrops at the shore to the generally flat terrain of the old Kahuku Airfield. South of the old runway and taxi strips is an area of ironwoods within which would be located the proposed improvements. Alterations and construction within the dunelands would be limited to such measures as required to prevent access by ORV's to Conservation District lands and sensitive dune areas. Improvements proposed for the site include a ticket office (360 sq ft), pavilion and restrooms (3,500 sq ft), security cabin (500 sq ft), maintenance facility (800 sq ft), and petrol storage area. The site can be reached by a private, paved roadway. An existing parking area can accommodate up to 30 vehicles. Cost of improvements, including utilities, is estimated to be approx. $200,000. Utilities such as water and electricity are presently available to the site. Water comes from an on-site well. Sanitary sewers are not available so sewage would have to be handled by an on-site system. Much of the property (except the mauka panhandle and the coastal dunes) would be devoted to use by All-Terrain or Off-Road Vehicles, rented on an hourly basis for outdoor recreation. The All-Terrain vehicles have three wheels, 8 1/2 horsepower engines and weigh less than 300 pounds. The vehicles are governed to operated at low speed (max. 15 mph). Venture Vehicles presently has 20 ORVs. The total number of vehicles proposed is 30. The facility would remain open from 9 am to 6 pm, 7 days a week. The present overall average use rate is estimated to be between 4 and 7 ORVs per hour (based on an average of 270 hours per month operating time), with the lower value most typical of wet months, and the higher value typical of the summer period. The clientele is estimated to be 50% Oahu residents and 50% visitors. Access by Venture Vehicles ORVs to Conservation District dunelands and the shoreline would be prevented by barriers constructed for this purpose. A system of barriers presently exists to establish the ORV operating area. These barriers include high mounds of soil along the property line where these cross the open runway areas, and a cable strung along the makai boundary to prevent ORVs from entering the Conservation District. Improvements are planned for the latter barrier. No use of public funds or lands are involved in the proposed action. The land is presently being used as described, although the various improvements (excepting barriers to limit access to and from the designated ORV area, and the ticket sales office) proposed have

OAHU DIVE OPERATORS

Aaron's Dive Shop
39 Maluniu Ave.
Kailua, HI 96734
(808) 261-1211

Aloha Dive Shop—Koko Marina †
Hawaii-Kai, Honolulu, HI 96825
(808) 395-8882

American Dive Hawaii
404 Piikoi, #105
Honolulu, HI 96814
(808) 239-5733

Bojac Aquatics Center
94-801 Farrington Hwy.
Waipahu, HI 96797-3193
(808) 671-0311

Dan's Dive Shop, Inc.
1382 Makaloa St.
Honolulu, HI 96814
(808) 536-6181

Down Under Divers
94-839 Farrington Hwy.
Waipahu, HI 96797
(808) 676-0880

Hawaiian Divers
2344 Kamehameha Hwy.
Honolulu, HI 96819
(808) 845-6644

Hawaiian Sea Adventures
98-316 Kam Hwy.
Aiea, HI 96701
(808) 487-7515

Leeward Dive Center †
85-979 Farrington Hwy.
Waianea, HI 96792
(808) 696-3414

Oahu School of Diving & Pro Shop
95 S. Kam Hwy.
Wahiawa, HI 96786
(808) 622-2283

Ocean Adventures, Inc.
98-406 Kam Hwy.
Pearl City, HI 96782
(808) 487-9060

Ocean Charter Services, Inc. †
P.O. Box 1585
Kaneohe, HI 96744
(800) 367-5696

Pacific Quest Divers †
46-216 Kahuhipa St.
Kaneohe, HI 96744
(808) 235-3877

Rainbow Divers
1652 Wilkina Dr.
Wahiawa, HI 96786
(808) 622-4532

South Seas Aquatics †
1050 Ala Moana Blvd.
Honolulu, HI 96814
(808) 538-3854

Steve's Diving Adventure †
1860 Ala Moana Blvd.
Honolulu, HI 96815
(808) 947-8900

The Scuba Shop
20 Sand Island Rd.
Honolulu, HI 96819
(808) 845-4561

Waikiki Diving, Inc./
Waikiki Diving, School
420 Nahua St.
Honolulu, HI 96815
(808) 922-7188

†—Member, Destination Hawaii

...des room, course instruction and ...iving and ground transportation.

Brad takes three to six divers on a 16 foot Zodiac to sites off the Waianae coast. Diver pick-up is available at nearby hotels. At this writing, Ocean Adventures is planning to add diver propulsion units to the shop's services.

PACIFIC QUEST DIVERS, owned by Zane Bilgrav and Richard Whittington, is in Kaneohe. Their 25 foot, canopied Radon, *Argonaut II*, takes two to eight divers. Because they trailer their boat, they can launch at Waianae and several other locations around the island. This gives them a large selection of sites. During the summers, for example, they dive the north shore.

Pacific Quest has a hotel package with the Turtle Bay Hilton (formerly the Kui Lima Hyatt) and a special Oahu/Maui package with Lahaina Divers. As Pacific Quest, Inc., they package outdoor adventure trips, such as hiking, camping and sailing in the Hawaiian Islands.

SOUTH SEAS AQUATICS is the oldest dive shop on Oahu. On Ala Moana Boulevard, it is well stocked and has the largest boat on Oahu. Owner Ken Taylor's 38 foot Delta, *South Seas II*, is a Coast Guard certified vessel approved for 26, but Ken limits trips to 18 divers unless a special group charter requests more. *South Seas II* has a freshwater shower, flush head, two boarding ladders and a 12 foot swim step for easy entry and exit. Snacks and beverages are included on the trip.

South Seas Aquatics has packages with five hotels including Maili Cove Condominiums. Groups should write for details about Ken's room/dive/land transportation package. Group packages are commissionable to the organizer.

For individual or family outings, South Seas Aquatics has leased Beach Comber Island. They can take you there on a catamaran with lunch and snorkeling or beginning scuba lesson.

STEVE'S DIVING ADVENTURES is on Ala Moana Blvd. in Waikiki. Owned by Steve Holmes and managed by Pogi Holmes, Steve's takes two to six divers each on its 17 and 28 foot boats. These are at Waikiki, so trips to nearby sites are short. Guided shore dives are available to Magic Island, Lanai Look Out and Hanauma Bay. There is a full sized bus to take snorklers to Hanauma Bay.

OAHU'S DIVE SITES

During most of the year, diving is best on the leeward (south) side of the island, from Kaena Point down to Hanauma Bay. And, when occasional storms or swells hit the south shore, the seas at the north shore flatten out and allow access to this rugged area.

Airplane Wreck is an intact 14 passenger DeHaviland that was deliberately sunk off Nanakuli by Ken Taylor of South Sea Aquatics to form an interesting dive site. Recently, Ken moved this twin engine aircraft closer to a reef to add variety to the site.

Big Eel Reef is a long reef, 50 to 60 feet deep, in Maunalua Bay. It is loaded with fish and large eels including a six foot snowflake moray.

Hanauma Bay is a marine preserve at the southeast point of Oahu. It is one of the most beautiful and popular beaches in the islands. The walk down to the beach is steep, but there is a shuttle service. A shallow, barrier reef protects the beach and swimmers from heavy seas. When the tide is high, beautiful parrotfish swarm in to feed on the algae.

Jackie's Mountain is a pinnacle with ledges at 50, 85 and 110 feet. The main pinnacle rises to within a few feet of the surface and is pierced with tunnels and surrounded with fish. From below, the site looks like a miniature mountain range with peaks surrounded by foamy clouds. Outside of protective Hanauma Bay, Jackie's Mountain is best dived on calm days.

Turtle Canyon is a special dive in Maunalua Bay. It has a series of canyons, 30 to 40 feet deep, where you can see turtles free swimming and resting under ledges. In late afternoon, when the turtles return from their feeding areas, it looks

like Turtle International Airport as they glide down over the tops of canyons.

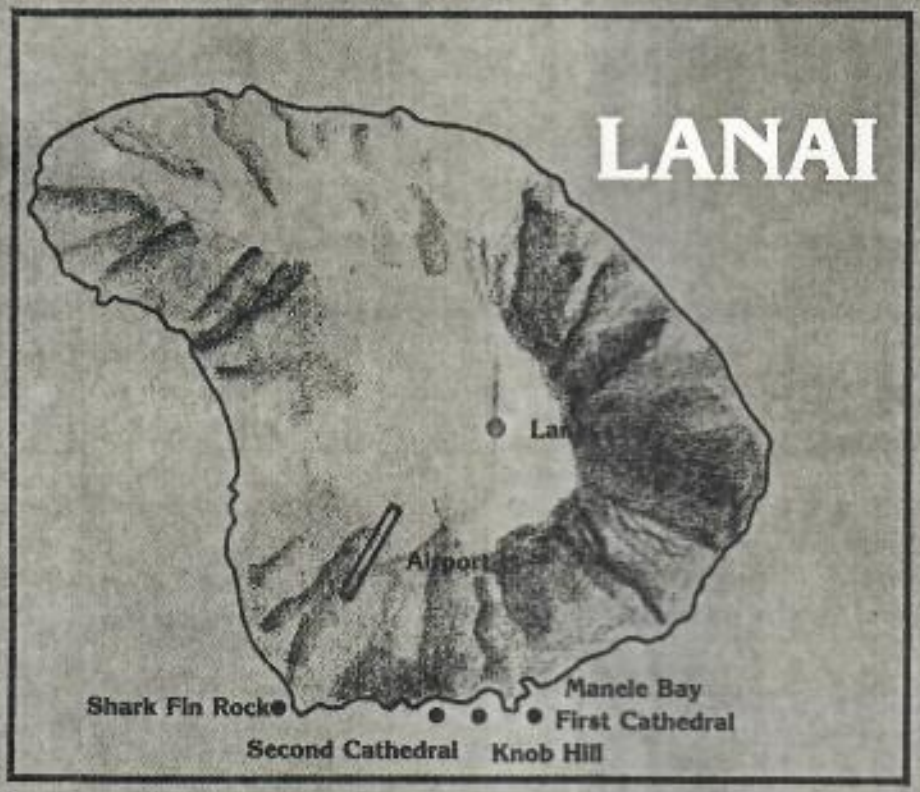
Magic Island (also called Rainbow Reef) is in front of Waikiki. This shallow site accessible from shore or boat, is an easy spot for introductory dives. The main attractions are the many different species of fish—including surgeons, butterflies, triggers, spotted green puffers, bird and saddle wrasses—that can be hand fed.

The ***Mahi*** is a 165 foot minesweeper deliberately sunk by Ken Taylor of South Sea Aquatics and several other dive operators to form a dive site. Resting upright in 90 feet of water south of Waianae, this intact ship is an exciting dive for exploration or U/W photography.

Makaha Caves is a huge dive site in 10 to 30 feet of water. The entire area is honeycombed with lava tube caves, grottos, archways and ledges. Because of occasional heavy seas, this site doesn't have much fragile sea life.

Twin Holes consists of two vertical lava tubes at the center of a V-shaped wall. The wall and tubes drop from 40 to 90 feet. You can enter the tubes at their tops or from openings at their bottoms.

Keiau Ledge drops from 30 to 70 feet. In one cavern, sunlight streams through more than six different openings to create a cathedral effect. Schools of squirrelfish hide in the shadows.



LANAI

They approached, then split, swimming around, over and under us. Cathy raised her Nikonos and 15 mm lens and panned one passing cluster after another. The lens was too wide for her playful subjects and they were just a few feet too far away. But later—as she examined the film, still wet from processing—she counted them. There were 47 dolphins in one picture alone. Although the photos lack the contrast needed for magazine reproduction, they are bright enough to remind us over and over of the joy of seeing hundreds of dolphins in the water off Lanai.

Lanai is a small island owned almost exclusively by the Dole company. It has over 15,000 acres of fields, with row after row of pineapple plants in perfect lines. The remaining 75,000 acres of the island are open space.

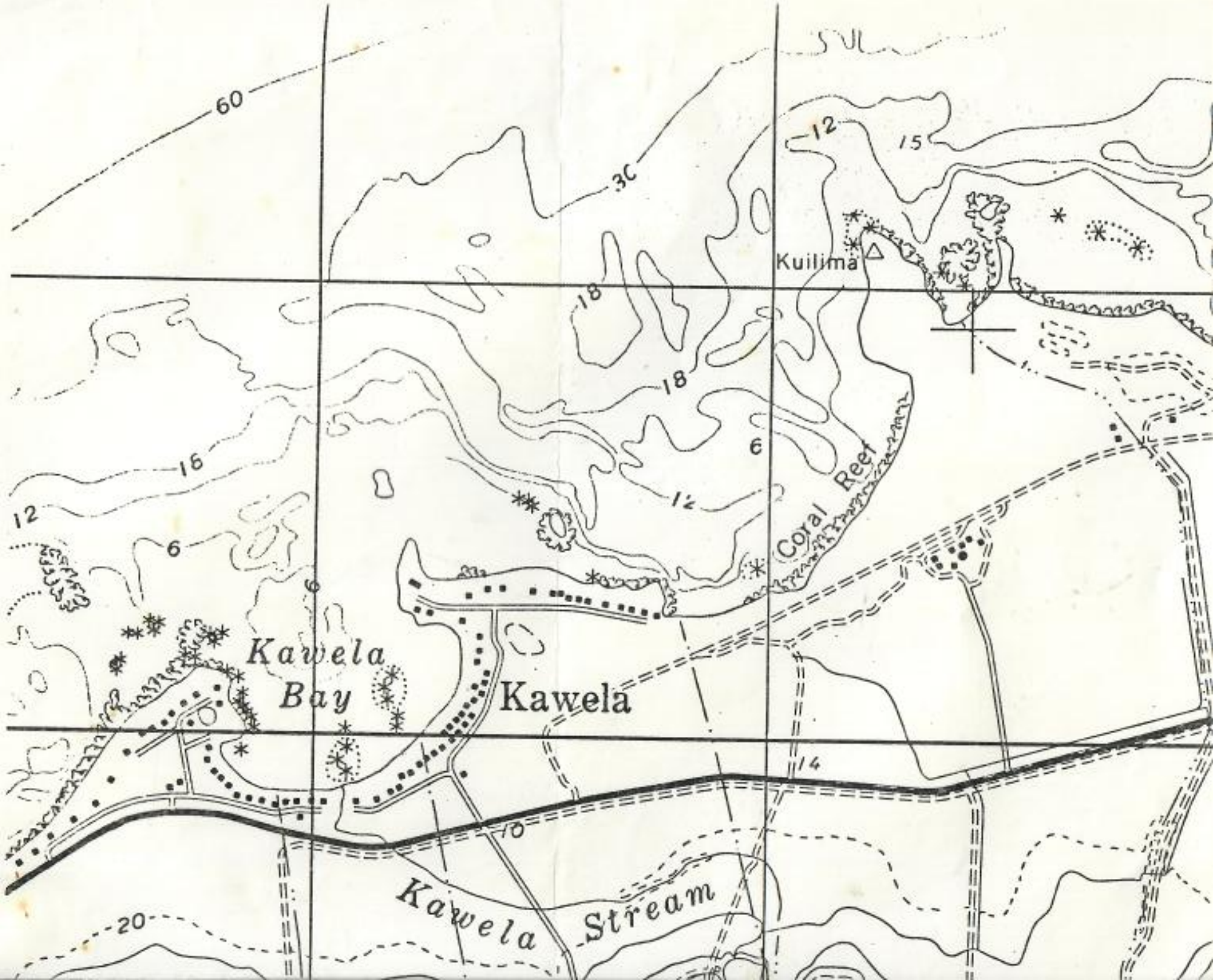
Lanai, a popular dive destination for Maui dive operators, will soon have (at this writing) its own dive operation. The ten room Lanai Hotel, operated by Ocean Activities Center and managed by Beth and Byrd Gleason, is now in business. It is in Lanai City, a company town 1,600 feet above sea level where the air is cool. The hotel, surrounded by tall Norfolk Pines, is reminiscent of a New England hunting lodge. Don't let the simple appearance of the dining room fool you—Beth's cooking is excellent.

Lanai is strictly rural and low-key.

LANAI DIVE OPERATORS

Ocean Activities Center †
Hotel Lanai
P.O. Box A-119
Lanai City, HI 96763
(808) 879-4485

†—Member, Destination Hawaii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Coral Reef
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Kawela Stream
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☆U.S. G.P.O. 1981-765-012/1151 REG.#6

FORM CD-14 (2-76) Prescr. by DAO 214-2 — U.S. DEPT. OF COMM. — TRANSMITTAL SLIP	DATE: 9/6/05
TO: George Balazs	REF. NO. OR ROOM, BLDG. HL
FROM: John Naught	REF. NO. OR ROOM, BLDG. WPPO

ACTION

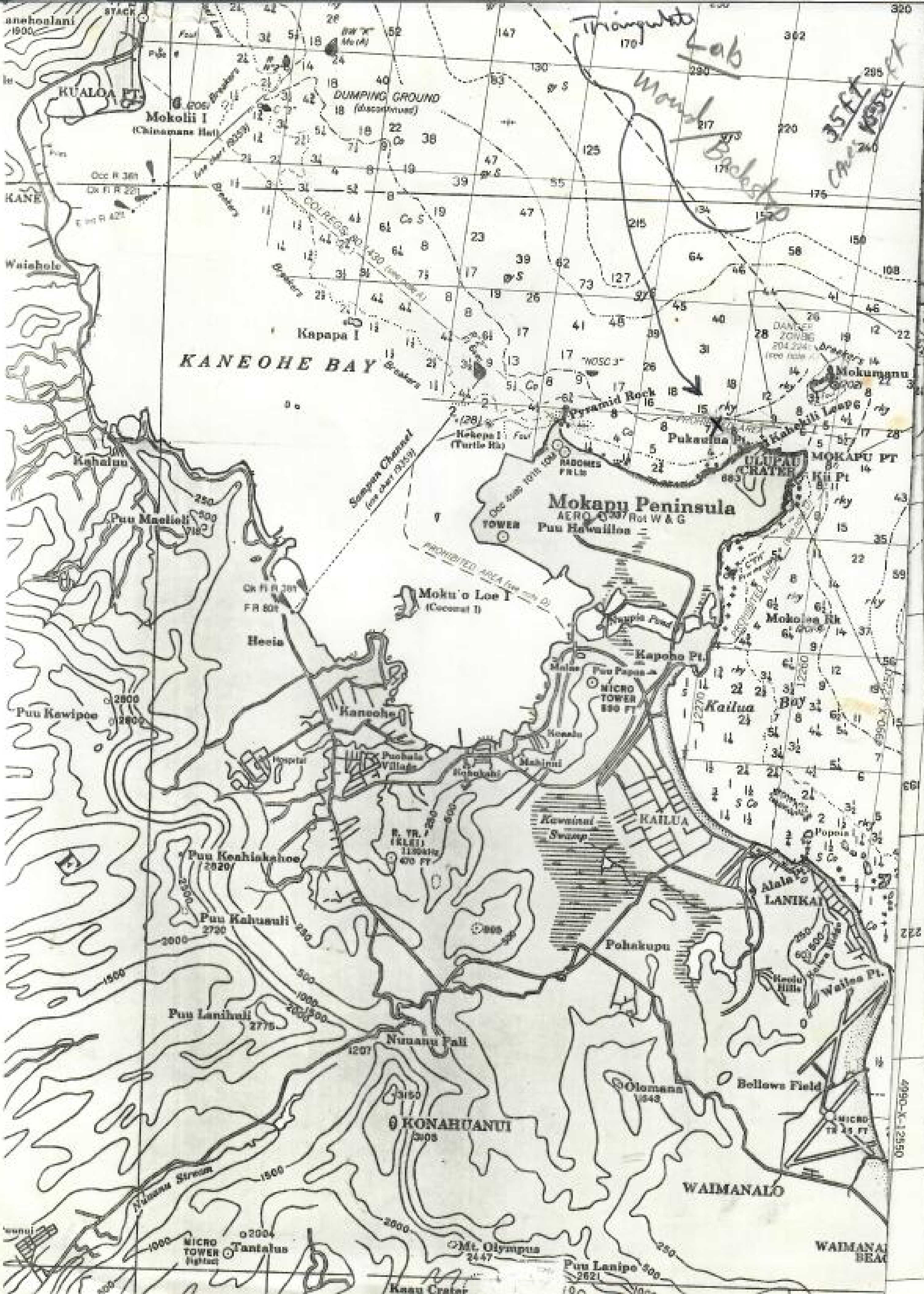
☐ NOTE AND FILE	☐ PER OUR CONVERSATION
☐ NOTE AND RETURN TO ME	☐ PER YOUR REQUEST
☐ RETURN WITH MORE DETAILS	☐ FOR YOUR APPROVAL
☐ NOTE AND SEE ME ABOUT THIS	☑ FOR YOUR INFORMATION
☐ PLEASE ANSWER	☐ FOR YOUR COMMENTS
☐ PREPARE REPLY FOR MY SIGNATURE	☐ SIGNATURE
☐ TAKE APPROPRIATE ACTION	☐ INVESTIGATE AND REPORT

COMMENTS:

George:
Attached is rough position of "turtle caves" off KMCAS. I can get more detailed position if we/you want to check it out.
John

O'AHU

Nickname: "The Gathering Place"
Land Area: 592.7 square miles
44 miles long; 30 miles wide
Third largest island in the Hawaiian chain
Mayor: Eileen R. Anderson
Population: 762, 534 (Dept. of Planning/ Economic Development, Oct., 1982)



KUALOA PT.
Mokolii I
(Chinamans Hat)
DUMPING GROUND
(discontinued)
COLREGS
Breakers
Waiahole
Kapapa I
KANEOHE BAY
Kekepa I
(Turtle Rk)
Sampan Channel
Pyramid Rock
Pukaulua Pt.
Mokumanu
ULUPAU CRATER
MOKAPU PT
Kii Pt
Mokapu Peninsula
Puu Hawaiiloa
TOWER
PROHIBITED AREA
Moku o Loe I
(Coconut I)
Kahaluu
Puu Maelieli
Heeia
Kaneohe
Hospital
Puohala Village
Kapoho Pt.
MICRO TOWER
Kailua
Bay
Mokolea Rk
KAILUA
Kawainui Swamp
Puu Kawipoo
Puu Keahiakahoe
Puu Kahuauli
Puu Lanihuli
Nuuanu Pali
Pohakupu
LANIKAI
Alala Pt
Popoia I
Keolu Hills
Wailea Pt.
Olomana
Bellows Field
KONAHUANUI
WAIMANALO
Nuuanu Stream
MICRO TOWER
Tantalus
Mt. Olympus
Puu Lanipo
Kaau Crater
DANGER ZONE
Lab

OAHU FILE

U.S. DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
Southwest Region
Western Pacific Program Office
P. O. Box 3830
Honolulu, Hawaii 96812

August 16, 1985 F/SWR1:ETN

Lt. Colonel R.G. Wilmes
Director, Facilities Department
Marine Corps Air Station
Kaneohe Bay, Hawaii 96863-5001

Dear Lt. Colonel Wilmes:

This is in response to your letter of August 9, 1985 regarding the expansion of the present Marine Corps training areas at Bellows Air Force Base and its potential impact on captive reared green turtles (Chelonia mydas) which have been released near the mouth of the Waimanalo Stream.

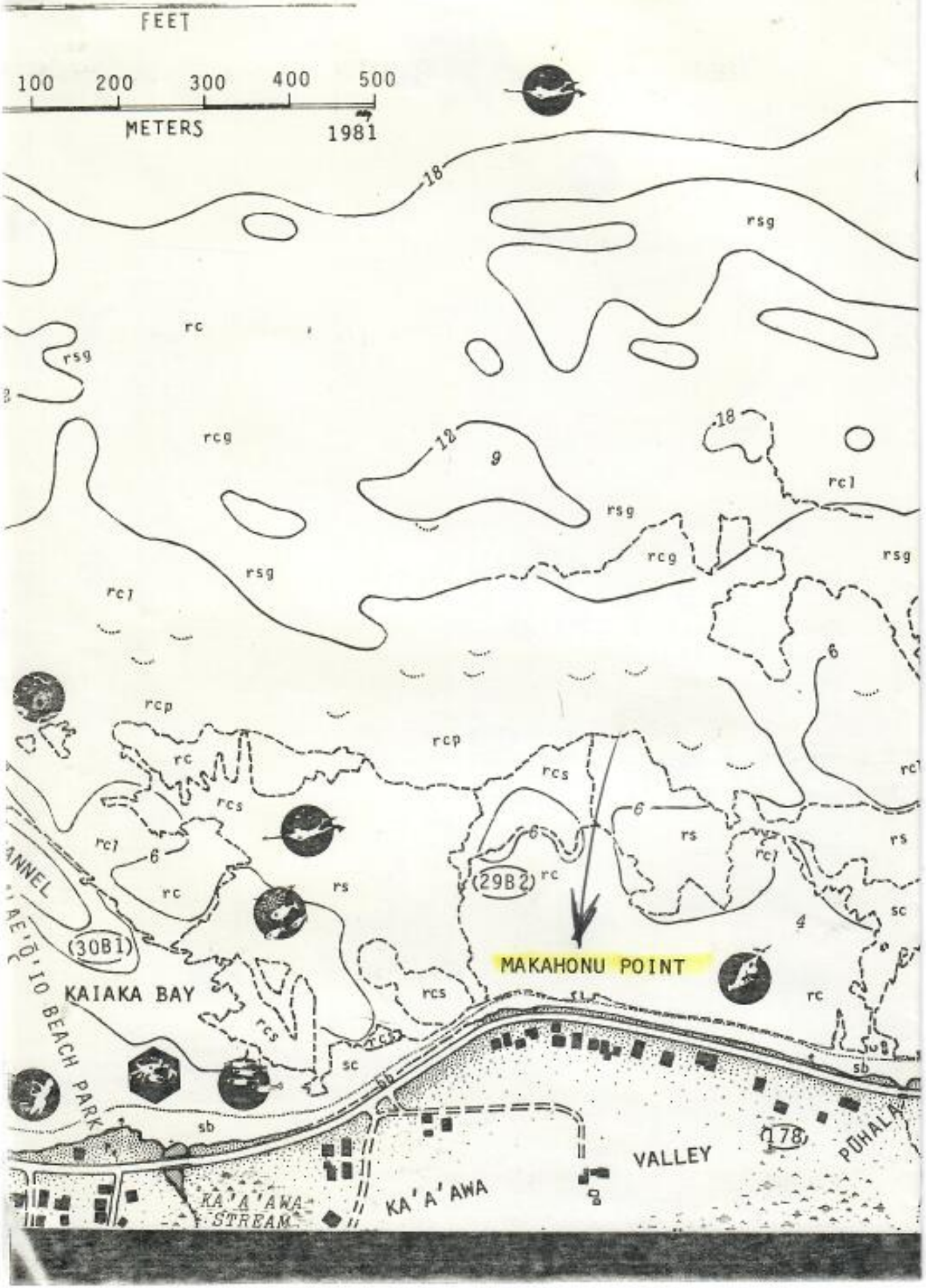
Based on the information provided with the letter we concur with your determination that the proposed expansion of the training sites are not likely to affect the green turtles released to the north of Waimanalo Stream. However, the Marine Corps should be aware that the National Marine Fisheries Service Honolulu Laboratory is conducting long term studies on green turtles that feed in the nearshore waters near Waimanalo Stream. We would appreciate notification of any future activities that may affect green turtle foraging habitat in the area.

Sincerely yours,

Doyle E. Gates

Doyle E. Gates
Administrator

cc: F/SWC2 - Balazs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METERS
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MAKAHONU POINT
KAIAKA BAY
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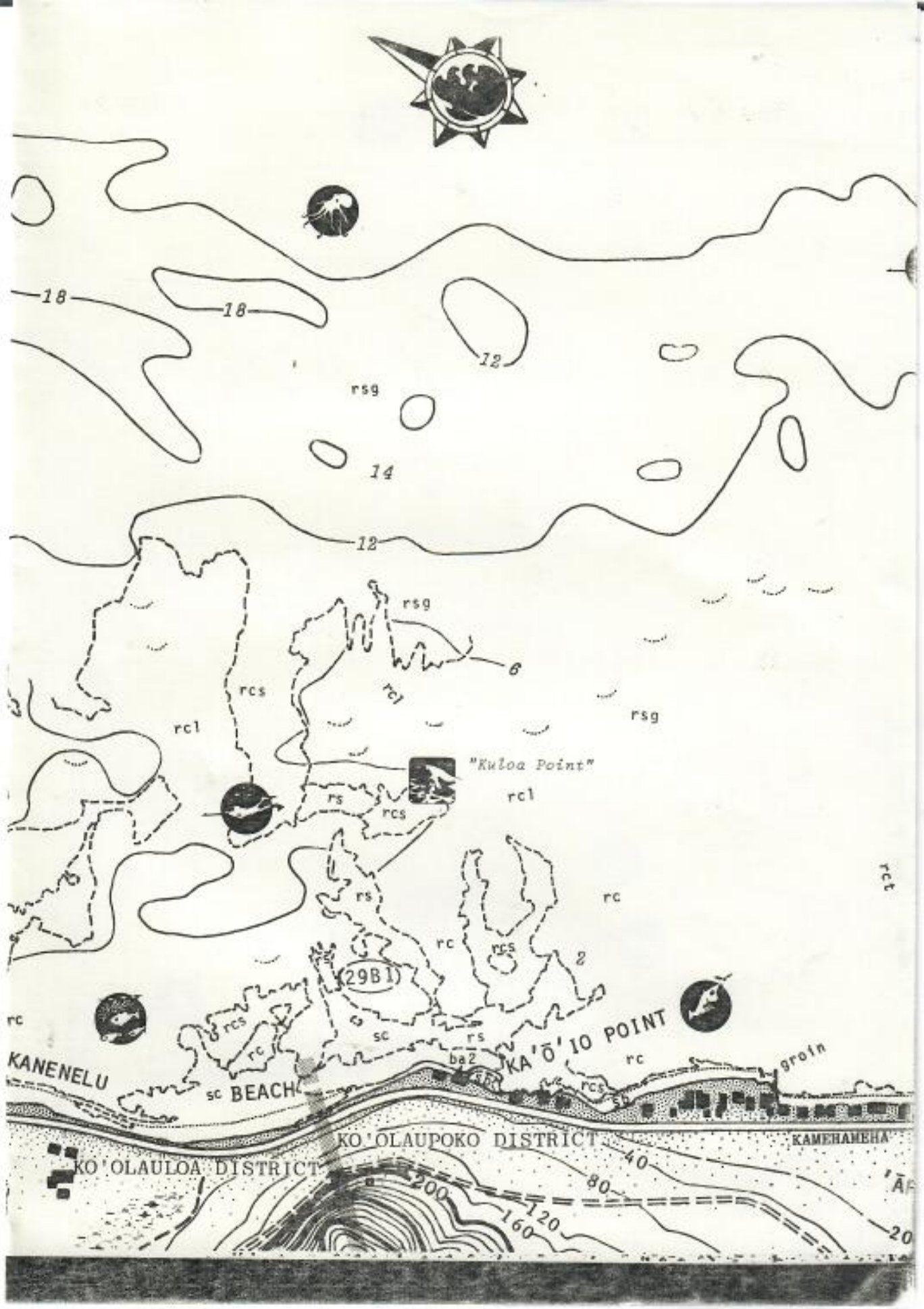
VALLEY
(178)
PUHALA
KA'A'AWA
KA'A'AWA STREAM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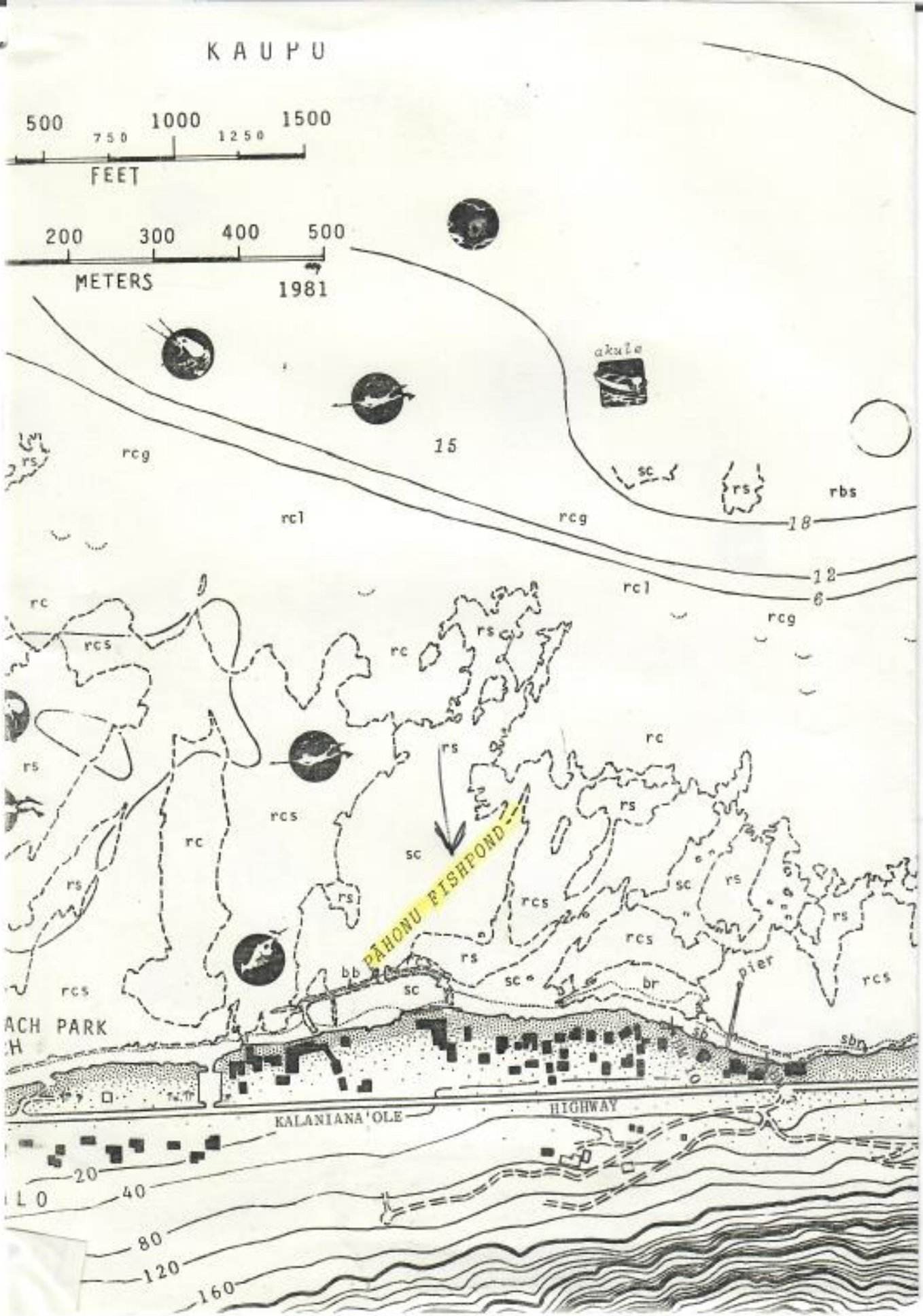
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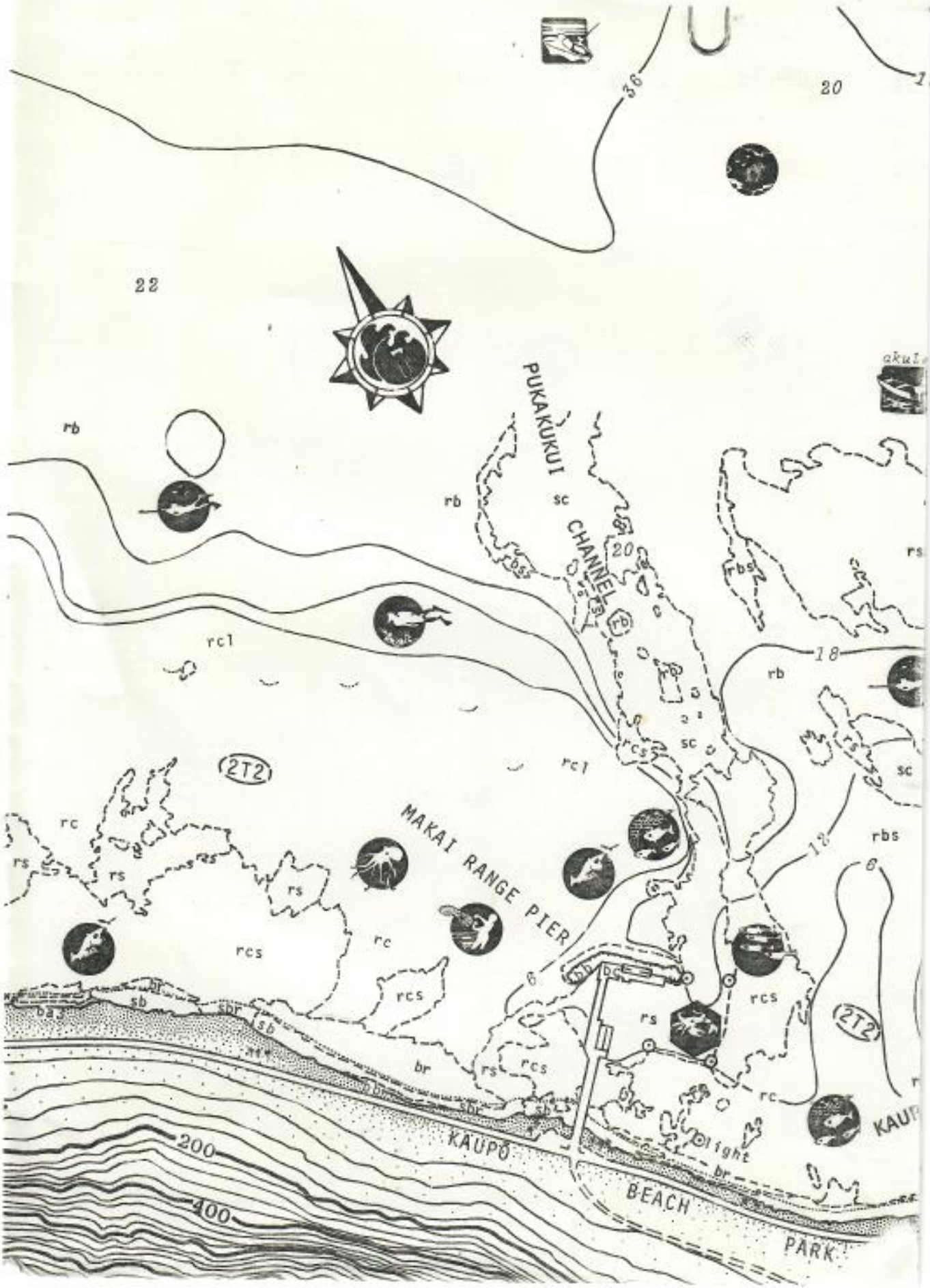
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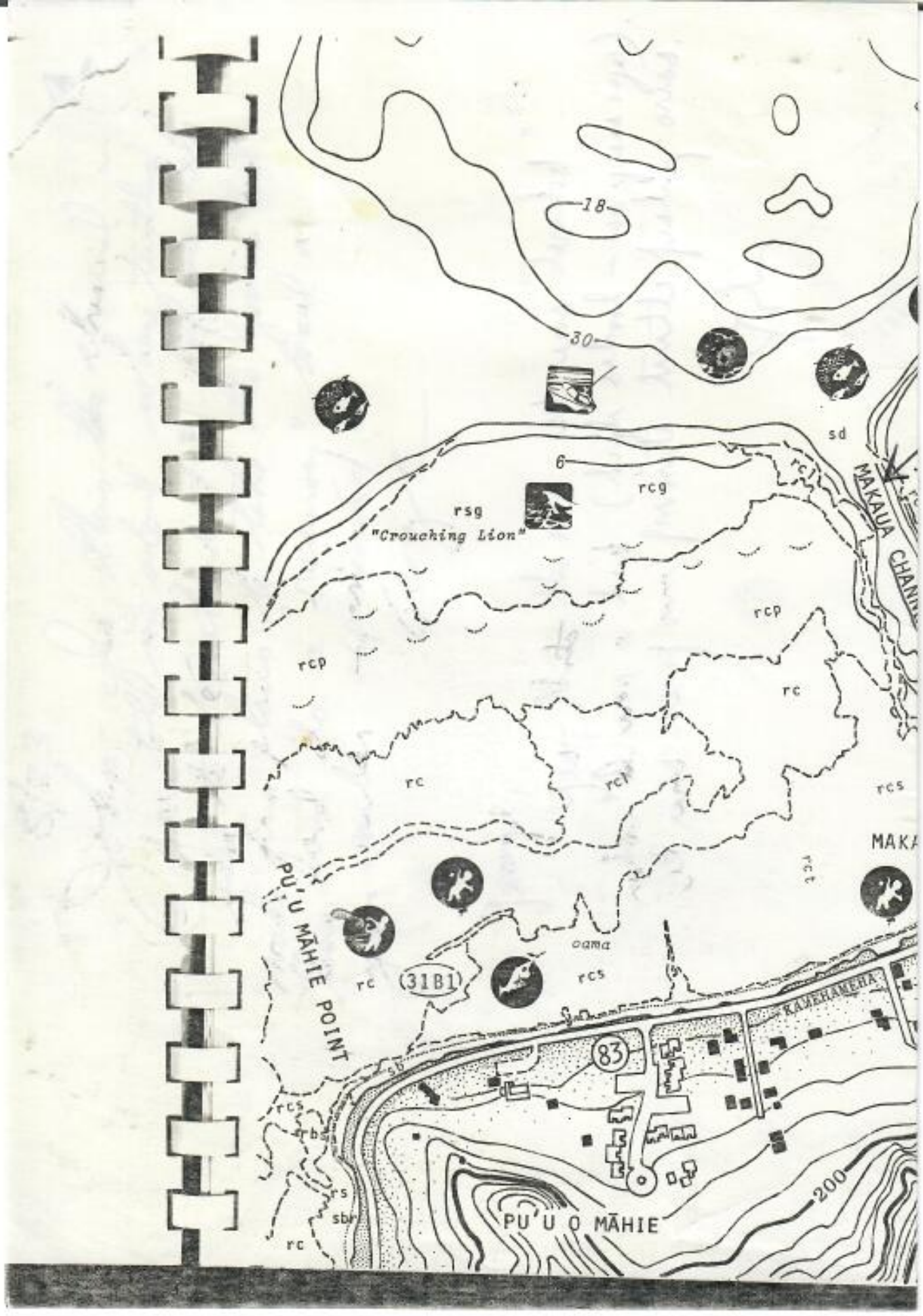
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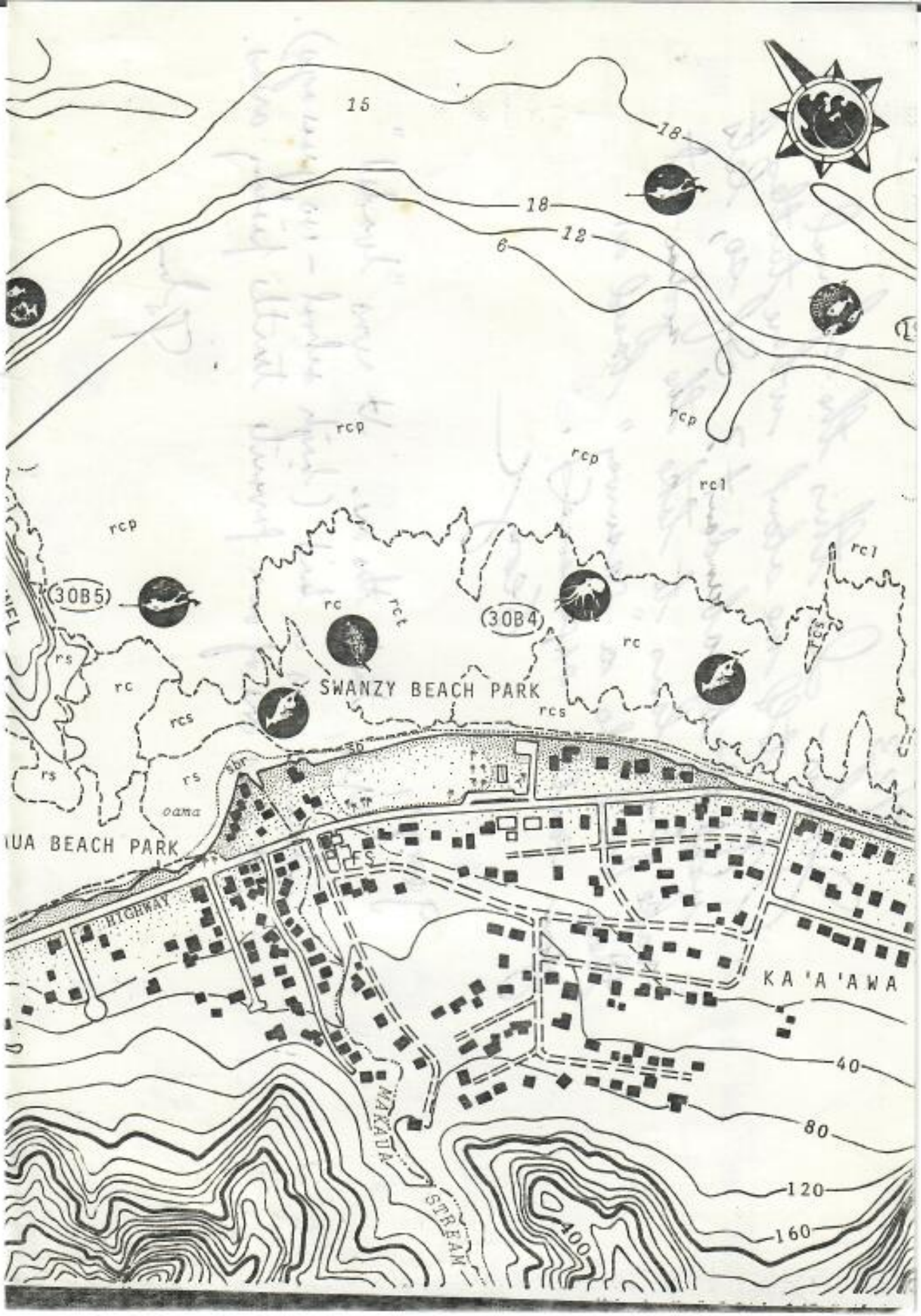
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MAKAHA STREAM

Via Molecular Transfer August 19, 1985 F/SWC2:WGG

TO: Richard S. Shomura, Director, Honolulu Laboratory (on T/S at LJ)

FROM: William G. Gilmartin, Acting Director, Honolulu Laboratory

SUBJECT: FY 86 Topics for Consideration for Entanglement $$ (These items below are listed in Coe's Attachment 3, Task Titles for Fy 86 Consideration, under the Information section.)

#12

1. "Further sea turtles impacts assessment"

Plastics and other synthetic debris in pelagic habitat occupied by sea turtles offer considerable potential for adverse impact. Concentrations of floating debris along drift lines are especially liable to be ingested by turtles that normally feed on invertebrates and other plankton during early life stages.

A recent worldwide literature survey and compilation of unpublished data (Balazs, The Fate and Impact of Marine Debris Workshop) found that plastic particles and plastic bags are often consumed by five of the seven species of sea turtles. Immature turtles are more frequently involved in debris ingestion than the adults. Where quantitative data were available, 6 to 87% of the turtles sampled had eaten various plastics. For example, in a commercial fishery for green turtles, Chelonia mydas, in Peru, 23% of 39 stomachs sampled contained plastic bags.

Little is known about the effects of plastic ingestion on sea turtles, although greater incidence has occurred since the early 1970's. Mechanical blockage of the digestive tract has been documented, but the frequency of the impact in unknown. The reduced transport of nutrients resulting from plastics against the gut wall, and the absorption of toxic plasticizers (PCB's), are two other potentially serious problems. The ubiquitous nature of plastic debris, and the mostly concealed pelagic life of turtles (especially during early developmental stages), present a difficult setting in which to assess the problem. A line of research that could be undertaken to address this issue would be the controlled feeding of plastics to captive turtles. This could be complemented with a sampling program for PCB's and other organochlorine residues in dead, free-ranging turtles identified as having ingested plastic debris. $25.0 K for initial studies on this in FY 86.

#13

2. Hawaii Endangered Species Continued Monitoring

During 1986 beaches and nearshore reefs in the Northwestern Hawaiian Islands (Kure Atoll, Pearl and Hermes Reef, Lisianski Island, Laysan Island, and French Frigate Shoals) will be regularly monitored for the presence of entangled seals and turtles. Personnel will note the presence or accumulation of nets and lines, and such flotsam will be measured, sampled, cataloged, and burned.

FY '86 ENTANGLEMENT PROJECT RANKING
(AD HOC COMMITEE MEETING, SEATTLE,WASHINGTON, 20-21 AUGUST 1985)

RANK	POINTS	PROJECT NUMBER		AMOUNT
1	60	1	Education	120
2	57	11	Dynamics of gill net	10
3/4	51	14	Seabirds (Hawaii)	20
3/4	51	36	Spectro and beach survey (Alaska)	47
5	50	5	Degradable material study	60
6/7/8	49	13	Hawaiian monk seal	10
6/7/8	49	19	"First aid" manual	25
6/7/8	49	37	Fur seal-large netting/entanglement	115
9/10	47	3	Disposable methodology	60
9/10	47	10	Fur seal/female/entanglement rate	25
11	46	22	Epipelagic debris survey	7 (+21)
12	45	6	Fur seal/pup entanglement	35
13/14/15	44	7	Fur seal/pup entanglement	15
13/14/15	44	16	Debris distribution/abundance ETP	5
13/14/15	44	39	Sinking dynamics of netting	10
16	43	27	At sea distribution-ships of opportunity	60
17	41	18	Neuston samples(tar balls)	20
18/19	40	9	Debris on rookery (fur seal)	5
18/19	40	20	Alaska beach litter survey (Merrill)	25
20/21	39	4	Debris data management	63.4
20/21	39	38	Development poll methodology	20
22	37	12	Turtle (Hawaii)	25
23/24	35	21	Ghost gill net study (New England)	45
23/24	35	23	Literature survey/impact protected sp.	40
25	34	33	Plastic ingestion/sea bird/New Eng.	10
26/27	29	8	Fur seal/ juvenile males	60
26/27	29	34	Commercial fishery survey (NE)	20

NOTES

1. Projects deleted include #2, #17, #24, #25, #28, #30, #31, #32, #35.

2. Project #26 (High seas squid gill net study) decision to be made after present '85 project on same subject has been completed and evaluated.

3. Project #29 (lost gear/ghost fishing in California waters) decision to be made after review of Cal Fish & Game reports on swordfish net studies.

4. Project #35 (noted under 1 above) has been funded with FY'85 funds. Project on seabirds from northern latitudes.

1976

HAWAIIAN GREEN TURTLE RESEARCH PROGRAM

SCHEDULE OF FIELD ACTIVITIES

1976

by
G. H. Balazs
Hawaii Institute of Marine Biology

JANUARY	FEBRUARY	MARCH	APRIL
15-22 French Frigate Shoals		8-9 Kure	8-19 French Frigate Shoals
MAY	**JUNE**	**JULY**	**AUGUST**
7-13 French Frigate Shoals	1 Release of aquarium turtles (Easy Rider)	28-12 French Frigate Shoals	11-15 Kau, Hawaii 26-
SEPTEMBER	**OCTOBER**	**NOVEMBER**	**DECEMBER**
-9 Midway 20 Mokapu, Oahu 23-26 Hawaii	10 Hanauma Bay	18-23 French Frigate Shoals	8-9 Kure, Midway and French Frigate Shoals 19 Oahu aerial survey

HAWAIIAN GREEN TURTLE RESEARCH PROGRAM

SCHEDULE OF FIELD ACTIVITIES

by
G. H. Balazs
Hawaii Institute of Marine Biology

1977

JANUARY	FEBRUARY	MARCH	APRIL
2 Hanauma Bay 4 Kaneohe Bay 19-31 Kure	11-19 Hanauma, Kailua and Kaneohe Bays 20 Oahu aerial survey 21-12 Fiji, Cook Islands and W. Samoa (South Pacific Commission)	18-19 Maui 31 French Frigate Shoals	
MAY	**JUNE**	**JULY**	**AUGUST**
4-8 Kau, Hawaii 18-19 Hanauma Bay 25-7 Midway and Kure	17 Bellows	20-3 French Frigate Shoals 9 Hanauma Bay 17 Molokai-Lanai aerial survey 21 Kawailoa 25-26, 28-29 Bellows 30 Kauai-Niihau aerial survey	1-3,5,8-9 Bellows 11 Reef Runway 11-12 Kawailoa 15-
SEPTEMBER	**OCTOBER**	**NOVEMBER**	**DECEMBER**
-7 Nihoa, Necker and Laysan (Easy Rider) 22-28 French Frigate Shoals 29 Kailua Bay	5-9 Lanai 19-20 Kaneohe Bay	2 Kaneohe Bay 4-8 Honolulu Harbor and Reef Runway 10-19 Necker (Easy Rider)	1-8 French Frigate Shoals 18-19 Bellows 21-23 Kure

HAWAIIAN GREEN TURTLE RESEARCH PROGRAM

SCHEDULE OF FIELD ACTIVITIES

BY
G. H. BALAZS
Hawaii Institute of Marine Biology

1978

JANUARY	FEBRUARY	MARCH	APRIL
19-27 Kau, Hawaii 29-31 Canton and Phoenix Islands overflight	2,11 Kaneohe Bay 16 - 4 Midway and Kure	20 Kaneohe Bay	5-7 Kure and Leeward Islands overflight 19,26-28 Kaneohe Bay
MAY	**JUNE**	**JULY**	**AUGUST**
2 Kaneohe Bay 7-22 NMFS turtle meeting- Mississippi IUCN turtle meeting- Ontario 26 Kaneohe Bay	5-21 French Frigate Shoals 23 Kahoolawe 30-2 Hawaii	5-6 Kaneohe Bay 9 Oahu aerial survey 11 Kaneohe Bay 12-27 Lisianski and Leeward Islands (Easy Rider)	4-7 Maui, Molokai and Lanai 16 Kaneohe Bay 23-25 Kahoolawe 31-
SEPTEMBER	**OCTOBER**	**NOVEMBER**	**DECEMBER**
-6 Kau, Hawaii 14-15 Bellows 17 Kailua Bay 23-	-7 Maro, Laysan, Lisianski & Pearl & Hermes (Easy Rider) 13-14 Kauai	26- Oahu aerial survey	

HAWAIIAN GREEN TURTLE RESEARCH PROGRAM SCHEDULE OF FIELD ACTIVITIES

G. H. Balazs
Hawaii Institute of Marine Biology

1979

JANUARY	FEBRUARY	MARCH	APRIL
30-	-1 Kure 16-19 Kauai, Niihau, Kaula 24 Molokai (Easy Rider)	6-8 Kaula, Niihau 11-25 San Jose, Costa Rica, SSC/Cities	3-4 Bellows 10-14 Washington, D.C. 17-18 Bellows 24-
MAY	**JUNE**	**JULY**	**AUGUST**
-12 Necker & FPS 29-30 Bellows	5-6 Bellows 10-30 French Frigate Sh.	31-	-2 NMFS meeting
SEPTEMBER	**OCTOBER**	**NOVEMBER**	**DECEMBER**
23-	-3 Mexico Suarez 10 NMFS meeting 21 French Frigate Sh.	24-	-2 Washington conf. 6-18 Noumea workshop

HAWAIIAN GREEN TURTLE RESEARCH PROGRAM

SCHEDULE OF FIELD ACTIVITIES

by
George H. Balazs
Hawaii Institute of Marine Biology

1980

JANUARY	FEBRUARY	MARCH	APRIL
3-4 Bellows 8-13 Gainesville-Oviedo 21-22 Bellows 23-26 Hawaii 28-29 Bellows		5-6 French Frigate Shoals 11-13 Kure-Midway 18-22 Kiholo, Hawaii 24-26 Kure	10-11 Bellows 16-17 Hilo 24-25 NHI Symposium
MAY	**JUNE**	**JULY**	**AUGUST**
6-8 Bellows 13-15 Bellows	6-	-1 French Frigate Shoals	26-28 Midway & Kure
SEPTEMBER	**OCTOBER**	**NOVEMBER**	**DECEMBER**
5-8 French Frigate Shoals	14-20 Kiholo, Hawaii 30-31 Bellows	5-15 Am. Samoa & Rose Atoll	2-5 Molokai 10-11 Bellows 15-19 French Frigate Shoals

need Blank forms

1981 expeditions -

January -

February - W. Samoa

March

April 21-25 April Maui

May - 2 May EWa Beach; 1 May Kaneohe/Chuuk/

- ~~EFS~~ 25 MAY - ~~18~~ JUNE FFS

June 2 June Galveston/Palau

Bellows 8-9 JULY

July - 22-29 JULY Big Island ~~from Kona~~ Kona

August 4-13 AUG ~~Pearl~~ Pearl & Hermes - Midway

18 AUGUST - KAHALA Hawaii Maui Area

September - 5 Sept SLP release Kauai

SLP Maui - Hilo

Hawaii

Bellows

Chuuk

Mokuleia

~~Ma~~ Makaha

OCT 16-31 W. Samoa / Tokelau

NOV 15-16 FFS

DEC 3-4 KAUAI LECTURE

DEC 15-16 Maui "

"

Freezing meat

Careful selection of animals. Select young, good quality, well-finished animals. Freezing does not greatly improve meat, but helps keep the original goodness.

Proper butchering. This service, as well as cutting up the carcass, generally is offered by locker plants. If not, consult an expert, for skilled butchering is essential to having good meat. Properly done, it can save you money and give you the cuts that fit your family needs.

Less desirable cuts should be ground. Avoid freezing too much big bone—it makes packaging difficult, wastes space. See meat-cut charts (pages 238, 246, 254, 258).

Preparation for freezing. Carcasses should be chilled quickly and completely to below 40°. Hold veal, pork, and lamb in the chilling room for 24 hours before freezing. Hold beef 8 to 10 days at about 34°. Poultry should be dressed, drawn, and chilled overnight before packaging for freezing.

Packaging and wrapping. Keep packages small for rapid freezing; make them family-size units. Separate individual portions with 2 sheets of paper—facilitates thawing. Wrap meat in moisture-vaporproof wrapping, folding in edges to exclude all possible air. Seal; label with contents, weight, and date.

Freeze quickly. Do not pack meat packages tightly in the freezer—this slows freezing process. If you have a large quantity to freeze at one time, it's best to have a locker plant freeze it, then transfer the frozen meat to your home freezer.

Store at 0° or below. If temperature fluctuates 10 or 15 degrees, meats will keep only a few months instead of 8 to 12 months.

How to freeze meats, fish, and poultry

Name of food	Preparation for freezing	How to thaw and cook	Storage time at 0° or below
Meat (general)	Select young, well-finished animals. Chill and age (see above). Cut into desired pieces. Avoid packing more bone than necessary. Wrap tightly in moisture-vaporproof material, separating individual portions with 2 layers of paper. Seal; label and date. Freeze quickly. Store at 0° or below.	Thaw, wrapped, in refrigerator—it will take about 5 hours per pound. Or let thaw at room temperature—about 2 hours per pound. If meat is cooked without thawing, allow 12-25 minutes extra cooking time per pound of meat.	Beef—6 to 12 months; lamb and veal—6 to 9 months; pork—3 to 8 months. Ground meat—1 to 3 months.
Sausage	Add seasonings, but omit salt.	Thaw; cook, adding salt.	1 to 3 months.
Poultry	Select high-quality birds. Bleed well. Clean, draw, and singe. Remove head, feet, and oil sac; wash cavity and giblets. Chill overnight. Wrap giblets separately; insert in cavity. Or, disjoint and cut up bird. Wrap bird or pieces carefully in moisture-vaporproof material. Seal and label. Freeze quickly. Never freeze stuffed poultry.	Thaw, wrapped, in refrigerator. Allow 6 to 8 hours for 3 pounds poultry. Or thaw, wrapped, at room temperature.	Chicken, 6 to 12 months. Turkey, duck, goose, 3 to 6 months.
Fish	Freeze immediately or refrigerate overnight. Clean and wash, as for cooking. Wrap in moisture-vaporproof material. To glaze a whole fish, freeze on a baking sheet. Warm to loosen and dip into ice water. Let ice film freeze. A second dipping will thicken the ice coating formed. Wrap carefully. Seal, label, and freeze.	Thaw, wrapped in refrigerator—a 1-pound package will take 6 to 10 hours. Cook as fresh. Or partially thaw; use a lower cooking temperature than for fresh fish.	3 to 4 months.
Shellfish	*Oysters, clams, and scallops:* Freeze immediately. Pack in freezer containers, allowing headroom for expansion.	Thaw, wrapped in refrigerator.	3 months.
	Crabs and lobsters: Cook as for eating. Chill in refrigerator. Remove meat from shell. Package.	Thaw wrapped, enough to break apart.	1 month. (Some shellfish become tough on long storage.)
	Shrimp: Freeze uncooked in shells, removing heads. Tip: Freeze shrimp on baking sheet. Store in plastic container.		

Dear Ms. Ono:

Purpose:
not (double) extra layering of legal protection involving needless bureaucracy - but rather focus attention on outer Is' needs unique - novel interesting - valuable Tourist Attraction - with a few simple safeguards qualifications so that turtles won't be driven away by this attention

Statewide system - but start small 1-2 see how it works - then proceed to develop further from there.

~~Aug 15th~~

~~Obtain ... captive breeding ... Head ...~~

CONSIDER –
+ fish harvesting concept

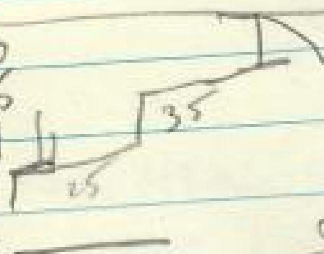
See: Hendrickson Paper & Kowarsky

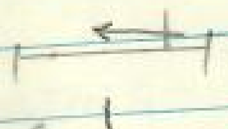
WSC McKeown – Solomon Is. FOLDER

NEED-BJORNDAL'S PAPER

Stage ① survival to time of release

25		1 125.0
35		2 87.5
45	25%	3 39.4
55		4 21.7
65		5 14
75		6 10.6
85		7 7.9
95		8 7.5

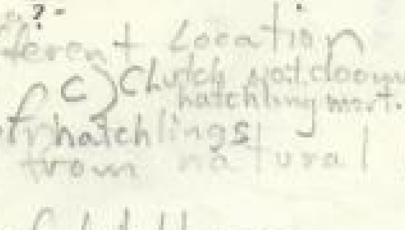




Stage ②

ASSUMING % SURVIVAL INCREASES WITH INCREASE IN BODY SIZE

Stage ③



TH

... is the source of the hatchlings used for Head Starting?

1.) EGG clutch moved to different location
   A) Clutch doomed
   B) known high mortality of hatchlings
   C) Clutch not doomed and hatchling mort. not high

2.) Live hatchlings collected from natural nest emergence
   A) Known high mortality of hatchlings
   B) Hatchling mortality not high

3.) ~~Doomed~~ hatchlings excavated from nest following natural emergence

II. What is the percent survival of hatchlings reared for Head starting

III. What is the percent survival of hatchlings to this size in the wild

FRAUGHT WITH UNCERTAINTIES

1) Presuppose the same wild predation rate on natural vs captive but difference in initial behavior may not make this so.

Kadger

2.) Consider survival rate of headstart turtles while being reared vs survival rate that would have occurred in the wild.

"Pathways"

1) from eggs
2) from hatchlings collected on the beach

NEED-BIOLOGICAL FACTORS SURVIVER-SHIP CURVES

FIRST STATE THE RATIONALE FOR HEAD STARTING -

TO INCREASE THE Percent survival OF hatchlings that reach a past-hatchling stage of a few months on up to one year of age

THEN ASK Primary Question -

- DOES HEAD STARTING DO THIS ?

In order to answer this question, the following must be known - I. What is the source of the hatchlings used for Head Starting ?-

because

1) EGG clutch moved to different Location
   A) clutch doomed
   B) known high mortality of hatchlings
   C) clutch not doomed and hatchling mort. not high
2.) Live hatchling collected from natural nest emergence
   A) known high mortality of hatchlings
   B) Hatchling mortality not high
3.) Doomed hatchlings excavated from nest following natural emergence

II. What is the percent survival of hatchlings reared for Head starting

III. What is the percent survival of hatchlings to this size in the wild. (GO TO ONE OF 1) ABOVE)

Need P

* - Headstarting Position/discussion paper -
as per request by Nicholas Mrosovsky

headstarting vs. natural course
juvenile predation vs hatchling predation
(levels and susceptibility (behavior)

SIMPLE TERMS
Proof of effectiveness can only be achieved through identification/resighting - no inferences or positive statements can be made if no observations are made.

ALSO - IDEALLY
"Natural course" needs to be known to have baseline comparison.

through tag resightings at various life stages preferably ~~as~~ nesting adults

Ultimate - identify as becoming functional members of the breeding colony, at rates significantly higher than would occur if "head-starting" were not carried out. How do you set out to prove this?

Problems
Don't know survival rates for "wild-starting" or "head-starting"
Due to 1) tag retention
2) time
3) long-term saturation breeding colony monitoring

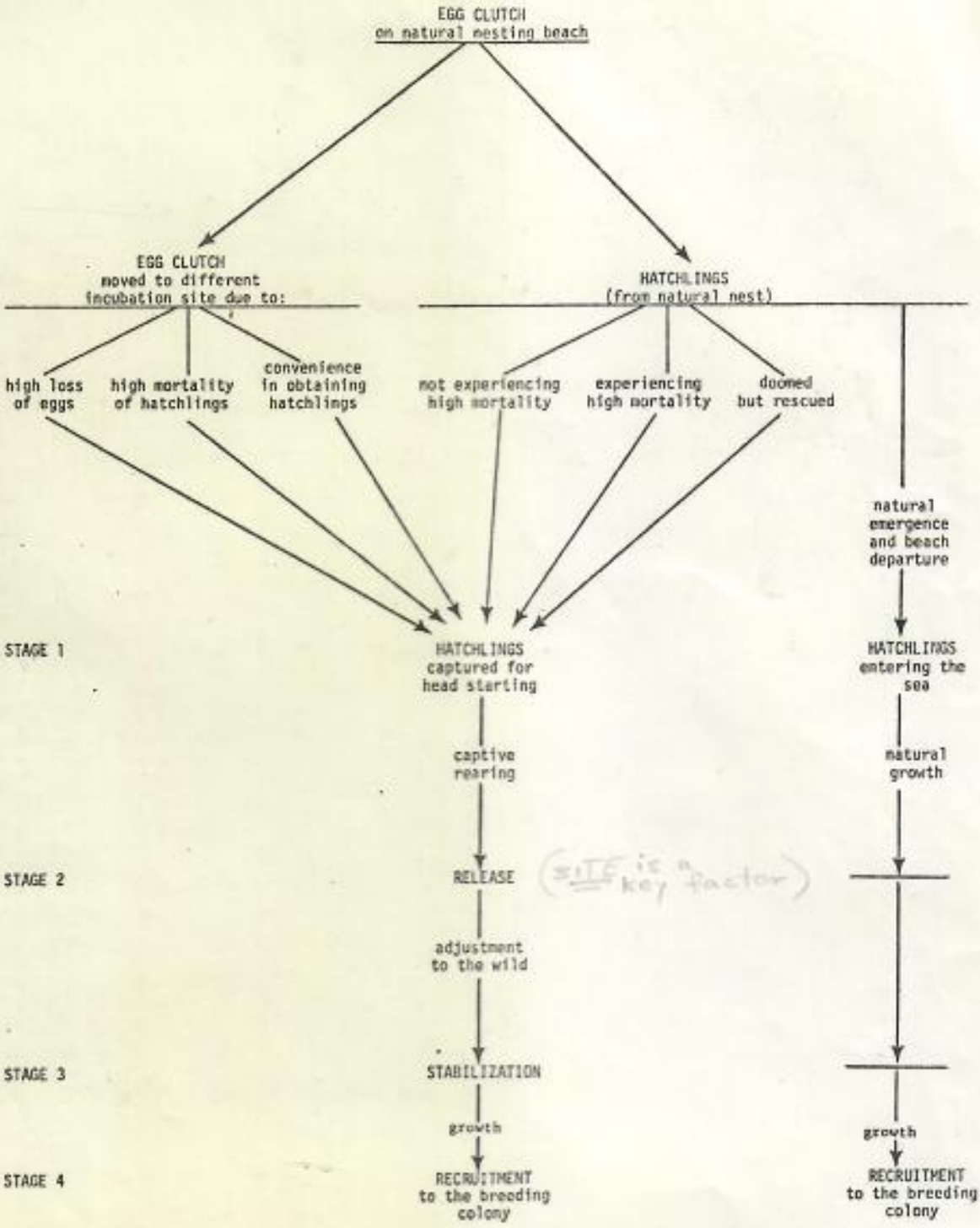
In lieu of ultimate - lesser test
Proof of head-starting carrying capacity:

Release site - subject to human exploit vs move in region

Behavior

Need for existing tag

initiative



Sources of hatchling sea turtles for head-start projects, illustrating four developmental stages for comparing survival rates.

By

George H. Balazs

Kawela Bay Archaeological S

CITY Hall

The redesignation of land at Kawela Bay should be deferred until an archaeological survey has been completed, James C. Lam has recommended in a letter to the City Council.

Lam, a retired state land officer, is active with a group called Voters for Kawela that wants to assure adequate public access to the small bay on Oahu's North Shore.

He also called the Council's attention to an article in the September 1936 issue of the Paradise of the Pacific magazine.

Prudential Insurance Co. is asking the Council to amend the development plan for the area from residential to resort use. It wants to construct four hotels, with 4,000 units, in the area from Kawela to Kahuku Point. Two of the hotels would be on Kawela Bay.

The City Planning Commission on Jan. 23 approved Prudential's request on condition the company dedicate 4.8 acres for park use and keep all buildings at least 100 feet from shoreline.

Lam said the offer of a 4.8-acre park does not adequately address the access issue. He proposes that a 150 feet wide area along the bay's shoreline be made available for public recreational use.

THE COUNCIL has until May 30 to act on the Planning Commission's recommendation.

The article in Paradise of the Pacific was written by Emma Ahuena Taylor, who said that in 1936 a spring — Ka Wai O Ke Kala (The Water of Forgiveness) — could be found at the upper extremity of Kawela Bay, almost at the edge of the sea.

tudy Urged

"About a stone's throw from this spot, facing the beach, is the site of the ancient abode of the austere and stately high priests, the Kahuna-poo-Kanaka, who were the guardians of the spring," she wrote.

"This sacred precinct was kapu, that is forbidden. The priests used the spring water for absolution before performing a religious ceremony."

She said that until a few years ago pilgrims came to the spring.

"The Kahuna Lapa-au, or medical priest, would send his patients there, to drink of this peculiar healing water, and live on a diet of certain fish and seaweed, found in Kawela Bay," she wrote.

A-6 Honolulu Star-Bulletin Friday, April 12, 1985

Council's 8-1 Vote Gives Go-Ahead to

City Council members yesterday approved an amendment to the Koolaulos Development Plan that would allow expansion of the Turtle Bay Hilton resort at Kuilima.

The Council discussed the proposal from Prudential Insurance Co. for several hours before voting 8-1 to redesignate from residential to resort a parcel of land that runs from Kuilima to Kawela Bay on the North Shore.

The development plan change will allow Prudential to seek rezoning for a 4,000-unit resort on about 460 acres of the 800-acre Kuilima site.

The resort proposal includes four beachfront hotels, condominiums, townhouses and two golf courses.

Councilwoman Welcome Fawcett was the only Council member to oppose the development as a whole.

Fawcett said she was worried about the impact of the massive project.

"I would prefer to have seen a less intrusive resort developed in the area," she said.

DISCUSSION of Prudential's project took most of the day yesterday, so Council members were to meet all day today to consider other changes in the Koolauloa Development Plan and the remaining seven plans.

During yesterday's session City Councilwoman Marilyn Bornhorst suggested the Council require the developers to wait to build the last 2,000 units until the state widens Kamehameha Highway near the resort.

But Council members voted against Bornhorst's proposal and approved the project under the phasing program proposed by the developer. The project is expected to begin within a year and be completed in about [illegible] years.

Council Chairwoman Pat[illegible]

Resort at Kawela Bay

Mink opposed Prudential's plan to build a portion of the project closer than 300 feet from the shoreline because of the threat of tsunamis.

However, Council members granted the company's request to construct 10 percent of the development within the 300-foot setback.

COUNCIL MEMBERS also supported the recommendations of Leigh-Wai Doo and Councilman Toraki Matsumoto to allow the developers to exceed the 70-foot height limits by 20 feet for design purposes. The developers say the roofs of the buildings will reflect a "Hawaiian character."

The Council committee room was packed yesterday with those supporting and objecting to Prudential's project. The same sign-carrying crowds have staged protests in front of City Hall in the past week.

Supporters of the project said it will create badly needed jobs in Windward Oahu.

Opponents of the development say Kawela Bay is a culturally and historically significant area that should remain as open space.

In addition to the height and setback limitations, Council members also are requiring the developers to allow public use of the beach by connecting five walkways to a 100-foot area along the shoreline from Kawela Bay to Kahuku Point.

Advertiser 4-9-85

Doo backs resort if shore access assured

Leigh-Wai Doo
Lists recommendations

By Gerald Kato
Advertiser Government Bureau

Prudential Insurance Co.'s plans to develop a 4,000-unit resort at Kawela Bay on the North Shore should be approved with conditions that guarantee public access to the shoreline, Councilman Leigh-Wai Doo, chairman of the Planning and Zoning Committee, said yesterday.

The committee is set to take up Kawela Bay and other recommendations from Doo during meetings Thursday and Friday that will set the stage for final action on the annual review of Oahu's development plans.

Doo yesterday put the finishing touches on his recommendations for the land-use and public facilities amendments under consideration this year.

Kawela Bay is one of the hottest issues confronting the committee. Over the past week there have been demonstrations for and against Prudential's plans to build 4,000 hotel units and two golf courses in the area from Kawela to Kahuku Point.

Doo said he's proposing approval of the resort project, but with strict conditions. For example, Doo said, he wants the setback from the shoreline to be at least 300 feet. The first 100 feet from the shoreline should be open for public use as a walkway along the entire coastline from Kawela Bay to Kahuku Point, Doo said.

To get to the shoreline, Doo wants Prudential to provide five access points for the public. Another condition, he said, would require that the city be provided two major parks, one at Kawela and the other at Kahuku Point.

Doo said public concern about access to the shoreline should be adequately addressed if the committee goes along with these recommendations.

"It would not be possible to satisfy all of the people's concerns, but to mitigate the detriments and multiply the benefits is what I have been able to structure," he said.

Highlights of Doo's recommendations include:

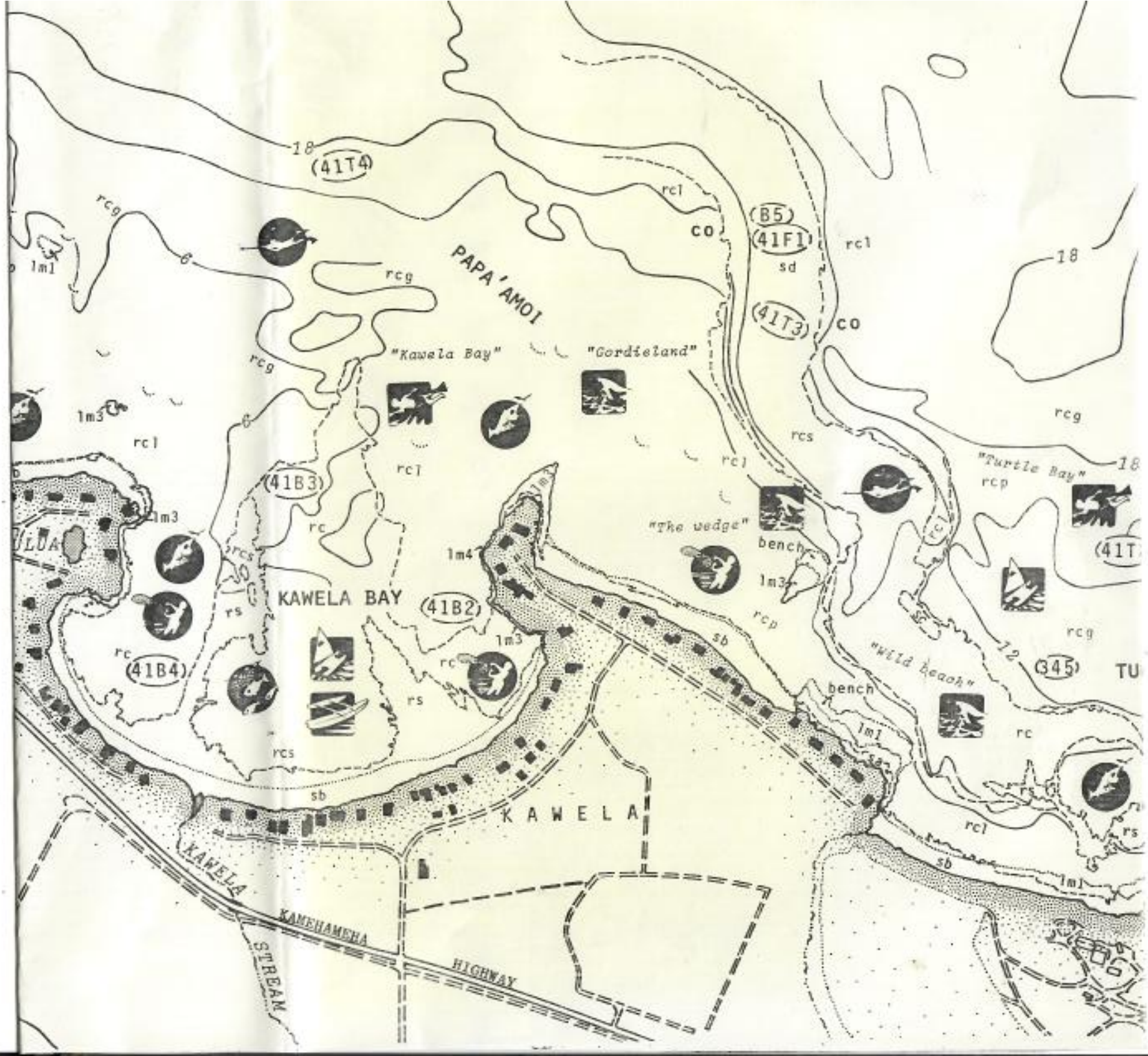
- Sending back for consideration as a general plan amendment Amfac's Waikele development for 3,000 residential units in Central Oahu. Doo said the project should first go through a general plan review before the council takes further action on it.

- Approval of a high-tech industrial park in Mililani.

- Rejection of residential development near Mount Olomana in Kailua.

- Approval of putting about three acres at Pounder's Bluff into preservation.

- A series of procedural changes to cut red tape and time off the processing of development plan amendments.


PAPA'AMOI
"Kawela Bay"
"Gordieland"
"The wedge"
"Turtle Bay"
"Wild beach"
KAWELA BAY
KAWELA
KAWELA STREAM
KAMEHAMEHA HIGHWAY
(41T4)
(41T3)
(41T2)
(41B5)
(41F1)
(41B3)
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bench
1m1
1m2
1m3
1m4

October 22, 1985 F/SWR1:ETN

Mr. Bruce Smith
Kahuku Prawn Company
P.O. Box 848
Kahuku, Hawaii 96731

Dear Mr. Smith:

We are receipt of a letter dated October 8, 1985 to you from the City and County of Honolulu, Department of Land Utilization, wherein you were advised to contact this office regarding nesting of green turtles (Chelonia mydas), a threatened species, adjacent to your proposed saltwater shrimp farm in Kahuku. Although the National Marine Fisheries Service (NMFS) shares federal jurisdiction of green turtles with the U.S. Fish and Wildlife Service (FWS), in this instance the FWS is the appropriate agency to evaluate the potential impacts to green turtles from your proposed shrimp farm. We have notified Mr. William Kramer of the FWS who will be contacting you shortly regarding their concerns. Thank you for your cooperation in this matter.

Sincerely yours,

Doyle E. Gates
Administrator

cc: FWS-Kramer

bc: George Balazs, F/SWC2


HAWAII KAI
HOTEL
HOTEL
HOTEL
CONFERENCE CENTER
RESORT SHOPPING
RESORT CONDOS
PARK
PARK
RESIDENTIAL
OCEAN RESEARCH
Ikekai-'o-Hawaii-Kai
Conceptual Master Plan

IKEKAI WORKS!

Ikekai is a quality Hawaii Kai resort designed to blend with the environment and benefit Hawaii's people. "Ikekai" means "look to the sea."

KNOW THE FACTS*

- OPEN SPACE: 151 acres (total site 210 acres)
  Parks—14 acres
  Shoreline access—15 acres Landscaped areas—80 acres
  Natural area—42 acres Parking areas—20 acres
- BUILDINGS
  3 First class hotels (2,250 rooms) 7–9 stories
  Resort condominiums (150 units), Restaurants, Shopping,
  Executive conference center, Oceanographic research center
- JOBS
  Construction jobs: Phase 1 (2200 per year),
  Phase 2 (3,100 per year)
  Operational jobs: TOTAL 5,200
- TAX BENEFITS/COSTS (Year 2005)
  County + $3 Million/$1 Million
  State + $9 Million/$1.4 Million
- PROPOSED TRAFFIC IMPROVEMENTS (Phased)
  Wailua Street/Hawaii Kai Drive/Extension and Widening
  Employer-provided transportation
- SCHEDULE
  Phase 1 (1995) ± 1,000 resort units, shopping, conference center
  Phase 2 (2005) ± 1,400 resort units
- CONTACT
  Questions, more information: Call Bina Chun or Dan Davidson at 395-2331

Visit our display booth at Kuapa Kai Center Nov. 1–3, or see the scale model of Ikekai at our office.

*Estimates subject to change.

BULK RATE CARRIER RT. PAID

HONOLULU OCT 1 '85 HAWAII

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PO BOX 796192

HAWAII RESIDENT
992A AWAANAANOA PL
HONOLULU, HAWAII 96825

A PROJECT OF KAISER DEVELOPMENT COMPANY
7120 KALANIANAOLE HIGHWAY, P.O. BOX 25007, HONOLULU, HAWAII 96825

TO: George

☑ YOU WERE CALLED BY– ☐ YOU WERE VISITED BY–

Green well

OF (Organization)

☐ PLEASE PHONE ▶ ☐ FTS ☐ AUTOVON

☐ WILL CALL AGAIN ☐ IS WAITING TO SEE YOU

☐ RETURNED YOUR CALL ☐ WISHES AN APPOINTMENT

MESSAGE

15 - 16 turtles off
Sandy Beach last Monday -
apparently all ♂
no new sightings of turtle with
hook in mouth

RECEIVED BY	DATE	TIME
Tim	4/25/85	12:30

63-110 NSN 7540-00-634-4018 STANDARD FORM 63 (Rev. 8-81)
Prescribed by GSA
FPMR (41 CFR) 101–11.6

* GPO : 1981 O - 381-529 (314)

FROM/TO	DISTANCE & TRACK n.m.	st.m.	km.	Route	°(T)
Hong Kong Intl. (Cont'd)					
Paris (Orly)	5198	5982	9627	G.C.	-
Peking (Capital)	1073	1235	1987	G.C.	-
Peking (Nan Yuan)	1053	1212	1951	G.C.	-
Penang Intl.	1303	1499	2413	G.C.	-
Perth Intl./Australia	3258	3748	6033	G.C.	-
Philadelphia Intl.	7030	8090	13020	G.C.	-
Phnom Penh (Pochentong)	840	966	1556	G.C.	-
Portland Intl./Ore	5686	6543	10529	G.C.	-
Portland Intl./Maine	6833	7864	12655	G.C.	-
Port Moresby	2721	3121	5039	G.C.	-
Prague (Ruzyne)	4745	5460	8788	G.C.	-
Prestwick	5190	5973	9612	G.C.	-
Rangoon	1071	1232	1983	G.C.	-
Regina	5974	6874	11063	G.C.	-
Rio de Janeiro (Galeao)	9552	10992	17691	G.C.	-
Rome (Ciampino)	5006	5761	9271	G.C.	-
Rome (Fiumicino)	5021	5777	9297	G.C.	-
Rotterdam	5034	5793	9322	G.C.	-
Saigon	817	940	1513	R.L.	212
Saigon	816	938	1510	G.C.	-
Sandakan	1011	1163	1873	G.C.	-
San Francisco Intl.	5992	6896	11097	G.C.	-
Santiago (Los Cerrillos)	10082	11603	18672	G.C.	-
Santiago (Pudahuel)	10087	11608	18680	G.C.	-
Seattle-Tacoma Intl.	5625	6473	10418	G.C.	-
Seoul A.B.	1127	1297	2087	G.C.	-
Seoul Intl.	1122	1291	2078	G.C.	-
Seychelles Intl.	3801	4374	7040	G.C.	-
Shanghai (Lunghua)	658	758	1219	R.L.	036
Shanghai (Lunghua)	657	757	1218	G.C.	-
Shannon	5414	6230	10025	G.C.	-
Shemya Is.	3259	3751	6035	G.C.	-
Siem Reap	798	918	1478	G.C.	-
Singapore A/P	1395	1605	2583	G.C.	-
Stockholm (Arlanda)	4636	5105	8215	G.C.	-
Stockholm (Bromma)	4440	5110	8224	G.C.	-
Swatow	152	175	282	G.C.	-
Sydney (K-S) Intl./Australia	3982	4582	7374	G.C.	-
Tainan	334	385	619	R.L.	084
Tainan	334	385	620	G.C.	-
Taipei Intl.	437	503	809	R.L.	068
Taipei Intl.	435	501	805	G.C.	-
Tashkent	2518	2898	4664	G.C.	-
Tehran (Mehrabad)	3339	3843	6184	G.C.	-
Tel Aviv Intl.	4182	4813	7745	G.C.	-
Tokyo (Haneda)	1561	1797	2891	R.L.	059
Tokyo (Haneda)	1552	1786	2874	G.C.	-
Tokyo Intl.	1585	1824	2936	G.C.	-
Toronto Intl.	6767	7788	12533	G.C.	-
Vancouver Intl.	5532	6366	10245	G.C.	-
Vienna (Schwechat)	4705	5115	8714	G.C.	-
Vientiane	705	811	1305	G.C.	-
Wake Is.	2933	3375	5431	G.C.	-
Whitehorse	4808	5533	8905	G.C.	-
Zurich A/P	5017	5773	9291	G.C.	-
Honiara (Henderson)/Solomon Islands		09255	16003E	(HIR)	
Kieta	318	366	589	G.C.	-
Kira Kira	127	146	234	G.C.	-
Lae	790	909	1463	G.C.	-
London (Heathrow)	8101	9322	15002	G.C.	-
Marau Sound	54	62	99	G.C.	-
Munda	177	204	328	G.C.	-
Nandi	1138	1309	2107	R.L.	116
Nandi	1132	1302	2096	G.C.	-
Nauru Is.	672	773	1244	G.C.	-
New York (J.F.K.) Intl.	7396	8512	13697	G.C.	-
Port Moresby	758	872	1404	G.C.	-
Port Vila	692	796	1281	G.C.	-
Rabaul	561	646	1038	G.C.	-
Santo (Luganville)	552	636	1023	G.C.	-
Santo (Pekoa)	557	641	1031	G.C.	-
Sydney (K-S) Intl./Australia	1549	1783	2869	G.C.	-
Torokina	351	405	651	G.C.	-
Townsville	973	1119	1802	R.L.	233
Townsville	969	1115	1795	G.C.	-
Vella Lavella Is.	219	252	405	G.C.	-
Vila Tagabe	695	800	1287	R.L.	136
Vila Tagabe	692	796	1282	G.C.	-
Yandina	51	59	94	R.L.	294
Yandina	50	58	93	G.C.	-

FROM/TO	DISTANCE & TRACK n.m.	st.m.	km.	Route	°(T)
Honolulu Intl./Hawaiian Islands	2120N	15756W		(HNL)	
Houston Intcl.	3384	3895	6268	G.C.	-
Istanbul (Yesilkoy)	7043	8105	13043	G.C.	-
Jakarta Intl.	5844	6726	10824	G.C.	-
Johnston Is.	717	824	1327	R.L.	247
Johnston Is.	713	820	1320	G.C.	-
Kaanapali	73	84	135	G.C.	-
Kahului	88	101	163	G.C.	-
Kalaupapa	54	62	99	G.C.	-
Kamuela	150	173	278	G.C.	-
Karachi A/P	6980	8033	12928	G.C.	-
Kauai	88	101	163	G.C.	-
Kingston Intl.	4536	5221	8402	G.C.	-
Kona	143	164	265	G.C.	-
Kwajalein	2123	2443	3931	G.C.	-
Lanai	64	74	119	G.C.	-
Lihue	88	101	163	G.C.	-
Las Vegas Intl.	2396	2758	4438	G.C.	-
London (Heathrow)	6274	7220	11619	G.C.	-
Los Angeles Intl.	2217	2551	4106	G.C.	-
Majuro Is.	1973	2271	3655	G.C.	-
Manaus (Ponta Pelada)	5912	6804	10950	G.C.	-
Manila Intl.	4598	5292	8515	G.C.	-
Marshall Is. Intl.	1997	2298	3698	G.C.	-
Massawa	8360	9620	15482	G.C.	-
Melbourne (Essendon)	4789	5511	8869	G.C.	-
Melbourne Intl.	4789	5511	8869	G.C.	-
Mexico City Intl.	3291	3788	6095	G.C.	-
Midway Is.	1136	1307	2105	G.C.	-
Misawa	3261	3753	6040	G.C.	-
Molokai	48	55	89	G.C.	-
Moncton	4618	5314	8552	G.C.	-
Montreal (Dorval) Intl.	4260	4902	7889	G.C.	-
Montreal (Mirabel) Intl.	4246	4886	7863	G.C.	-
Munich (Riem)	6595	7589	12214	G.C.	-
Nagoya A.B.	3480	4005	6446	G.C.	-
Nairobi Intl.	9317	10722	17256	G.C.	-
Nandi	2761	3177	5113	R.L.	212
Nandi	2756	3171	5104	G.C.	-
Nauru Is.	2442	2810	4523	G.C.	-
New York (J.F.K.) Intl.	4320	4972	8003	G.C.	-
North Bay	4018	4624	7441	G.C.	-
Noumea	3342	3845	6188	G.C.	-
Oakland Intl.	2090	2405	3870	G.C.	-
Okinawa (Naha)	4041	4650	7484	G.C.	-
Osaka Intl.	3557	4093	6588	G.C.	-
Oslo (Fornebu)	5894	6783	10916	G.C.	-
Oslo (Gardermoen)	5877	6763	10884	G.C.	-
Ottawa Intl.	4183	4817	7748	G.C.	-
Pago Pago Intl.	2269	2611	4203	R.L.	200
Pago Pago Intl.	2268	2609	4200	G.C.	-
Perth Intl./Australia	5878	6764	10886	G.C.	-
Philadelphia Intl.	4265	4908	7899	G.C.	-
Phoenix Intl.	2530	2911	4685	G.C.	-
Pittsburgh (Allegheny Co.)	4048	4658	7496	G.C.	-
Portland Intl./Ore.	2259	2600	4184	G.C.	-
Portland Intl./Maine	4427	5095	8200	G.C.	-
Port Moresby (Jackson)	3721	4282	6891	G.C.	-
Prestwick	5993	6897	11099	G.C.	-
Rangoon	5878	6765	10886	G.C.	-
Rarotonga	2554	2939	4730	G.C.	-
Regina	3033	3491	5618	G.C.	-
Rio de Janeiro (Galeao)	7197	8283	13330	G.C.	-
Rio de Janeiro (Dumont)	7203	8289	13340	G.C.	-
Rome (Fiumicino)	6973	8025	12195	G.C.	-
Saigon	5463	6287	10117	G.C.	-
St. John's/Ntld	5041	5801	9336	G.C.	-
St. Louis Intl.	3580	4120	6631	G.C.	-
San Bernardino	2274	2617	4212	G.C.	-
San Diego (Lindbergh)	2267	2608	4197	G.C.	-
San Francisco Intl.	2080	2394	3853	G.C.	-
Sao Paulo (Congonhas)	7024	8084	13010	G.C.	-
Saskatoon	2990	3440	5537	G.C.	-
Seattle-Tacoma Intl.	2324	2672	4304	G.C.	-
Seoul A.B.	3936	4529	7289	G.C.	-
Singapore A/P	5827	6706	10791	G.C.	-
Sondrestrom	4612	5308	8541	G.C.	-
Stockholm (Arlanda)	5936	6831	10993	G.C.	-
Stockholm (Bromma)	5955	6853	11028	G.C.	-
Sydney (K-S) Intl./Australia	4409	5073	8165	G.C.	-
Tahiti (Faaa)	2384	2743	4414	G.C.	-
Taipei Intl.	4379	5040	8110	G.C.	-
Tehran (Mehrabad)	6998	8053	12960	G.C.	-
Tel Aviv Intl.	7515	8689	13919	G.C.	-
Tokyo (Haneda)	3342	3846	6189	G.C.	-

TATA / TAI MONTREAL CANADA

FROM/TO	DISTANCE & TRACK n.m.	st.m.	km.	Route	°(T)
Honolulu Intl./Hawaiian Islands (Cont'd)					
Tokyo Intl.	3310	3809	6130	G.C.	-
Toronto Intl.	4031	4638	7465	G.C.	-
Vancouver Intl.	2349	2703	4350	G.C.	-
Victoria (Patricia Bay)	2323	2673	4302	G.C.	-
Vienna (Schwechat)	6623	7621	12265	G.C.	-
Wake Is.	1994	2295	3693	G.C.	-
Windsor/Ont.	3897	4484	7217	G.C.	-
Winnipeg Intl.	3307	3806	6124	G.C.	-
Zurich A/P	6609	7605	12239	G.C.	-
Hoonah Seaplane/Alaska	5807N	13527W			
Juneau	31	36	58	G.C.	-
Hooper Bay/Alaska	6132N	16609W	(HPB)		
Scammon Bay Town	26	29	47	G.C.	-
Hoquiam (Bowerman)/Wash. U.S.A.		4658N	12356W	(HQM)	
Olympia Muni	42	49	78	G.C.	-
Seattle-Tacoma Intl.	73	84	134	G.C.	-
Horsham/Vic. Australia	3640S	14210E	(HSM)		
Melbourne Intl.	141	162	261	G.C.	-
Warracknabeal	24	28	45	G.C.	-
Hoskins/Solomon Islands	0528S	15024E	(HKN)		
Jacquinot Bay	112	129	208	G.C.	-
Rabaul	131	151	243	G.C.	-
Talasea	23	27	43	G.C.	-
Hossanah/Ethiopia	0733N	3752E	(HOS)		
Soddu	43	50	80	G.C.	-
Hot Springs (Memorial Field)/Ark., U.S.A.		3429N	9306W	(HOT)	
Little Rock	45	32	84	G.C.	-
Memphis Intl.	157	181	291	G.C.	-
Montreal (Dorval) Intl.	1102	1269	2042	G.C.	-
Pine Bluff	61	70	112	G.C.	-
Shreveport	127	146	236	G.C.	-
Texarkana	76	87	141	G.C.	-
Hot Springs (Ingalls Field)/Va. U.S.A.		3757N	7950W	(HSP)	
Roanoake Muni.	39	44	71	G.C.	-
Staunton	48	55	89	G.C.	-
Houailou (Nesson)/New Caledonia		2115S	16537E	(HLU)	
Kouaoua	17	19	31	G.C.	-
Noumea	57	65	105	G.C.	-
Plaine des Gaiacas	39	45	73	G.C.	-
Poindimie	27	31	49	G.C.	-
Touho	34	39	63	G.C.	-
House Harbour – See Magdalen Islands					
Houston Intercontinental/Tex., U.S.A.		2959N	9521W	(IAH)	
Kansas City Intl.	560	644	1037	G.C.	-
Kingston Intl.	1245	1433	2305	G.C.	-
La Fayette Regional	174	201	373	G.C.	-
Lake Charles Muni	111	128	206	G.C.	-
La Paz (El Alto)	3200	3683	5927	G.C.	-
Las Vegas Intl.	2984	3433	5526	G.C.	-
Leesville	129	148	239	G.C.	-
Lima Intl.	2732	3144	5060	G.C.	-
Little Rock	362	375	603	G.C.	-
London (Heathrow)	4190	4821	7759	G.C.	-
London/Ont.	1037	1194	1921	G.C.	-
Longview	148	170	273	G.C.	-
Los Angeles Intl.	1194	1374	2212	G.C.	-
Lufkin	81	93	150	G.C.	-
Malta (Luqa)	5212	5998	9653	G.C.	-
Managua	1187	1366	2199	G.C.	-
McAllen Intl.	275	317	510	G.C.	-
Melbourne (Cape Kennedy)	780	897	1444	G.C.	-
Memphis Intl.	407	469	755	G.C.	-
Mexico City Intl.	664	765	1231	G.C.	-
Miami Intl.	837	963	1550	G.C.	-
Midland-Odessa	371	427	688	G.C.	-
Moncton	1726	1986	3196	G.C.	-
Montego Bay Intl.	1174	1351	2174	G.C.	-
Monterrey Intl.	356	410	660	G.C.	-
Montreal (Dorval) Intl.	1376	1583	2548	G.C.	-
Nashville Metro	571	657	1057	G.C.	-
Nassau Intl.	995	1145	1843	G.C.	-
Newark Intl.	1215	1398	2250	G.C.	-
New Orleans Intl.	265	305	491	G.C.	-

FROM/TO	DISTANCE & TRACK n.m.	st.m.	km.	Route	°(T)
Houston Intercontinental/Tex., U.S.A. (Cont'd)					
New York (J.F.K.) Intl.	1230	1415	2278	G.C.	-
New York (La Guardia)	1229	1414	2276	G.C.	-
Oklahoma City	344	396	638	G.C.	-
Orlando Intl.	740	852	1371	G.C.	-
Ottawa Intl.	1305	1502	2417	G.C.	-
Panama City Intl.	1540	1772	2852	G.C.	-
Paris (C de Gaulle)	4355	5012	8066	G.C.	-
Paris (Le Bourget)	4353	5009	8061	G.C.	-
Paris (Orly)	4357	5014	8069	G.C.	-
Philadelphia Intl.	1150	1323	2130	G.C.	-
Phoenix Intl.	874	1006	1620	G.C.	-
Pittsburg (Allegheny Co.)	977	1124	1809	G.C.	-
Prestwick	3965	4563	7344	G.C.	-
Quebec A/P	1501	1727	2780	G.C.	-
Quito	2048	2357	3793	G.C.	-
Rio de Janeiro (Galeao)	4365	5023	8083	G.C.	-
St. Louis Intl.	581	668	1076	G.C.	-
San Angelo	278	320	516	G.C.	-
San Antonio Intl.	165	189	305	G.C.	-
San Diego Intl.	1129	1299	2090	G.C.	-
San Francisco Intl.	1418	1631	2625	G.C.	-
San Jose Intl.	1353	1557	2505	G.C.	-
San Salvadore (Ilopango)	1036	1192	1919	G.C.	-
Santiago (Los Cerrillos)	4058	4669	7515	G.C.	-
Santiago (Pudahuel)	4050	4660	7500	G.C.	-
Sao Paulo (Congonhas)	4268	4911	7904	G.C.	-
Saskatoon	1423	1637	2635	G.C.	-
Seattle-Tacoma Intl.	1625	1871	3010	G.C.	-
Shreveport	168	193	310	G.C.	-
Tampa Intl.	683	786	890	G.C.	-
Tampico Intl.	480	553	890	G.C.	-
Tapachula	920	1059	1704	G.C.	-
Tegucigalpa Intl.	1057	1217	1958	G.C.	-
Temple Muni	127	146	235	G.C.	-
Toronto Intl.	1112	1280	2060	G.C.	-
Tulsa Intl.	374	430	693	G.C.	-
Vancouver Intl.	1710	1967	3166	G.C.	-
Victoria/Tex.	108	122	197	G.C.	-
Wichita Muni	472	542	873	G.C.	-
Winnipeg Intl.	1199	1380	2221	G.C.	-
Houston (William P. Hobby)/Texas U.S.A.		2939N	9517W	(HOU	
Kingston Intl.	1232	1418	2281	G.C.	-
La Paz (El Alto)	3182	3662	5892	G.C.	-
Las Vegas (McCarran) Intl.	1071	1233	1984	G.C.	-
Lima Intl.	2712	3121	5023	G.C.	-
London (Gatwick)	4219	4855	7814	G.C.	-
London (Heathrow)	4203	4837	7784	G.C.	-
Managua (Las Mercedes)	1167	1333	2162	G.C.	-
Melbourne Reg.	775	891	1435	G.C.	-
Mexico City Intl.	648	746	1199	G.C.	-
Miami Intl.	829	954	1535	G.C.	-
Montreal (Dorval) Intl.	1388	1597	2570	G.C.	-
Nashville (Berry Field)	582	670	1077	G.C.	-
Nassau Intl.	988	1136	1829	G.C.	-
Newark Intl.	1224	1419	2267	G.C.	-
New Orleans Intl.	262	302	485	G.C.	-
New York (J.F.K.) Intl.	1239	1426	2294	G.C.	-
New York (La Guardia)	1238	1424	2293	G.C.	-
Ottawa Intl.	1318	1517	2441	G.C.	-
Panama City Intl.	1523	1753	2820	G.C.	-
Paris (C de Gaulle)	4368	5026	8089	G.C.	-
Paris (Le Bourget)	4365	5023	8084	G.C.	-
Paris (Orly)	4370	5029	8093	G.C.	-
Pittsburgh (Allegheny Co.)	988	1136	1829	G.C.	-
Quito	2029	2334	3757	G.C.	-
Rio de Janeiro (Galeao)	4349	5005	8054	G.C.	-
San Diego (Gillespie Field)	1123	1293	2081	G.C.	-
San Jose Intl.	1334	1535	2471	G.C.	-
San Salvador (Ilopango)	1017	1171	1885	G.C.	-
Santiago (Los Cerrillos)	4038	4647	7478	G.C.	-
Santiago (Pudahuel)	4030	4637	7463	G.C.	-
Sao Paulo (Congonhas)	4251	4892	7872	G.C.	-
Temple Muni.	142	163	263	G.C.	-
Tampa Intl.	678	780	1255	G.C.	-
Tampico Intl.	462	532	856	G.C.	-
Tapachula	900	1035	1667	G.C.	-
Tegucigalpa Intl.	1037	1193	1921	G.C.	-
Victoria (County Foster)	98	113	182	G.C.	-
Hsian (Hsi-Kuan)/China	3414N	10853E			
Peking (Nan Yuan)	489	563	905	G.C.	-
Shanghai (Lunghua)	660	761	1223	G.C.	-
Tai Yuan (New)	278	321	516	R.L.	04
Tai Yuan (New)	278	320	515	G.C.	-

Bernard M. Scherman, M. D.

6-15-86

Dear Mr. Balazs,

Enclosed are some snapshots taken of the turtle we spotted by our property recently. Although these pictures were taken of a healthy turtle which might have been the same one that was severely injured in the eyes when we called you several weeks ago.

We just thought you might be interested in these pictures.

Respectfully,

Madeline J Scherman

ONE KAILUANA PLACE • KAILUA, HAWAII 96734

Look in "Place Names"

Map 29

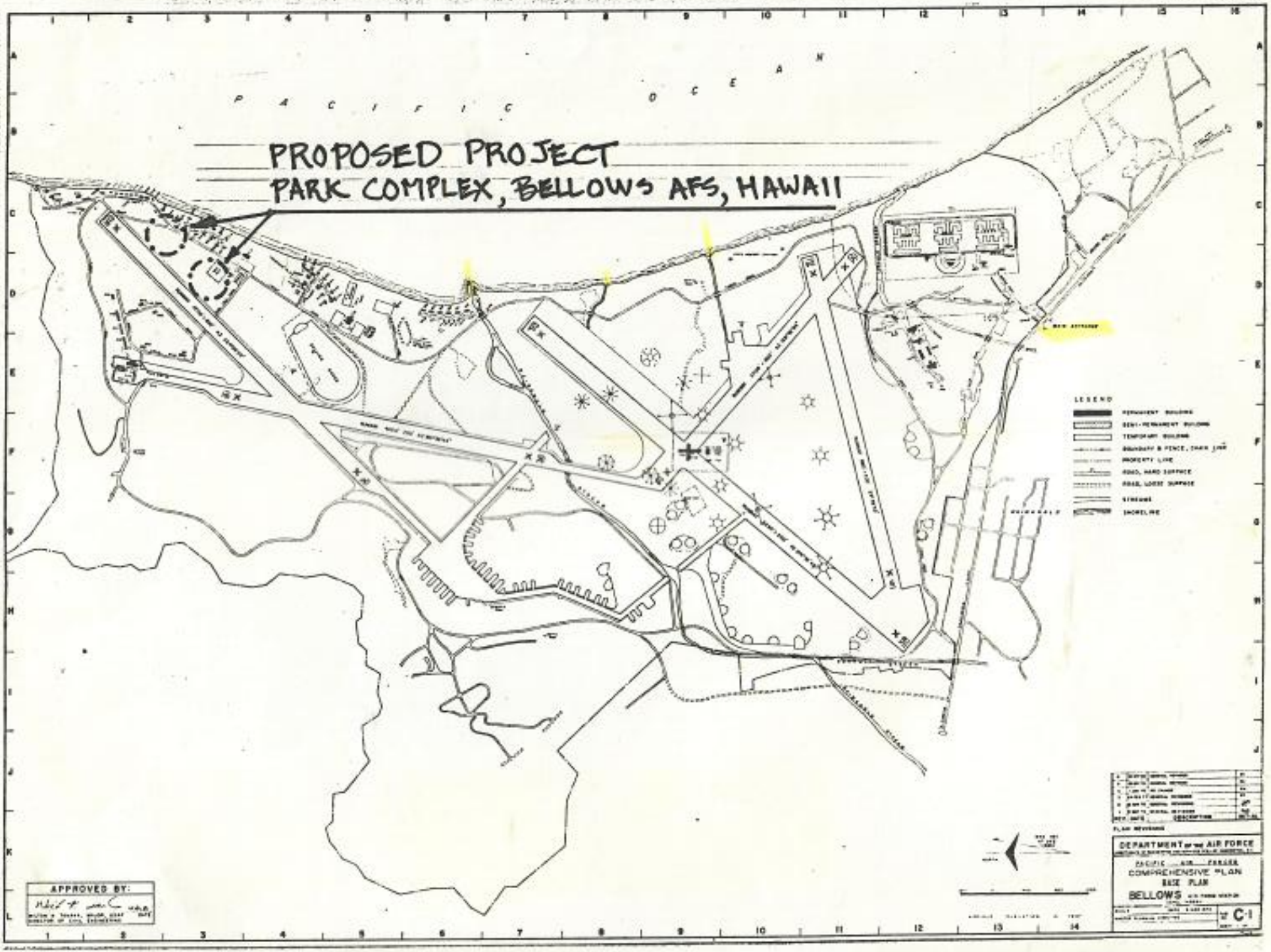
"Makahonu" Pt.

Kaawa

Map 41 Kawela

Map 47 Haliwa

Map 67-68 west beach


PROPOSED PROJECT
PARK COMPLEX, BELLOWS AFS, HAWAII
P A C I F I C O C E A N
LEGEND
APPROVED BY:
DEPARTMENT OF THE AIR FORCE
COMPREHENSIVE PLAN
BASE PLAN
BELLOWS
C-1

SUMMARY OF INFORMATION ON SEA TURTLE NESTINGS AT KAHUKU BEACH, OAHU, 1982-85.

by

George H. Balazs and William G. Gilmartin
Southwest Fisheries Center Honolulu Laboratory
National Marine Fisheries Service, NOAA
2570 Dole Street
Honolulu, HI 96822-2396

1982

8-3	At least two emergences resulting in four excavations.
8-14	Emergence tracks but no excavations.
8-17	Emergence tracks and excavations.
8-21	Emergence tracks but no excavations.
8-27 (approx.)	Emergence tracks and numerous excavations.
9-2	Emergence tracks and a large excavation.
9-7 and 9-8	Tracks of hatchlings originating from an earlier excavation site.
9-9	Nest site excavation resulted in the recovery of 62 empty egg shells; 3 advanced development but dead embryos; 1 early development but dead embryos; 1 advanced development but deformed albino embryo; 3 eggs with no apparent development; and 2 undersized eggs with no development. Nest therefore contained 72 eggs, with 62 hatchlings (86%) having emerged at the surface. Embryos identified as the green turtle, Chelonia mydas.
9-24 (approx.)	Tracks of hatchlings orginating from an earlier excavation site. Several egg shells recovered and identified as C. mydas on the basis of size.

1983

No observations made of nesting activity. Hurricane "Ewa" removed a considerable quantity of beach sand.

1984

5-12 (approx.)	Emergence tracks and excavation.
5-20	Turtle seen on the beach by Gay Bartell.

7-8 (approx.)	Tracks of hatchlings originating from an earlier excavation site. Also a recent excavation present.
7-13	Nest site excavation resulted in 62 empty egg shells and 3 eggs with no apparent development (65 total). Identified as C. mydas on the basis of egg shell size.
7-19	Emergence tracks and excavation.
7-20	Tracks of hatchlings originating from an earlier excavation.
7-24	Nest site excavation resulted in 69 empty egg shells and 2 eggs with no apparent development (71 total). Identified as C. mydas on the basis of egg shell size.
1985	
	No observations made of nesting activity.

SUMMARY OF INFORMATION ON SEA TURTLE NESTINGS AT KAHUKU BEACH, OAHU, 1982-85.

complied by

George H. Balazs and William G. Gilmartin
Southwest Fisheries Center Honolulu Laboratory
National Marine Fisheries Service, NOAA
2570 Dole Street
Honolulu, HI 96822-2396

and

David Woodside
U.S. Fish and Wildlife Service
P. O. Box 50167
Honolulu, HI 96850

1982

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7-24	Nest site excavation resulted in 69 empty egg shells and 2 eggs with no apparent development (71 total). Identified as C. mydas on the basis of egg shell size.

1985

No observations made of nesting activity. Storm waves removed a considerable quantity of beach sand.

924-8203

395-6662 The Natural Resources

8/21/86
11:45am

George,

No luck up at Kahuku with the Turtle returning. The last day I checked the beach was Tuesday, I haven't been up there since but that was 16 days anyway. I did actually stay up there Saturday night, too bad she didn't show up. Anyway, here's all the tagging stuff + the bulletin I borrowed from your friend. I do have all the days logged that I checked for the sea turtle starting back in March, I guess. I just wrote down what the trash situation looked like, tire tracks, etc. If you're interested in it give me a call. Also, how are we going to follow this up now?

Talk to you later.

Vanya

Schrader's

Windward Marine Resort

KANEOHE BAY • HAWAII

FOR RESERVATIONS SEE YOUR TRAVEL AGENT

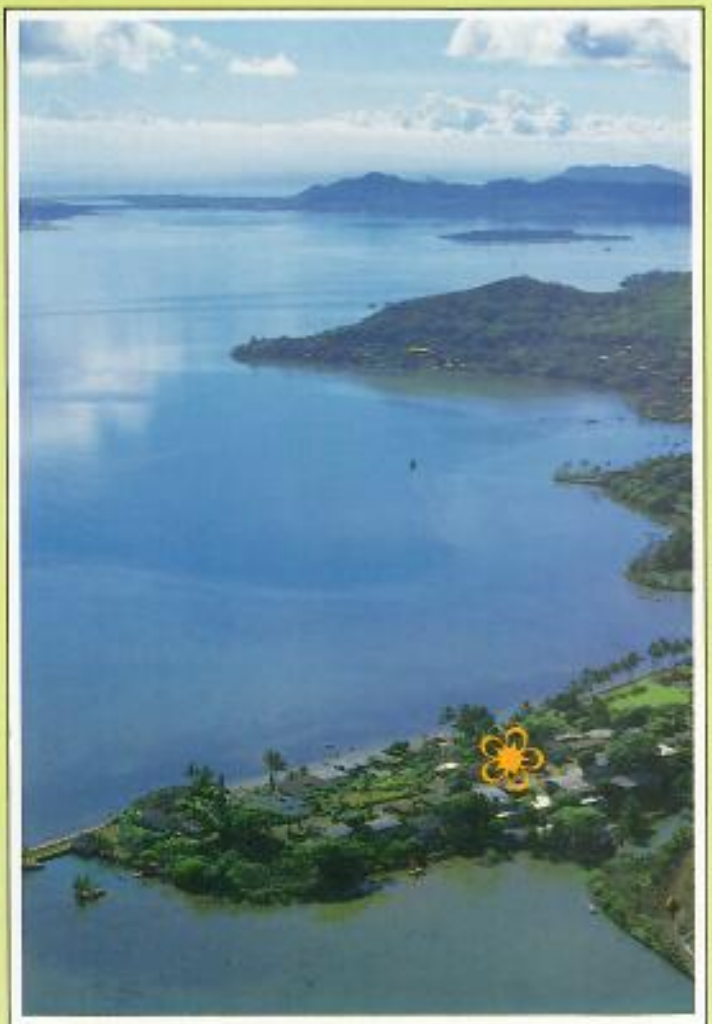
WINDWARD MARINE RESORT, INCORPORATED
47-039 Lihikai Drive, Kaneohe 96744
(808) 239-5711
Reservations call Toll Free
USA 1-800-367-8047 Ext. 239
Canada 1-800-423-8733 Ext. 239

The Marine Resort Concept

The Hawaiian Islands have been called the most isolated group of islands on the face of the earth. Over 2,000 miles to the closest land mass and all the area in between covered by Ocean. It is inevitable then that Islanders feel a special relationship with the Ocean and recognize that their future will be largely determined by how the ocean is used or misused. The Ocean, particularly the deep ocean, remains largely unknown; however interest is being generated, and resources committed, in an effort to increase our Ocean knowledge. Nowhere is that effort being given greater encouragement than in Hawaii.

The University of Hawaii (a Sea Grant College) and the Oceanic Institute (a private organization situated at Makapuu) have led the way. Successful programs are being carried out in, Marine aquaculture, Ocean Thermal generation of electricity, Marine resource development and management, Ocean recreation, Sea Law and others. The State of Hawaii Legislators have recently appropriated over 10 million dollars to create an Ocean Awareness Center. The people of Hawaii are committed to seek out and develop the hidden potential of its vast surrounding Oceans.

The role of a marine resort is to open up the field of Marine Recreation to visitors and residents. No location is better suited for this than Kaneohe Bay. Marine activites such as diving, fishing, surfing, sailing and boating along with excellent instructions are available or can be arranged with qualified personnel through our office. It is our intent, to make available to our guests, insight into the progress being made in all related marine fields, so that they too can participate in this marine "adventure"



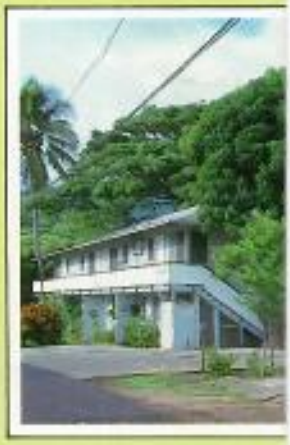
Kaneohe Bay

The ideal bay for water sports! Besides its spectacular scenery, pictured above, Kaneohe Bay offers an area of over 7,500 acres, protected on its windward side by a reef and islands. The *"Tradewinds"*, 10 to 25 knots, blow practically continuously for 9 months out of the year. Those who have sailed on the mainland will appreciate the 72° water temperature and the sub-tropical climate that prevails.

As a final attribute, consider that while the area around the Bay is home for many people who work in Honolulu, the lack of adequate marine facilities have left it relatively unused.

Windward Marine Res

Rural Hotel & Vacation Cottage



For years visitors to Hawaii have been going to the Nuuanu Pali lookout and gazing down on Kaneohe and Kailua with admiration. Few, however, have had a chance to spend much time in Honolulu's favorite suburban community and savor the delights that have attracted local residents. The "Windward Side" is cooler, because of our exposure to the tradewinds, greener because we have more showers, life is a little more leisurely and people a little closer to the land.

Our resort is located on Wailau Peninsula which projects into the northern part of Kaneohe Bay. Our resort is a rural resort, (how rural? Our guests tell us it is the only resort on the island where you can hear the fish jump at night.) We have about 50 units in low rise buildings, spread along the shore of the Bay. Some of these units are right on the water and others are on a slope overlooking the pool and boat landing. Our two acres of land provide most units with an excellent view of Kahaluu Fishpond, Waihee Valley and the Windward Pali's. This site has been long recognized as one of the most beaut
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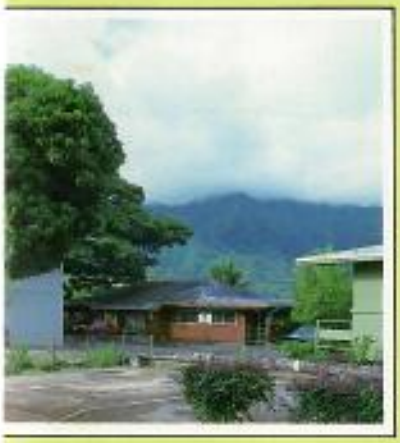
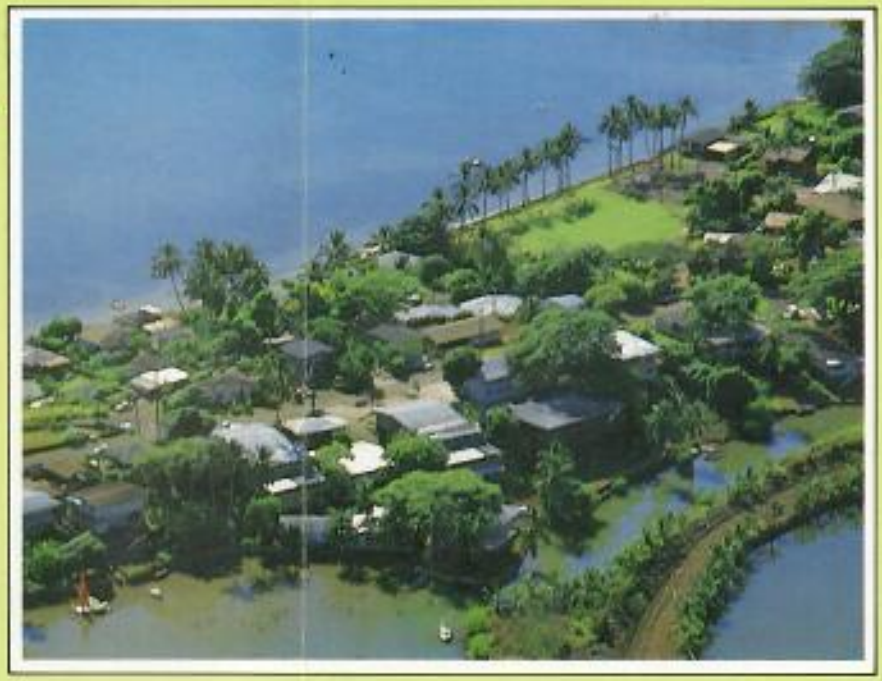
s on Kaneohe Bay



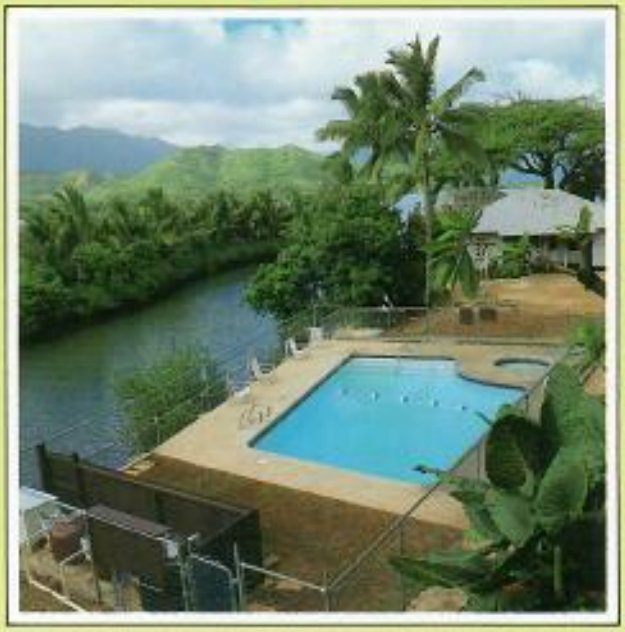


iful on Oahu and was recently chosen as cation for the filming of the *"Karate Kid II"*. e can usually accommodate you with either a ! bedroom unit, however, we do have a few 3 om units for larger groups. All of our units equipped with computerized phones and TV's that are connected to cable for the best tion. About half of our units have air condi- s while the balance are serviced by the tradewinds. of our units have covered lanais. A new swimming and spa have recently been constructed for your pleasure. is also a launderette on the site open during normal daylight hours.

Schrader's Windward Marine Resort

Most of our units are equipped with a kitchen, as we do not have a restaurant. The Windward Side, however, has a good selection of restaurants, most are inexpensive as their primary business is with local people living in this area.

One of the nice features about Windward Marine Resort is its location on the island relative to the major population and tourist center. Out of the hustle and bustle of Waikiki, yet if you seek "action" it is only about a 30 minute drive to Waikiki, Downtown Honolulu or the Airport. Arrangements can be made with rental companies for visitors to pick up an automobile at the Airport. Public transportation is available about one block away.



47-039 Lihikai Drive • Kaneohe, Hawaii 96744 • Telephone (808) 239-5711

March 31, 1987 F/SWC2:GHB

Mr. Harry Kon
Caretaker, Kawela Bay P.O. Box 737
Kaunakakai, HI 96731

Dear Mr. Kon:

I appreciated having the opportunity to speak to you by telephone this morning. Thank you for agreeing to watch for the injured sea turtle reported to be in Kawela Bay on March 28th and 29th. We are anxious to give aid to the animal, if possible, and also our Federal Enforcement Branch is interested in investigating the cause of the animal's injuries.

As promised, I am sending you several articles about sea turtles which relate to our agency's responsibilities under the U.S. Endangered Species Act.

Sincerely,

George H. Balazs
Zoologist

cc: Kuilima Development Corp.

Balazs
HL

GHB:ey

United States Department of the Interior

FISH AND WILDLIFE SERVICE
300 ALA MOANA BOULEVARD
P.O. BOX 50167
HONOLULU, HAWAII 96850

George Balazs
National Marine Fisheries Service
1270 Dole St.
Honolulu, HI

February 27,1987

Dear George:

I understand there has been some confusion concerning the fate of the green sea turtle nesting on the beach makai of the James Campbell National Wildlife Refuge, Kii Unit in 1986. David Woodside has monitored this nest site in previous years but understood that Vanya was working with you and that she was also monitoring the site. I reviewed with David his findings concerning this nest in 1986 which are presented below.

June 16, 1986 - two turtles in the water off of beach were observed
July 8 - no sign of hatching
August 5 - David noted that a nest had been dug during the previous few days and estimated a laying date of 1-3 October.
August 19 - no turtle sign present
Sept. 29 - no sign of turtle hatching
Oct. 8 - no sign of turtle hatching
Oct. 14 - no sign of hatching
On Oct. 20, 1986 David talked with Ken Niethammer, Nancy Norvell and Vanya and found that they had dug out the nest (exact date not known though was within a few days prior to 20 Oct.) and that there were 75 eggs and 72 hatched eggs in the nest.Eggs were reburied or left on the beach.

David assumed that Vanya had your permission to dig up the nest as he thought she had been volunteering with your efforts. Nancy Norvell was a volunteer at Tern who had assisted Rick and Larry in the turtle hatchling recovery efforts there. From our records here, I can find no permit to authorize any of our staff to dig up turtle nests. Do the folks on Tern have a permit for these activities? Does NMFS issue these permits or does FWS? Who issues your permit to dig up nests?

At any rate, I hope this information is useful. We will continue to monitor this nest site in 1987 and coordinate with your office when nesting occurs.

Sincerely yours,

Stewart

Stewart I. Fefer
Refuge Complex Manager

Tsunami was complete

TSUNAMI from A-1

While the wind kept a 75-foot windmill churning, supplying electricity in the early days of the ranch, it frustrated the landscaping attempts of the family's full-time gardener.

Palm trees wound up battered with stripped leaves. "They didn't look good at all," Davis recalled. "The only trees (Kaiser) could put up would be ironwood, and that's hideous."

The salt air blew through the house, repeatedly rusting away all the metal fixtures, she added. The window screens also took a beating.

"We had the help, so we could do it," Davis said.

The well-to-do family could afford to deal with these difficulties, but no amount of money can stop a tidal wave.

The memory of watching the ocean smash apart her home prompted Davis to testify before the City Council last week against the Sandy Beach project.

"I lived in that area and I had an important story to tell," she said. "Nobody had thought much about (the tsunami) because it happened in 1946. Those people (the council members) are much younger."

The tsunami struck at 6:30 a.m. on April Fool's Day. Davis woke up at 5:30 a.m. to feed her 8-month-old baby and then tucked the infant into her perambulator.

"I heard a swishing kind of noise," she recalled, "but I thought it was the wind in the coconut trees. Then Alan said, 'Grab baby and run! There's a tidal wave!' "

Davis ran outside to the car with the baby while Alan, wearing only a towel, grabbed a pair of pants and the couple's 13-year-old daughter, Nancy.

By the time Alan went back to retrieve the dog, three feet of water filled most of the house.

The highway lay about 200 feet from the home, and the family drove up it toward Makapuu as the ocean washed away the road by Sandy Beach. They parked on the Lighthouse Road where they had a good view of the destruction.

"I could see our house getting smashed up," Davis said. "It was fascinating, in a way, to watch. I had always thought a tidal wave was just a huge wave. But it was this surge of water coming in, then rushing and roaring back out."

While the Davis family managed to escape quickly, their neighbor, Mrs. Walter Wix, was caught in the surge and battered against the lava rock beforing being rescued.

"She looked like centipedes had bitten her all over," Davis said. "She was in the hospital for quite a while."

Surviving without a scratch made losing their home and virtually all of their possessions less of a tragedy, Davis said.

"Material things aren't that important, you learn. One thing I keep missing is my photographs, my albums," she added.

A few ironies stood out in the aftermath of the destruction — like the uncracked eggs in the battered refrigerator.

"My daughter, Nancy, collected miniatures," Davis said. "Her whole room was smashed up, but all these little miniatures were fine. And I remember one lilac vase floating around — it didn't even have a chip."

Bits and pieces of their lives kept turning up on the rocky shoreline, with the Navy helping to salvage valuables with metal detectors.

"They found my flat silver in the back pastures," Davis said. "It was all there, in its case."

She found one domino next to the gate. "I thought, 'I'll never find the rest of them,' so I threw it away. The next day, someone found all the rest."

Davis managed to salvage one good laugh out of the disaster. Two days after the wave hit, she was standing by the gate when a man from Hawaiian Electric Co. drove up.

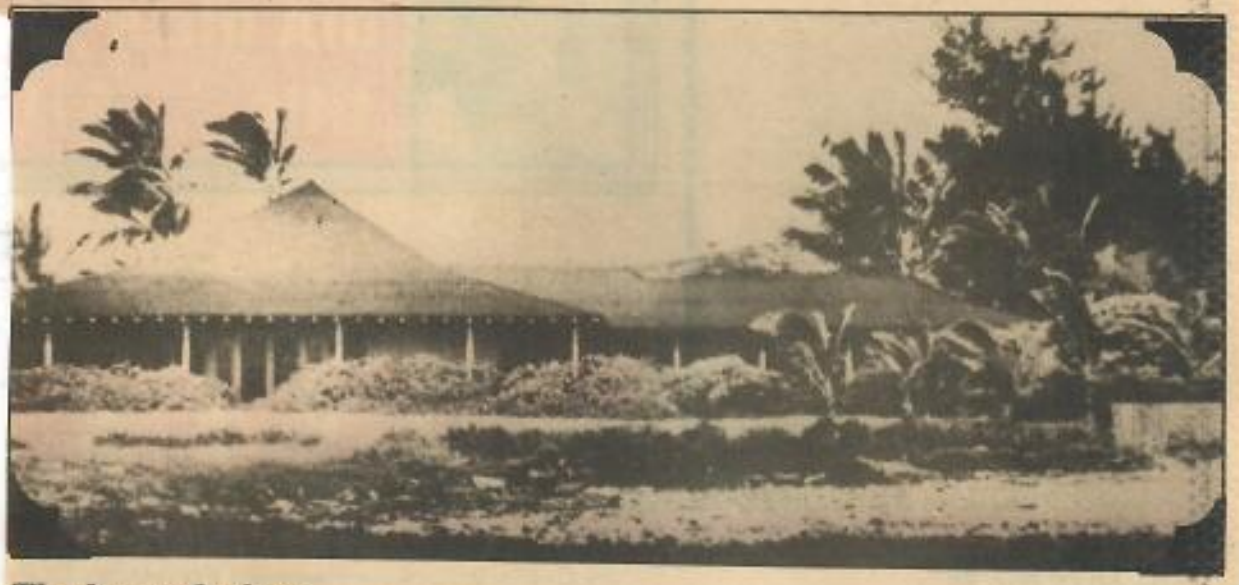
"He said, 'Mrs. Davis, I came to read the meter.' I said, 'Well, go ahead if you can find it.'"

Davis can't recall exactly how far the water surged inland during the tsunami, but the Civil Defense map shows a 2,000-foot innundation zone for the Sandy Beach area.

Her testimony about the 1946 tsunami included slides showing the extent of the destruction. But the council approved Kaiser's project, to her dismay.

"I hope residents living where we once did and around Sandy Beach never have to undergo the terrible experience I describe," Davis told the council.

wipe-out at Queen's Beach



The house before . . .

. . . and after

Star-Bulletin Monday, November 12, 1984 Honolulu

Where Have All t

By Susan Manuel
Star-Bulletin Writer

THE big fish story on the Waianae Coast these days is that there are any fish at all. From Barbers Point to Kaena Point, trollers, pole fishers, net throwers, divers and spear fishers are scrambling to catch an ever-dwindling fish population.

"You can see it each year getting worse, and this year is the worst that I've seen yet," says troller Merle Painter. "I go looking for fish. I just can't find them."

Ahi haven't run along the Waianae Coast in any significant number for two years.

"I never heard of anybody catch an *ahi* here for six months," says "Uncle" Paul Blakemore, the white-bearded don of the Waianae Boat Harbor.

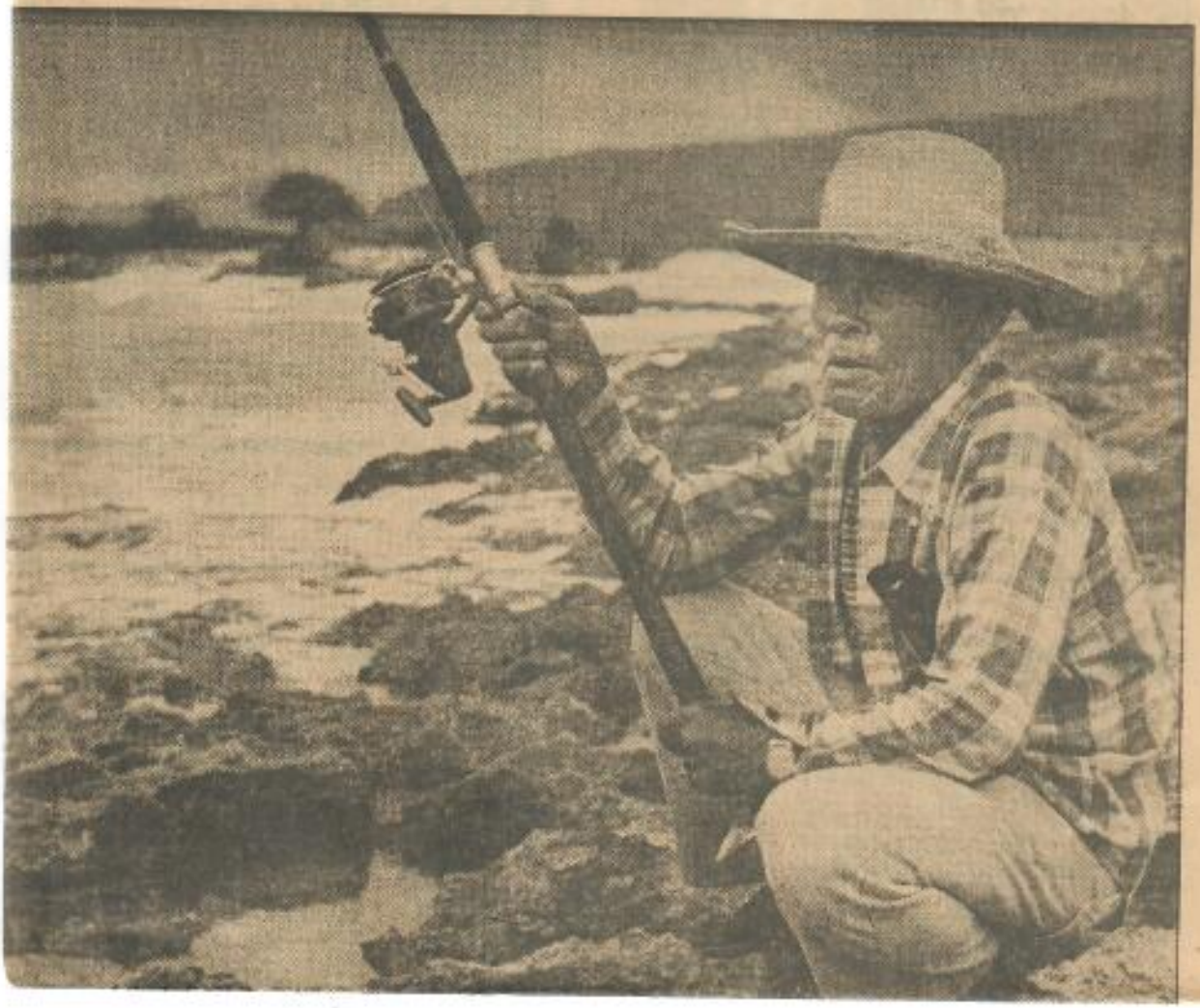
The scarcity has caused tensions: fishermen from Waianae may not be welcome in Haleiwa. The practitioner of one style blames the other.

Pleasure fishermen at Waianae Boat Harbor say they've watched commercial *aku* boats clean the harbor, a designated sanctuary, of *nehu*, a small fish used for bait, netting *halalu* at the same time and dumping

ent

Section B

the Fishes Gone?



them later.

When an *aku* boat comes alongside a smaller troller, throws on its sprinklers and starts "chumming" minnows, "you may as well give up," says Blakemore.

Net throwers feel they're discriminated against by restrictions written by bureaucrats whose ethnic background favors pole fishing.

"When there's no big fish, Hawaiians go out and drop their net," says Lucio Badayos. "To me I say they're not stealing anything ... Hawaiians are literally taking the rap for fewer fish."

Akule fishers who used airplanes to spot schools are accused of wiping out the species.

"One guy came in last week with 12,000 pounds," Blakemore said. "You oughtta see the net. Every eye had a fish and they taking them out with a chopstick. That's why it's all fished out."

Newcomers are blamed for wiping out fishing areas, instead of taking only what a family could use, the way people say it was in the old days.

"They're thinking about today and to hell with tomorrow," says Blakemore.

A few years ago, bombing coral holes with Clorox bottles was popular—a practice comparable to napalming fish dwellings.

There are myriad reasons for the lack of fish as well as unsolved mysteries.

Everyone agrees more people are fishing. But at the same time, coastal developments have killed coral and frightened off sea life. Since a channel entrance was blasted into the Barbers Point Deep Draft Harbor, fishing there has all but ceased.

"The turtles, they went insane," says *akule* fisherman Carl Jellings "You could drive right up to them."

A plume of silt emanating from harbor construction can dye the water for up to two miles along the coast.

"You can sit and watch this white area move, surrounded by blue," says Leeward Diveshop owner Peter Basabe, also a tropical fisherman. "It was like a phantom. Silt doesn't let sunlight into the coral. So, it dies. It could kill all the coral in two or three years."

Lucio Badayos casts his nets upon the water.

Carl Jellings: 'The turtles, they went insane...'

Joseph Kealoha.—Star-Bulletin photo by Craig T. Kojima.

A sewage outfall extension being built in Pokai Bay and effluent from the Kahe Point power plant have also contributed to fishing's demise.

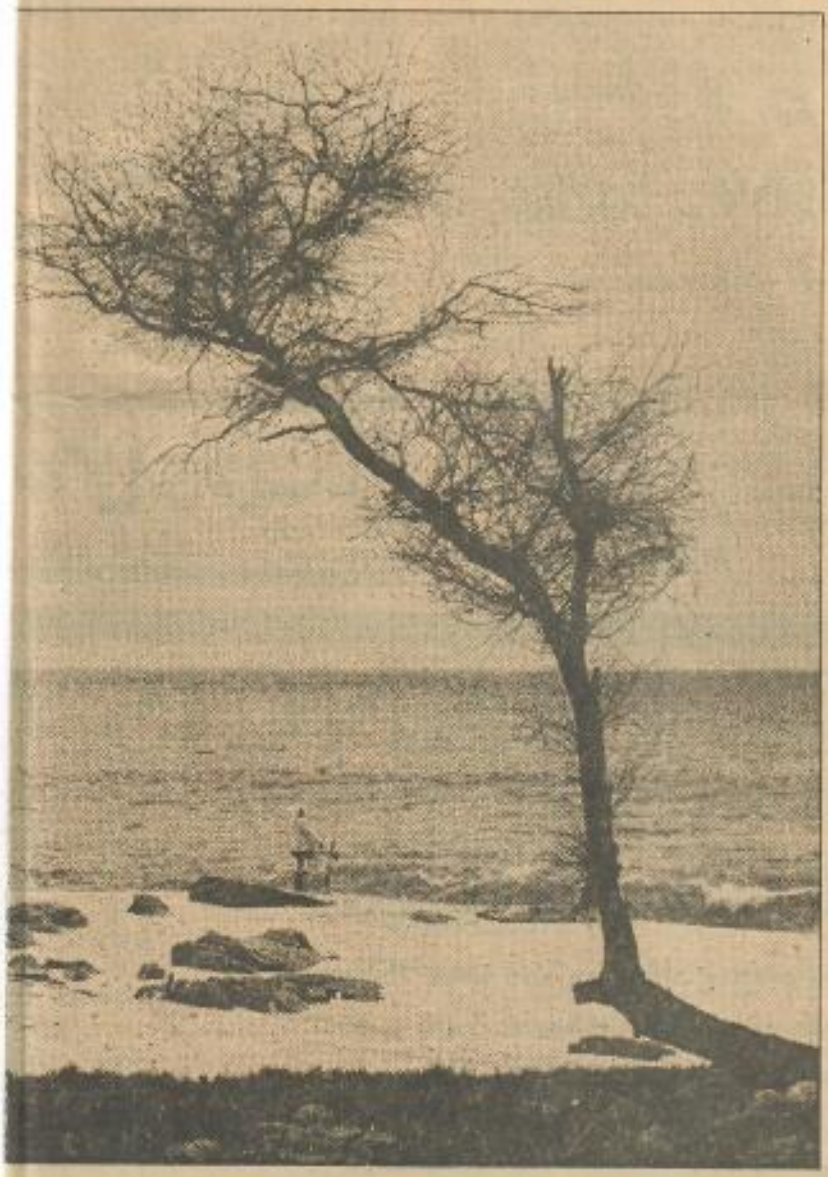
Nature added to man-made insults when Hurricane Iwa scoured the ocean floor in 1982.

"There was more damage done by the hurricane than will be done by any amount of dredging in 100 years," Basabe says.

Fish lay eggs in coral. What was once a 20-foot deep field of finger coral "is now hard, flat bottom and there's nothing there, all the way from Barber's Point to Kaena Point. You couple that, which is nature, with silt from the new harbor...," Basabe goes on. "A lot of new rubble is there. It looks like somebody dropped an A-bomb. There are no fish left."

Merle Painter believes the striking absence of fish could be cyclical, and scientists have observed a shift in species like yellowfin tuna from the Hawaii area to the American west coast.

"A friend of mine went to



Don Mesiona, above, pole-fishes at West Beach. Left, the area south of Paradise Cove that may be developed. —Star-Bulletin photos by Dean Sensui.

Mexico. There was fish laying all over that pier and no one knew what they were."

Painter pole-fished in Waianae in the late 1960s. Now he and Blakemore say they have to travel 40 miles by boat to catch anything.

The two surveyed the scores of boats docked in the harbor one day last week. A single blue flag fluttered from one mast, a sign that a marlin had been caught recently. No more than two dozen trailers are in the parking lot on weekends.

"They don't go anymore because there's nothing there. People are giving up," Painter says. "We're all kind of waiting to see if the fish come back."

Most species are getting scarce, they say, except the *humuhumu*, a smelly, thick-skinned bottom fish that leaps on bait before the more edible species.

Recently, Painter hooked a half dozen *humuhumu*. While he was waiting for the fish to relax from their bloated state of decompression, a 600-pound shark ate them. Recalling an ad offering 50 cents a pound for shark meat, Painter was tempted.

"I was getting desperate too. I was going to hit him."

People have had to get creative. They fish at night. Partners communicate in codes across CB radio channels.

"When they come in," Blakemore says of boats returning with catches, the conversation goes "'What'ya get?' 'Nothing.'"

Bravado pays off: Jellings' crew takes on the sharks and the silt off the Deep Draft Harbor.

"There's less fishing done and more productivity. If a fisherman goes here, he'll get more fish. Depends on how much guts you got," Jellings grins.

Fishermen downing beers at Waianae Boat Harbor one holiday afternoon talked about the tactics of scarcity.

"Once you've found a place," says Stan Tamoria, "You stick to it and you don't tell anyone. You never show them your catch."

"That's why I got this boat," says Jim Horie. "Not many peo-

Turn to Page B-2

Where Have All the Fishes

Continued from Page B-1

ple can afford to go where I go. It's dog-eat-dog."

Oahu fishermen have been pushed to the outlying Islands where their methods have made enemies of some.

"Honolulu people are known to rape the ocean and outer Islands," Tamoria added. "There's nothing here."

Jellings and his crew are eating laulau in a Nanakuli yard full of nets and fishing gear. Catches have shrunk for them too, in spite of their methods of finding fish. Alerted from the air, their boats surround a school of *akule* with nets.

"We used to spot from the mountain and get 1,000 pounds," he points behind him. "Now we get an average of 500 pounds with a plane.

"It's kind of our fault. We drop two times a day. Some others drop seven or eight times. The more you harass the fish, the less eggs they lay."

Fishermen say the proposed development at West Beach in Ewa will only make matters worse. To help tourists enjoy the water without stubbing toes on the sharp coral, West Beach developers plan to carve out four lagoons up to five acres large and a 36-acre marina.

Jellings fears tourism at the new development will scare off fish in the area rich with *akule*.

"Right now, the way it is, it's excellent. Jet skis, sailboats—they hear a sound and they just break up. Tourism will jam it up."

"It (will be) affecting the squid, turtle, *aweoweo*, *paulu*, *palani*," spear fisherman James Kealoha complained. "They're all reef eaters.

"I do a lot of fishing over there. If they blasting over there, it'll definitely affect the game. A squid, he can pick up a blast, like a firecracker. They move away.

"The West Beach will affect me. I cannot afford a $10,000 boat. I grab my dollar-fifty fins and my crackerjack goggles and go dive. I fish for eat. I'm a *puka* man. I cannot go where a lot of other guys go."

Basabe says there will be "goods and bads" to West Beach.

"It will displace a whole bunch of turtles, the ones as big as tables. There's a congregation (of 30 to 40) at Barbers Point. They don't like people. That's the last place without people.

"Right off Campbell Estate has one square mile of the most beautiful coral formation on the west coast. Coral and lava tubes, holes you can swim through. No way to get around it. West Beach will hurt it."

Don Mesiona is crouched with a long pole on ragged coral south of Paradise Cove, along what could some day be the Waianae Coast's Waikiki. He's fished the West Beach area for the past 20 years.

"I think maybe later on no more fishing here. Over here I catch *uhu* plenty times before. But not now. I used to go fishing on that side (he points south). But since that harbor, too dirty now."

Mesiona stayed away during construction because signs warned that fish may have been contaminated by ciguatera poisoning. Lucio Badayos says he was sick for six months after eating

Gone?

fish that ate poisoned algae in Pokai Bay when the Waianae Boat Harbor was built.

Oceanographer Paul Bienfang, a consultant for the West Beach development, told the state Land Use Commission that no scientific link has been established between ocean construction and ciguatera poisoning.

Bienfang also told the commission the resort will eliminate some sea life habitat and will increase fishing pressure by making the coastline more accessible.

But he and other West Beach consultants say the impact from carving out the lagoons and marina will be short-lived; wave action will flush silt from the man-made lagoons, just as it does from the natural lagoons at Paradise Cove.

Basabe won't wait to find out.

"It'll be great for business—more tourists, more dive classes. But I'll move before it gets here. I can't see what's happened to this coastline since 1970. It's one of the last virgin areas for wildlife and sealife. We'll deplete it if we're not careful."

25 JUNE 1987 HONOLULU ADVERTISER A4

Ewa group blasts lagoon proposal

By William Kresnak
Advertiser Government Bureau

An Ewa community group last night threatened to go to court if West Beach Estates uses explosives to create five ocean lagoons at its Ko Olina resort project.

"What we are saying as a community is we are not going to tolerate any more blasting. We are going to go into litigation if we have to," said John Frederick, president of the Honokai Hale/Nanakai Gardens Community Association.

Frederick made the comment during a community association meeting in which Bill Blaisdell, project general manager for West Beach Estates, briefed about 25 area residents on the status of the resort project, formerly known as West Beach.

Blaisdell said it may be necessary to blast "to loosen up coral" to create proposed lagoons, but any such blasting would be several months away and the community would be kept informed.

It may not be necessary to blast, he said, although West Beach Estates, the developer, is "pretty sure we'll have to blast."

Blaisdell said the developer would try new technology first to see if the lagoons could be created by other means. For example, officials said they will bring in a high-tech, underwater bulldozer to see if it can do the job.

But the possibility of blasting had some residents upset, complaining of problems they had during blasting to create the nearby 90-acre Barbers Point Deep Draft Harbor.

"You have no idea what it was like to live through that," said Jane Ross, a 20-year area resident.

Residents said their houses shook, roofs would go "bang" and children and animals were frightened by the blasting.

Ross said the experience caused her health problems as she looked for cracks in her home and sought documentation to prove the blasting damaged her house.

"It cost my insurance company $11,000-plus to correct the damage to my house from the last blasting," she said.

Frederick noted some people got no settlements for damage to their homes.

Blaisdell said West Beach Estates wants to be a good neighbor and won't blast if it doesn't need to.

He also said blasting for the lagoons can't be compared with the deep-draft harbor blasting.

"The harbor went down 55 feet and we're talking 10 feet," he said. He also said about 10 million yards of material was removed for the harbor. The amount for the lagoons wouldn't even be close to that, he said.

Construction of the Ko Olina Resort project began in March. Blaisdell said infrastructure work is under way, consisting of such things as grading and water reservoir work.

The current work will go on for about two years, he said. No buildings will go up for about 1½ years, he said.

The project is proposed as a first-class destination resort and residential community on par with the Kaanapali Beach Resort on Maui.

Astronomical event cause of record tide

Combined Staff, Wire Reports

The highest tide of 20 years surged against the Pacific Coast yesterday without causing the enormous damage many feared.

The event was caused by a gravitational pull on the oceans resulting from a rare alignment of the sun, moon and Earth.

For several days extreme tides will be helped by the coincidence of other factors. Earth is closest to the yearly orbit of the sun, and an annual variation in the moon's orbit has brought it 25,000 miles closer to Earth. When these factors combine once every 18.6 years with the alignment of the sun, moon, Earth, much of the planet experiences very high and low tides.

Hawaii residents, however, won't see much difference, according to Saul Price, staff meterologist for the National Weather Service.

"In Honolulu the difference in tide (will be) almost unnoticeable, 0.1 or 0.2 foot higher than the high tide normally would be."

Price said the main reason is that the Islands are surrounded by very, very deep water, so the difference between the highest and lowest annual tide at Honolulu Harbor is about 3 feet. This can be greater if there are storm or wind generated waves.

Price said, "Tidal differences are most pronounced where there are large, sloping continental shelves or peculiar local configurations of the coastline."

Continental shelves exacerbated Mainland tidal differences during the 1982-83 winter, when heavy rains helped high tides smash shoreside homes and businesses, causing $100 million damage to more than 3,000 structures.

This winter, fears of similar damage inspired thousands of coastal residents to sandbag their properties and board up windows with plywood panels.

But yesterday's high tide came and went, leaving few souvenirs except for mostly unneeded sandbags.

No rain occurred along the California coast, and the little rain in Oregon and Washington made little difference. Rain is important because high tides push rain-swollen rivers even higher, and rain-soaked ground lets water run off into the rivers faster.

Not only was there little rain this week, but California's total so far this season was generally only half of normal. As a result, rivers flowing into many bays were very low.

At San Francisco's Golden Gate the high point yesterday morning was 7.4 feet above mean low tide, although the surf added a couple of feet on top of that. Tides varied along the coast in height and timing.

In San Diego, Ray Hamil, owner of a Mission Beach Sports Center, said, "It's a great day for surfing. There's no danger to our building. The water came up to the (sidewalk) wall but not above."

Although high tides scared property owners, the low tides that go with them delighted beachcombers and clam collectors. The lows were nearly 2 feet below the mean low, and a drop of only a single foot exposes a vast expanse of beach for examination.

Yesterday's tides typically were the highest in 18.6 years and often higher. In Eureka, Calif., a 9.1-foot tide was thought to be the highest in a century.

UPI photo

An onlooker tries to avoid the crash of a wave hitting a sea wall in San Diego yesterday when record tides were reported along the West Coast.

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EAST OAHU SUN PRESS
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WHAT A MESS: Jason Perez displays a "pompon" saturated with oil after being used to clean a single rock beneath the Makai Pier, near Sea Life Park.

Karin Corea-Laurel photos

Experts say effects of spill will persist at beaches here

By SUZANNE ROIG
Sun Press Staff Writer

WINDWARD

While the worst of last week's 42,000 gallon oil spill appears to be over, experts say the effects will long be seen on Oahu's Windward coastlines.

Even though workers already have cleaned Makapuu Beach Park three times, crews will be there through the weekend mopping up the rocks along the bay's rocky coast. It is considered the hardest-hit beach, with oil puddles still floating onto the shore.

See OIL on A-4

of more oil come in, Coast Guard executive officer Richard Vlaun said. Kailua Beach still has dime-sized blobs of gooey oil washing up on shore. Queen's Beach in Hawaii Kai also will require an extensive rock cleaning.

Evidence of the spill could be found in "pancakes" of oil that still litter the beach and by the glistening sheen on lava rocks. The rocks are hardest to clean because they are porous, said Lt. Cmdr. Ken Keane of the Coast Guard.

The tide pools also showed the impact of the oil spill that occurred Jan. 20 in the Molokai Channel.

A now-idle Makapuu lifeguard said, "All the tide pools are dead. The opihi, limu and

Clean-up efforts are expected to continue through Sunday at a cost of $100,000, which the company will pay.

At Makapuu, state, city and federal officials gathered Wednesday morning to view first-hand the oil damage to the lava rocks.

The rocks must be cleaned by hand with plastic "pompons." A group of five people worked steadily, hunched over, mopping up the rocks near a tide pool at the far end of the park.

Officials cannot yet "predict the extent of the damage off shore. As for the beaches, you can see the oil on the rocks — that won't go away," Keane said.

If you spot an oil puddle call 541-2068.

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HAWAII TRIBUNE HERALD
FEB. 3 1987

Oil kills turtle?

HONOLULU (UPI)— The death of a young green sea turtle may have been caused by the recent oil spill off Oahu's windward coast.

A biologist at the National Marine Fisheries Service's laboratory said the intestines of a dead turtle found at Bellows Beach showed "a thick, black substance."

But he said a laboratory analysis will be conducted to identify the material and determine whether it contributed to the turtle's death.

Meanwhile, clean-up of the spill, which came from a barge off the west end of Molokai 22 days ago, continued this week along the Waimanalo coast.

Lawmaker urges state to study ways to disperse oil spills at sea

2/5-2/11/87 Sunpress

By SUZANNE ROIG
Sun Press Staff Writer

HAWAII KAI

Using an oil "dispersant" to hinder an oil spill's gooey mess from washing up on Oahu's beaches probably would not have worked any better than the current cleanup measures, Coast Guard Lt. Cmdr. Ken Keane said.

Even so, Windward state Rep. Cam Cavasso said the state should stockpile the cleanser, to use on future oil spills.

The detergent, or "dispersant," would break up an oil slick into "microscopic drops." The drops still would wash up on shore, but the detergent would push the slick outward in a wider range, lessening the ill effects to wildlife.

State laws governing the use of dispersants ban their use in waters less than 60 feet deep. Before the cleanser can be used, approval must be granted by the federal Environmental Protection Agency and the state.

State and city government officials met with Coast Guard officers at Makapuu Beach Park last week to view first-hand how much the Jan. 20 oil spill affected the shoreline. Oil washed up from Hanauma Bay to Kahana Bay after a Sause Brothers Ocean Towing Co. barge, spilled 42,000 gallons of crude oil into Molokai Channel.

At the informal meeting, Cavasso and other officials mulled over the logistics of using detergents to diffuse oil slicks in Hawaiian waters.

"If there was a stockpile, they (cleanup crews) could have used it and had the authority to do so. It is possible that the spill could have been dispersed at sea and never had to hit the beaches," said Cavasso, R-20th District (Lanikai-Waimanalo).

However, Keane said, "I think in this situation, the dispersant wouldn't have done us any good" because of the heavy tar properties of the bunker oil. If the oil was of a lighter substance, Keane said, the detergent would have worked.

See OIL on A-3

Queen's Beach rocks hamper cleanup of oil

EAST OAHU

Queen's Beach, one of the beaches hit worst by the Jan. 20 oil spill, is still undergoing a good scrubbing by mop-up brigades.

"Queen's Beach is probably one of the last beaches to clean up," Coast Guard executive officer Richard Vlaun said. Because the beach is so inaccessible, cleanup crews have focused their energies on beaches that the public uses regularly, Vlaun said.

Queen's has received cleanup attention only on the Diamond Head side of the inlet, which "got hit really bad," Vlaun added. Queen's Beach is the hardest to clean because of the inordinate amount of rocks, which crews must clean by hand with plastic "pompoms" that soak up the oil, he said.

Of the extensive Makapuu Beach cleanup effort, Vlaun said crews were out over the weekend uncovering large buried "globules" of oil in the sand.

"Tides and heavy wave action tend to bury some of the oil," he said. "It's like finding a needle in a haystack."

Crews tilled the sand a foot deep across the entire width of the beach looking for buried oil.

The oil is from a Sause Brothers Ocean Towing barge that spilled 42,000 gallons of oil during a Molokai Channel crossing. The barge was filled with bunker crude oil.

Sporadic cleanup efforts are expected to continue and to cost a total of $100,000, which the towing company will pay.

—Suzanne Roig

State urged to use detergents for dispersing oil spills at sea

Oil, from A-1

When the spill was first spotted, Keane said he flew over the slick and could see only a sheen floating on top of the water's surface. He could not see the submerged black sludge.

Oil dispersants are most effective, Keane said, when they are applied directly to the "leading edge" of an oil spill. But since the oil "burped" out of the tanker late in the evening the oil spill was not detected until much too late.

There also is still some question about the harmful effects to wildlife from the oil detergent, Keane said. "The trade-off is between the harm of the spill floating on top of the water or having the spill in microscopic particles, which could clog up small and

"There's still the fear that they (oil cleansers) are very dangerous," he said. During the mid-1960s, Keane said, a dispersant was applied to an oil spill off the coast of France, causing more damage to wildlife than the oil itself.

Cavasso's belief that the state should at least have the dispersant on hand, will be strengthened if a bill he authored is passed.

Cavasso said the bill will include an oil spill preparedness outline, advising state and city agencies to stockpile the oil detergent; to establish feasible dispensing methods; and to formulate workable plans for the state Civil Defense, enabling faster response in the future.

Sun Press 1/29/87

Aftermath of an oil spill:

Sea Life Park rigs 'birdbath' to rescue winged wildlife

MAKAPUU

Sea Life Park's laundry room was converted to a giant birdbath last week for the benefit of Oahu's seabirds, the unsung casualties of the Jan. 20 oil spill off the Windward coastline.

The efforts came too late to save one member of the world's only sea colony of red-footed boobies, said Kiana Pugh, assistant curator of birds and mammals at the park. That bird washed up on the Kaneohe Bay shoreline — coated from its small beak to its webbed feet with the goosy oil — and died.

Oil on bird feathers acts like glue causing feet, wings and bills to stick together, and rendering birds unable to swim or fly. They have no other choice but to sink and die.

"The oil is really harmful," said Ingrid Shallenberger, curator of birds and mammals at the park. "And worst of all, when they clean themselves, they ingest the oil."

The park is in charge of cleaning the state's winged wildlife in the event of a disaster like the one last week, when an estimated 42,000 gallons of "bunker crude" oil spilled from a Sause Brothers Ocean Towing Co. tanker.

Seven of the boobies, frigates and other birds that roost at the park at night had been cleaned by the end of last week. Five had not returned at all.

The first step in the clean-up was to coat the birds' feathers with mineral oil, which helps to break up the

See BIRD on A-4

OILY BUSINESS: One of the casualties of the oil spill, a booby, recuperates after a good cleaning.

WHAT A MESS: Jason Perez displays a "pompon" saturated with oil after being used to clean a single rock beneath the Makai Pier, near Sea Life Park.

Karin Corso-Laurel photos

Experts say effects of spill will persist at beaches here

By SUZANNE ROIG
Sun Press Staff Writer

WINDWARD

While the worst of last week's 42,000 gallon oil spill appears to be over, experts say the effects will long be seen on Oahu's Windward coastlines.

Even though workers already have cleaned Makapuu Beach Park three times, crews will be there through the weekend mopping up the rocks along the bay's rocky coast. It is considered the hardest-hit beach, with oil puddles still floating onto the shore.

See OIL on A-4

Baron Sekiya photo

SPILL OVER: A team of Coast Guard personnel inspects Kailua Beach for signs of last week's oil spill off the Windward coast.

Spokesmen say effects of spill will linger on Windward coast

OIL from A-1

Officials agree that while oil is still visible on the ocean surface and shoreline, the beach should remain off limits to bathers. The beach has been closed since Jan. 21.

Most of the other Windward beaches also have been closed and are being raked as reports of more oil come in, Coast Guard executive officer Richard Vlaun said. Kailua Beach still has dime-sized blobs of gooey oil washing up on shore. Queen's Beach in Hawaii Kai also will require an extensive rock cleaning.

Evidence of the spill could be found in "pancakes" of oil that still litter the beach and by the glistening sheen on lava rocks. The rocks are hardest to clean because they are porous, said Lt. Cmdr. Ken Keane of the Coast Guard.

The tide pools also showed the impact of the oil spill that occurred Jan. 20 in the Molokai Channel.

A now-idle Makapuu lifeguard said, "All the tide pools are dead. The opihi, limu and black sand crabs are all dead."

Small reef fish also could be seen scattered along the tide line at Makapuu.

The spill occurred when the lid popped off a Maui-bound Sause Brothers Ocean Towing Co. barge filled with bunker crude oil.

Clean-up efforts are expected to continue through Sunday at a cost of $100,000, which the company will pay.

At Makapuu, state, city and federal officials gathered Wednesday morning to view first-hand the oil damage to the lava rocks.

The rocks must be cleaned by hand with plastic "pompons." A group of five people worked steadily, hunched over, mopping up the rocks near a tide pool at the far end of the park.

Officials cannot yet "predict the extent of the damage off shore. As for the beaches, you can see the oil on the rocks — that won't go away," Keane said.

If you spot an oil puddle call 541-2068.

Experts rally to save birds

BIRD from A-1

coating of tanker oil, and to wrap them in the torso section of control-top pantyhose, Pugh said.

The birds need to be protected from chill because the tanker oil strips the natural oil in their feathers that helps them float and keep warm, she said. To help keep them toasty for the night, Pugh and Shallenberger put the birds in cardboard boxes in a warm room with a dehumidifier.

"We really didn't have the facilities to do this," Pugh said. "We had to convert Ingrid's office" into an incubator.

The next morning, she added, the birds received a scrubbing in "as hot a bathwater as we could possibly stand," soaping up in New Dawn dishwashing liquid. Once the bird is rinsed off, it is set out in the sun to warm up.

One of the birds, a red-footed booby, had to have feathers from his tail and wings snipped off because he was "so gunked-out with oil," Pugh said.

Since birds preen, the oil stuck on their feathers will find its way into their digestive tracts. And it only takes a teaspoonful of oil to ensure that a bird will never reproduce, Pugh said.

Cleaning a wild bird is a delicate operation, requiring the expertise of park officials.

In a related wildlife matter, a dead green sea turtle washed up on Bellows beach Monday morning. Fisheries officials won't know until an autopsy is performed whether the oil spill caused the turtle's death.

John Naughton, a National Marine Fisheries marine biologist, said his office has been patrolling the beaches for other casualties. So far, he said, a small fish kill at Kailua Beach is the only problem.

1/23/87
THA

Advertiser photo by Gregory Yamamoto

Bags of oil-stained sand stack up on Kaiona Beach opposite Sea Life Park yesterday.

Oil spill closes Windward beaches; barge firm says mop-up going well

By Will Hoover
Advertiser Staff Writer

Several Windward Oahu beaches were closed yesterday because of a 1,000-gallon oil spill from an interisland barge Tuesday. The state warned that the spill "may have serious impacts" on fish, wildlife and humans.

A spokesman for Sause Bros. Ocean and Towing Co., which owns the barge, said that most of the oil had been cleaned from the beaches by yesterday and expects the job to be completed by the weekend. Clean-up crews hired by Sause Bros. were raking and shoveling globs of oil on the beaches.

The Oahu Civil Defense Agency closed Makapuu Beach on Wednesday and Kaiona, Waimanalo, Bellows and Mokapu beaches and a portion of Hanauma Bay yesterday.

The state Department of Land and Natural Resources issued a statement urging the public to use caution when swimming in the area and not to "handle, take or consume any fish . . . from shorelines or waters affected by the spill." It also asked anyone finding injured seabirds to take the animals directly to Sea Life Park to be treated. The park already has cared for 15 birds affected by the oil spill.

Jack Lutey, petroleum and products manager for Sause Bros., said the barge in the Molokai Channel on Tuesday spilled 1,000 gallons of oil, not "several thousand gallons" as has been reported by some news media. He said the exact amount of the oil spilled can't be calculated.

"There's no way we'll ever know how much oil was lost," he said. "What happened was the barge was in some high seas and the lid came off the tank, and as the barge rolled around, some of the oil burped out. It wasn't a leak."

Lutey said that Sause Bros. had contracted the Clean Island Council to mop up the spill from beaches and that a 30-person crew had completed 75 to 80 percent of the task by yesterday afternoon. The work will continue today, Lutey said, and "we hope to have the whole thing secure by this weekend."

Coast Guard spokesman Dan Waldschmidt said much of the spill had been contained from Makapuu Point to Hanauma Bay yesterday. He said clean-up crews will concentrate on the area north of Makapuu today.

Waldschmidt said a 15-foot area on the far right side of Hanauma Bay containing heavy sludge had been sectioned off and was under control. He estimated that 1,000 bathers and snorkelers seemed unaffected by any oil in the bay.

Ingrid Shallenberger, curator of mammals and birds at Sea Life Park, said the park has cleaned and cared for 15 boobies, frigates and terns affected by the oil. Of these, only one sooty tern had to be killed because it had a broken wing, was weak and had been severely oiled.

OIL POLLUTION

—A threat to marine resources and recreation

by LARRY OGREN and JACK B. PEARCE

At a time when the nation and world are looking to the seas as a supplier of resources and recreation, pollutants of various types are diminishing the quality and quantity of natural resources and recreational areas, particularly those associated with the near-shore zone.

Oil is a major, and in some areas the most obvious, pollutant of the marine environment. Sources of oil pollution are numerous and include major spills resulting from accidents at sea and in harbors. The sinkings of the *Torrey Canyon* and *Ocean Eagle* are the most obvious recent examples.

On March 7, 1968, we were called to San Juan, Puerto Rico to assess the damage caused to marine life by the sinking of the oil tanker *Ocean Eagle*. One of the difficulties in determining the impact of a sudden pollution of aquatic environments is that there is usually little recent data in regard to the flora and fauna existing before the incident. No faunistic surveys or comprehensive ecological studies have been made in San Juan Harbor for over 50 years, and thus there would be little hope for a comparative study of conditions before and after the sinking. Fortunately, only limited amounts of detergent were used following the accident and the damage to pelagic and bottom dwelling fishes appeared to be slight.

Both Mr. Ogren and Dr. Pearce are on the staff of the Sandy Hook Marine Laboratory, Highlands, N. J.

The results of sinkings can, however, be severe; the ecology of many English beaches will for years testify to the sinking of the *Torrey Canyon* and the subsequent efforts to eradicate the beaches of oil. Fortunately in this case numerous investigations of marine life had been made shortly before the sinking and marine scientists have been able to document the resulting damage. (Smith, 1968).

The following pages are based upon our experiences in Puerto Rico and our observations along the New Jersey shore, an area severely affected by chronic oiling.

Less spectacular but equally degrading to the marine environment are the chronic conditions brought about by seepage, bilge pumping, dockside transfer, bunkering, effluents from industrial complexes and small craft operation. Such conditions are for the most part the result of carelessness or neglect of existing regulations.

Frequently, the efforts to clean up gross spillage can result in greater damage to marine life and topographical features than does the oil. Following the sinking of the *Torrey Canyon*, the detergents used along the Cornish coastline to remove oil resulted in extensive kills of intertidal invertebrate animals, fishes, and birds. It also initiated geological processes which resulted in erosion of previously stable beaches.

The consequences of oil pollution on living and geological resources are

diverse. Heavy coatings of oil can directly interfere with the respiration of many intertidal organisms. When gills, and other body surfaces where oxygen diffuses are oiled, the result is suffocation of the organism. Following the sinking of the *Ocean Eagle* in Puerto Rico, we observed numerous dead shore crabs covered with oil (Fig. 1). O'Sullivan and Richardson (1967) reported a similar observation following the *Torrey Canyon* disaster off the coast of England.

In addition to the direct effects of oil on oxygen uptake, large areas heavily polluted by oil tend to become anaerobic—i.e. the amount of oxygen dissolved in the water is greatly reduced. This reduction often is the result of activity by increased numbers of bacteria which can feed on oil. Their numbers increase because of the added nutrients (the petroleum products) and, like most living organisms, these bacteria require oxygen for metabolism. Hence, as their numbers increase in response to the new nutrient source the bacteria can reduce the oxygen level in the environment and other organisms can no longer live in the same area. Anaerobic conditions not only affect adult marine animals but may also kill eggs and juveniles. When temporary oil pollution and associated low oxygen levels occur simultaneously with reproduction of a certain species, the reduction in populations can be evident for one or more years.

Petroleum products may also be directly toxic to marine organisms. Research to date indicates that limited amounts of petroleum occurring over short periods are not poisonous in themselves (O'Sullivan and Richardson, 1967). Over longer periods of exposure, however, such products may have adverse effects. Experiments performed at the Sandy Hook Marine Laboratory revealed that some animals exposed to chronic oiling are more susceptible to the effects of thermal pollution by virtue of not being able to withstand exposures to high temperatures which unoiled individuals could endure. Refined petroleum products, such as gasoline and diesel fuels, may be much more toxic than unrefined crude oil. North, *et al* (1965) found that the vital process of photosynthesis was inhibited when marine plants were exposed to refined diesel fuel.

Although some intertidal animals (limpets) have been observed to feed directly on crude oil covering rocks on which they normally live (Spooner, 1967), other animals living in similar environments are unable to feed under these conditions. Where oil covering is heavy or tarry, and not readily removed by natural means, various animal species may starve. In addition, algae and other food organisms may be killed and therefore removed from the *food-chain*. Again this will result in starvation of those animals, particularly attached invertebrates, which are not directly affected by the oil itself.

Aquatic birds are especially susceptible to oil pollution. In many cases they are apparently attracted to oil slicks where they can be killed or have their flight inhibited by surprisingly small amounts of oil in their feathers (Manwell and Baker, 1967) (See Fig. 3).

Although the total and eventual effects of oil pollution on marine organisms remain to be seen, it is known that major oil spills so affect the delicate balance of organisms in intertidal communities that many years may be required for the normal flora and fauna to reestablish themselves.

In addition to the damage caused to biological resources by oil pollutants, there are many other consequences which result from the major accidents and chronic incidents involving oil spillage. Topographical and geological features of coastlines are altered. It was

Fig. 1. Oiled mangroves and fiddler crab, Uca, *burrow holes at the mouth of a tidal stream in San Juan Harbor. This low gradient intertidal zone was particularly vulnerable to oil pollution.*

noted that certain beaches along the English coast were severely eroded following oil pollution and the subsequent application of emulsifiers to clean up the oil. Apparently the detergent-oil complex settles into the interstices of the sand thus affecting the normal stability. Normal wave action then erodes the sand, moving it from the beach to deeper waters. In addition to the actual change in topography, many beaches were rendered useless for bathing and recreation because of oily residues.

Residues can foul fishing lines, nets and other marine gear and considerable time and expense is required to clean them. Boat hulls are frequently discolored and damaged by oily substances. All this directly affects the pleasure and profit associated with sports and commercial fishing and boating activities.

While the more spectacular accidents reach the headlines, the chronic day-in and day-out effects of oil pollution are probably of greater damage to the nation's resources. How many of us have not been offended by oily residues and slicks which accumulate on our bodies during swimming or SCUBA diving?

What are the ultimate effects of present levels of oil pollutants on marine fisheries and other biological resources? As tankers become larger and more numerous and as our dependence on overseas oil supplies bring ever increasing maritime tonnage to our harbors. what will increased oil pollution do to our marine resources? These problems are not easily resolved and the responses depend upon adequate research

Fig. 2. Mortality of crustaceans was noted at the mouth of Cano de Martin Pena, draining into San Juan harbor. This heavily oiled shore crab, Pachygrapsus transversus, *was collected from the surface of the water.*

Fig. 3. The number of brown pelicans, Pelecanus occidentalis, *affected by the oil spilled from the* Ocean Eagle *was not as high as it might have been. Most of the resident pelican population had migrated to nesting sites away from San Juan Bay.*

and study. Sufficient evidence presently exists, however, to at least suggest some remedies.

Solutions to the problem of major oil spills are dependent partly on what is at stake at the time of a disaster and what could be done in the future to prevent it from happening. Clean up methods are foremost on the minds of the people in a stricken area. The sight of thick, black crude oil washing up on beaches and water front property demands action of some sort *immediately*. Herein is the problem facing governments today, with prospects of increasing numbers and severity of marine disasters in store for the future.

Currently accepted methods employed when dealing with major disasters have created additional problems. The use of emulsifiers to disperse the oil throughout the water mass while alleviating one problem, has created conditions far worse in the marine environment. The detergent itself in concentrations as low as .01 part per million is a highly lethal substance to living organisms (Manwell and Baker, 1967). Ironically, they also endanger the very property (beaches) that they were intended to clean.

Results from scientific investigation of the *Torrey Canyon* disaster indicated variations in damage to the marine biota. Where emulsifiers were used on the Cornish coast, damage was severe. Conversely, the northern coast of France escaped the serious consequences of detergent pollution to its marine environment because mechanical means were used to clean up the shoreline. The oil weathered naturally in short time; the more toxic volatile portions escaped to the atmosphere and the heavier non-toxic components sank and were degraded by bacteria. The marine environment has recovered rapidly in these areas in contrast to areas where detergent strategy was

used. Where no detergents were applied the subtidal environment was uncontaminated and survived with little change

Clean up methods by mechanical means are certainly more desirable from the biological standpoint, but are frequently inefficient and costly. When bird life is threatened by oil and yet detergents are to be avoided at all costs, the widespread use of a non-toxic absorbent material such as styrofoam pellets, could be applied to aid mechanical pick up. Removing the balance of the tanker's cargo by lighters should be done immediately rather than towing the leaking hulk to sea.

Preventative measures should be stressed in accordance with this growing problem. Responsibility of the groups involved in the petroleum and shipping industry should be spelled out. Costs for clean up levied against the offenders should result in a tightening up of their own operating procedures. Enforcement of existing laws regarding disposal of petroleum wastes at sea is imperative.

Efforts to combat the degrading effect of chronic oil pollution in the environment should not be overshadowed by major marine disasters such as the *Torrey Canyon* and *Ocean Eagle*. Chronic conditions are just as acute in many areas but not as well publicized as the grounding of an oil tanker. Effective policing of rivers, lakes and harbors that drain into our estuaries and the sea could prevent the accumulation of high levels of oily wastes. Mechanical means could be employed in this area to control effectively spills and leakage problems that would prove inadequate in gross accidents. Oil skimmers, booms, pumps and non-toxic absorbants could be employed efficiently against these chronic sources of oil pollution.

The list of offenders is great and coupled with the indifference of polluters and acceptance of these conditions by the public, accumulated wastes can easily produce a chronic condition. Responsibilities for guarding the marine environment against fouling by default lie not only with the seaside dweller, industrialist and merchant fleet but with the individual residing far from the ocean's shore. Each of us is tied to the sea in different ways. Citizens living inland, remote from the sea, gain sustenance from it at one time or another. With increased mobility, many of us frequent the seashore bent on recreational pleasures.

All are therefore dependent upon marine resources and responsible for their wise use. Only by being informed and supporting the activities of responsible action groups can we guarantee the preservation of our resources for future generations.

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Fall 1968

2-2-87 STAR-BULLETIN

Oil Spill Is No 'Act of God'

In the Jan. 22 issue of the *Star-Bulletin* the public was informed about the "accidental" oil spill that occured on Jan. 20 from a Sauce Bros. Ocean Towing Co. tug boat.

Gary Sauce, port captain for Sauce Bros., said that the oil spill was caused by an "act of God."

I find it interesting to note how out of touch this captain is with acts of God. God does not cause oil spills and other such manmade disasters to occur. Why can't people or groups of people take the responsibility for the obvious mistakes that they have made?

I believe that the public has been mislead to believe that the oil spill is being taken care of by the Sause Bros. via the Clean Island Council. I doubt if the Sause Bros. would be getting off as easily if the oil spill affected Waikiki Beach. The CIC is only employing 50 people, too few to handle the problem and CIC has been uncooperative in picking up the oil collected by volunteers.

In my opinion the Sause Bros. should be fined a substantial sum regardless of their superficial efforts to clean up their mistake.

Future oil spills could have the potential of temporarily wiping out Hawaii's tourism, not to speak of substantial environmental impact.

Eric Brennan

Faulty Estimates on Oil Spill

It looks like the old heptachlor information people from the Health Department are now working at Sause Bros.

How else to explain the discrepancy between their estimate of 1,000 gallons of oil spilled and the Coast Guard's estimate of 42,000?

I'd like to souse the Sause Bros. for allowing that barge to go out in high winds.

Penelope Hazzard

Preventing oil spills

2/2/87 Honolulu Advertiser

The Advertiser's editorial, "A costly oil spill" (1/24), skirted the real issues at hand regarding last week's oil spill in the Molokai Channel. Yes, it is quite apparent that public awareness of the environment is stirred only by disaster. And yes, companies responsible for environmental accidents should be fined under state environmental laws.

The comment made, however, that the spill "may have been unavoidable" is very questionable, and, in effect, implies that Sause Bros. should be fined for an accident they could not prevent. Is this really the case? It has been reported that large timbers lashed to the deck of the barge broke free in big seas and sheared two aft tank hatch covers. Surely such mishaps must be anticipated by carriers in the Molokai Channel, widely known as one of the roughest waterways in the Pacific. There is a strong implication that adequate safeguards were not taken by Sause Bros.

Restitution is indeed essential, but shouldn't the prevention of similar and potentially worse accidents in the future be the issue here? Perhaps it is time to review the regulations which govern the means of containment and transport of petroleum products in Hawaiian waters. Given the extreme fragility of Hawaii's environment, it is dangerous to assume that such accidents cannot be prevented.

DOUGLAS K. HOLMES

* * *

I am angered not because of the oil spill itself, but at the attempts to minimize its seriousness by the state and the Sause Bros. Co.

The state warned that the spill "may have serious impacts on fish, wildlife and humans." Why say "may"?

The spokesman for Sause Bros. doesn't ever say, "Gee, we're sorry this happened, but defensively says that most of the oil had been cleaned up and the job will be complete by the weekend. All is well, just like that.

Amid all the effort to placate the public, nowhere is there a statement or regret or apology. Sure it is an accident; it is forgivable. But all the sidestepping is dishonest and that's what makes me mad.

MARY C. BARNES

Barge Dangers in Isle Waters

This recent oil spill is only an example of what can happen if a barge loaded with fuel goes aground as the Hawaiian Tug and Barge freight barge did a few weeks ago off the Big Island.

I would like to direct your attention to a potentially hazardous situation existing within the marine industry in the Hawaii region.

Reductions in the manning on towboats and barges have created conditions that increase the statistical probability of disaster. In their attempts to reduce operating costs, certain shipping companies are assigning a low priority to the safety of their employees, placing in jeopardy the lives and property of the general public, and endangering the environment.

At present some tow boats, have only one man on watch in the wheelhouse and no regular watch in the engine room. This is very hazardous.

For example, a tow boat went off course, its barge struck an anchored yacht on which a man and a pregnant woman were sleeping, and ran aground. This happened near Mala Wharf on Maui, close to Lahaina. The barge was loaded with fuel oil. Fortunately, there were no serious injuries although a major disaster could have occurred if the barge had exploded or even if a puncture of the hull had caused an oil spill.

Oil and fuel are transported by barge around the Islands; if an oil barge runs aground, the damage to the environment, including fish and edible seaweed, could be devastating. Endangered species of shore birds could be affected adversely. Heavily used beaches might be coated with oil, which would have a detrimental effect on Hawaii's tourist industry.

Having only one person on watch in the wheelhouse presents an unsafe situation. Most towboats are equipped with an automatic pilot that steers the boat; however, as any experienced seaman can attest, these can malfunction.

Sometimes the only person on watch is engaged in plotting a position on the chart (i.e., navigating), using the radio or going to the head (bathroom). He may even fall asleep.

The dangerous practice of running towboats with only one person on watch in the wheelhouse and nobody on watch in the engine room places both the vessel and the crew at risk.

It is true that alarm systems have been installed in the engine room, but alarm systems can and do malfunction and, in any event, alarms are not activated until after something has happened.

Many of the towboats are old, and the engines frequently break down. Maintenance is erratic, or done on an as-needed basis, rather than being preventive.

In a "worst case possible" scenario, suppose that a towboat with a barge carrying fuel or black oil were to catch fire, ignite the loaded barge and an explosion ensue, while the towboat lay, ablaze, engines inoperable, in Honolulu harbor. The consequences would be tragic.

John M. Gouveia
Hawaii Regional Director
Inlandboatmen's Union
of the Pacific

Sunday

The Sunday Star-Bulletin & Advertiser

Advertiser photo by Carl Viti

Worker Bryon Summers, wearing trash bags on his feet for protection, wipes oil from his hands after cleaning the beach at the Makai Pier, near Makapuu.

Prepared by the staff of the Honolulu Advertiser January 25, 1987 A-3

3 beaches declared clean; mop-up volunteer disagrees

By Robert Hollis
Advertiser Staff Writer

Several Windward beaches were declared clean yesterday as Oahu's oil spill continued to move northward, fouling parts of Kahana Bay, above Kaaawa.

Mop-up efforts along the island's Windward coast reached a point where three popular beaches, Makapuu, Waimanalo and Bellows, were clean enough to reopen today, Coast Guard Chief Petty Officer Mike Staley said.

But the organizer of a volunteer cleanup effort in Kailua disagreed with this assessment. Aiden Schmer, owner of Kailua Sailboard Co., said much of the oil on area beaches has simply been covered by shifting sand.

The state Health Department warned people Friday to stay away from six beaches as globs and sheets of heavy bunker oil were driven by ocean currents and trade winds onto Oahu's eastern shore.

They were Waimanalo, Kaiona, Makapuu, Sandy Beach, Lanikai and a part of Hanauma Bay. The Air Force also closed Bellows beach.

Don Horio, Health Department spokesman, said "contaminated water" warning signs will probably remain at all affected beaches until tomorrow even though Coast Guard officials have declared three of them clean.

"Those signs are not the law," he said. "They're just there to advise the public."

Norm Lamb, a state Department of Land and Natural Resources official, said Waimanalo Bay State Recreation Area will remain closed today. Waimanalo beach park, however, is accessible from Kalanianaole Highway.

Ninety paid workers and perhaps 30 volunteers worked the coast with backhoes, rakes, scoops and skimming or soaking gadgets from Hanauma Bay to Kahana Bay yesterday.

A gooey band of oil still coated about 1½ miles on the northerly part of Kailua Bay's beach, officials and residents said. Pockets of contamination also remained at Queen's Beach, in the rocks near Makapuu and along Lanikai's shore.

"It's going north on the wind and currents," said Ken Blair, superintendent of Pacific Environmental Corp., one of the firms hired for the cleanup. "We're chasing it."

Coast Guard officials say the black stain on Oahu's Windward beaches was caused by 1,000 gallons of bunker oil that spilled from a Sause Bros. Ocean and Towing Co. barge between Oahu and Molokai during a storm Tuesday.

The company is paying for the massive cleanup and faces a $5,000 civil fine, Coast Guard officials have said.

Oil yesterday reached scenic Kahana Bay, a mile or two north of Swanzy Beach Park, which was the farthest extent of the spill Friday, Blair said.

There was also a report of pollution in the Laie area. But Gary Sause of Sause Bros. inspected beaches in Laie and was unable to find any trace of oil there, Blair said.

Blair and Coast Guard officials said yesterday the spill seems to have reached the limit of its damage. "For the most part, what will hit has hit," Blair said.

The thoroughness of the professional beach cleaning was questioned yesterday by Schmer and others in Kailua who have been using donated bags and tools to scoop up oil.

"They're going to need a lot longer and a lot more people to clean up the beaches," Schmer said. "The oil is being covered by sand. The crews are going to have to go over (the beach) again and again as the oil comes up."

Schmer said people who use Makapuu, Waimanalo and Bellows beaches today, despite Coast Guard assurances that they are clean, should be prepared to have their feet and legs coated with oil.

Schmer's prediction was supported by Bob Marx, a visitor from Connecticut who has been staying with relatives on Kamani Kai Place, along Kailua Bay.

"I went jogging this morning and I came back with my feet covered with black sludge," he said.

The Coast Guard's Staley stood by his agency's conclusions. "My guys are walking the beaches. Our teams indicated that, yes, they're clean," he said.

Health officials have warned beachgoers and cleanup workers to avoid contact with the oil.

A mild detergent or lanolin-based cream should be used to remove it from the skin, they said. Do not use gasoline, kerosene or other solvents because they may contain contaminants or irritants.

Wednesday, February 4, 1987
The Advertiser A-16

Pollution: what now?

It's been more than two weeks since heavy fuel oil spilled from an interisland barge. Although the spillage was relatively small — estimates range from 12,000 to 42,000 gallons — there's no question the oil has damaged our fragile environment.

The spill also has made residents more aware than ever of the financial and social costs to our community of such accidents.

SO IT'S FOR good reason then that lawmakers are considering more stringent rules to deal with pollution. As noted in an earlier editorial, corporations responsible for such contamination have an obligation to make restitution.

The questions now are: What is the correct penalty for a polluter? And what can government do to prevent, or minimize the effects of, further spills or other environmental problems?

Under the federal Water Pollution Control Act and civil penalties, companies face a maximum fine of $5,000 and pay for cleanup. That's a meager fine and does not reflect the potential severity of some problems.

Harsher fines are one form of punishment, especially in cases of negligence. But it may take a stricter form, such as temporary suspension of an operating license, to convince companies and individuals that keeping the Islands pollution-free is of the highest priority.

The state's role in dealing with emergencies is critical. Perhaps the greatest need is for a central agency to coordinate events during a calamity.

To that end, some House Democrats believe what's needed is a state environmental protection agency, which would also control such problems as hazardous waste and sewage disposal.

HAWAII'S fast-growing resident and visitor population are placing ever-greater stress on our environment. With big tankers off our shores and with barges carrying millions of gallons of oil between Islands, the potential for a major disaster is real.

We've been lucky so far. But there should be no delay in putting the proper regulations and agencies in place so we will be more adequately prepared to deal with future environmental problems.

Monday, February 2, 1987 Honolulu Star-Bulletin A-3 Star-Bulletin

By Mike Tsukamoto, Star-Bulletin

BAGGING IT—Ken Blair, general superintendent of Pacific Environmental Corp., oversees the disposal of oil-soaked materials from the cleanup of the Sause Bros. oil spill plaguing the Windward Coast.

Oil Cleanup Proving to Be 'a Lot of Knuckle Busting'

By Lucy Young
Star-Bulletin Writer

Overcast skies and porous shoreline rock are hampering cleanup of spilled fuel oil along the Waimanalo coast, according to project crew members.

Recent cool weather and gray skies have caused oil to stay in the porous rocks, while intermittent sunny periods have caused some of these trapped pockets to loosen and "bleed out," said Ken Blair, general superintendent of Pacific Environmental Corporation (PENCO), the company doing the cleanup.

This routine has caused a "lot of reworking over and over again" as the oil is alternately absorbed and leaked, Blair said.

It has made for "a lot of knuckle busting, a lot of elbow grease" as PENCO workers and community volunteers scrub the oil off rocks, he said.

But with most of the more accessible public shores under control, PENCO will now be concentrating its cleanup efforts on oil-contaminated areas which are harder to reach: rocky Queen's Beach and Makapuu Point.

Makapuu Beach waters were off limits to beachgoers yesterday.

Blair said he inspected the areas around Rabbit Island and Black Rock (Kakalaioa) late last week, but found no evidence of new oil at either location.

Blair estimated another week before the cleanup operation is called off, but anticipates that "residual" oil reports will continue to filter in afterward.

The fuel oil was spilled into the Molokai Channel on Jan. 20 from a Sause Bros. Ocean and Towing Co. barge.

While saying that progress has been made steadily, Blair noted that establishment of a state Environmental Protection Agency would expedite similar operations in the future.

Blair said a state EPA, to handle all types of pollution, could help with speedier issuance of permits, whether they be for beach access, sewage disposal, waste treatment, or setting up of equipment for operations.

Spill Suspect in Turtle's Death

By Helen Altonn
Star-Bulletin Writer

A young green sea turtle may have been a victim of the recent oil spill that fouled Oahu's Windward coast.

The turtle, found dead on Bellows Beach, had "a thick, black substance" in its intestines, said George Balazs, sea turtle biologist at the National Marine Fisheries Service's Honolulu Laboratory.

He said there was no evidence of oil fouling outside the animal's body and he can't identify the material in the gut until a laboratory analysis is completed.

But NMFS scientists are concerned about potentially fatal effects of oil on green sea turtles, an endangered species protected by state and federal laws, Balazs said.

He said the turtles feed on algae and "may not be able to discriminate between oil-fouled algae and clean algae."

They also feed on balls of tar that float on the surface from oil spills, "possibly mistaking them for natural food items like jellyfish and other invertebrates they sometimes eat," Balazs said.

Oil spills and tar globules are part of a bread problem of pollution — including plastic bags, styrofoam and other debris — that can kill sea turtles feeding and growing in coastal waters, he said.

BALAZS IS LEADER of the Hawaiian Sea Turtle Recovery Team, a panel of scientists concerned with problems threatening green sea turtles.

The population depends on only about 750 adult females which nest in the northwestern Hawaiian Islands every one to three years.

Adults and younger turtles feed and rest yeararound in the main Hawaiian Islands. They are seen all along Oahu's east coast, including areas affected by the oil spill, Balazs said.

He said studies have shown that marine turtles have limited ability to avoid oil slicks and their respiration, skin, some aspects of blood chemistry and salt gland function "are significantly affected by oil."

The salt gland, necessary to maintain the turtle's internal water and ion balance, may stop functioning, he said.

Tar balls that are eaten also can physically clog a turtle's mouth and throat, he said. There are many records of sea turtles eating tar in the Gulf states where oil spills are common, he said.

Turtles also choke on plastic bags and balloons, which are released in masses at sporting events and celebrations and drift into the water.

Packing material and fishing gear that is dumped or lost by fishing and other oceangoing vessels are a great source of the plastic-debris problem.

Persons who find disabled or dead sea turtles should call the NMFS laboratory at 943-1221, or the state conservation hotline after hours, 548-5918.

Killing or harassment of sea turtles should be reported to NMFS special agents at 541-2727, or the conservation hotline.

U.S. DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
Southwest Fisheries Center Honolulu Laboratory
2570 Dole St. • Honolulu, Hawaii 96822-2396

March 31, 1987 F/SWC2:GHB

Mr. Stewart I. Fefer
Refuge Complex Manager
U.S. Fish and Wildlife Service
P. O. Box 50167
Honolulu, HI 96850

Dear Stewart,

I thought it might be best to summarize in writing what we have discussed by telephone in recent weeks concerning turtle nesting at Kahuku, and your letter of February 27, 1987.

Both David Woodside and I were exceedingly surprised to learn that the turtle nest laid during early August of 1986 had been dug up without our prior knowledge or direct involvement. We have always cooperated closely on these matters in the past. I had previously instructed Vanya and Ken on watching daily for signs of turtle nesting at Kahuku. In addition, they spent one night there with tags and pliers I supplied, hoping to actually find the turtle renesting. Unfortunately, this did not happen. I had specifically stated that no nest should ever be disturbed by digging into it, and that after sufficient time had passed for incubation and emergence, I would presonally excavate the nest to determine species and productivity.

A few times over the past year Vanya expressed interest and talked to me about volunteering on a project involving sea turtles. We had agreed upon some needed work at Bellows Air Force Station and I wrote to the Commanding Officer to make arrangements. However, Vanya either changed her mind or became involved in other activities. It was never clear to me exactly why she did not follow through. With regard to Nancy Norwell, I met her at Tern Island but at no time talked to her about "volunteering" for me here at NMFS.

The question about my authorization to work on green turtles is answered in the attached letter, dated July 19, 1980 from the Federal Wildlife Permit Office. In addition, we are required annually to have a permit from the State of Hawaii, Department of Land and Natural Resources.

I hope this clarifies everything so that no misunderstanding still exists. Best regards.

Sincerely,

George H. Balazs
Zoologist

SUMMARY OF INFORMATION ON SEA TURTLE NESTINGS AT KAHUKU BEACH, OAHU, 1982-86.

complied by

George H. Balazs and William G. Gilmartin
Southwest Fisheries Center Honolulu Laboratory
National Marine Fisheries Service, NOAA
2570 Dole Street
Honolulu, HI 96822-2396

and

David Woodside
U.S. Fish and Wildlife Service
P. O. Box 50167
Honolulu, HI 96850

1982

8-3	At least two emergences resulting in four excavations.
8-14	Emergence tracks but no excavations.
8-17	Emergence tracks and excavations.
8-21	Emergence tracks but no excavations.
8-27 (approx.)	Emergence tracks and numerous excavations.
9-2	Emergence tracks and a large excavation.
9-7 and 9-8	Tracks of hatchlings originating from an earlier excavation site.
9-9	Nest site excavation resulted in the recovery of 62 empty egg shells; 3 advanced development but dead embryos; 1 early development but dead embryos; 1 advanced development but deformed albino embryo; 3 eggs with no apparent development; and 2 undersized eggs with no development. Nest therefore contained 72 eggs, with 62 hatchlings (86%) having emerged at the surface. Embryos identified as the green turtle, Chelonia mydas.
9-24 (approx.)	Tracks of hatchlings orginating from an earlier excavation site. Several egg shells recovered and identified as C. mydas on the basis of size.

1983

No observations made of nesting activity. Hurricane "Ewa" removed a considerable quantity of beach sand.

1984

5-12 (approx.)	Emergence tracks and excavation.
5-20	Turtle seen on the beach by Gay Bartell.
7-8 (approx.)	Tracks of hatchlings originating from an earlier excavation site. Also a recent excavation present.
7-13	Nest site excavation resulted in 62 empty egg shells and 3 eggs with no apparent development (65 total). Identified as C. mydas on the basis of egg shell size.
7-19	Emergence tracks and excavation.
7-20	Tracks of hatchlings originating from an earlier excavation.
7-24	Nest site excavation resulted in 69 empty egg shells and 2 eggs with no apparent development (71 total). Identified as C. mydas on the basis of egg shell size.

1985

No observations made of nesting activity. Storm waves removed a considerable quantity of beach sand.

1986

8-3 (approx.)	Emergence tracks and one excavation.
10-20 (approx.)	Nest site excavation resulted in 72 empty egg shells and 3 unhatched eggs of unknowns status (75 total). Presumed to be C. mydas, but positive identification not made.

U.S. DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
Southwest Fisheries Center
Honolulu Laboratory
P. O. Box 3830
Honolulu, Hawaii 96812

March 10, 1986 F/SWC2:GHB

Captain Patrick A. Fallon
Commander, Bellows Air Force Station
P. O. Box 1010
Waimanalo, HI 96795

Dear Captain Fallon:

I am writing to provide you with a brief summary of the results of our work at Bellows last Wednesday night, March 5.

Our net was set near the jetty for a 14-h period extending throughout the night. We were able to catch one green turtle, but at sunrise we saw several others in the immediate area. I believe that the glassy ocean conditions, with almost no swell present, aided these turtles in seeing and avoiding our net. Nevertheless, the single turtle that was captured resulted in the collection of valuable data on growth and site fixity to a foraging pasture. The turtle had been originally captured and tagged at this same location in May of 1979. In May of 1980 it was captured there again. Since that time, it had grown from 50.5 to 59.1 cm in carapace (shell) length, or about 1.5 cm (5/8 inch) per year. The turtle is still not large enough to be mature, so we are unable to say if it is a male or a female. The mean carapace length of mature female green turtles in Hawaii is about 92 cm (36 inches). When mature, green turtles in Hawaii migrate several hundred miles to the northwest of Oahu where they mate and lay eggs at French Frigate Shoals. When the breeding season is completed, they return to their resident coastal foraging pasture (such as Bellows).

Our work at Bellows always attracts the attention of beach-goers and various people staying in your guest cottages. I am impressed with the high level of interest displayed, and the great relief demonstrated, when people learn that the turtles we have caught will return to the sea after tagging. Most people that talk to us at Bellows are very concerned about the welfare of the turtles, and are eager to learn more about them. This time I had a lady come to me that was upset over a turtle that had been accidentally hooked the previous day by a fisherman on the jetty. The turtle escaped after breaking the line. I mentioned this continuing problem to you in my last letter.

I will be contacting you again in a few months when we are ready to do more work at Bellows. Again, thank you for your cooperation and assistance.

Sincerely,

George H. Balazs
Zoologist

cc: R. Cates

United States Department of the Interior

FISH AND WILDLIFE SERVICE
WASHINGTON, D.C. 20240

ADDRESS ONLY THE DIRECTOR,
FISH AND WILDLIFE SERVICE

In Reply Refer To:
FWS/WPO PRT 2-6842

JUL 29 1980

Dr. Richard S. Shomura
Director, Honolulu Laboratory
National Marine Fisheries Service
Southwest Fisheries Center
Honolulu Laboratory
P.O. Box 3830
Honolulu, Hawaii 96812

Dear Dr. Shomura:

This letter is in reply to your July 16 request for a threatened species permit to work with green sea turtles (Chelonia mydas).

50 CFR 17.31(b), enclosed, provides that any employee or agent of the National Marine Fisheries Service (NMFS) who is designated by his agency may, when acting in the course of his official duties, take threatened wildlife to carry out conservation programs. It appears from your application that the proposed sea turtle identification project falls into this category. No permit is required but anyone working on the project should be so designated in writing by NMFS.

Since you do not need a permit to conduct the activities you propose, your application for a permit is denied. As provided in 50 CFR 13.21(d) enclosed, you may submit additional information or justification why your permit should not be denied. Such further submission shall not be considered a new application, but should be received in this office within 30 days of the date of this letter.

Please contact Bob Batky of this office (703/235-1903) if you have any questions.

Sincerely yours,

Donald G. Donahoo
Chief, Permit Branch
Federal Wildlife Permit Office

Enclosures

El Nino's opposite to

OAHU FILE

La Nina due to bring relief

Honolulu Advertiser Staff and Advertiser News Services

Too hot for you yesterday? Relax — relief may be on the way.

Recently published findings suggest that an opposite phenomenon to El Nino — called La Nina — has arrived and will bring a cooler-than-normal winter to Hawaii. The upshot is that recent high temperatures may not be due to the Greenhouse Effect, but to an odd absence of Las Ninas over the past 13 years.

La Nina is associated with a pool of colder water in the tropical Pacific. (El Nino, pronounced el-NEEN-yo, is Spanish for the Christ child, a name that springs from weather phenomena that occur around Christmas. La Nina, or little girl, was selected to describe the opposite effect.)

There has been a wave of new information recently about El Nino, a complex series of atmospheric and ocean events that occurs every two to seven years. The one occurring in 1982-83 attracted widespread attention by disrupting weather patterns worldwide.

The 1982-83 event, which coincided with Hurricane Iwa, eventually was blamed for 1,500 deaths and damage ranging from $2 billion to $8 billion. The disruptions worsened Africa's deadly drought, caused severe winter storms in California, reduced fish catch in South America, precipitated Australia's worst drought in 200 years, produced heavy rainfalls in Peru and Ecuador and spawned the first typhoon to hit French Polynesia in 75 years. Five more typhoons followed in five months.

Normally, Los Ninos and Las Ninas oscillate back and forth,

A-1 10-2-88 55-B&A

cool Isle winter

from hot weather

but new research has found that there were virtually no cold episodes in the tropical Pacific between 1975 and 1988. As reported in the Aug. 26 issue of Science magazine, the researchers claim it was a unique hiatus in a record that goes back to 1881.

Scientists at the National Oceanic and Atmospheric Administration, the University of Massachusetts at Amherst and the University of Colorado found a strong correlation between the absence of any La Nina and higher-than-normal land temperatures in the tropics.

So La Nina's return will mean a colder than normal winter for Hawaii and other tropical areas, predicts George Kiladis of the University of Colorado.

The first half of 1988 has brought near-record warmth, but Kiladis says there is about a six-month lag between a temperature switch in the tropical Pacific and its influence on the global atmosphere.

"It's almost certain that in late 1988 and early 1989, the mean temperature of the tropics equator-ward of a latitude of

See La Nina, Page A-4

La Nina is due to bring

From Page One

about 30 degrees will be below normal," Kiladis told Science.

That area encompasses half the area of the Earth, including Hawaii, which lies at about 21 degrees north latitude. "Unless the tropics are offset by higher latitudes, the globe will be colder," said Kiladis.

In related research, a University of Hawaii seismologist has found an intriguing and controversial link between El Nino and sea-floor earthquakes near Easter Island.

Daniel Walker of the Hawaii Institute of Geophysics, in an article in the American Geophysical Union's weekly periodical "Eos," reports correlation between increases in sea-floor earthquakes around Easter Island and an air pressure drop in the region.

Falling air pressure at Easter Island tends to be a good indicator of an El Nino, according to Walker's analysis.

The article was "published

relief from hot weather

with our recognition that it presents controversial material. . . . Even the possibility of linkages here should be of interest to both geophysicists and oceanographers," wrote Eos oceanography editor Robin D. Muench.

Increased earthquake activity occurred at about the same time as Los Ninos of 1965, 1976-77 and 1986-87 and just ahead of Los Ninos of 1972-73 and 1982-83, Walker found.

While he doesn't draw any conclusions about cause and effect, Walker points out that the likelihood of these things occurring together by chance is one out of 313 cases.

And he notes that the sea-floor fractures in the Easter Island region that tend to generate the earthquakes vent large amounts of heat into the ocean.

If this heat were enough to warm the waters above, it could help generate rising air currents, reducing the normal air pressure in the region. Some scientists have been skeptical about this possibility, however.

The Honolulu Advertiser
Saturday, October 8, 1988

Conservationists sue over new ocean rules

Two conservation groups and several Maui residents yesterday sued the state Department of Transportation in an attempt to get the state's new Ocean Recreation Management regulations declared invalid.

The rules, which went into effect Oct. 1, establish zones for jet skis, swimmers, sailboards, etc., where they might otherwise knock heads in crowded coastal waters.

But the Sierra Club, Greenpeace Foundation and several Maui residents, including County Councilman Wayne Nishiki, say the rules allow jet skis and parasailing in areas where they could harm humpback whales and green sea turtles, two endangered species.

Mike Sherwood, staff attorney for the Sierra Club Legal Defense Fund, said the National Marine Fisheries Service has asked the state to ban thrill craft and parasailing from certain areas, including Haleiwa and the south shore off Oahu and the Kaanapali/Lahaina and Kihei areas off Maui, during whale season (December through May).

The Fisheries Service has also asked the state to prohibit them from areas frequented by green sea turtles off Hawaii Kai and at Nualolo Kai on Kauai's north shore.

State boating manager Dave Parsons, whose office created the rules, said the state received the Fisheries Service letter Oct. 3, after the rules were implemented.

AERIAL OBSERVATIONS OF SEA TURTLES IN THE INSHORE WATERS OF THE MAIN HAWAIIAN ISLANDS

by

George H. Balazs
Hawaii Institute of Marine Biology

December 1978

Survey No./ Date	Time	Aircraft Type	Area Surveyed	Principal Sightings	Total
1 19 Dec 1976	0855-1025 *1:30*	Cessna N2251Y	Oahu-c	Reef runway-25 Campbell Industrial-4 Kailua Bay-15 Waimanalo Bay-10	62
2 20 Feb 1977	0900-1040 *1:40*	Cessna N2251Y	Honolulu to Kaneohe and return-cc	Reef runway-15 Kaneohe Bay-8	33
3 17 July 1977	0850-1145 *2:55*	Cessna N2251Y	West Molokai to Kaunakakai-c; North Lanai to Kamalapau-c		0
4 30 July 1977	0830-0930 1030-1230 1330-1430 *4:00*	Piper N4802T	Kauai-c Niihau-c Kaula	Reef runway-2	2
5 9 July 1978	1030-1215 1305-1355 *2:05*	Cessna N2251Y	Honolulu to Makapuu-c; Kaunakakai to West Molokai	Kawailoa-2 Kahuku-2 West Molokai-1	5
6 26 Nov 1978	0920-1055 *1:55*	Piper N7708J	Oahu-c	Reef runway-6 Kawailoa-5 Kaneohe Bay-2 Kailua Bay-4	19

c - clockwise
cc - counterclockwise
altitudes - 500 to 1500'

HAWAIIAN GREEN TURTLE RESEARCH PROGRAM

SCHEDULE OF FIELD ACTIVITIES

1976

by
G. H. Balazs
Hawaii Institute of Marine Biology

JANUARY	FEBRUARY	MARCH	APRIL
MAY	**JUNE**	**JULY**	**AUGUST**
	1 Release of aquarium turtles (Easy Rider)		11-15 Kau, Hawaii
	28-12 French Frigate Shoals		26-
SEPTEMBER	**OCTOBER**	**NOVEMBER**	**DECEMBER**
-9 Midway	10 Hanauma Bay	18-23 French Frigate Shoals	8-9 Kure, Midway and French Frigate Shoals
20 Mokapu, Oahu			19 Oahu aerial survey
23-26 Hawaii			

HAWAIIAN GREEN TURTLE RESEARCH PROGRAM

SCHEDULE OF FIELD ACTIVITIES

by
G. H. Balazs
Hawaii Institute of Marine Biology

1977

JANUARY	FEBRUARY	MARCH	APRIL
2 Hanauma Bay 4 Kaneohe Bay 19-31 Kure	11-19 Hanauma, Kailua and Kaneohe Bays 20 Oahu aerial survey 21-12 Fiji, Cook Islands and W. Samoa (South Pacific Commission)	18-19 Maui 31 French Frigate Shoals	
MAY	**JUNE**	**JULY**	**AUGUST**
4-8 Kau, Hawaii 18-19 Hanauma Bay 25-7 Midway and Kure	17 Bellows	20-3 French Frigate Shoals 9 Hanauma Bay 17 Molokai-Lanai aerial survey 21 Kawailoa 25-26, 28-29 Bellows 30 Kauai-Niihau aerial survey	1-3,5,8-9 Bellows 11 Reef Runway 11-12 Kawailoa 15-
SEPTEMBER	**OCTOBER**	**NOVEMBER**	**DECEMBER**
-7 Nihoa, Necker and Laysan (Easy Rider) 22-28 French Frigate Shoals 29 Kailua Bay	5-9 Lanai 19-20 Kaneohe Bay	2 Kaneohe Bay 4-8 Honolulu Harbor and Reef Runway 10-19 Necker (Easy Rider)	1-8 French Frigate Shoals 18-19 Bellows 21-23 Kure

HAWAIIAN GREEN TURTLE RESEARCH PROGRAM

SCHEDULE OF FIELD ACTIVITIES

BY
G. H. BALAZS
Hawaii Institute of Marine Biology

1978

JANUARY	FEBRUARY	MARCH	APRIL
19-27 Kau, Hawaii 29-31 Canton and Phoenix Islands overflight	2,11 Kaneohe Bay 16 - 4 Midway and Kure	20 Kaneohe Bay	5-7 Kure and Leeward Islands overflight 19,26-28 Kaneohe Bay
MAY	**JUNE**	**JULY**	**AUGUST**
2 Kaneohe Bay 7-22 NMFS turtle meeting- Mississippi IUCN turtle meeting- Ontario 26 Kaneohe Bay	5-21 French Frigate Shoals 23 Kahoolawe 30-2 Hawaii	5-6 Kaneohe Bay 9 Oahu aerial survey 11 Kaneohe Bay 12-27 Lisianski and Leeward Islands (Easy Rider)	4-7 Maui, Molokai and Lanai 16 Kaneohe 23-25 Kahoolawe 31-
SEPTEMBER	**OCTOBER**	**NOVEMBER**	**DECEMBER**
-6 Kau, Hawaii 14-15 Bellows 17 Kailua Bay 23-	-7 Maro, Laysan, Lisianski & Pearl & Hermes (Easy Rider) 13-14 Kauai	26- Oahu aerial survey	

HAWAIIAN GREEN TURTLE RESEARCH PROGRAM-SCHEDULE OF FIELD ACTIVITIES

G. H. Balazs
Hawaii Institute of Marine Biology

1979

JANUARY 30-	FEBRUARY -1 Kure 16-19 Kauai, Niihau, Kaula 24 Molokai (Easy Rider)	MARCH 6-8 Kaula, Niihau 11-25 San Jose, Costa Rica, SSC/Cities	APRIL 3-4 Bellows 10-14 Washington, D.C. 17-18 Bellows 24-
MAY -12 Necker & FFS 29-30 Bellows	JUNE 5-6 Bellows 10-30 French Frigate Sh.	JULY 31-	AUGUST -2 NMFS meeting
SEPTEMBER 23-	OCTOBER -3 Mexico Suarez 10 NMFS meeting 21 French Frigate Sh.	NOVEMBER 24-	DECEMBER -2 Washington conf. 6-18 Noumea workshop

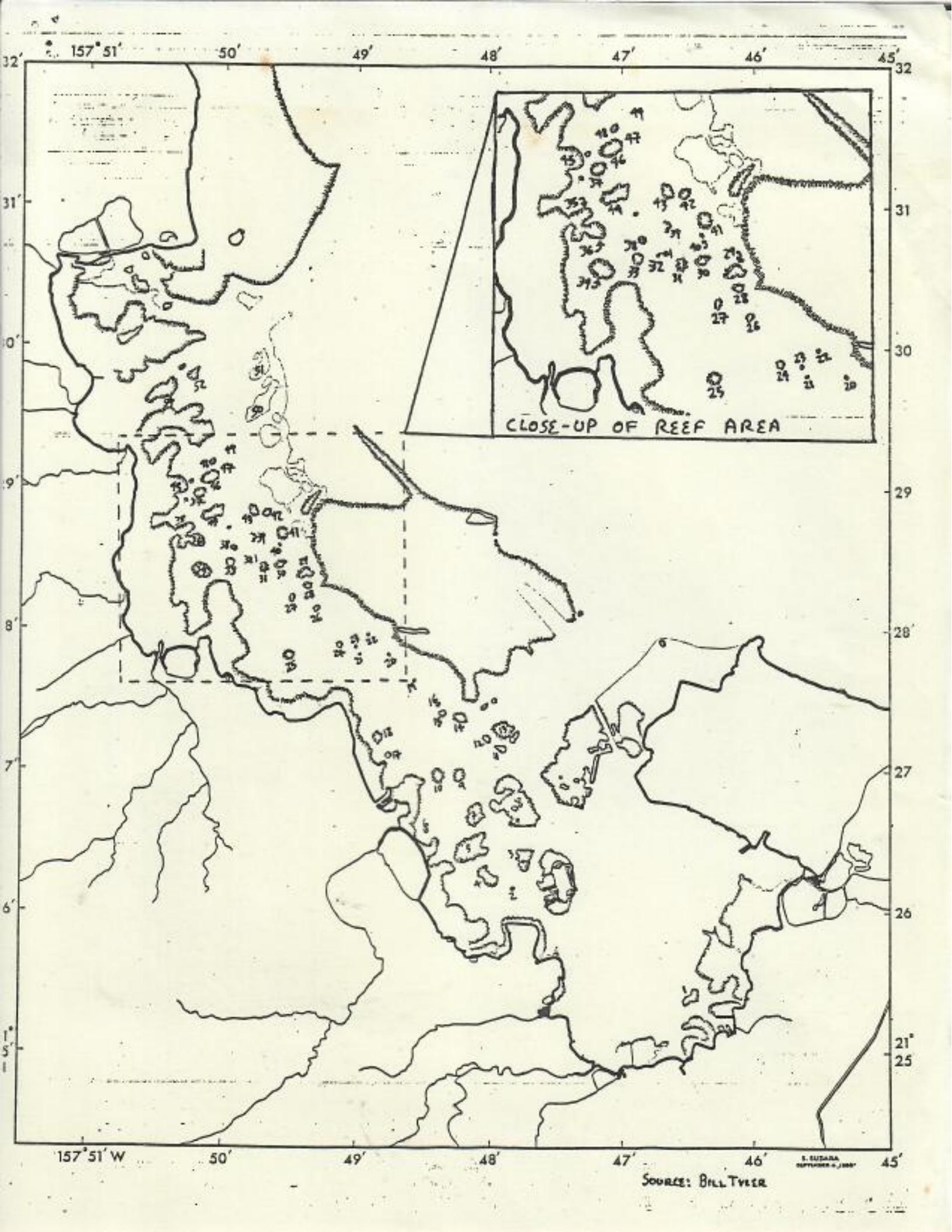
HAWAIIAN GREEN TURTLE RESEARCH PROGRAM

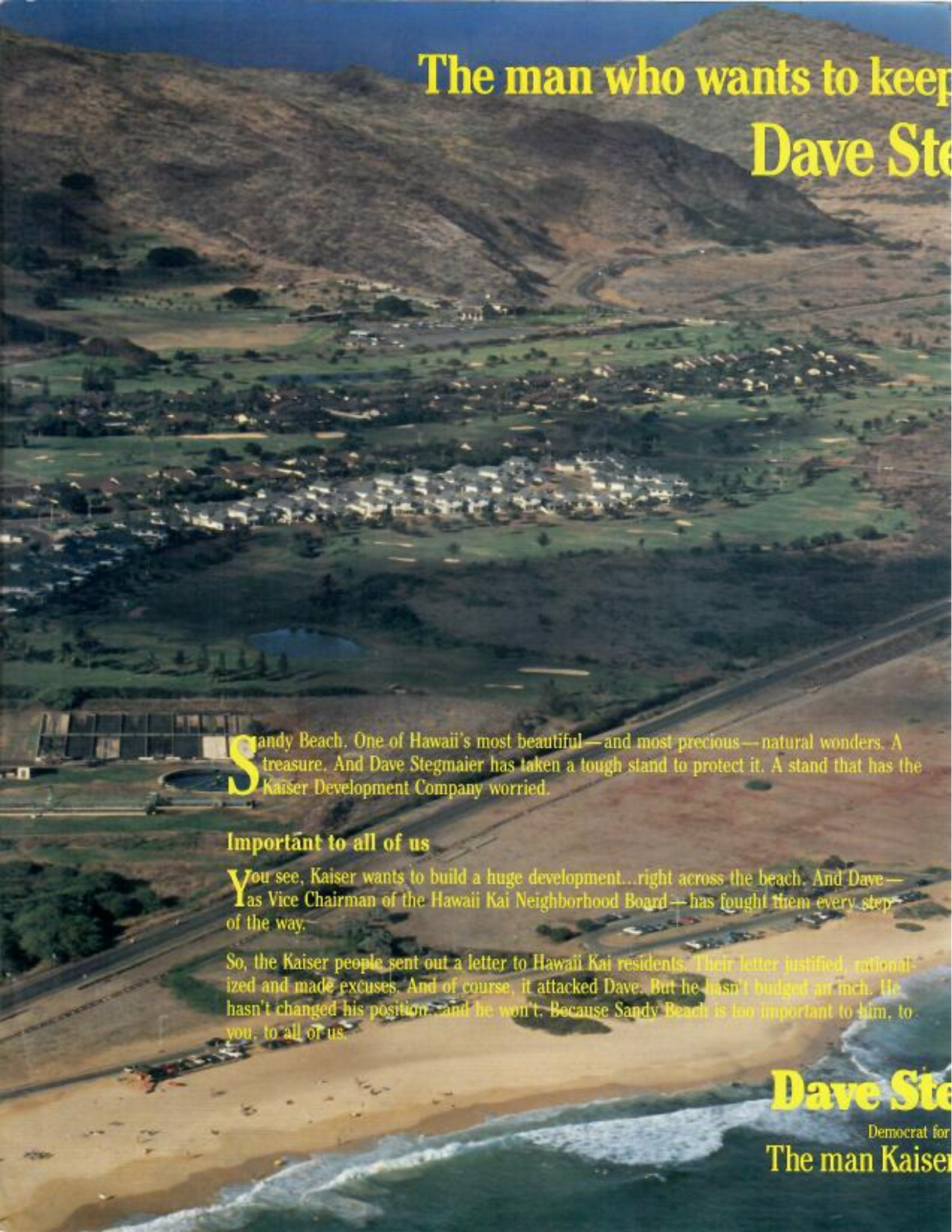
SCHEDULE OF FIELD ACTIVITIES

by
George H. Balazs
Hawaii Institute of ~~Marine Biology~~

1980

JANUARY	FEBRUARY	MARCH	APRIL
3-4 Bellows 8-13 Gainesville-Oviedo 21-22 Bellows 23-26 Hawaii 28-29 Bellows		5-6 French Frigate Shoals 11-13 Kure-Midway 18-22 Kiholo, Hawaii 24-26 Kure	10-11 Bellows 16-17 Hilo 24-25 NHI Symposium
MAY	**JUNE**	**JULY**	**AUGUST**
6-8 Bellows 13-15 Bellows	6-	-1 French Frigate Shoals	26-28 Midway & Kure
SEPTEMBER	**OCTOBER**	**NOVEMBER**	**DECEMBER**
5-8 French Frigate Shoals	14-20 Kiholo, Hawaii 30-31 Bellows	5-15 Am. Samoa & Rose Atoll	2-5 Molokai 10-11 Bellows 15-19 French Frigate Shoals


157°51'
50'
49'
48'
47'
46'
45'
32'
31'
30'
29'
28'
27'
26'
25'
CLOSE-UP OF REEF AREA
157°51' W
SOURCE: BILL TYLER



The man who wants to keep
Dave Ste

Sandy Beach. One of Hawaii's most beautiful—and most precious—natural wonders. A treasure. And Dave Stegmaier has taken a tough stand to protect it. A stand that has the Kaiser Development Company worried.

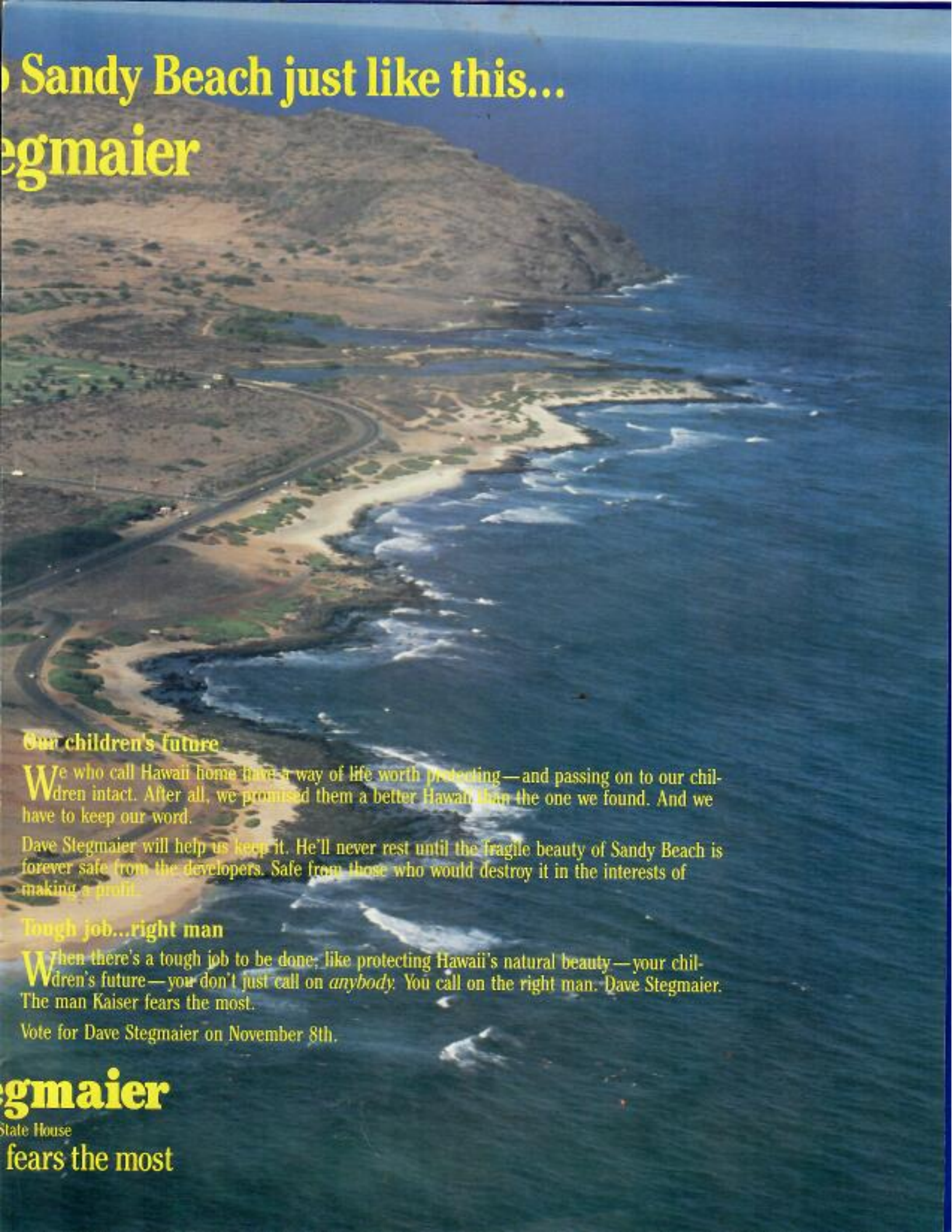
Important to all of us

You see, Kaiser wants to build a huge development...right across the beach. And Dave—as Vice Chairman of the Hawaii Kai Neighborhood Board—has fought them every step of the way.

So, the Kaiser people sent out a letter to Hawaii Kai residents. Their letter justified, rationalized and made excuses. And of course, it attacked Dave. But he hasn't budged an inch. He hasn't changed his position...and he won't. Because Sandy Beach is too important to him, to you, to all of us.

Dave Ste

Democrat for
The man Kaiser


Sandy Beach just like this...
egmaier
Our children's future.
We who call Hawaii home have a way of life worth protecting—and passing on to our children intact. After all, we promised them a better Hawaii than the one we found. And we have to keep our word.
Dave Stegmaier will help us keep it. He'll never rest until the fragile beauty of Sandy Beach is forever safe from the developers. Safe from those who would destroy it in the interests of making a profit.
Tough job...right man
When there's a tough job to be done; like protecting Hawaii's natural beauty—your children's future—you don't just call on *anybody*. You call on the right man. Dave Stegmaier. The man Kaiser fears the most.
Vote for Dave Stegmaier on November 8th.
egmaier
State House
fears the most

Who does Kaiser fear the most?

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Honolulu, HI

CAR-RT SORT **CR 03
THE BALAZS FAMILY
OR CURRENT RESIDENT
992 AWAAWAANOA PL, A
HONOLULU, HI 96825

Paid for by Friends of Dave Stegmaier, 441 Kekauluohi Street, Honolulu, HI 96825, Gail Ozawa, Treasurer

March 5, 1987

To: WPPO, W.Gilmartin, G. Balazs

From: John Henderson

Subj: Telecon w/Dick Wass

Dick Wass called to inform us of the following situation Rick Vetter reported from FFS:

1) Tar balls are washing ashore. Balls are up to 3" in diameter, approx. 10-15' apart on beach. Winds have been from the north recently, and the north side of the islands have heaviest concentration, particularly East Island, in the area where the boat lands. Rick has collected samples and will send in...perhaps Coast Guard can "fingerprint". Red-footed boobies are getting oiled; of 50 birds in their study, 7 were oiled. Balls tend to liquefy on beach during heat of day, then set up at night. Rick may do cleanup...I told him best do it in early A.M. or night when seals were up in vegetation.

2) Rick has observed juvenile (approx. 30-40 cm) turtles feeding on Portuguese man-of-war which are in wind rows off of Tern Island. There are also tar balls and plastics in the wind rows, so they may also be ingesting some of these. Rick collected a sample of the wind row materials. Dick is aware of the documented toxicity of ingested tar on turtles.

3) For the record, on March 4 one seal pup was sighted on East Is. (approx. 2 wk old), and one was sighted on Whale-Skate Is. (approx. 1 wk old). Mother on Whale-Skate with recent ventral wound.

Jet skis to be regulated if state plan is adopted

Sept 3, 88 HSB

KOKUA LINE

By Harriet Gee

QUESTION: I have noticed for the past few months that Jetskis Plus, a jet ski rental operator, has been using the Haleiwa Harbor area for docking purposes and riding the rented vehicles. Is this allowed? The area is within the Alii Beach Park and Jameson's by the Sea restaurant breakwaters.

It seems with all the water traffic in that area that it would be dangerous to allow it, especially since most of its customers are first-time users of jet skis. There also is a "No Vending" sign not more than 20 feet from where company employees park and wait for their customers. Are they excluded from this prohibition?

ANSWER: There is nothing in current state laws or regulations that prohibit Jetskis Plus from operating in that area, said Dick Elwell, spokesman for the state harbors division. However, jet ski riders may not go over 5 knots when they are within 200 feet of swimmers, moored boats, divers and others in the water, he said.

But jet ski operators may not be able to continue using this area after Oct. 1 if the proposed rules in the harbors division's Ocean Recreation Management Plan are accepted. An area farther from shore will be designated for jet ski use, Elwell said. The proposed rules will designate areas where jet skis and other thrill craft may use. Thrill craft are small, speedy vessels.

Informational hearings on the proposed rules have already been held on the major islands. The first public hearing on the proposed rules will be conducted at 7 p.m. Sept. 13 at Waikiki Elementary School cafetorium, 3710 Leahi Ave.

Elwell said the "No Vending" sign is not being violated because the company in question is "not actually conducting a transaction there. It is just meeting customers there and escorting them to the jet skis."

Q: Not too long ago the jet ski operators in the Waikiki area stayed well out at sea. Now, other operators have begun to do business just off Kuhio Beach. They anchor their boats there and shuttle customers out to the skis by canoe. Will an accident be necessary before some kind of control is imposed?

Besides the many swimmers and surfers in the water, a lot of government-protected turtles feed off the reefs. Auwe!!! I'm afraid all the racket from the skis will scare the turtles away, or even kill them!

A: If the state's proposed rules to regulate jet skis and other thrill are accepted, all such operations will be moved well offshore, according to state harbors division spokesman Dick Elwell. "We receive complaints against all jet ski operators," he said. His office is studying the practice of shuttling customers out to the skis. Elwell said it "probably will not be allowed to continue."

Auwe!!!

"As someone who recently started her own business, I am very dissatisfied with the way some businesses are conducted, even if they have taught me how NOT to run one. I would like to send a big auwe to a bicycle shop for its lack of aloha, competence and service. I had to take my bike in several times to be fixed because it was not done properly the first time. I paid $88 and got nothing, not even an apology. They won't get my business anymore!"

4.2-mile run alert

The Mid-Pacific Road Runners Club will hold its annual Old Pali Road 4.2-mile run tomorrow, starting at 7 a.m. from the mauka side of the intersection of the new H-3 freeway and Kamehameha Highway, by the Pali Golf Course.

Registration will begin at 6 a.m. Awards will be given in several age divisions. The entry fee is $2 for non-members, free for members. Call Ron Pate at 735-9378 for more information.

Vines on poles?

"I have a suggestion for the ugly street light poles in Waikiki," a reader writes. "How about decorating them with hibiscus blossoms in one corner and growing vines on them to soften the lines so that they will be more eye-pleasing?"

Need help with problems? Call 525-8686 or write Kokua Line, Box 3080, Honolulu 96802.

HAWAII
Saturday, September 24, 1988 ■ Star-Bulletin

■ Soviet troops patrolling in Armenia A-5
■ Church conductor insists on excellence A-8
■ INXS has full house screaming, dancing A-8

Sportsman urges tighter rein on jet skis

☐ He says the new state regulations favor commercial operators

By Mary Adamski and Richard Borreca
Star-Bulletin

The state now has regulations on the use of jet skis, windsurfing and parasailing craft and other shoreline recreation, but it didn't listen to ocean users in drafting them, an ocean sportsman says.

"It is the opinion of some that they are meeting the needs of commercial operators beyond the desires of individuals," said Terry O'Halloran, head of the Ocean Recreation Council of Hawaii.

He said members of the group, which includes sailing, windsurfing, kayaking, scuba diving and other interests, will ask the state Legislature to go beyond the limitations set in the Ocean Recreation Management Plan drafted by the state Department of Transportation.

State Sen. Rick Reed of Maui says he will draft legislation to ban jet skis and parasail rigs.

The regulations limiting the use of jet skis, windsurfing rigs and other shoreline recreational craft will go into effect Oct. 1, but state officials say the regulations won't be enforced for a month or more.

The rules define specific areas that commercial operators of jet skis and parasailing may use and require them to be licensed by the state Transportation Department, said Paul Dolan, state boating regulation officer.

The rules also will apply to private thrill craft users, says one commercial operator, and that is something businesses look forward to.

Companies that operate in Maunalua Bay off Hawaii Kai "have been regulating ourselves because of safety concerns," said Ellen Bick of American Sports. "We are in favor of the water management plan; we want to see it enforced.

"There are a couple of private owners who go hotdogging around and give all jet skiers a bad name.

"The state took a lot of effort to get input" at a series of public hearings, she said.

O'Halloran disagreed.

"The state did not make a single change in the draft presented at the public hearings, although public opinion was overwhelmingly for tighter controls. There was no indication that the even listened," he said.

"People around the state were saying 'no jet skis' or that the proposed controls on them are not enough."

"Our members are in sympathy with the people in (jet ski) business so we favor a phasing out, giving them time to divest themselves of jet ski business over two to five years," he said.


Terry O'Halloran


Rick Reed

The rules signed Wednesday by Gov. John Waihee are overdue, says Reed, who has been fighting the use of thrill craft in local waters. He complained that the state should have had "its act together" sooner.

"The state hasn't put any real emphasis on governing water use in the past," Reed said. "They should have been ready, but I am not surprised there is a lag."

The state's marine patrol, with the Transportation Department, will be in charge of enforcing the new restrictions. But Dolan said the state doesn't have enough people to enforce the regulations across the board.

Thrill craft operators found outside the specified areas are liable for fines up to $10,000. Dolan said it is expected that the actual fines levied will be in the range of $1,000.

He said that even though the regulations go into effect Oct. 1, there will be a 30- to 60-day grace period.

"I don't expect any problems, though," he said.

"We do have a lot of people who want to cooperate — they know the time has come. I think the public will also be a helpmate to us."

Reed, however, said the state "took the coward's way out" by allowing the operation of noisy jet skis close to shore in popular recreational areas.

He said swimmers on Maui are particularly upset by the state's actions.

"These rules don't satisfy anyone except the commercial operators . . . I am going to introduce legislation to totally ban thrill craft and parasailing in the next legislative session."

"It is still the responsibility of ocean users to regulate ourselves based on common sense and courtesy, despite what the state puts out," said O'Halloran.

"We expected the government would respond to the wishes of the majority who testified. When they don't respond, it creates distrust and an adversarial relationship. We would prefer to see cooperation between the public and the government rather than an adversarial situation," O'Halloran said.

10-6-88

NEWSWATCH HSB

Repairs to sewage main continue

City workers last night worked to finish repairs on a broken sewage main that burst at about 5 p.m. Tuesday, sending nearly 100,000 gallons into Kapakahi Stream near Waialae Golf Course.

Meanwhile, the state Department of Health left signs at Kahala Beach Park that were posted shortly after the pressure-main break. The signs were to turn beachgoers away and warned them of possible contamination.

Waters off the park, which include the beach fronting the Kahala Hilton, is located at the mouth of Kapakahi Stream into which the raw sewage from the break flowed after entering a storm drain.

The mouth of the stream is blocked by a sandbar, but it was feared that high-tide waves might wash over the dunes and into the mouth where the sewage had backed up, thereby washing waste debris into the waters of the beach park.

The sewer break occurred at the Kahala Sewage Pumping Station at the intersection of Kealaolu Place and Kealaolu Avenue. Repair work on the main was to be completed by late evening or today.

Work on Barbers Point pier begins

A groundbreaking ceremony for a new 1,600-foot pier at Barbers Point Harbor was scheduled for 11 a.m. today.

The concrete pier is expected to be completed in March 1990 and will cost $13.2 million, according to the state Department of Transportation.

The DOT expects the pier to be used for container operations, loading and unloading of fuel and bunkering and bulk cargo operations.

H:Summary. GHB

SUMMARY OF INFORMATION ON SEA TURTLE NESTINGS AT KAHUKU BEACH, OAHU, 1982-86.

complied by

George H. Balazs and William G. Gilmartin
Southwest Fisheries Center Honolulu Laboratory
National Marine Fisheries Service, NOAA
2570 Dole Street
Honolulu, HI 96822-2396

and

David Woodside
U.S. Fish and Wildlife Service
P. O. Box 50167
Honolulu, HI 96850

1982

8-3	At least two emergences resulting in four excavations.
8-14	Emergence tracks but no excavations.
8-17	Emergence tracks and excavations.
8-21	Emergence tracks but no excavations.
8-27 (approx.)	Emergence tracks and numerous excavations.
9-2	Emergence tracks and a large excavation.
9-7 and 9-8	Tracks of hatchlings originating from an earlier excavation site.
9-9	Nest site excavation resulted in the recovery of 62 empty egg shells; 3 advanced development but dead embryos; 1 early development but dead embryos; 1 advanced development but deformed albino embryo; 3 eggs with no apparent development; and 2 undersized eggs with no development. Nest therefore contained 72 eggs, with 62 hatchlings (86%) having emerged at the surface. Embryos identified as the green turtle, Chelonia mydas.
9-24 (approx.)	Tracks of hatchlings orginating from an earlier excavation site. Several egg shells recovered and identified as C. mydas on the basis of size.

1983

No observations made of nesting activity. Hurricane "Ewa" removed a considerable quantity of beach sand.

1984

5-12 (approx.)	Emergence tracks and excavation.
5-20	Turtle seen on the beach by Gay Bartell.
7-8 (approx.)	Tracks of hatchlings originating from an earlier excavation site. Also a recent excavation present.
7-13	Nest site excavation resulted in 62 empty egg shells and 3 eggs with no apparent development (65 total). Identified as C. mydas on the basis of egg shell size.
7-19	Emergence tracks and excavation.
7-20	Tracks of hatchlings originating from an earlier excavation.
7-24	Nest site excavation resulted in 69 empty egg shells and 2 eggs with no apparent development (71 total). Identified as C. mydas on the basis of egg shell size.

1985

No observations made of nesting activity. Storm waves removed a considerable quantity of beach sand.

1986

8-3 (approx.)	Emergence tracks and one excavation.
10-20 (approx.)	Nest site excavation resulted in 72 empty egg shells and 3 unhatched eggs of unknowns status (75 total). Presumed to be C. mydas, but positive identification not made.

March 12, 1986 F/SWR1:LDC

LDC

Captain Patrick A. Fallon
Commander
Bellows Air Force Station
P.O. Box 1010
Waimanalo, Hawaii 96795

Dear Captain Fallon:

On March 5, 1986 one of my staff had the opportunity to assist George Balazs with green sea turtle research at Bellows Station. George mentioned past incidences of green turtle - fishing interactions and suggested you might be willing to place one of our signs near the jetty. As I'm sure George has told you, all sea turtles are protected by the U.S. Endangered Species Act of 1973, as amended, as well as by Hawaii State law. We have 12"x18" aluminum signs with the wording "WARNING - ALL SEA TURTLES AND MARINE MAMMALS ARE PROTECTED BY FEDERAL AND STATE LAW."

We would like to have at least two of these signs put up at Bellows Station - one at the jetty, the other at the T-intersection with the other signs (weekend public access area). The signs would serve to remind visitors of the turtles' protected status. If you agree the signs would be useful, I will have my staff deliver them to you at your convenience.

Sincerely yours,

Doyle E. Gates
Administrator

bc: George Balazs, F/SWC2

April 8, 1986 F/SWC2:GHB

MEMORANDUM FOR: F/SWR1 - John J. Naughton

FROM: F/SWC2 - George H. Balazs

SUBJECT: Your request for comments on the proposed expansion of the existing recreational complex at Bellows Air Force Station

As you know the nearshore waters of Bellows Station, especially where Waimanalo Stream enters the sea, constitute important foraging habitat for the green turtle, Chelonia mydas. I have been periodically sampling and tagging turtles at this site since 1977.

The proposed location for expansion of recreational facilities would not appear to cause a direct impact on the nearshore waters. However, it must be recognized that overall increases in the number of people using the complex will invariably result in greater impacts of a secondary and cumulative nature. Increases in shoreline fishing is one such problem, since we know that green turtles are regularly snagged and entangled at the mouth of Waimanalo Stream.

In the Environmental Assessment supplied with the proposal, I was surprised to find that the green turtle, a threatened species under the U.S. Endangered Species Act, was not listed under Section 1D (i.e., fauna present at Bellows Air Force Station). I recommend that steps be taken to ensure that all future EA or EIS documents pertaining to Bellows include this listed species.

If I can be of further assistance, please do not hesitate to contact me.

cc: Balazs
HL

U.S. DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
Southwest Fisheries Center
Honolulu Laboratory
P. O. Box 3830
Honolulu, Hawaii 96812

March 26, 1986 F/SWC2:GHB

Captain Patrick A. Fallon
Commander, Bellows Air Force Station
P. O. Box 1010
Waimanalo, HI 96795

Dear Captain Fallon:

I am writing to request permission for one of our volunteer biologists, Ms. Vanya de Jung, to visit Bellows Station a few times each week for the purpose of doing observational surveys of sea turtles from shore, and also to informally interview fishermen and other recreational users. This work would be focused around the beach area and popular rock jetty at Jetty Lane. I presume that our current Real Estate Use License would cover this type of research activity, but I wanted to contact you in advance to be certain.

Once again I want to express appreciate for your fine assistance with our continuing studies of sea turtles at Bellows Station.

Sincerely,

George H. Balazs
Zoologist

DEPARTMENT OF THE AIR FORCE
DETACHMENT 1, 15TH AIR BASE WING (PACAF)
BELLOWS AIR FORCE STATION, HAWAII 96795

28 March 1986

Mr. George H. Balazs
National Marine Fisheries Service
Honolulu Laboratory
P. O. Box 3830
Honolulu, Hawaii 96812

Dear Mr. Balazs

Your request for visitation to Bellows for the purpose of collecting information on green sea turtles at the rock jetty is approved. As for your informal interviews for the purpose of collecting data from fishermen and recreational beach users, please minimize the amount of time spent interupting our guests. Also, restrict your questions to matters concerning the collection and preservation of green sea turtles. I don't mean to sound too confining, but some of our guests do resent anyone interupting their vacations or hobbies. Please do as we do, we try as much as possible to respect their requests.

Please inform your volunteer biologist, Ms. Jung, she should bring a swim suit, beach equipment and tanning oil - for Bellows is the best recreation beach on Oahu.

Sincerely

PATRICK A. FALLON, Capt, USAF
Commander

cc: Det 1, SP

February 24, 1986 F/SWC2:GHB

Captain Patrick A. Fallon
Commanding Officer
Bellows Air Force Station
P. O. Box 1010
Waimanalo, HI 96795

Dear Captain Fallon:

During the afternoon and night of March 5 (Wednesday), we would like to net and tag green sea turtles at Bellows Station under provisions of our current Real Estate Use License. We plan to arrivew at Bellows in a Government vehicle at approximately 3 p.m. and deploy our net from the jetty of the drainage stream near the second guard station. As you may know, sampling of turtles at this site has been periodically carried out for the past 7 years. We anticipate a successful overnight study visit. The only possible inconvenience may be the temporary disruption to any fishermen that may be on the jetty when we set out the net.

Please telephone me if you have questions about our work, or if you foresee any problems with the date we have selected.

Sincerely,

George H. Balazs
Zoologist

cc: Balazs
HL

March 10, 1986 P/SWC2:GHB

Captain Patrick A. Fallon
Commander, Bellows Air Force Station
P. O. Box 1010
Waimanalo, HI 96795

Dear Captain Fallon:

I am writing to provide you with a brief summary of the results of our work at Bellows last Wednesday night, March 5.

Our net was set near the jetty for a 14-h period extending throughout the night. We were able to catch one green turtle, but at sunrise we saw several others in the immediate area. I believe that the glassy ocean conditions, with almost no swell present, aided these turtles in seeing and avoiding our net. Nevertheless, the single turtle that was captured resulted in the collection of valuable data on growth and site fixity to a foraging pasture. The turtle had been originally captured and tagged at this same location in May of 1979. In May of 1980 it was captured there again. Since that time, it had grown from 50.5 to 59.1 cm in carapace (shell) length, or about 1.5 cm (5/8 inch) per year. The turtle is still not large enough to be mature, so we are unable to say if it is a male or a female. The mean carapace length of mature female green turtles in Hawaii is about 92 cm (36 inches). When mature, green turtles in Hawaii migrate several hundred miles to the northwest of Oahu where they mate and lay eggs at French Frigate Shoals. When the breeding season is completed, they return to their resident coastal foraging pasture (such as Bellows).

Our work at Bellows always attracts the attention of beach-goers and various people staying in your guest cottages. I am impressed with the high level of interest displayed, and the great relief demonstrated, when people learn that the turtles we have caught will return to the sea after tagging. Most people that talk to us at Bellows are very concerned about the welfare of the turtles, and are eager to learn more about them. This time I had a lady come to me that was upset over a turtle that had been accidentally hooked the previous day by a fisherman on the jetty. The turtle escaped after breaking the line. I mentioned this continuing problem to you in my last letter.

I will be contacting you again in a few months when we are ready to do more work at Bellows. Again, thank you for your cooperation and assistance.

Sincerely,

George H. Balazs
Zoologist

cc: Balazs; HL
cc: D Cates

U.S. DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
Southwest Fisheries Center
Honolulu Laboratory
P. O. Box 3830
Honolulu, Hawaii 96812

March 4, 1986 F/SWC2:GHB

Captain Patrick A. Fallon
Commander
Bellows Air Force Station
P. O. Box 1010
Waimanalo, HI 96795

Dear Captain Fallon:

Thank you for your letter of February 27, 1986 approving of our plan to net and tag green turtles at Bellows Station on the afternoon and night of March 5.

I want to take this opportunity to respond to the concern you expressed about our research activity possibly damaging the popular fishing grounds off the jetty where we work. I appreciate having the opportunity to clarify this important point for you and your staff. Let me assure you that there is no possible way that our netting could adversely affect the sport fishery resources of the area. The nets that we use have a minimum stretched mesh size of 16 inches made specifically for entangling sea turtles. In all the years that I have sampled turtles at Bellows, dating back to 1977, no finfish (or sharks) have ever been captured. The mesh size is simply too large for any fish inhabiting the area to be captured. Other than turtles, the only marine life we have caught were several sting rays measuring up to 3 feet in width. On one occasion, this proved to be exceedingly troublesome when a ray drove it's tail barb more than 2 inches into the arm of my coworker. He had to have surgery at Castle Hospital a short time later, and didn't regain full use of his arm for several months. Needless to say, any rays now found in our net are treated with great caution. If they cannot be safely removed alive, it sometimes becomes necessary to dispatch them with as bang stick.

While our activity has no significant effect on the Bellows' fishing grounds, I should mention that over the years I have gathered information that fishing activity from the jetty at times adversely impacts the turtles. I have captured turtles with rusted hooks imbedded in them, and interviewed fishermen that told me about turtles taking their baited hook and breaking the line. A few years ago, but well after sea turtles were listed under the U.S. Endangered Species Act in 1978, I received a reliable report of a turtle being reeled in at the jetty and taken away in the trunk of a car. We also

now know that lost monofilament fishing line is hazardous to sea turtles as entangling debris.

I wanted to mention these past problems to you so that your security personnel can be alerted of the protected status of sea turtles from time to time, although this may already be taking place. I understand that in the near future our management branch will be contacting you about the possibility of placing small permanent signs at Bellow warning that all sea turtles and marine mammals are protected by federal law. The jetty area would be an excellent site to place one of these signs.

Thank you again for your assistance and cooperation. I always look forward to working at Bellows because of it's pleasant setting, friendly security personnel, and because we almost always end up catching turtles.

Sincerely,

George H. Balazs
Zoologist

cc: D. Gates

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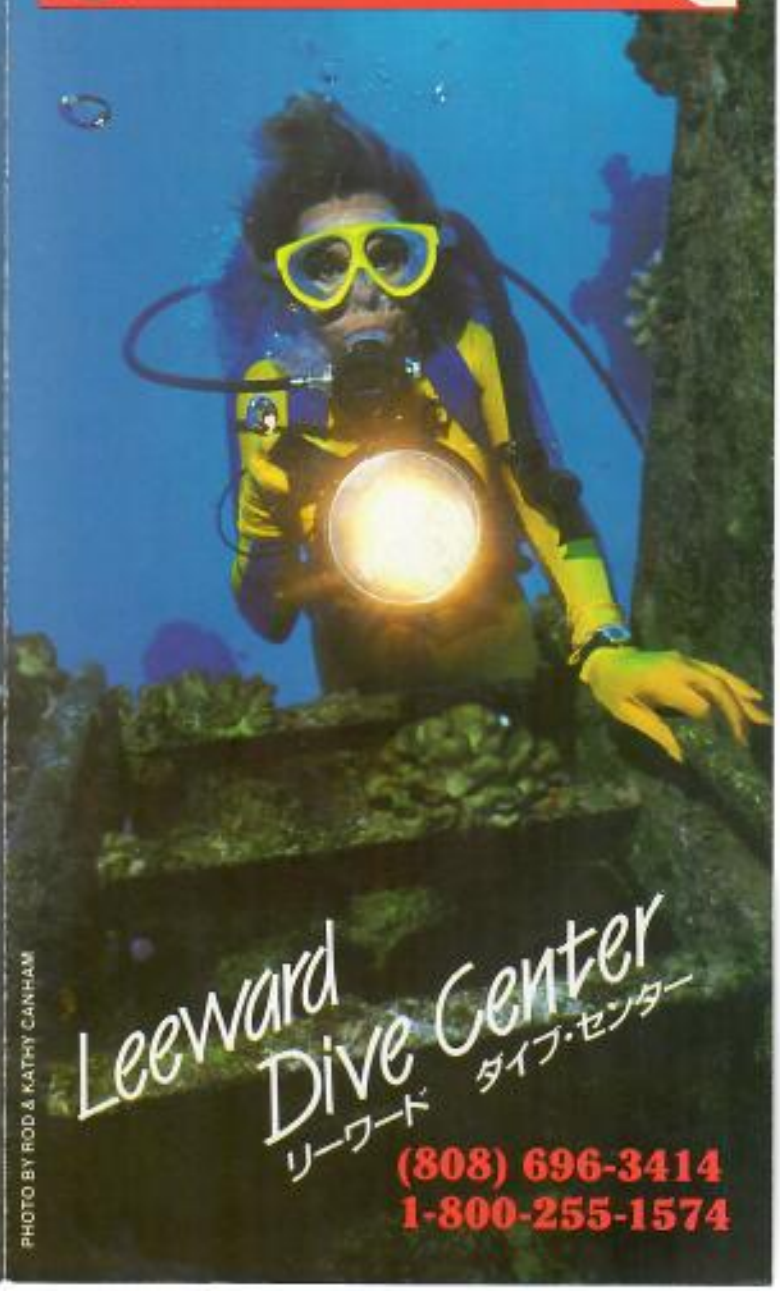

PHOTO BY ROD & KATHY CANHAM

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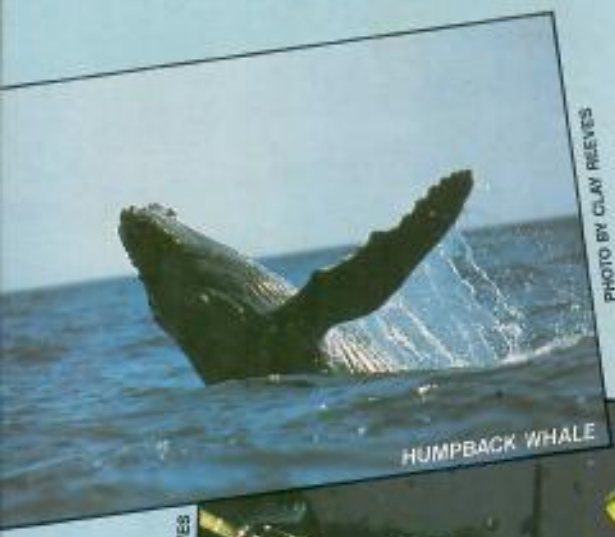

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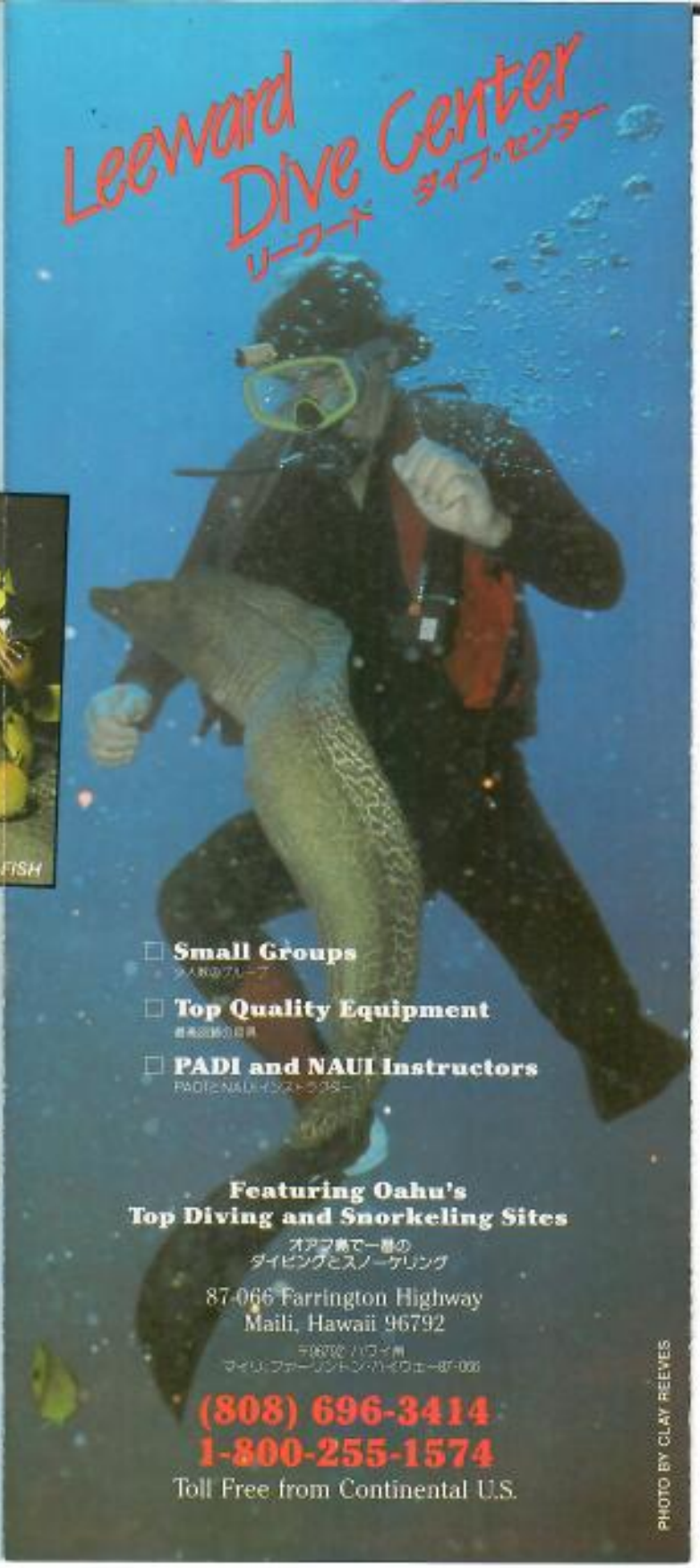

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See the park's most unusual resident, the world's only known living wholphin, a unique hybrid of a false killer whale and Atlantic bottlenose dolphin. Another attraction is the Hawaiian Monk Seal Care Center which serves as a temporary home for injured or stranded monk seals. On Friday nights, local entertainers take the stage at 8:30 p.m. in the Sea Lion Cafe. Guests enjoy tours and mini-lectures. Call for daily express shuttle service information.

FAST FACTS

- Hours:9:30 a.m.-5 p.m. daily
- Friday till 10 p.m.
- Phone: 923-1531, 259-7933
- Location: Map D, B-12

You can still drive to Makapuu Beach! Read on to find out how and when.

Oahu Traffic Advisory

If you're thinking about visiting Hanauma Bay Beach Park Halona Blow Hole, Sea Life Park, Sandy Beach, Makapuu and othe East Oahu recreation sites, please note that the State Department o Transportation is engaged in a major construction project or Kalanianaole Highway, from Aina Haina to Hawaii Kai. The Hawai Kai-bound lanes will be closed on weekdays between 9:00 a.m and 3:00 p.m., which leaves only one lane open for traffic flow.

Getting to the East side of Oahu, especially Hanauma Bay - befor 9:00 a.m. is a good idea; but to avoid any traffic delays after 9:0 a.m., you should take the Pali Highway, instead of Kalanianaol Highway. It's easy. Once you're on the Pali Highway (see I-14 o our Oahu fold-out map on our inside back cover), just go through the tunnel, and at the third traffic signal turn right (see G-16). Tha puts you on the other end of Kalanianaole Highway. Enjoy th scenic drive through Waimanalo; you'll reach your East Oah destination much faster and without construction delays.

If you're returning to Honolulu before 4:00 p.m., take Kalanianaol Highway through Hawaii Kai toward Waikiki. After 4:00 p.m. onl one lane going toward Honolulu will be open, and you will sav more time going back by way of the Pali.

And while we're at it, take a tip from This Week and "buckle up your seatbelt. Hawaii's seat belt law is one of the toughest in th nation. Be sure to buckle-up when you get into your rental ca Failure to do so will result in tough fines. And buckling-up may sav your life.

Hawaiian Islands Offer Delights For Divers In Paradise

By Steve Rosenberg

The Hawaiian Islands offer some of the most unusual and exciting diving to be found anywhere in the world. However, the majority of people who dive in Hawaii are in the process of becoming certified or are relatively new to the sport. Dive operations have a tendency to cater to the needs and abilities of the novice diver rather than to the expectations of the seasoned advanced diver.

But many of the dive operations in the islands will now also arrange special advanced dive trips for groups of divers once they are sure that the experience and competency of the individuals warrant such excursions.

All of the islands have some sites that require a higher level of diving skills or specialized ones. The reasons for the the higher skill level can be greater depths, strong currents, rough water, extensive lava tube systems, blue-water diving, or the presence of large pelagic animals.

Although many of the these sites are more remote and require either a live-aboard boat or fast boats with greater range, some are close to heavily populated areas and easily accessible. A number of very exciting dives can even be reached from shore.

The major islands of Maui, Kauai and the Big Island of Hawaii draw vacationers from all over the United States and abroad. The islands are a wonderful vacation destination, offering warm weather, beautiful beaches, lush tropical greenery, balmy breezes and an endless variety of water sports. Many writers talk about dive sites that are great but seldom visited by the dive operators. Most of the locations located on the leeward sides of the various islands are protected from prevailing harsh weather and easily accessible by boat or from shore.

© 1991 Steve Rosenberg

Maui Resident — A green sea turtle glides through Hawaiian seas.

It is also important to know that dive operators have their favorite spots, and a lot of areas are simply not available to visiting divers. To see Hawaiian diving at its best, you need to know what Hawaii has to offer, where to go, and how and when to go there. Each of the individual major islands has its own advantages and disadvantages in relation to a dive vacation.

The diving in Hawaii in general is different from most other warm-water destinations. The major attractions that accompany the warm water and excellent visibility are the colorful reef fishes, the rare and unusual marine animals and the interesting and sometimes spectacular underwater terrain.

Hawaiian weather can be divided into two distinguishable seasons during the year: summer and winter. During the summer season — May through September — the weather is usually warmer and drier, with temperatures ranging from the mid-70s to the low 90s, and water temperatures averaging around 80 degrees. In the winter, surface temperatures are usually around 70 to 75, but they may occasionally dip into the high 50s at night. Winter water temperatures ... islands has a windward coast that is exposed to these trade winds. In the winter months, large swells usually make it impossible to dive the northern and eastern sides of the various islands.

However, each of the islands also has a leeward coastline that faces away from the trade winds. The leeward side is usually protected, making the waters in these areas divable most of the year. During the summer months, when an occasional southern swell buffets the islands, the diving is usually the calmest on the northern shores. Diving conditions are good somewhere on each island throughout most of the year. To get the most out of diving in Hawaii, it is usually a good idea to rely on the experience and expertise of local guides.

Diving On Oahu

Oahu, the third-largest of the major Hawaiian Islands, is home to Honolulu, Waikiki Beach, Hawaii's International Airport, Pearl Harbor and approximately 80 percent of the state's entire population. The diving on Oahu is concentrated into three main areas: the southeastern shore from Waikiki to Makapu'u Point; the Waianae Coast on the leeward west coast from Nanakuli north to Kaena Point, and the north shore from Haleiwa to Waimea Bay. The east side of the island offers interesting diving, but due to rough surf conditions, the area is rarely dived.

During the calm summer months, there are a number of interesting shore dives on the north side of the island that are very popular. At **Shark's Cove**, located on the east end of Pupukea Beach Park, there is an elaborate system of caves and caverns. At **Three Tables**, named after three flat sections of lava rock that protrude just above the surface about 20 yards from shore, a maze of lava tubes, ledges and overhangs can be explored. Divers also find a wide variety of colorful reef fishes. Visiting

tures average between 72 to 75 degrees. Local weather on the islands is greatly affected by the prevailing trade winds that come out of the northeast during most of the year. Each of the

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divers should always check with local dive stores to find out about ocean conditions, entry points and potential hazards before attempting shore dives anywhere in the islands.

The leeward side of the island offers what many believe to be the best boat-dive sites on Oahu. The most requested dive site on Oahu is the *Mahi*, a 165-foot minesweeper that rests fully intact and upright on a flat sandy bottom in 95 feet of water. A variety of marine animals, including schools of milletseed butterflyfish and blue-stripe snapper, moray eels, nudibranchs, squirrelfish, lobster and even a whitetip reef shark, have made the artificial reef their home.

The Makaha Caves is another popular spot off the west shore of Oahu. During the day, this is a great area for photographing turtles, schools of blue-striped snapper, rudderfish and occasionally, scrawled filefish. In the shallower areas, a labryinth of tunnels, arches and overhangs harbor Moorish idols, menpachi squirrelfish, puffers, hawkfish, and other tropicals. The Makaha Caves is also an ideal area for a boat night dive, offering varieties of nudibranchs, including the large, bright-red Spanish dancer, spiny lobsters, hairy Hawaiian lobsters and green-head moray eels.

Ke'eau Corner is an extensive drop-off reef

(Continued On Next Page)

Hawaii's Underwater Sites Offer Unusual Topography, Marine Life, More

(Continued From Previous Page)

characterized by a series of canyons. The walls of the canyons are full of arches, caves and tunnels, giving the area a Swiss-cheese appearance. The top of the lava shelf is in just 30 feet of water, while the wall drops to a sand-and-rubble bottom in 50 to 70 feet of water. Normally this area has very little current.

Twin Caves, another west coast site, is primarily for advanced divers because of the depths and strong currents. This area is characterized by an impressive drop-off. The wall drops vertically from 50 feet on top to a sloping sand-and-rubble bottom in 80 to 90 feet. Yellow margin, zebra, green-head and white-mouth morays are all fairly common in the rubble areas at the bottom of the drop-off. The site gets its name from two vertical lava tube columns which are accessed at the bottom of the drop-off.

On the southeast shore, dive boats operating out of Maunalua Bay offer a number of nearby dive sites, including **Turtle Canyon, Anglerfish Reef, Big Eel Reef, the Kahala Barge** and **Fantasy Reef.** These southeast shore dive sites are mostly novice to intermediate dives, offering a variety of tropical fishes and frequent sightings of medium-sized green turtles. The newest wreck dive on the island is the ***Atlantis Wreck,*** a 110-foot Navy oiler that was sunk as an artificial reef off Waikiki in late 1989. The wreck sits upright in about 100 feet of water, offering varied dive profiles between the main deck at 5 feet and the top of the masts at 35 feet.

Hanauma Bay, a well-known snorkeling and shore dive site, is located just to the east of Maunalua Bay. This scenic bay was formed when the sea eroded the outer wall of an extinct volcano. Now an underwater park, the bay has a protected shallow inner reef, and a gently sloping outer reef.

Diving On Maui

On the west coast of Maui, almost every hotel and shopping mall on or near the beach has some sort of recreational activities center which provides a variety of services from snorkeling and scuba rentals, to introductory dives and full certification courses. This area is the leeward side of the island, where visitors find good diving conditions almost every day of the year.

The configuration of the coastline, together with the location of the neighboring islands, provides protection from even the worst of the winter swells. The most popular scuba diving sites, however, are not actually on Maui, but on the nearby, partially-submerged Molokini Crater and on the southeast side of Lanai.

© 1991 Steve Rosenberg

Marine Life — Divers are treated to a variety of sea creatures such as this red pencil urchin.

Molokini Crater lies offshore of the southwestern coast of Maui. It is actually an extinct volcano, and only a 400-yard section of the crater rim now rises above the surface of the water. The backside of the crater provides a vertical wall dive to depths of 100 feet or more, depending upon the dive plan. Whitetip reef sharks can usually be found resting on sandy ledges, while small gray reef sharks, manta rays and eagle rays are often sighted in the blue water along the wall.

Inside the crater, divers find an abundance of colorful coral formations. Because Molokini is a marine life preserve and because the area is contantly visited by divers and snorkelers, the schools of lemon butterflyfish and jacks have come to expect being fed and will literally swarm divers. Next to Molokini, perhaps the

most well-known dive sites that are associated with Maui are the **Cathdrals**, located off the southern end of Lanai. These sites are regularly visited by dive operations from Lahaina on the northwest shore of Maui and less regularly by the operations in Kihei and Wailea, depending on the wind and water conditions.

When the water is calm, the visibility is often in excess of 100 feet. The term "cathedrals" actually refers to two separate locations that are a few miles apart. The **First Cathedrals** consists of two connecting grottos on the inside of a massive underwater ridge. Rays of sunlight stream into the larger cavern through a lattice-work of holes in the rear wall, giving it a "cathedral-like" appearance. Recesses in the walls and ceilings are crowded with schools of menpachi squirrelfish, solitary bigeye squirrelfish and slipper lobsters.

The **Second Cathedrals** is actually a number of adjoining grottos located inside a large pinnacle

(Continued On Next Page)

Hawaiian Paradise Can Be Found Underwater As Well As Topside

© 1981 Steve Rosenberg

Butterflies — In Hawaii special ones fly under the surface. Here pyramid butterflyfish swim.

(Continued From Previous Page)

the ceiling of the shallow tubes. Huge spiny puffers, lobsters, eels and large schools of tangs and other tropicals drift with the surge.

On the Kona Coast of the Big Island of Hawaii, there are two shore dives. One of the most unforgettable experiences that Kona has to offer is the night dive with mantas ray at the Kona Surf Hotel. This hotel sits on the lava rock shore, a few miles south of the town of Kailua-Kona. On almost every night of the week, divers find from two to as many as 10 manta rays, with wingspans measuring up to 12 feet. As long as there are only a few divers or snorkelers in the water, the manta rays remain in the area, continuing to feed and usually ignoring the divers.

In water as shallow as 15 feet, the mantas perform an underwater ballet, including somersaults and figure eights, sometimes gently pushing divers out of the way.

A shore dive at the **Place of Refuge Park** offers another exciting dive experience. This site is located at Honaunau just a few miles south of Kealakekekua Bay (Captain Cook's Bay). The Place of Refuge is probably one of the more protected shore dives along the Kona Coast, and yet it offers more diversity than any other shore dive in the islands. Easy access to the water at the center of the bay is provided by natural lava steps. To the right of this entry point is a vertical wall that drops from a shallow shelf in 20 feet of water to a flat sandy bottom over 100 feet deep. Along this wall divers almost always find a great cloud of baitfish. You can swim with the huge school of fish, as large, predatory amberjacks feed, causing the cloud to continuosly change shape and direction.

Most of the more exciting dives in Hawaii are boat dives. The most spectacular and accessible array of lava tubes in Hawaii can be found at **Cavern Point**, which is located on the northern edge of Laeokamimi Point on the Kona Coast, to the south of Kealakekua Bay and the Place of Refuge National Park.

Cavern Point is one of the most interesting newly discovered diving areas on the Kona Coast. This is actually a number of different dive sites in the same general area. The Kona Coast's live-aboard dive boats and a number of the dive operations make regular stops at these sites.

The two primary sites are Twin Lava Tubes and Three Room Cave. At **Twin Lava Tubes**, divers will find two parallel underwater tubes, one on top of the other, that extend over 200 feet straight into the lava rock wall. Massive cliffs tower above the water, plunging vertically to the ocean bottom, which levels out 50 feet below the surface.

A rock column that rises out of the water marks the entrance to the lava tubes. Immediately behind this rock sentinel there is a spacious cavern, with entrances on either side of the column. Dive lights, gear and training for the overhead environment are a necessity when exploring the interior of these caves. Except for the light from the entrance, which quickly fades as one swims back into the recesses of these natural pipelines, no light penetrates the depths of the tubes.

The interior dimensions of these particular tubes range from 10 to 20 feet in width and about the same in height. The walls are scored with cracks and crevices, that hide a variety of cowries, shrimps and lobsters. Schools of soldierfishes and solitary bigeyes and glasseye snapper roam the perpetual night in the interior of the tubes.

Three Room Cave is located south of Twin Lava Tubes, on the northern side of the point. A vertical wall on the this side of the point drops to a depth of between 20 and 30 feet. To find the entrance to Three Room Cave, swim along the vertical wall in toward shore. The opening is fairly large. A back door to the series of caverns, leads to another interesting lava tube.

In many places the ceilings of the tunnels and caves are full of recesses and holes. In this area divers find numerous lobsters, including the bright-orange, hairy Hawaiian lobster, bullseye lobsters, slipper lobsters, spiny lobsters and mole lobsters. Turkeyfish are also quite common, as well as pockets full of cowrie shells, whitetip reef sharks, leaf scorpionfish, frogfishes and other rare and interesting animals.

Of course, there are innumerable good dive sites along the Kona Coast. Most of the area is honeycombed with lava tubes and tunnels. Docile whitetip reef sharks are commonly seen resting

(Continued On Next Page)

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Hawaii:

Pacific Island Paradise Calls To Scuba Divers

(Continued From Previous Page)

on sandy bottoms inside caves and tunnels.

Hawaii's Kohala Coast, located north of Kona, also provides some spectacular diving. Numerous excellent sites, including the **Pentagon**, near the Waikoloa Beach Resort in Anaehoomalu Bay, and **Horsehoe Cove**, off the north Kohala District can be dived. Just to the north of the Horseshoe is a lava tube beginning in 25 feet of water that gradually slopes upward, eventually ending in an above-water chamber. It is encircled with window openings, some of which provide good vantage points of the nearby anchorage.

Diving On Kauai

Most of the year-round diving on Kauai is found on the south shore, which offers an excellent selection of interesting boat dive locations. The north shore has some great beach dives, as well as a few remarkable boat dive sites. Because of heavy surf during the winter months, this area is usually only divable during the summer. The east side of the island is only accessible when the trade winds are calm, often during the winter.

In the summer, when the winds diminish, there are opportunities for some exceptional and exciting advanced diving at the **Mana Crack** on the northwest shore of Kauai and off the nearby island of Niihau.

The north shore has a number of very good shore dive sites. **Cannons Reef** and **Tunnel Reef** are located on either side of the Haena Beach Park. At Tunnel Reef, divers find lava tubes, interconnecting passageways and caverns. At Cannons Reef is a large archway, and holes and caves in the reef wall. The tropical fishes at these sites include chubs, parrotfish, goatfish, from the reef and interact with the divers. The marine life also includes all kinds of tropicals, schools of ta'ape, spiny lobsters and slipper lobsters, shrimp, cowries, and lionf'sh. The **Koloa Landing** is a popular shore dive which is often used for introductory dives and certification classes.

Turtle Hill, which is located near **Oasis Reef** and the **General Store**, is one of the most popular dive sites on the south shore of Kauai. It is known for a crescent of plateaus and pinnacles frequented by a large number of green sea turtles, as well as octopuses and whitetip reef sharks. This area has lots of caves, ledges, arches and overhangs to explore, which are inhabited by lobsters, menpachi, and a variety of invertebrates. Schools of ta'ape, durgeons, pyramid butterflyfish and pennantfish are encountered, as well as a few of Kauai's rare boarfish.

Niihau, located 17 miles west of Kauai across the Kaulakahi Channel, offers some exciting diving. Trips to this island are scheduled on an infrequent basis during the summer months. Although there is not a substantial amount of coral, the underwater sites feature incredible drop-offs, underwater canyons, giant sea arches and cathedrals, and an abundance of large marine life, including game fish.

surgeonfish, Moorish idols and varieties of butterflyfishes. Whitetip sharks and turtles are seen frequently. These sites are normally only divable in the summer, when the ocean is relatively calm. The north shore also offers some excellent opportunities for boat dives. The **Oceanarium** is an excellent advanced dive. Several large pinnacles, which rise from 140 feet to 70 feet, sit just off a lava shelf near the mouth of Hanalei Bay. This site offers huge branches of black coral, rare fishes such as morwongs and boarfish, large hairy hermit crabs, as well as frequent sightings of pelagic fishes.

The dive sites on the south shore are accessible during most of the year. **Brenneke's Drop-Off** is a lava shelf on the southeast shore that extends for several miles. The wall, which drops from 65 to 90 feet, is covered with tubastrea and has large branches of black coral. Large schools of ta'ape (blue-striped snapper), and also whitetip sharks and turtles reside here. The terrain offers lots of coral, octopuses, cowries, and more.

The **Sheraton Caverns**, located just west of Poipu, is most well-known for its three large-diameter parallel lava tubes, which make this the most popular cavern dive on Kauai. Two friendly, green sea turtles are usually on hand to greet divers at the surface. Another attraction at this site is the large number of eels that emerge

Channel eruption

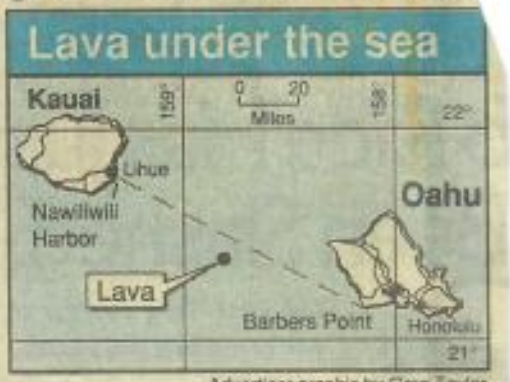
Undersea mapping company finds

By Jan TenBruggencate
Advertiser Kauai Bureau

An undersea mapping firm has apparently confirmed a 1956 volcanic eruption in the channel between Kauai and Oahu.

The eruption, in water two miles deep, was reported to have killed three whales and caused the sea to boil. Its sulfur stink was so strong that people in airplanes could smell it as they passed over a steaming, brown and yellow ocean.

Frisbee Campbell, a marine geologist and vice president of Seafloor Surveys International, said his firm's high-resolution seafloor mapping system was being tested when it located the flow.



Advertiser graphic by Greg Taylor

It stood out on a computer readout

# of 1956 pinpointed

s a lava flow while testing system

stark and black against the sediment-covered surroundings. Campbell said he was reminded of the reports of an eruption between Kauai and Oahu on May 22, 1956.

Campbell, who worked as a geologist with the University of Hawaii for 25 years before joining Seafloor Surveys, said there is at this time no way to be absolutely certain it's the same flow, but the evidence is pretty convincing.

Campbell said the lava flow, 10 miles long and about 4 miles wide, is within 6 or 7 miles of where a military aircraft navigator placed the surface disturbance on May 23, 1956.

Navigation in 1956 was far less precise than it is today, and currents might have moved the surface disturbance some distance from an eruption two miles below.

Campbell said the Seafloor Surveys mapping system, towed behind a boat, makes pinging sounds, and then measures the time it takes for the sound to reach the ocean floor and bounce back.

With sophisticated computer equipment, it is able in one pass to make a map of the ocean floor with a width of 15 kilometers, or about 10 miles. The resulting charts can be used much like aerial photographs. They

See Page A4

Channel: Location of '56 eruption found?

FROM PAGE ONE

are regularly used by firms installing undersea cable, but have also located sunken aircraft and ships, he said.

"About two weeks ago, we were in the channel between Kauai and Oahu doing some testing, when we found what looked like a very young lava flow. It could have been created yesterday or 100 years ago or 1,000 years ago, but it looks fresh, like you were looking at an area of the Big Island with a lava flow on it," he said.

The image suggests a small volcanic cone at one end of the flow, and the black lava falling away downhill to the south, he said.

Everything else in the area appears gray, representing ancient ocean floor covered heavily with sediment. The sharp, new lava makes a black outline on the printout, he said.

"This could indeed be the 1956 eruption," said Tom Wright, scientist in charge at the Hawaiian Volcano Observatory on the Big Island.

The eruption caused a brief uproar in Hawaii, particularly since it followed two other eruption reports the year before.

Military aircraft flying from the main Hawaiian Islands to the Northwestern Hawaiian Islands reported two separate eruptions on Aug. 20, 1955, and Sept. 22, 1955. One was reported 60 miles from Necker Island, raising a raft of pumice so big that crews said they thought it was a new island. The other, 200 miles south of Necker, displayed a plume of yellow-orange water. Both smelled of sulfur, aircraft crews reported.

Less than a year later, military and commercial aircraft flying between Kauai and Oahu reported water discolored yellowish-green and brown. Observers said they saw the water bubbling and steaming. Some spotted streaks of bright yellow that they took to be sulfur, and brown rafts of pumice.

The discoloration was first spotted just after noon, covering more than a square mile of the surface. Within a few hours, the discoloration covered 15 miles, with the center strangely calm. By the next morning, a Trans-Pacific Airlines pilot said the discoloration was within 15 miles of Lihue Airport. A cloud of brown smoke rose more than a mile high, observers said.

The pilot of a Kauai-based cropduster flew over the eruption and reported seeing three dead whales floating in the area. Many pilots and passengers reported smelling sulfur in the air. But within three days, the only remaining sign was floating pumice, or porous volcanic rock.

Campbell said the eruption was most likely associated with stresses on the Earth's crust caused by the weight of the Hawaiian Islands. The weight causes the crust to sag close to the Islands and to arch somewhat farther from them before it evens out.

The stress areas can develop cracks and rejuvenated volcanic activity. Undersea volcanic activity is commonly seen on the Hawaiian Arch, a broad shallow area north of the Islands, he said.

Wright said it could be that, but it could also be a new example of the secondary volcanic activity that created such features as Diamond Head and Salt Lake Crater on Oahu, a million years after the rest of the island was formed.

"It's very intriguing. If this is really defined as a cone and a volume (of lava) comparable to some of the stuff on land," then the eruption might be part of those late-stage eruptions, which have also been seen on Kauai, Wright said.

The secondary eruptions may, like the Hawaiian Arch eruptions, be related to the weight of the Islands on the Earth's crust, but how all this works is still largely a mystery, he said.

"It's not all that clear in detail how all this relates to these late-stage eruptions," he said.

Wright said it would take detailed chemistry and mineralogy tests on volcanic material from the eruption to determine whether it fits into the Hawaiian Arch type of eruption or the late-stage type.