1990s-2000s
G.H. BALAZS

HAWAII SEA TURTLE
NEWS ARTICLES

Endangered olive ridley turtle lays eggs at Hilo Bay

OCT 12, 2002 HSB A1

Officials are asking the public to not disturb the rare nest, which has 124 eggs

By Rod Thompson
rthompson@starbulletin.com

HILO >> State officials are asking for the public's cooperation in protecting 124 eggs of a rare olive ridley turtle that dug her nest Monday on the sands of Hilo Bay.

Biologists guessed that the turtle was an olive ridley after hearing a description from fishermen, who watched the egg-laying Monday night. They reported it to the state Department of Land & Natural Resources the next morning.

"This would be only the second confirmed nest of an olive ridley in Hawaii," said a statement from the department.

The panda.org Web site of the World Wildlife Federation says olive ridleys are "relatively numerous in tropical waters" around the world, although some populations are depleted or "virtually extinct."

All sea turtles in Hawaii are considered endangered or threatened and are protected by state and federal laws. Violators can be fined $10,000 for "each specimen" of an endangered species killed or removed.

The Land Department attached a sign to a tree on the Hilo beach warning the public that turtles are protected, and the Hawaii County Department of Parks & Recreation provided

Please see **Turtle, A6**

Rare species

Olive ridley turtles are usually seen in large flotillas traveling between breeding and feeding grounds, eating small shrimp, jellyfish, crabs, snails and fish, which are crushed by their strong jaws. They are hardly ever seen near Pacific oceanic islands. The female lays about 100 eggs in a pit in the sand and covers them. She then begins a strange movement peculiar to ridleys, rocking from side to side so that each edge of the shell thumps the sand in turn.

GRAPHIC BY BRYANT FUKUTOMI / BFUKUTOM@STARBULLETIN.COM

TURTLE: Eggs are being monitored at UHH

From Page 1

a white foam cooler under a desk in a tiny room that's kept at sauna-like temperatures in the University of Hawaii at Hilo's Life Sciences complex.

The fragile clutch of turtle eggs was rescued after it was laid Oct. 7 below the waterline of Hilo Bay where they surely would have perished, Balazs said. State conservation officers and university students quickly reburied them higher on the beach.

Barriers were built to protect the eggs, but when the nest was checked Dec. 5, a significant number appeared to be slow in developing. The late fall temperatures in Hilo were probably too cool for the olive ridley eggs. The species more commonly inhabits waters off southern Mexico and Costa Rica, Balazs said.

The eggs were dug up again and removed to UH-Hilo, where they now are kept warm and monitored regularly by students and professors.

Balazs said DNA samples taken from the eggs have confirmed that at least the mother turtle is an olive ridley, a species that has nested in Hawaii only twice in the past 50 years.

There was some question about the species at first. When two fishermen reported the turtle nest, scientists were puzzled. It was the first time in 30 years that any kind of sea turtle had nested at the Hilo Bay, Balazs said, and it was not the normal time of year for Hawaii turtles to nest.

It was a moonless night and when the mother, after laying its clutch, started heading toward the lights of downtown Hilo, a night fisherman carried it back to the water where it swam off into the darkness.

The fisherman's estimate of the turtle's weight was about half that of a typical green or hawksbill or turtle in Hawaii. And the eggs didn't look like a typical Hawaii turtle's eggs. Balazs guessed it was a rare appearance by an olive ridley and his suspicion was confirmed Dec. 14.

On Dec. 20, Balazs went to Hilo and helped cull the bad eggs carefully from the warm clutch. Some have small, perhaps dead, embryos, said biology professor Bill Mautz. "But the eggs are round and firm enough that it is worth keeping them under incubation."

Scientists maintain hope that all the movement and unusual circumstances surrounding the rare eggs did not cause them all irreparable harm. Leon Hallacher, UH-Hilo biology professor, said most species naturally produce many more eggs than eventually will be hatched, and it only takes one to hatch successfully from a clutch such as this for species preservation.

"We should all have satisfaction in ... doing the best possible job under a difficult situation that the mother of the eggs left us with," said Balazs, "and (in) knowing that the mother continues to live to lay eggs again another day due to the rescue actions of the two fishermen."

Within the next 15 days, scientists will know whether their efforts to help one wayward olive ridley have paid off.

Hunter Bishop can be reached at hunter@hawaiitribune-herald.com

Turtle nest in Hilo great rarity in itself

10/12/02 TH A1

By Hugh Clark
ADVERTISER BIG ISLAND BUREAU

HILO, Hawai'i — It was a rare event by all accounts when what was believed to be an olive ridley turtle hauled itself to shore at Hilo's bayfront on a moonless night this week and laid 124 eggs before returning to the sea.

Marine biologists say it is the first known turtle nesting in modern times at the popular shoreline area. If reports that the turtle was an olive ridley turtle turn out to be true, it would be only the second such nest to be found in Hawai'i. The other olive ridley turtle nest was documented nearly 20 years ago on Maui's Pā'ia Beach, according to turtle expert George Balazs of the National Marine Fisheries Service.

The endangered species normally is found off Mexico and Costa Rica.

Balazs said the size of the eggs and other details convinced him that the eggs were not those of the more prevalent green sea turtle or the rare hawksbill. Biologists won't know for sure until the eggs hatch in about two months.

Fishermen who observed the turtle Monday night notified officials the next morning. Because the nest was close to the water line, there were fears that waves might dislodge the eggs, said Deborah Ward of the Department of Land and Natural Resources. Under Balazs' direction, students with the University of Hawai'i-Hilo's Marine Option Program moved the eggs to higher ground, where they were reburied.

The Hawai'i County Parks Department provided concrete barriers to protect the nest from cars that frequent the park area, which is home to several canoe clubs. Signs were posted to warn the public not to disturb the eggs.

The nest will be closely monitored by students and state officers.

It's possible the turtle may return.

Olive ridleys may nest one, two or three times per season at 14-day intervals, typically producing 100 or more eggs on each occasion.

Turtle: Eggs moved farther from shore to prevent washing away by waves

Continued From **A1**

concrete barriers to protect the nest site.

But first, students from the University of Hawaii-Hilo Marine Options Program, under Land Department guidance, moved the nest. "The nest was very close to the waterline, where winter waves could wash it away," according to the Land Department statement.

The moving process involved digging a new nest hole and lining it with mucus-saturated sand from the first nest.

Then eggs were moved with care to prevent "rotating" them. Embryos attach to their shell within 24 hours and will not survive if rotated, the Land Department said.Finally, the new nest was covered with sand from the old nest.

"The next step is up to the community to leave the turtles alone during their two-month incubation," the Land Department statement said.

ROD THOMPSON / RTHOMPSON@STARBULLETIN.COM

Concrete barriers protect the Hilo bayfront site where 124 eggs of a rare olive ridley turtle are incubating for the next two months. A female of the endangered species laid the eggs on another part of the beach Monday, and biologists moved them to a safer spot.

Eggs are from rare turtle

❑ Tests reveals an olive ridley used Hilo Bay to nest

By Hunter Bishop
Tribune-Herald

On Christmas eve, 79 days since a rare olive ridley turtle laid 154 eggs on a Hilo Bay beach, 28 remain that could yet hatch.

"We simply won't know for sure, one way or the other, until about day 95," said biologist George Balazs of the National Marine Fisheries Service. Ninety-five days is the outer limit of sea turtle egg incubation, he said.

While scientists anxiously await the moment, the eggs are wrapped in moist towels inside

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Leon Hallacher, a biology professor at University of Hawaii at Hilo, notes the conditions inside a room on campus where 28 rare olive ridley turtle eggs are undergoing carefully monitored incubation. The eggs are kept warm and moist inside the foam cooler beneath the desk. Scientists hope to see hatchlings in about 15 days.

T-H photo by William Ing

Letters

TO ALANI APIO: 3/4/01

'No, that's not how I think or talk' THA

Me, I'm not Hawaiian by blood or by birth. So I'm one of the "you" called out by Alani Apio to speak up about the "1,000 little cuts" that bleed the life out of Hawaiian culture. Alani asks "That's what you think, isn't it?" after several lines of thinking that are anti-Hawaiian. No, that isn't how I think or talk.

Instead, I sing heartily from "Hawai'i 78" with my friend Hawaiian John: "How would he feel if he saw Hawai'i nei ... now these condominiums ... these traffic lights and railroad tracks?"

How do I feel about this modern city life? It hurts to be visually assaulted by an urban-scape of freeways and high-rises and even uglier low-rise apartments that reveal a culture reminiscent of the worst of California, and anything but Hawaiian. (I resonate with Colorado's signs: "Don't Californicate Colorado!") That loss of a Hawaiian sense of place cuts me, too, though not to the same extent it does "indigenous" people; only one generation of my family lived here before me. It's not my treasured way of life, my culture that was "paved over" when "they put up a parking lot." But it's a culture I appreciate and value, to the small extent I understand it.

How do I think? I think we have inherited a "fine mess" from both our well-meaning and our greedy ancestors. We have an understanding of their mistakes from a perspective they couldn't have had. So we can do better if we will. But we also inherited a legal system that is increasingly less a servant of what's "right and just" and more a servant of what can be proved, given the right amount of money. So I disagree with the "Rice v. Cayetano" decision while recognizing its technical legality. I think the copycat suits (some filed, some foretold) are outrageous. And I think the most extreme expectations of some Hawaiians to "undo history" are also outrageous. We can do better if we are willing to find and work from common ground, thinking of ourselves as "allies for a better future in Hawai'i." Or we can do worse, in the oppositional framework of the courts, fighting against each other from our most outrageous polarized viewpoints. That's how I think.

How do we think, the "yous" called out by Apio? Look at the OHA election: We helped weed out the radical candidates, especially those who would have gutted the purposes of OHA from the inside. I spent more time studying and listening to my Hawaiian friends on this issue than all other election issues combined.

We can read history as a series of wars and bloodless coups that disrupt established cultures, or we can read history as a series of culture building episodes between the disruptions. I think we have a chance to be culture builders now, in a way that gives just honor to Hawaiians and Hawaiian ways. And we must do so in the face of greed, extremism and "blind progress," or we all lose.

Glenn Sackett
Kailua

SPECIAL PRIVILEGES

Blame the problem on 'Hawaiians only'

Me, I'm a Hawaiian, too. I'm also part Chinese and part Filipino.

My Chinese and Filipino relatives knew they couldn't rely on anybody but themselves to get educated and buy their own land. But they did it, on their own, without the Department of Hawaiian Home Lands, without the Office of Chinese or Filipino Affairs, without special entitlements, without any freebies at all.

What's Alani Apio complaining about (Focus, Feb. 25)? As I see it, Hawaiians have got it pretty good here in Hawai'i. We're not discriminated against at all. If you look at all the government programs, we're the favored race.

Just look at the list of "Hawaiians only" freebies:

- Kamehameha Schools, with an estimated $8 billion for Hawaiians only.
- More than 100 bills passed in the Legislature favoring Hawaiians only.
- In recent years, Congress has awarded more than $440 million for Hawaiians only
- The Office of Hawaiian Affairs now holds almost $400 million — for Hawaiians only.
- Hawaiian Home Lands, where more than 200,000 acres of public lands and $30 million more every year are for Hawaiians only.

With all these special privileges, what is preventing Apio from living, speaking and being Hawaiian?

Is it perhaps all these race-based freebies themselves that are causing the cultural genocide he feels? Has the degrading message (that if you have a drop or more of Hawaiian blood, you are a victim who cannot make it on your own) taken its toll? Have the years of racial grievance systematically destroyed the pride and self-esteem of generations of Hawaiians?

Is it time for us to free ourselves from the bondage of dependency by cutting off OHA and all the other well-intentioned but degrading programs and breathing the fresh, clean air of equality?

Sandra Puanani Burgess

Apio commentary on '1,000 cuts'

TH A 3/1/01

Divisiveness won't solve any problems

The pain that underlies the Feb. 25 comments by Alani Apio ("1,000 little cuts to genocide") is one more reason the divisive hype surrounding native Hawaiian "issues" accomplishes little for anyone — native Hawaiian or not.

America is a land of great spiritual opportunity for those who get an education, work hard and stay out of trouble. On the other hand, the entitlement mindset (e.g., "someone owes me something because of what I choose to believe happened a hundred years ago ... ") is bounded by profound societal and personal risks.

Those who choose the latter lifestyle will get little or nothing of genuine value for their effort — and they will make themselves and others miserable in the process. Therefore, because so few individuals actually benefit, tax dollars should not be spent on projects designed to "recompense" an entitled few.

Indeed, it's time Hawai'i and the federal government stop wasting precious resources on such mean-spirited nonsense. Instead let's get our schools fixed, foster respect for others and get to work.

Mike Rethman
Kāne'ohe

These Islands belong to all Hawai'i citizens

Regarding Alani Apio's Feb. 25 Focus commentary: He speaks of "Warriors" — well, I am an old man who was a "Warrior" in his youth. I witnessed the effects of war on people, so I pray he will cease these veiled threats and learn that we all need love and truth in our hearts if a solution to this issue is to be found.

Apio needs to spend more time with his neighbors of all cultures in these Islands. I can assure you my family and friends do not sit around the kitchen table daily and grumble about Hawaiian demands, lawsuits and false claims of history.

For the most part, we are concerned with paying our taxes, paying the rent or house payment, and the future of the children of Hawai'i.

However, I do wonder if 23 years ago, had we not established the Office of Hawaiian Affairs, if the hundreds of millions of dollars that now choke its coffers would be enough to help our public schools out of the dilemma they now face, keeping in mind that all the funds from ceded lands went to the Department of Education prior to OHA's establishment. Would this help Native Hawaiians? Of course — the vast majority attend public schools.

All of the people of Hawai'i are just trying, as Hawaiians are, to make ends meet and enjoy our beautiful state. That's right, our beautiful state. It belongs to us all, not a race or culture. We all live in these Islands, and all our ancestors came here from somewhere else. There are no superior cultures or religions in America. There is one quote in Apio's letter that I do agree with: "Give me a break."

The only cuts Apio has are self-inflicted.

Roger Grantham
Lahaina

Culture is no excuse for being exclusionary

Alani Apio's Feb. 25 commentary suggests there is common ground in the debate over Hawaiian sovereignty. We all support participation in Hawaiian culture. But that goal is harmed by programs that exclude people from participation based on ancestry.

Cultures are learned and lived, not genetically inherited. We all benefit from learning about and participating in Hawaiian cultural activities. Traditionally, Hawaiian culture has welcomed newcomers and new ideas.

Apio's cultural argument does not justify exclusionary programs like the Office of Hawaiian Affairs and the Department of Hawaiian Home Lands. Programs that exclude people based on ancestry violate both the Hawaiian tradition of openness and the American Constitution.

They pay off some people, regardless of any knowledge of Hawaiian culture, while driving away others who appreciate it and want to participate. Blood-based programs divide Hawai'i along racial lines, aggravating the racial resentment illustrated by Apio's overheated rhetoric.

To learn, practice and take pride in culture, people do not need separate ethnic governments. Government best assists people to flourish culturally when it treats them as equal citizens, guaranteeing them individual rights of free expression and association. The First Amendment protects these rights for everyone. Democracy is stronger when citizens have a diverse range of cultural choices. The state properly subsidizes Hawaiian culture with public money so that everyone can participate.

Let's drop the obsession with blood and follow the Hawaiian and American tradition of openness.

Patrick W. Hanifin

Writer of '1,000 cuts' has refreshing style

Thank you, Advertiser editors, for printing Alani Apio's first of three articles ("1,000 little cuts to genocide," Feb. 25). He has a refreshingly honest and natural writing voice.

I, and I'm sure thousands of other readers, native Hawaiian or not, thoroughly enjoyed his slam-bam, to-the-point "na'au" opinions. We happily anticipate the next two pieces. Right on, Alani!

Marisa M. Plemer

Hawaiian hymn books offer lessons in history

THA 2001

By Derek Paiva
Advertiser Staff Writer

New England missionaries began translating their English-language hymns into Hawaiian immediately after settling in Honolulu in 1820, publishing their first collection of these in 1824.

Slipping on a white glove, Mission Houses Museum head librarian Marilyn Reppun gingerly reaches into a small manila envelope and pulls out a 175-year-old first-edition copy of the collection titled "Nā Himeni Hawai'i," or "Hawaiian Hymns," and begins an impromptu history lesson on hymn books. A number of the museum's large collection of 19th- and 20th-century hymn books and manuscripts will be displayed at this weekend's museum-sponsored "Nā Himeni: A History of Hymns in Hawai'i" lecture and music program.

"There's so many here that we'll have to really choose what we have out on Saturday," Reppun says of the museum's hymnal collection, procured mostly from private donations. The Mission Houses Hawaiian Mission Children's Society Library has more than 100 hymnals from the 19th century alone, Reppun says.

Measuring just 5.3 by 3.3 inches and bound between somewhat faded though remarkably sturdy tortoiseshell covers, the volume Reppun holds in her hand was compiled by the Revs. Hiram Bingham and Richard Ellis and printed on a Ramage Press on the Mission Houses grounds.

"Since musical notes couldn't be printed until the 1834 edition of the hymnal, this first edition has just lyrics," says Reppun, carefully flipping pages with a metal page turner. Only 2,000 copies of the hand-bound 60-page hymnal were published for use by Native Hawaiian parishioners during Congregational Church services at Kawaiaha'o Church and a number of missions that were being started around O'ahu at the time. The hymnal's 47 hymns include a number of original Hawaiian works, translations of well-known Western hymns such as Watts' "50th Psalm" and even a few choruses from Handel's "Messiah."

The most recent 11th edition of the hymnal, titled "Nā Himeni O Ka 'Ekalesia" or "The Hymns of the Church," was published in 1999 after six years of research and translation work led by Kahu Richard Kamanu, pastor of Kapa'a First Hawaiian Church and a scholar on the history of Hawaiian hymns. Kamanu will lead a lecture and sing-along on Hawaiian hymnology as part of this weekend's "Nā Himeni" program.

"These hymns are an important part of the Hawaiian culture in post-missionary times," Kamanu says of the collection. "The Congregational Church was the only church in the Islands for quite some time before other religious groups were able to come in."

In preparing the most recent edition of "Nā Himeni" — the first revised edition of the hymn collection in more than 25 years — Kamanu and his staff re-examined previous translations of traditional hymns and added a number of contemporary hymns, boosting the collection to 227 compositions. New additions to the text include Graham Kendrick's "Shine, Jesus, Shine" (in Hawaiian, "Kau Mai Ke Aloha") and Kamehameha Schools Performing Arts director Randie Fong's 1988 composition "Na Iehova No I Hana," or "Jehovah's Creative Works."

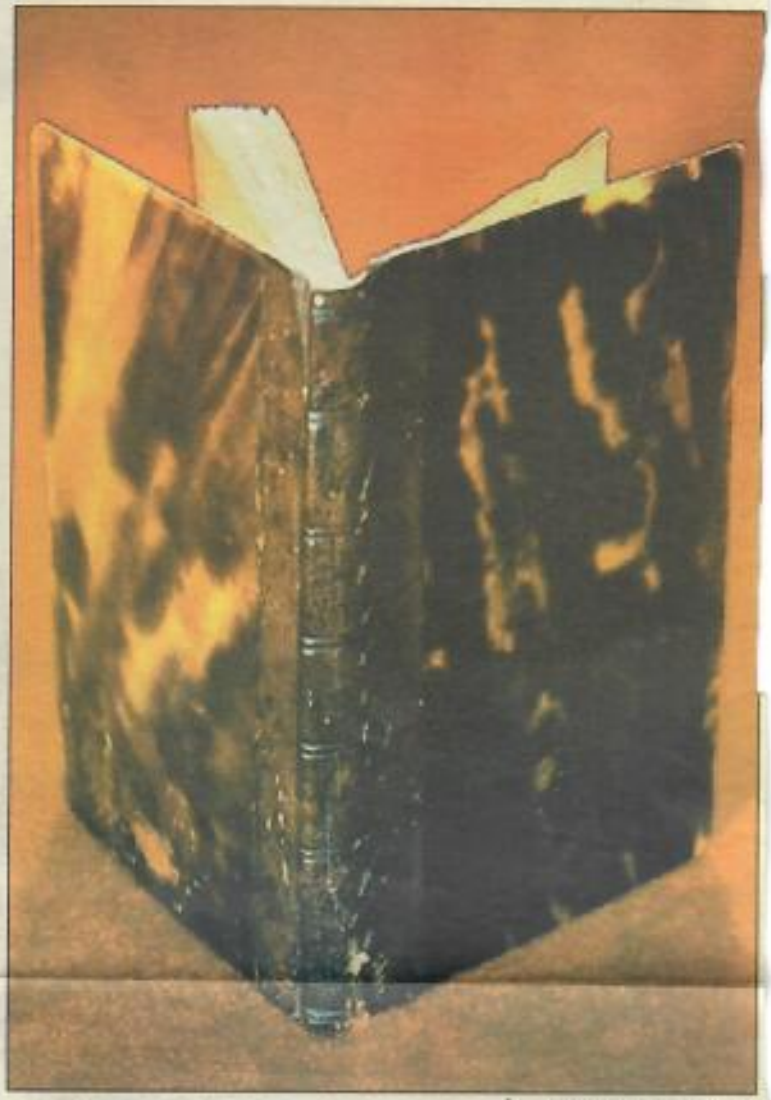
In addition to his hourlong Hawaiian hymnology lecture, Kamanu will lead a sing-along of a few of the 11th-edition's new hymns.

The Mission Houses' Nā Himeni program will also include a hymn performance by the Hawai'i Youth Opera Chorus led by Kawaiaha'o Church choir director Nola Nahulu, and a hymn-printing demonstration on the museum's Ramage Press replica. The entire Mission Houses Museum complex will also be open to the public for free tours.

"I've been wanting to do a program on Hawaiian hymns for years," says Mission Houses Museum executive director Deborah Dunn of this weekend's inaugural program. "If it all goes over well, I'd love to make it an annual event."

'Nā Hīmeni'

A History of Hymns in Hawai'i
10 a.m.-1 p.m. Saturday
Mission Houses Museum
Free
531-0481



Mission Houses Museum

This 175-year-old first-edition copy of "Nā Hīmeni Hawai'i," or "Hawaiian Hymns," bound in tortoise shell, is part of the Mission Houses Museum's collection. Saturday's free event at the museum will focus on Hawaiian hymn books and manuscripts.

Rescued turtle

Experts removed the shaft of a spear from female reptile found off Makena

By VALERIE MONSON
Staff Writer

MAKENA — Even for turtles, there's no place like home.

With a crowd of adoring fans cheering it on, the spunky green sea turtle that had the shaft of a spear surgically removed from its neck and head, was released Tuesday afternoon off Puu Olai into the same waters from which it had been rescued Friday morning.

"This is a rare occasion," said Skippy Hau, the state aquatic biologist, after watching the 140-pound female turtle chug through the black sand to return to her Maui home beneath the sea. "It makes you feel good."

It was the first turtle release of the year for state officials on Maui — and, considering the injury, a remarkable one, at that.

"It was utterly amazing," said Robert Morris, a veterinarian with the National Marine Fisheries who performed the procedure in his Kailua office on Oahu. "The spear missed her brain and all the vitals. She's quite a feisty turtle."

No doubt about that. When Hau and Nalu Yen of the state Department of Land and Natural Resources lifted the turtle from a carrying case and gently laid her on the beach, she needed no time to get reoriented. Despite a growing throng of beachgoers intrigued by the scene and a cluster of photographers surrounding her, the turtle immediately headed for home, plowing the wet sand with her mighty flippers. When she reached the edge of the surf, she seemed to pause briefly to bask in the cool foam washing over her.

Seconds later, she was gone.

"She knew exactly what she was doing," said Lia Hammon, a coral reef technician who helped in the rescue and release. "She's really strong. She wasn't afraid of the waves at all."

The turtle came back with not only the spear removed, but a new official identity, as well. To help researchers in their studies, the female was labeled C5 in white etching on her shell. Because those markings will probably fade in a few months, Morris said microchips — just like those placed under the skin of pet dogs and cats — were also inserted in each back flipper.

That will help biologists follow her life's journey if they're lucky enough to run into her again. The next encounter might happen off Makena or 600 miles away in the French Frigate Shoals, where C5 could go to lay eggs. Hau said the turtle could be between 15 and 20 years old, just entering her reproductive years.

The story of C5 was one of those unusual happy endings for sea turtles that too often wind up stranded, beached or covered with tumors.

"At least this turtle has a chance," said Hau.

For nearly a month, Hau and other wildlife officials had been hearing reports from divers about a turtle swimming around the Makena area with a 6-inch spear protruding from its neck. After finally getting a good bead on the animal's location last week, Hau, Hammon and some colleagues headed out in a boat with scuba and snorkel gear. They found the creature resting on the sandy bottom in about 20 feet of water and, following a few slippery attempts, managed to capture it.

To prepare the turtle for its flight to Oahu, the spear was trimmed back and the neck swathed in bubble wrap to keep the shaft from harming it more. Once Morris examined the animal, he discovered that the spear had not only gone into the turtle's neck, but continued on through the mouth, anchoring its jaw shut.

Fortunately, said Morris, turtles can go weeks — even a few months — without food and can breathe through their noses. Even though it hadn't eaten for about a month, Morris said the animal was still healthy.

By Friday evening, the turtle was recovering in a tank at Kewalo Basin. Morris said he and George Balazs of the National Marine Fisheries decided C5 should go home.

"We thought she should go back to Maui since that's where she came from," said Morris. "We like to release them in the areas where they were found. It's incredible, though, how they have a way of finding their way home anyway. A few times, for convenience sake,

returned to ocean

The Maui News / AMANDA COWAN photo

Onlookers gather to watch C5, a female turtle who was rescued with a 6-inch spear in her neck, as she makes her way to the ocean at the black sand beach at Puu Olai on Tuesday afternoon. C5 was captured in the ocean off Puu Olai last Friday morning to allow an Oahu veterinarian to remove the spear. The injury was not serious and the animal was returned to Maui for release.

State aquatic biologist Skippy Hau (center) gets a hand unloading turtle C5 from coral reef technician Lia Hannon and Nalu Yen, an enforcement officer with the Department of Land and Natural Resources. They released the creature at the black sand beach at Puu Olai on Tuesday afternoon.

we've released turtles from the North Shore off Kaneohe and they end up back at the North Shore.

"They know their way around."

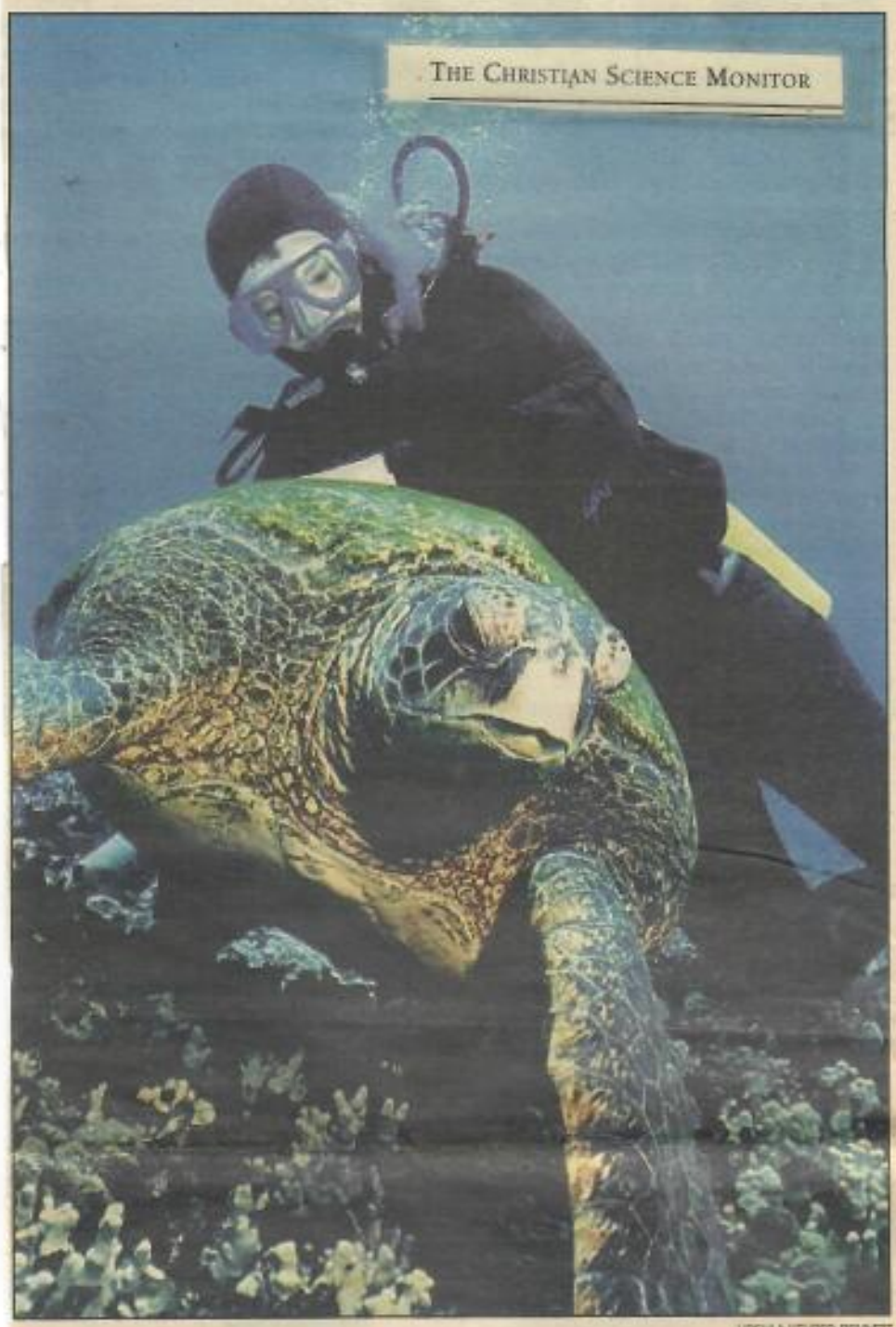
C5 arrived on an Aloha Airlines flight (in the cargo hold) before being loaded up (still in the carrying case) into the back of a truck for the homecoming trip to Makena.

While there was general excitement and fawning over the turtle at the black sand beach, Hau reminded everyone that the turtle was not a pet — and never would be.

"You need to respect it as a wild animal," he said. "Some people like to call it by a name, but then they set themselves up for disappointment."

The green sea turtle is a threatened species that is protected by state and federal law. The investigation into how the turtle was speared continues.

Anyone with information, should call 984-8110 or 243-5294.



URSULA KEUPER-BENNETT

GEORGE BALAZS AND FRIEND: The biologist inspects a flippered (but unflapped) green turtle for tags off the coast of Maui. He led a campaign to save the turtles in the 1970s.

– like being born with a compass. However she did it, Kai swam back to East Island.

Kai mated with a male green turtle offshore. A few weeks later, she crawled onto the sandy beach. Like all nesting turtles, Kai came at night, just after high tide. It was June 1996.

Kai carefully dug a hole in the sand and laid about 100 eggs, each about the size and shape of a Ping-Pong ball. Instead of being hard like chicken eggs, Kai's eggs were leathery and soft.

Balazs and his team found Kai. They saw her lay her eggs. Afterward, she was given four metal tags. (Using more than one tag helps scientists tell how well tags stay on.) Kai was carefully examined and measured. Then Kai disappeared again, back into the Pacific.

In 1996, Kai was one of about 700 female green sea turtles nesting in the French Frigate Shoals. That was very different from 1973, when Balazs found fewer than 150 nesting turtles. "The population started to increase within a few years after state and federal protection," Balazs says. "The turtles that would have been killed were able to grow up, then migrate and reproduce."

With hunting over, turtles get closer

Protecting sea turtles changed the way turtles act around people, too. "Along with the greater number of turtles has come an amazing increase in tameness, or at least toleration of people," Balazs says. "The turtles now go about their business as long as you give them a comfortable distance."

That distance can be very small. At some places in Hawaii, green sea turtles graze on seaweed inches from the toes of people wading in the ocean. Today, turtles sometimes rest on shore, something they never did when they were hunted. "The turtles haul out right next to people on beach blankets," Balazs says. "You don't even have to snorkel to see them."

But even though sea turtles are no longer hunted, they still face dangers. Over the past 12 years, Balazs and volunteers all over the islands have rescued 152 sea turtles and returned them to the wild.

Continued on next page

THE CHRISTIAN SCIENCE MONITOR

MICHELLE CHRISTENSON/CORPUS CHRISTI CALLER-TIMES/AP – FILE

SKITTER TO THE SEA: A baby Kemp's ridley turtle charges toward the Gulf of Mexico during a turtle release at the Padre Island National Seashore near Corpus Christi, Texas.

Continued from previous page

Some were entangled in fishing lines, or had fish hooks stuck in them. One small turtle was rescued from a dog's mouth – it had been "retrieved" right off the beach!

Some of the rescued juvenile turtles also have tumors, which scientists think may be linked to ocean pollution. Balazs is working to find out more.

Some turtle dangers are as old as turtles themselves. Kai may have been at the surface, taking a breath of air. The big tiger shark grabbed Kai's right rear flipper in its jaws. The shark shook its head, biting off part of the flipper. Kai escaped.

Perhaps Kai's injury kept her away from East Island. Adult female green turtles usually nest every two to three years. After her first nesting in 1996, though, Kai didn't return for six years. On June 13, 2002, Kai was back on East Island.

Balazs and his team found Kai. She had grown slightly – 2/3rds of an inch. Of the four tags Kai was given in 1996, only one was left. Balazs's team put a tiny microchip in her left rear flipper. This new high-tech tag can be "read" at close range using a special scanner. They also painted a number on her shell: 293C. They saw that most of her right rear flipper was gone, but that the wound was healed.

Kai returned several times over the next two weeks, each time laying a clutch of eggs. This year was a good one for Hawaii's green turtles. From fewer than 150 in 1973 to about 700 in 1996, the number grew to about 900 by the end of the 2002 nesting season. Scientists say green sea turtles may live to be around 50 years old in the wild. Kai may return many more times to East Island.

Face-to-tail with Kai

I met Kai while scuba diving off Kauai in September, at a spot known for its many turtles. I watched a large male turtle wiggling and twisting on a coral head. (A male turtle's tail is twice as long as a female's.) Clearly, turtles enjoy a good belly scratch! Nearby, another turtle floated to a "cleaning station." A school of small surgeonfish swarmed over his shell, pecking at algae like pigeons pecking at breadcrumbs. After a few minutes of this, the turtle glided off. Another turtle customer, waiting patiently, took his place.

A young male turtle slept soundly on a ledge. He looked as contented as a puppy on a rug. A large female was a few feet away. She rested with her head inside a crevice and her rear end sticking out. Her right rear flipper was mostly bitten off. There was something written in white paint on her shell: 293C.

In the three months since she had nested on East Island, Kai had swum 400 miles to her feeding grounds off Kauai. Several years ago, Balazs used satellite tags to track 16 green turtles after they left the French Frigate Shoals. Most made a beeline to the main Hawaiian Islands. But one turtle made a huge loop through the open ocean before finding her way to coastal waters. I hope Kai took the direct route!

I saw Kai once more. We were climbing on board the dive boat when Kai surfaced nearby. She eyed us, then swam right over to the ladder at the back of the boat.

"This one is really friendly," said Debbie, our dive guide. She reached down and pushed Kai away, so the flopping ladder wouldn't hit her.

"Nice turtle," Debbie said.

Kai took one last look and vanished under the swells.

Pamela S. Turner

The Home Forum

Tale of a sea turtle has a happy ending

Back from near-extinction – and getting closer to people

KAI worked hard to escape her sandy nest on East Island, near Hawaii. The baby green sea turtle waved her tiny flippers until she was free.

Around her, dozens of her little brothers and sisters were scrambling out, too. Kai (Hawaiian for "sea") flopped and flapped across the sand, sometimes running over another hatchling, and sometimes being run over. The turtles knew, instinctively, they must get to the water.

Soon Kai was lifted by a wave and tossed upon the sea. She began to swim. On the beach, she'd looked like a flopping stone. Now she was as graceful as a bird. Kai's brothers and sisters swam, too. But of all the hatchlings in her nest, only Kai would return to East Island.

In the early '70s, when Kai was born, times were hard for Hawaii's green sea turtles. Hundreds were killed every year and eaten as soup, fritters, and steaks.

Hunting made turtles frightened of humans. "Turtles used to flee at the very sight of people or at a scuba diver's bubbles," says biologist George Balazs, an expert on sea turtles. "All you saw was the turtle's rear end as it swam away."

Dr. Balazs didn't plan to become a sea turtle scientist. But he saw Hawaiian fishing boats unloading dozens of turtles they'd caught. If so many were being killed, how many were left to breed? Were turtles in danger? He decided to find out.

Balazs knew turtles nested on a group of tiny islands (including East Island) 400 miles from Hawaii called the French Frigate Shoals. They are part of the Northwestern Hawaiian Islands Coral Reef Ecosystem Reserve. Balazs traveled to the islands in the summer of 1973 and began counting and tagging nesting sea turtles. He discovered that only about 150 nesting females were left. Most of them nested on East Island, where Kai was born.

While Balazs was learning about turtles, Kai was learning to survive. Young turtles swim in the open ocean, eating jellyfish and fish eggs. The open ocean can be dangerous. Large fish and sharks love to eat small turtles, and there is nowhere to hide. Still, the Pacific is big, and baby turtles are small and easy to overlook.

Kai grew bigger and stronger. One day, when she was about six years old, she swam toward Kauai, one of the main Hawaiian Islands. She had avoided becoming a shark snack. Could she avoid becoming turtle soup?

When Balazs realized how few sea turtles were left, he began an effort to protect them. In 1974, thanks to Balazs's work, Hawaii protected green sea turtles. In 1978, the United States government listed sea turtles as an endangered species. Today, all seven species of sea turtles (green, hawksbill, olive ridley, Kemp's ridley, leatherback, loggerhead, and flatback) are protected. Most of Hawaii's sea turtles are green turtles like Kai.

Although sea turtles could no longer be hunted, Balazs's work was not over. He has returned to the French Frigate Shoals every year to count and tag turtles. He has also studied turtles living near the main Hawaiian Islands. Children often help.

"We herd the turtles into a net on a shallow reef," Balazs says. "The kids catch the turtles gently, by hand, and bring them to our boat. The kids help weigh, measure, examine, and tag the turtles. Then we let them go free."

Kai grows up and goes home

Meanwhile, Kai had found a home. Juvenile and adult turtles prefer the seaweed and sea grasses found in coastal areas. Off Kauai there was plenty to eat, and underwater nooks for resting. Kai had never been hunted, so she was not afraid of people. She swam close to shore at high tide to feed. When she wasn't eating, Kai rested in the nooks and crannies of offshore reefs. She grew a bit each year. When she reached adulthood at 25, her shell was three feet long and she weighed 200 pounds or so.

One day, Kai left Kauai behind. She was heading home. Scientists still aren't sure how sea turtles find their way across hundreds, sometimes thousands, of miles of ocean to their nesting beaches. Perhaps turtles can sense the Earth's magnetic field

For more information

You can watch sea turtles in Hawaii on Oahu (Laniakea, on the North Shore), the Big Island (Kahaluu Beach Park, south of Kailua-Kona), and Kauai (the cove next to Kuhio Shores on Lawai Road, Poipu). The best time is at high tide, when the turtles emerge to eat seaweed on the rocks.

Remember, never grab, catch, or ride on turtles. Don't feed them human food. Move away from a turtle if it seems disturbed. Don't go close to a nesting turtle that has not yet laid her eggs. For more guidelines, go to: **www.coral.org**. See also **www.turtles.org** and look under 'Things you can do to help.'

Sea Turtles of Hawai'i, by Patrick Ching (University of Hawaii Press, 2001, all ages). A wildlife ranger native to Hawaii explores the life history, breeding, biology, and conservation of the *honu*, the green sea turtle.

Interrupted Journey: Saving Endangered Sea Turtles, by Kathryn Lasky (Candlewick Press, 2001, Grades 3-6). A 10-year-old boy helps to rescue a sea turtle stranded on Cape Cod.

SCHOOL REPORT

Hawaii Prep students conduct health assessment on Lanai's Hawaiian green sea turtles

Hawaiian green sea turtles living off the east coast of Lanai appear to be healthy and well fed, according to Marc Rice, director of the Hawaii Preparatory Academy Sea Turtle Research Program.

Recently, Rice and George Balazs, leader of the Hawaiian Marine Turtle Research for the National Marine Fisheries Service (NMFS), Honolulu Laboratory, led a team of five HPA students to capture, measure, weigh, and conduct health assessments on Lanai turtles.

HPA student assistants were Rebecca Emory, Liz Evans, Brenden Lavender, Jill Quaintance, and Nick Quaintance.

HPA alumni graduates Arjun Clary and Mike Coelho, enforcement officer for the Hawaii Department of Land and Natural Resources (DLNR), supported the group.

This was the first time since 1992 that the NMFS examined the Lanai turtles.

The team spent a week working the outer shallows near White Rock and at Federation Camp, located a few miles to the north.

"We swam out about 300-400 yards to capture turtles and then transported them back to shore on tubes for measuring, weighing and health assessment," said Rice.

"We captured 48 turtles with four of those being recaptures of turtles that were tagged in 1992.

"We saw only one case of fibropapilloma tumors, which was marvelous.

"The rate of infection was much higher during earlier expeditions."

Fibropapillomatosis is characterized by external and internal fibrous, non-cancerous tumors that can cause blindness, difficulty breathing, and increased susceptibility to entanglement, parasites and other diseases.

Although Rice noted it is dangerous to declare any health trends based on this small sample, the results are encouraging.

Team members also walked the more than three-mile length of Polihua Beach to check for any signs of turtle nesting.

"This had been reported as an important nesting beach in historic times," said Rice.

"If it was indeed a nesting beach," he said.

"We found that it doesn't appear to be one now."

After work, the students visited several historic sites, including the Luahiwa petroglyph field and Kaunolu Bay in southwest Lanai.

The group also saw Kahikili Leap, the world-famous cliff diving site and location of the recent Red Bull World Championship Cliff Diving Competition.

HPA student participation in this study was made possible through a unique partnership with the NMFS.

Since 1987, students in the school's marine science program have worked with NMFS on a turtle research and monitoring project in West Hawaii.

The work has grown over the years in scope, magnitude, and importance to overall species conservation.

"Our students did a great job and the people on Lanai were extremely helpful and friendly," said Rice.

"It was a great trip and we will probably return for a follow up in about six months."

PHOTO BY MARC RICE

Learning how to "geocache" on Lanai, HPA students (left to right) Arjun Clary, Nick Quaintance, Brenden Lavender, and Jill Quaintance show their tools.

PHOTO BY MARC RICE

Members of the Lanai team captured, measured, tagged, and released two green turtles at Federation Camp in East Lanai. Pictured left to right: Jill Quaintance, Rebecca Emory, Brenden Lavender, George Balazs, Nick Quaintance, Arjun Clary, Marc Rice, and Liz Evans.

Honu Return Hilo

they would search, back and forth
word by word, like fetuses hunting, sensing
by feel or sound, a house of darkness opening
to a new dawn, thin glittering thread by glittering thread

hilo, hoaka, ku kahi, ku lua, ku kolu
ku pau, 'ole ku kahi, 'ole ku lua

someone will play a guitar and make up a song
the news spreading, by disc jockeys, by maids
how did she get so far from mexico's warm seas
no matta, she most welcome heah

'ole ku kolu, 'ole pau, huna, mohalu
hua, akua, hoku, mahealani

isn't the sky so beautiful, she sang, riding
her bike, the tulip trees blazing in an orange
and a red red gingerly delight. workers move the nest
up higher on the beach, and no one

ku lua, la'au ku kahi, la'au ku lua,
la'au pau, 'ole ku kahi, 'ole ku lua

and no one could remember when such a thing
had last occured. they moved the eggs, they moved
the sand and they protected the nest with the thinest
of yellow bands. had honu become disoriented

'ole pau, ka loa ku kahi, ka loa ku lua, ka loa pau
kane, lono, mauli, muku

during her days of uncertainty. in the old days awa
would have flowed and drums pounded and perhaps
Kane would have sounded his horn, kiha-pu, for her
return. a newspaper page blows across the sand.

hilo, hoaka, ku kahi, ku lua, ku kola
ku pau, 'ole ku kahi, 'ole ku lua

George Balazs & Shawn Muramaru 12/27
Hello George & Shawn,
Thanks for the information re turtle eggs.
Sorry to hear yr efforts protecting didn't work.
enclosed poem I'm working on. the chorus
are the nights of the phases of the moon, repeated
twice for 2 months. what is the avg. time of egg
gestation? maybe i need another verse or two.
will send a finished copy (hopefully with pertinent photos)
hopefully another month. Thanks again
Tommy McNeely
tommymc@verizon.net

in the sparseness she laid her eggs and returned
to the sea in confusion the sand over the years had long
been hauled, wagon by wagon for cement, for fields
of cane, oh where da beach, where she go?

'ole ko kolu, 'ole pau, huna, mohalu
hua, akua, hoku, mahealani

she swam through the tumultuous ocean, danced
in the dark spaces of the waves and trembled
in the light, then she left our world
can we regrasp what has been dreamt?

ku lua, la'au ku kahi, la'au ku lua,
la'au pau,'ole ku kahi, 'ole ku lua

we wait, one moon, two, at the edge of the world
standing on the back of giants, a sweet richness
in the air, the nutricious scent of decay, an upswelling
release of regeneration, we wait, one month, two

'ole pau, ka loa ku kahi, ka loa ku lua, ka loa pau
kane, lono, mauli, muku, hilo

thin glittering thread by glittering thread

terry mcneely 2002

T. McNeely
84 St George Mews
Sonoma Ca 95476

Honolulu Star-Bulletin

HAWAII

MONDAY, DECEMBER 16, 2002 / 529-4747 / CITYDESK@S

TO REACH US

City Editor: Ed Lynch
529-4758 / elynch@starbulletin.com

Experts hope to save

Prospects for the rare clutch found in Hilo remain unclear

By Rod Thompson
rthompson@starbulletin.com

HILO >> Biologists have moved a clutch of rare olive ridley turtle eggs from the beach at Hilo Bay to an improvised hatching facility at the University of Hawaii at Hilo with the hope of saving at least some of them.

The mother laid the eggs at the water's edge on the night of Oct. 7. Students from UHH, under state supervision, reburied the eggs on higher ground.

Since then the eggs have not done well, said George Balazs, a marine turtle expert with the National Marine Fisheries Service.

The temperature of the eggs was too low to ensure survival, Balazs said. Leaving them buried in the sand would have meant certain death, he said.

William Mautz, a reptile biologist at UHH, said the temperature in the clutch stayed at 75 degrees. It should have been 84 degrees for proper development of the embryos.

On Dec. 5, the 59th day after the eggs were laid, they were dug up again. Of the original 124, 47 appeared to have been infertile from the start, Balazs said.

Those were wrinkled and collapsed, Mautz said.

Of the remaining 77, 38 seem to have embryos growing, while the remainder are in doubt, Balazs said.

Balazs, Mautz and Balazs' longtime collaborator, UHH marine biologist Leon Hallacher, created a hatching facility in an "animal room," a tiny cabin on the UHH campus. The eggs were placed in two Styrofoam coolers. The air in the room is kept hot and humid with bubbling hot water and a small heater.

Olive ridley turtles are rare and protected by law in Hawaii, although they are more numerous in tropical waters elsewhere.

Results of a DNA test, received here Saturday, confirmed that the mother is an olive ridley, Balazs says. By today further information will show whether the mother came from the eastern Pacific (Mexico or Costa Rica) or the western Pacific (Thailand or neighboring parts of Southeast Asia), Balazs said.

The prospects for the eggs are unclear. "Everything about it is weird," said Mautz.

For example, the mother laid the eggs too late in the year, he said. She should have laid them in the summer when temperatures were warmer.

Although the eggs should have hatched in about 60 days, successful hatching up to 100 days after laying is possible, Balazs said.

"We are clearly dealing here with the equivalent of a very high-risk 'pregnancy,'" Balazs said.

Once the babies hatch, a decision will be made on what condition they are in and on where and when to release them, Balazs said.

Hilo Bay front is not a good place for hatchlings because city lights could distract them away from the sea, Balazs said.

It is unknown if the babies, once mature, would return to Hilo Bay to breed, he said.

MTRP

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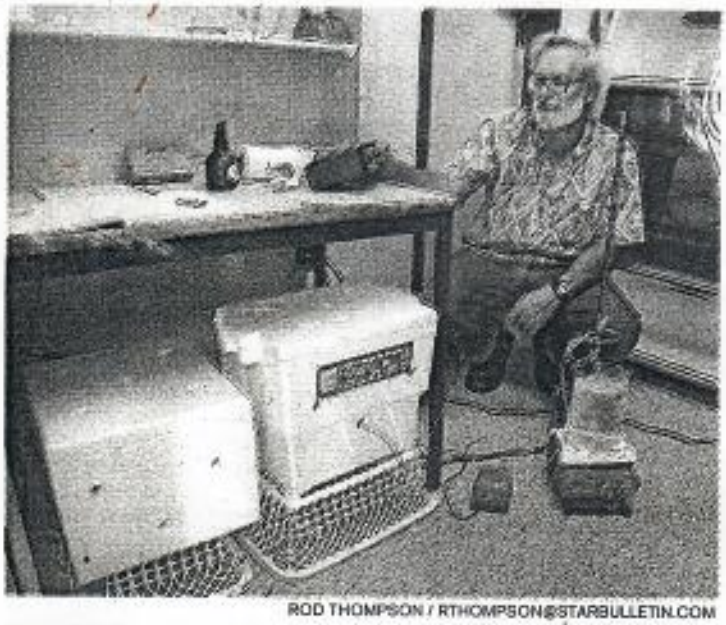
turtle eggs



ROD THOMPSON / RTHOMPSON@STARBULLETIN.COM

University of Hawaii-Hilo reptile biologist William Mautz looked at an instrument monitoring the temperature of 77 sea turtle eggs in two white coolers on Friday.

Mideast conflict

Israel threatens militant leaders

On Page A8

SATU

Augus

TODAY'S FORECAST I

Sunshine and patchy clo

The Ma

Good Morning!

Maui's N

Turtle with spear in

RUSSELL SPARKS photo

A piece of a 6-inch spear protrudes from the neck of a green sea turtle captured Friday morning off Makena. While the spear did not cause serious damage to the mature turtle, it pinned the turtle's mouth shut and was removed by a National Marine Fisheries Service veterinarian on Oahu.

Creature taken to Oahu, where surgery a success

By VALERIE MONSON
Staff Writer

MAKENA — A green sea turtle with a 6-inch spear in its neck was rescued by state wildlife officials Friday morning off Puu Olai and sent to Oahu, where it underwent successful surgery to remove the rusty shaft.

"We think he's cured already," said Robert Morris, a veterinarian with the National Marine Fisheries who performed the procedure at his Kailua office. "He's down in the tank at Kewalo Basin for observation."

The turtle's injury seemed similar to those bizarre cases where someone gets shot in the head with an arrow and lives to tell about it. The spear went through the 140-pound animal's neck and came out in its mouth, where it pinned its jaw shut but apparently caused no damage to vital organs.

Based on reports of sightings, the injury occurred more than three weeks ago.

RDAY
t 23, 2003

OR THE CENTRAL VALLEY
ds. *Complete report on A2*

MIL football

Sabers preview; Lunas start play

On Page B1

ui News

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neck captured, treated

"It's kind of an unusual case," said Morris. "He was lucky that the spear missed his brain and a few other vital structures in there, even blood vessels. When we extracted the spear, he didn't even bleed."

It was a much better outcome than two weeks ago when a sea turtle with a noose around its neck was found tied to a stake in Lahaina already dead.

"We feel really good about this one," said Randy Awo, Maui District branch chief of the state Division of Conservation and Resources Enforcement. "We were so pleased we could get the turtle to Oahu safely."

State aquatic biologist Skippy Hau and education specialist Russell Sparks led a team that captured the creature early Friday.

Reports of a turtle with a piece of a spear sticking out of its neck had been coming in since July 31. But it wasn't until Thursday that Hau and Sparks got a good idea where the turtle might be, when a diver with B&B Scuba called in a GPS coordinate after spotting the injured creature near Puu Olai.

On Friday morning, Hau and Sparks headed off in their boat with fishery technician Rodney Young and coral reef technician Lia Hannon. Just after 7 a.m., Hau and Sparks dived in with scuba gear while Young and Hannon stayed closer to the surface with snorkels.

After a few searches of caves and other underwater hiding places, Hau spotted the speared turtle resting on the bottom of the ocean in about 20 feet of water. Sparks moved in to shoot video, but when the turtle saw him, it started to go up. Hau set off in pursuit, but the animal – even with the spear – was too quick.

"It would stay in front of me, just ahead of my swimming speed," said Hau. "If I would get close, he would speed up. If I would slow down, he wouldn't go as fast."

But when the turtle needed to breathe, it had to surface. Young was right there to grab it. Because the creature was so huge and in no mood to be caught, Hau came in to relieve Young, who also needed to surface and breathe.

"The turtle kept trying to get away and we didn't want it to get injured any more," said Hau.

See TURTLE
on Page A4

Rescued turtle to be released

The green sea turtle was found last week with a spear in its neck

By Gary T. Kubota
gkubota@starbulletin.com

WAILUKU >> State wildlife officials planned today to release into the ocean a green sea turtle that survived being speared in the neck.

The 140-pound turtle, which was flown to Oahu after its rescue, had a rusty 6-inch spear surgically removed from its neck Friday by a veterinarian.

It is scheduled to be flown back to the Valley Isle today and released off Puu Olai in South Maui, where it was rescued by state wildlife officials.

Meanwhile, state enforcement officials are investigating the spearing of the turtle and also the death of another green turtle that was found on Aug. 8 with a noose around its neck on a beach in Lahaina.

The rope was tied to a metal spike in the sand.

Green sea turtles are a threatened species and protected by state and federal laws.

A person found guilty of purposefully injuring a green sea turtle could face fines of up to $5,000 per violation and administrative fees up to $10,000.

Deborah Ward, a spokeswoman for the state Department of Land & Natural Resources, said wildlife officials are worried about what appears to be an increase in the number of reported turtle injuries, including those injured by fishhooks.

Skippy Hau, a state wildlife biologist, said he has received several reports of fishhooks in turtles. Hau said green turtles normally feed on vegetation but can develop an inclination to go for food on fishhooks, if fed by human beings.

"That's why we want people not to feed the turtles," he said.

Honolulu Star-Bulletin
HAWAII
MONDAY, AUGUST 25, 2003 / 529-4747 / CIT

Doctors save turtle with spear in its neck

State wildlife officials rescue the endangered sea creature off Maui

Associated Press

MAKENA, Hawaii >> A green sea turtle found off Maui was unable to eat for at least three weeks before a rusty 6-inch spear was surgically extracted from its neck.

The 140-pound turtle was flown to Oahu for the procedure Friday after state wildlife officials rescued it off Puu Olai.

The turtle was lucky because the spear missed its brain, other vital structures and even blood vessels, said Robert Morris, a veterinarian with the National Marine Fisheries Service who performed the surgery.

However, the spear pinned the turtle's jaws shut, making it impossible to eat.

Fortunately, turtles are able to go for several weeks without food, Morris said.

Officials first heard of a turtle with a spear sticking out of its neck July 31.

There was a possibility the turtle could be returned to Maui and set free off Puu Olai, state aquatic biologist Skippy Hau said.

On Aug. 8 a 100-pound green sea turtle with a noose around its neck was found dead on a beach in Lahaina, Maui. The length of rope was tied to a metal spike in the sand.

Green sea turtles are a threatened species, protected by state and federal laws.

Anyone found guilty of committing a criminal act against a turtle could face fines of up to $5,000 per violation and administrative fees as high as $10,000.

Investigations into both cases are continuing, officials said.

Anyone found guilty of committing a criminal act against a turtle could face fines of up to $5,000 per violation and administrative fees as high as $10,000.

Turtle

Continued from Page A1

"The turtle was so strong. It just wanted to get away."

Hau and his colleagues managed to get the turtle into their boat, where they trimmed the spear to about 2 inches to keep it from digging into the animal's shell. Hau said the turtle was agitated at being snared, but never snapped at anyone, not realizing the spear had made that impossible.

Green sea turtles can't pull their heads into their shells as some other turtles can.

To immobilize the animal, the team placed bubble wrap around its neck that was secured with duct tape. The turtle was then loaded into a large animal carrier and cushioned with towels to protect its flippers. It was then flown to Oahu on Aloha Airlines.

Once it had been delivered to Morris' office, X-rays were taken and the procedure began. There was no barb on the end of the spear so it was simply removed. The wound was flushed and the turtle was given antibiotics.

"He wasn't a happy camper," said Morris. "He was pretty big to handle."

While the injury was out of the ordinary, the species was not. Morris said the Maui turtle was his third this week — he worked on two victims of boat strikes earlier. One lived and one died.

Because its jaw was pinned shut, the turtle (although everyone called it 'he' during interviews, he turned out to be a she) had not eaten for a month and had to breathe through its nose, instead of its mouth. Morris said, fortunately, turtles can go several weeks without food.

If the turtle returns to good health, Hau said there's the possibility that it could be returned to Maui and set free off Puu Olai again.

Awo asked anyone with information about how the turtle was speared — or about criminal acts against any sea turtle — to contact authorities at 984-8110 or 243-5294.

Green sea turtles are a threatened species, protected by both federal and state laws. Anyone found guilty of committing a criminal act against a turtle could be fined up to $5,000 per violation. The party could also face administrative fines between $2,500 and $10,000.

Coincidentally, as the speared turtle was undergoing surgery, state officials said they were receiving information about someone who might have been involved with the turtle that was left noosed on a Lahaina beach

Investigations into both turtle cases are continuing.

Turtle rescue

Two green sea turtles that were believed to have been trapped in an enclosed brackish water pond in Ka'u for several years were finally captured, examined and then released back into the ocean.

This rescue mission was a multi-agency collaboration between the University of Hawaii at Hilo Marine Option Program, U.S. National Marine Fisheries Services and Hawaii Preparatory Academy, led by leading turtle researcher George Balazs.

"The Ninole Pond in Ka'u, in which the turtles were found, seems to be completely separated from the ocean by old lava flows, but nobody is sure if there are any underwater passages that connect the two," said Balazs.

"The rescue team struggled for nearly five hours to locate the two turtles seen in the pond sporadically for more than three years now.

"It remains a mystery how these turtles got into the pond, and whether they remained there permanently, or if they are able to get back to the ocean," he added.

The turtles were caught using a netting method designed for turtles and were brought out of the pond upon capture.

Both appeared to be generally healthy. The turtles were weighed, measured and examined before being tagged and released.

"It was discovered later that one of the captured turtles had been previously captured in the ocean, nearby the Ninole Pond, and tagged in February of 1984 by students from the UH-Hilo MOP and USNMFS," Balazs said.

"Its capture during this rescue effort was the first time it has been seen in 18 years." The other turtle was previously untagged.

"Upon release, the turtles swam away swiftly and happily," Balazs said.

"Such a reaction could be an indication that it was time for them to return to the place they call home."

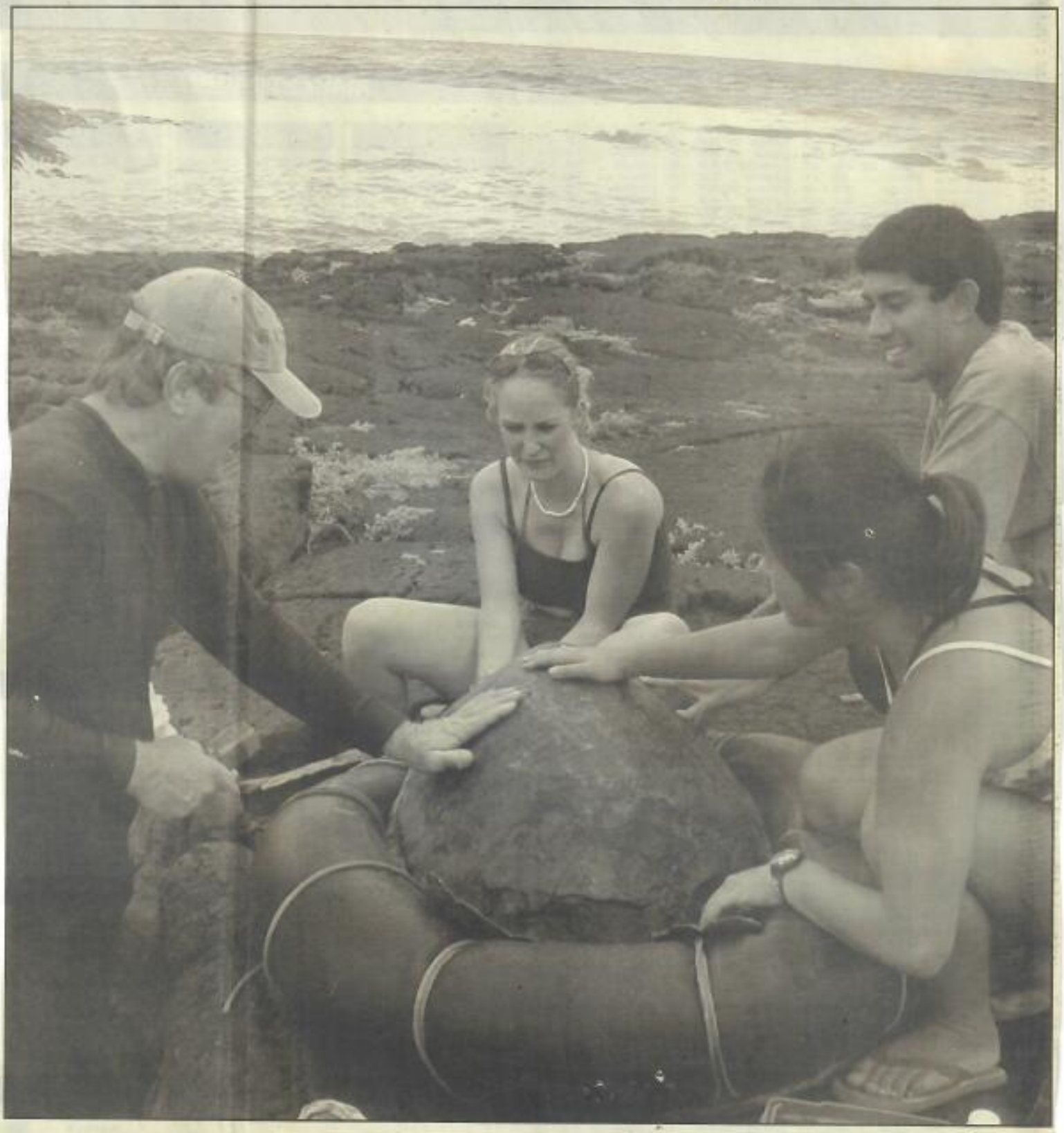
This rescue mission is not the first of its kind. In 1999, Balazs and students from UH-Hilo had rescued a hawksbill turtle that was stranded in a murky pond by the Punaluu Black Sand Beach.

The rescue team removed a fishing line that was wrapped around one of its front flippers, tagged it, checked it for other injuries and then released it back into the ocean.

Such turtle rescue efforts will continue in the future, when the need arises, Balazs said.

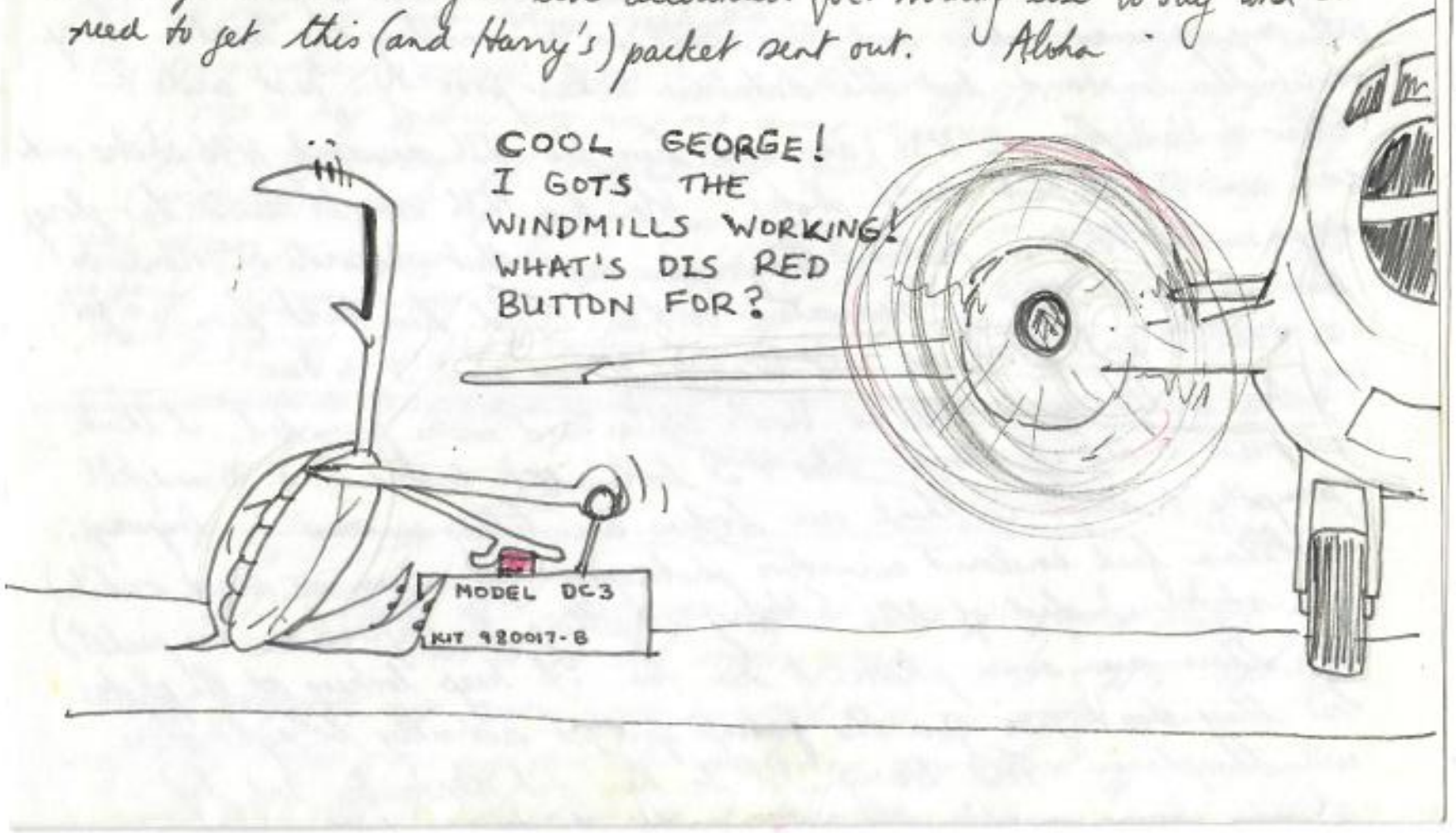
> "The pond in which the turtles were found seems to be completely separated from the ocean by old lava flows, but nobody is sure if there are any underwater passages that connect the two. The rescue team struggled for nearly five hours to locate the two turtles seen in the pond sporadically for more than three years now.
>
> **— turtle researcher George Balazs**

mission releases trapped duo



Two green sea turtles that were believed to have been trapped in an enclosed brackish water pond in Ka'u for several years were finally captured, examined and then released back into the ocean. This rescue mission was a multi-agency collaboration between the University of Hawaii at Hilo Marine Option Program, U.S. National Marine Fisheries Services and Hawaii Preparatory Academy, led by leading turtle researcher George Balazs, at left.

so far she hasn't.
usually shows. Everyone else accounted for. Nothing else to say and I need to get this (and Harry's) packet sent out. Aloha -



Aloha,

Peter's three dives down in entering turtle data into computer and what with my sprained ankle and this ^south swell we're catching our breaths. Sorry about the longhand but the database takes priority. Just wrote a letter to Harry (owner N36) and sent him the N36 mousepad, N36 photos and even some of my best turtle photos. Told him N36 can be seen in her glory days on the Net, in National Geographic and that I wrote a tribute to her on Trax that I dedicated to him. Told him next time we get to KINKO's will print out all Trax stuff and send it to him.

Six shells up at once at Turtle House and we're grounded... I think we need a day off though. Peter + I both went to bed at 8:30 and fell promptly to sleep. I think our bodies are telling us something. Anyways...

Please find enclosed six, two photocopies (one colour, one black + white) of a sketch I did of N36. (Harry is getting the original in his packet.) Also there are some photos of her too. I keep looking at the photos but they don't give you the feeling you get actually being right there with the plane. Told Harry I'd be here til September 2nd but I already know we'll

[illegible] will be the highlight of this summer.
(Hmmm... the surf here has given up and the swell seems dying down...)
I had taped the N36 part to send inside the envelope then thought better of it. Would rather give it to you in person.
Every sunset I look to the northwest past Molokai - (here)

...and think about the staggers at FFS. The 25th was a wonderful distraction from the regular bad news from FP. Another important artifact is I got to appreciate you more. (Course, the other consequence is I get more intimidated by your reputation)
Hmmm... the more I write the calmer the ocean gets - nothing like last night - another hour or two we might try a dive!)
"Bathtub ring" all the way to the Turtle House though will make for shitty visibility. Last three days we had morning "reversacurrents" meaning instead of normal current we had strong Lahaina to Kapalua ones. That's when Shredder (A240)
over →

High-tech tags give scientists tools

2-18-02

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Scientists are using transmitters like this one to track and study the behavior of marine animals.

By Helen Altonn
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Scientists are seeing the ocean through the eyes of seals, whales, turtles and other marine life via a variety of high-tech tags and sensors.

"It's an innovative approach to studying the movements and habits of large pelagic animals ... to send out fleets of (tagged) animals and see the ocean from their perspective," said Jeffrey Polovina of the Honolulu Laboratory, National Marine Fisheries Service.

Polovina and other scientists discussed new tools to study marine animals in their home waters at international Ocean Science meetings in Honolulu last week.

Programs are developing to use new electronic technology to follow animals in the ocean and learn what they do, said George Boehlert of the Pacific Fisheries Environmental Laboratory in Pacific Grove, Calif.

A 10-year international research program, called Census of Marine Life (CoML), plans to investigate the diversity, distribution and abundance of marine organisms throughout world oceans, he said.

"The CoML will enable scientists to compare what once lived in the oceans to what lives there now, and to project what will live there in the future,"

to track sea animal movement

A3 Honolulu STAR-Bulletin

Boehlert said.

A new class of electronic tags, small microprocessor-based units that can record information on the animals' migrations and ocean conditions, will be used in two pilot projects, he said.

Pacific bluefin tuna, elephant seals, albatross, leatherback sea turtles, sharks and whales will be released simultaneously in the Tagging of Pacific Pelagics project to learn how they migrate and seek food.

In a Pacific Ocean Salmon Tracking project, acoustic sensors on young salmon will send signals to listening stations to track movements of adult salmon in the open ocean.

"We don't really have good information on where salmon go and what they do when they're out there," Boehlert said.

Use of electronic sensors on migratory animals have shown they are more wide-ranging than formerly believed but feed primarily in specific areas.

Some animals must be recovered to retrieve data, but with some technology the tag pops off, floats to the surface and relays data via satellite to researchers, Polovina said.

Data from tagged elephant seals show they cover most of the Pacific Ocean and spend 90 percent of their time under the surface at depths of 900 to 2,000 feet, said Daniel Costa, ecology evolutionary biologist with the Long Marine Laboratory in Santa Cruz, Calif.

Bruce Mate and his colleagues at the Hatfield Marine Science Center at Oregon State University tagged 100 blue whales off California's coast and found the animals — as large as 100 feet long and weighing up to 100 tons — travel much farther and faster than it was believed.

The new technology enables scientists to collect data on up to 20 whales and other species simultaneously for four to five months, Mate said. In the past, they had to follow each tagged whale by boat and could only go as far as the signal — five miles, he said.

Advertiser library photo/June 1996

ttractions Hawaii will continue to manage Sea Life Park, above, nd Waimea Falls Park, both of which are under new ownership.

N.Y. firm taking over Sea Life, Waimea parks

THA 10/5/96 B6

By Frank Cho
Advertiser Staff Writer

A Mainland real estate developer has bought a controlling interest in Attractions Hawaii, saving two of the state's most popular visitor attractions from the auction block.

Bank of Hawaii filed to foreclose on Attractions Hawaii, which owns and operates Sea Life Park and Waimea Falls Park on Oahu, on July 5 after the company defaulted on a $12 million loan it took out in 1989.

New York-based Christian Wolffer, general partner of the new formed Oahu Entertainment Parks, has agreed to pay off the loan and take control of Attractions Hawaii. Final terms of the deal were not disclosed. Wolffer is the former managing partner of the Kona Beach Development Venture.

The sale means the foreclosure action will be halted and the company's 300 employees at both parks will keep their jobs. Attractions Hawaii also will continue to manage the parks.

"This is good news for the parks and for Hawaii because they needed the infusion of cash," said Bill Bigelow, director of communications for Sea Life and Waimea Falls parks.

The new owners said short-range plans for the parks include improved maintenance of

See Parks, Page B3

4/28/97
THA

Hawaii's Environment

JAN TENBRUGGENCATE

Most Island reefs unhurt by footsteps

Hundreds of people walking across the top of a reef can't be good for the reef, right?

Surprisingly, on many Hawaii reefs, it's not as destructive as you might think.

"It's certainly not as hard on the reefs as overfishing," said University of Hawaii oceanographer Richard Grigg.

Take Hanauma Bay, perhaps one of the most-visited reefs in the state.

"The whole top of Hanauma reef is coralline algae or fossil limestone," Grigg said. "Most of what you see is this veneer of coralline algae," a marine plant that produces a very hard, and quite strong, surface.

"They are very stony, and they are not impacted by people walking on them. This is pretty tough stuff. It's conventional wisdom that there's this tremendous impact. It just isn't so," he said.

Another coral reef expert, University of Hawaii botanist Cynthia Hunter, generally agreed.

"Coralline algae are much more resilient" than either fleshy algae or corals themselves, she said. Hunter said she could think of only two Hawaii reefs where people walking on top of the reef can cause serious damage: Anini reef off Kauai's north shore, and Kapoho off the Big Island.

"Basically, anywhere the reef goes 'crunch, crunch, crunch' underfoot, you're causing damage. In most areas (outside Hawaii), it is a threat," she said. Hunter said she hesitates to tell people how tough the tops of Hawaii reefs are, fearing they'll go to reefs elsewhere in the Pacific and cause serious damage by doing the same things.

There is one problem with people walking on reefs of coralline algae, though: It can prevent actual corals from taking hold.

"Corals love to settle on coralline algae. In a place like Hanauma, who knows whether there isn't coral on the top of the reef because all the people are walking there," she said.

Another, indirect effect of people walking on reef tops is that they may stir up sediment, which can then settle on corals that are growing in cracks and holes in the reef, weakening them.

Reef-building corals are tiny animals that contain single-celled algae called zooxanthellae. There are also corals that do not build reefs and do not contain clusters of zooxanthellae. These corals tend to live in deeper areas, caves and other marine spots where there's less light.

Marine algae are plants and come in many forms. The common seaweeds are marine algae. So are the zooxanthellae that live in coral polyps. And so are the coralline algae like the reddish-colored *Porolython oncodes* that covers much of the Hanauma reef top.

Jan TenBruggencate writes about science and the environment. He can be reached at (808) 245-3074, or through e-mail at tenb@aloha.net.

Study will tail rare isle turtles

Hawksbills' satellite transmissions could reveal where they hang out

9-5-95 Honolulu Star-Bulletin A1

BY GREG AMBROSE
Star-Bulletin

Researchers have examined the most intimate details of Hawaii's rarest sea turtles, but they want to know more.

The habits of the female hawksbill turtle when it comes ashore to lay eggs from June to September are well-studied, but scientists know nothing about what they do after that.

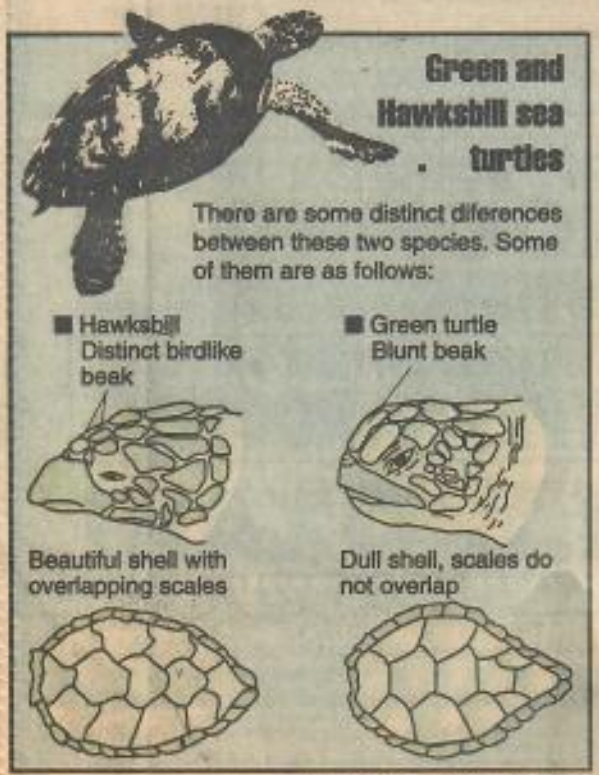
To find out, National Marine Fisheries Service turtle expert George Balazs and Volcanoes National Park biologist Larry Katahira last week attached one-pound, fist-sized transmitters to two female hawksbills with fiberglass and epoxy. Now they are waiting for a satellite to pick up the transmissions and show them where the turtles go for two to three years between nestings.

The information is essential: Hawksbills don't share the same happy story as green sea turtles, which have made a dramatic surge in numbers here under the protection of the Endangered Species Act.

Hawksbills in Hawaii are a critically endangered species, possibly just one natural or man-made disaster away from being wiped out. Federal law protects them with a $25,000 fine and a year in jail for killing one, but that threat hasn't halted the worldwide trade in their shells.

Two attempts at tracking hawksbills in the Caribbean were thwarted by equipment problems, but

PLEASE SEE TURTLES, A-6



VINT BLACKBURN, Star-Bulletin

TURTLES: Researchers hope to find where they go from here

FROM A-1

"we're not discouraged," Balazs said yesterday. "We have a unique situation because we're so dog-gone isolated in the ocean.

"They could take very lengthy migrations, or we may find their migrations are much more reduced, maybe within the Hawaiian Islands. Or are they going to other Pacific Islands where they are hunted? We need to be able to protect them."

That is a difficult task even here. Only one of a thousand green sea turtle eggs makes it to adulthood. That ratio might be even worse for hawksbills.

On land, cats, mongooses and pigs gobble the eggs and hatchlings. Survivors that reach the ocean are devoured by numerous sea predators. Man is their biggest threat, running them over with boats and ensnaring them in cross nets and driftnets and abandoned plastic of every sort.

Hawaiian green sea turtles are illegally killed for their meat. The meat of the hawksbill can be poisonous. "They are a beautiful animal," said Balazs, and that is their curse. They are exploited worldwide for their shells, although 18 months ago Japan halted all trade by Japanese companies in hawksbill shells.

"It certainly helps out hawksbill populations throughout the rest of the Pacific, where Japanese traders had been buying and importing shells to Japan," Balazs said.

Hawaii is the only place in the United States that has nesting hawksbills, and because researchers are looking harder, each year they are finding more hawksbills nesting on the Big Island.

When they first started counting in 1991, they found and tagged 12 females in a few scattered spots, said Katahira. That number has grown to 27 this year, at Halape and Apua in Volcanoes National Park, and Kamehame and three other spots north of Punaluu in the Kau district.

Three other nesting sites at Punaluu are a special problem, with people camping on potential nesting sites and four-wheel drive vehicles running over the nests.

At Kealia Pond on Maui, female turtles seeking nests have been killed by cars on the shoreline highway. Park workers are so serious about protecting them that volunteers and staffers baby-sit the eggs around the clock at six beaches to ensure that the hatchlings emerge and enter the ocean.

"It's an indicator that something is wrong in the ocean or land today when you have numbers that are so low and they aren't recovering," said Katahira. "If we don't do something about it, we're going to lose them."

Balazs and Katahira worked with the Volcanoes National Park, the U.S. Fish and Wildlife Service, the National Marine Fisheries Service and the Hawaii Natural History Association to obtain $70,000 for workers at the beach to protect the turtles, two transmitters and satellite time. "We anticipate that we will not get as many signals from hawksbills as we have from the greens, because their diving behavior generally takes them under water for longer periods. Only when the six-inch antenna sticks up on the surface do we get a signal," Balazs said.

But over the next year, they should get enough signals to find out where the turtles go after they leave the beaches. "I'm really excited," said Katahira, "it's really the forefront of hawksbill studies."

Study finds deep-set lines could spare most turtles

Since loggerhead turtles stay near the surface, they would avoid fishers' lines, scientists say

By Helen Altonn
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Loggerhead turtles generally spend most of their time at or near the ocean's surface and seldom dive deeper than 75 feet, National Marine Fisheries Service scientists have discovered.

As a result, they concluded, turtles are not likely to be caught by longline fishing gear if it is set deep in northern waters.

This was among findings in a study of diving behavior of loggerhead and olive ridley turtles by ocean ecologist Jeffrey Polovina and turtle specialist George Balazs.

Their research confirms that the present management plan for longline fishermen will substantially reduce loggerhead turtle catches, said Polovina, who directs ecosystem environmental investigations at the Fisheries Service's Honolulu Laboratory.

He said the plan, which prohibits shallow longline gear in northern waters, will protect endangered loggerheads while allowing longliners to set deeper gear to go after tunas or perhaps swordfish.

Polovina teamed with Balazs to study the turtles' behavior — how deep they dive and how

Please see **Turtle, A21**

DENNIS ODA / DODA@STARBULLETIN.COM

National Marine Fisheries scientists Jeff Polovina, left, and George Balazs demonstrated last month how they attached a transmitter to track loggerhead turtles.

Turtle: Research finds that loggerhead populations rarely dive deep

Continued From **A13**

much time they spend at different depths. Evan Howell and Denise Parker, with the University of Hawaii Joint Institute for Marine and Atmospheric Research, worked with them. Parker, now in La Jolla, Calif., still does computer work for the project, Balazs said.

The researchers discovered some "curious phenomena," Polovina said, noting the turtles often change diving habits.

He said loggerheads did not dive generally for more than 45 minutes or go below 75 feet. Yet one animal, caught in a big storm north of Hawaii last winter, changed its diving time at night to spend two to three hours underwater.

"We saw one loggerhead swimming against the wind and currents into a strong storm and it dives deeper to avoid faster-moving surface water," he said.

"It goes deeper but encounters colder water and ends up spending a longer time. Cold water slows down oxygen utilization. It can spend two to three hours under water. Other dives can be less than an hour."

BALAZS HAS been tracking turtles for years with satellite tags to see how long they would survive if hooked by a fisherman's longline.

"We thought, if there was a hook anywhere on an animal, it probably would go off the air in a couple weeks because the animal would die. But things didn't turn out that way," Balazs said. "Many of them, we learned, do survive, and apparently survive very well for long periods of time."

That discovery resulted in longer tracks, over weeks and months, he said. "I tossed some of the things Denise Parker and I gathered at Jeff, and he got excited about it."

Observers on longline fishing boats had outfitted 50 turtles with electronic transmitters for Balazs' program, Polovina said.

More sophisticated recorders were used to transmit data to National Atmospheric and Oceanographic Administration satellites with Argos receivers, allowing Polovina to study oceanographic features and the animals' dive profiles.

DENNIS ODA / DODA@STARBULLETIN.COM

Fifty turtles were equipped with transmitters used by National Marine Fisheries scientists Jeff Polovina, left, and George Balazs and tracked via satellites to study their behaviors. The research team found that loggerhead turtles tend to stay close to the ocean's surface.

Satellite-linked time-depth recorders were placed on two loggerheads and two olive ridleys to see if loggerheads are diving deep enough in the central North Pacific to be caught in deep longline gear.

Polovina said the deepest loggerhead dive recorded was 584 feet, "which is pretty deep nevertheless for turtles we're used to seeing around Oahu. Green turtles are always in a shallow area."

Olive ridley turtles, which aren't endangered, often dive below 830 feet, he said. However, that's the deepest the recording device goes, so they may dive even deeper, he said.

"They really do operate differently," he said, explaining loggerheads are found in colder, shallower northern waters with swordfish and olive ridleys are in warmer, southern water where the tuna are.

"Loggerheads generally are on the edge of oceanic fronts, generally feeding near the surface. Olive ridleys tend to go deeper and take advantage of the vertical structure in the ocean while loggerheads take advantage of the horizontal structure."

Loggerheads make shorter dives in the day and longer dives at night, he said. They drop down and sleep underwater, naturally buoyant, but spend most of their time at a shallower depth.

"We don't know if they're just exploring the water column to look, maybe, for the best foraging area, or maybe they're looking for the bottom because they come from a coastal habitat," Polovina said.

When the present longline fishing management plan was drawn up, Polovina said there were no data to indicate what would happen if deep gear was used in the northern waters because shallow sets were always used to catch swordfish.

NOW, IT LOOKS as though turtles wouldn't be affected if the industry moves further north and sets gear below 330 feet, which is permissible.

But there are exceptions to the diving pattern, Polovina said. "One loggerhead spent a month and a half riding around the edge of an eddy and every day it dove to 200 to 300 feet.

"This is a depth where it might begin to encounter some deep-set longlines, particularly when the currents of the eddy may keep longlines from sinking deeper."

The researchers also discovered that the turtles aren't just randomly going across the ocean, Polovina said. Olive ridleys go back and forth, but loggerheads always move westward toward Japan.

There is a loggerhead population off Mexico, and the scientists think the animals are starting to leave the area and move across.

Loggerheads have nesting beaches in Japan, "but these animals out there generally are too young to lay eggs in Japan," he said. "They're just spending several years out there in an oceanic habitat."

They travel along a wall of chlorophyll, a transition zone discovered by the Honolulu fishery biologists between low-chlorophyll subtropical waters and high-chlorophyll subarctic waters. "So they're using this as foraging pasture, but the olive ridleys are going in both directions ... We don't understand the total migration pattern," Polovina said.

BUT THOUSANDS of remote sensing observations help them learn where the turtles go and what they're doing.

"It's a phenomenal thing," Polovina said. "Now we're able to look at the ocean in ways we never could see it before, by putting instruments on animals to see where they're going, and by looking at remotely sensed data, seeing what the habitat looks like."

This has "really revolutionized" fisheries research, he added.

"Turtles are not supposed to be killed and hurt," Balazs said. "We want to come up with science-based ways management can use to have fisheries prosper with minimal or virtually no impact to species that are not target for food fish."

Letters

Columns missed

I am saddened to see the demise of the community columns in The Maui News.

There is life in the communities, but without the community columns people lack solid news about what goes on in their towns.

The new weekly Community Page cannot begin to cover the details — the many things that go on in individual communities. Not only is space lacking but the editor decides what to report; very different from community resident reporters in touch with community people and organizations.

Community news in a place like Maui is the muscle and bone of local news, not the fat. Please make cuts elsewhere and resume the community columns.

Gene Thompson
Kihei

Turtles to be celebrated

Hawaiian tradition relates that a mystical marine turtle named Kauila makes her home at Punaluu Bay in the Kau district of the Big Island. Kauila could turn herself into human form to watch over children and play with them along the shoreline. The people of Kau loved Kauila.

The spirit of Kauila can still be felt today through the gentle sea turtles that live at this special place. On Nov. 25 a bronze and lava stone monument honoring the Kauila legend and Hawaii's sea turtles will be unveiled in a public ceremony at Punaluu Beach Park. After the dedication, community volunteers and leaders will mark the day with a celebration called "He La Honu-Turtle Day 95." Festivities will include Hawaiian music, hula, food, exhibits, and arts and crafts. And, of course, watching the turtles as they gracefully swim and feed in the bay.

The educational monument and day of celebration are the result of two years of hard work by community volunteers, private organizations, county officials, and several generous donors. But the guiding light of encouragement has been the school students of Kau, who have demonstrated that their community efforts can make a difference. Surely Kauila will gaze upon her children and smile on Nov. 25.

George Bulazs
Honolulu

Maui News 11-17-95

The Maui News policy on letters

The Maui News welcomes and encourages letters to the editor. The letters should be brief and to the point and on subjects of general interest. Letters must be signed and include an address and phone number where the writer can be reached during working hours for verification. The writer's name and community will be published.

Letters should be limited to 250 words or less with shorter letters being given priority. Letters of any length are subject to editing. Typed letters are preferred but others will be accepted if they are legible. Letters to third parties will not be published.

Poetry is not accepted.

Letters may be mailed to The Maui News, 100 Mahalani St., Wailuku 96793; or may be faxed to 242-9087.

Hawaii Kai scientist's efforts help restore dwindling population of green sea turtles

By CARRIE O'CONNOR
Staff Writer

HAWAII KAI — Hawaii Kai scientist George Balazs views the Big Island's celebration this weekend honoring the green sea turtle as a satisfying culmination of his 20-year effort to rebuild the reptile's dwindling population.

"I am very excited about this," said Balazs, a National Marine Fisheries Service expert who will be among the guests attending "He La Honu — Turtle Day '95. "I have dreamed about this and thought about this for many years."

The event, set for Saturday morning at Punaluu Beach Park, features the unveiling of a large bronze disc that will be mounted for permanent display at the park. The disc, approximately 4 feet in diameter, is a creation of Maui artist Dale Zarella and depicts the goddess Kauila on the back of a giant sea turtle.

The disc is designed around the Ka'u legend about Kauila, a sea-turtle goddess who is supposed to have turned herself into a child so that she could play with children at Punaluu Bay and keep watch over them.

Balazs is an adviser for the federally funded Honu Project, a non-profit organization now in its fifth year that is dedicated to conserving endangered sea turtles worldwide.

He said it is interesting that the Hawaiian legend only recently surfaced, even though his studies on the turtles started in the 1970s. However, the myth has strengthened efforts to protect the turtles, which are part of the 1978 U.S. Endangered Species Act.

"This is a legitimate myth," Balazs said. "(Artist) Herb Kane gave rebirth to the legend. It is a supernatural thing almost for a rural community that is 40-some miles down from the Volcano with one radio station and a monthly newspaper."

> ***"There is a definite increase. The turtles are very tame, they are out during the day. Generally, you see about 20 turtles a day there in the water."***
>
> — George Balazs, National Marine Fisheries Service

The message of the environmentally conscious community is so strong that even tourists understand the vulnerability of the sea turtles, he said.

"The tour buses stop there," Balazs said. "They see, they watch and there is an educational awareness that we need to protect these animals."

Before the act was in place, people hunted turtles and killed them with nets, spear guns, firearms and grappling hooks attached to bamboo poles. During the 1960s and early 1970s, the animals were sold to resort restaurants.

Since 1976, the federal government has enabled scientists to examine, tag and free 183 green turtles at Punaluu. Local scientists have since recaptured approximately 34 percent of the turtles and fre them again. Scientists French Frigate Shoals al have discovered three of t tagged turtles.

Balazs said more sea turtl are alive today.

"There is a definite increase he said. "The turtles are ve tame, they are out during t day. Generally, you see abo 20 turtles a day there in t water."

PHOTOS: GEORGE BALAZS

Sea turtles migrate long distances to breed and nest.

SEA TURTLE UPDATE

Following decades of exploitation, green sea turtles, or honu, are showing encouraging signs of recovery after receiving protection in 1978 under the U.S. Endangered Species Act. Around Hawaii, they are frequently seen feeding on marine plants in shallow coastal waters, including Ala Moana Beach Park and other locales near downtown Honolulu.

As adults, green turtles in Hawaii migrate once, every two to five years, across hundreds of miles of ocean to breed at isolated French Frigate Shoals in the northwestern Hawaiian chain. During the summer months, females come ashore at night to dig nests and deposit eggs in the sandy islets at this special location. In the daytime, both the adult male and female turtles bask peacefully in the sun along the shoreline.

Newly hatched turtles emerge from underground nests after the eggs incubate for about two months. The hatchlings then swim out to sea and drift on the surface, where they feed on small invertebrate animals. After growing to dinner-plate size, the juveniles show up mainly in the near-shore Island waters, extending from the Big Island to Niihau, where they graze on algae and seagrass and sleep on the bottom under protective coral ledges.

As vegetarians, green turtles grow slowly, taking more than two decades to reach an adult breeding size of 200 pounds or more. Although numbers have clearly increased during recent years, green turtles living at certain areas around Hawaii continue to be threatened by a disease that causes fibrous growths on the eyes, neck, flippers and in the mouth. A mysterious virus is believed to be the cause of this often-fatal affliction, which only affects sea turtles. Research is underway to find ways to prevent or control the disease.

The hawksbill or honu'ea is also native to Hawaii, but is critically endangered. As with the green turtles, they often nest many miles away from where they live. The hawksbill nests on several small unprotected sandy beaches on the Big Island, Maui, Molokai and Oahu. A recent study using satellites to track hawksbills suggests that the adults nesting at Kamehame, in the Ka'u District of the Big Island, live on the opposite side of the Island, along the rugged Hamakua Coast.

The leatherback turtle is a regular visitor to Hawaii's offshore waters, but does not nest on beaches. The leatherback is the world's largest turtle and can weigh up to 2000 pounds. Leatherbacks seen in Hawaii are thought to originate from breeding sites in Mexico, Costa Rica, Irian Jaya (Indonesia) and possibly even Malaysia.—*George Balazs*

The green sea turtle population has grown markedly in recent years.

Workshop Session Title: MAGNIFICENT AND MYSTICAL MARINE TURTLES OF THE HAWAIIAN ISLANDS

Session Presenter: George H. Balazs
Leader, Marine Turtle Research Program
Honolulu Laboratory
National Marine Fisheries Service

For the past 22 years George Balazs has been involved in just about every conceivable aspect of Hawaii's sea turtles, ranging from research and conservation, to historical, cultural, and supernatural significance. Starting in 1972 Balazs initiated a grass roots campaign to gain long-overdue protection for the Hawaiian honu (or green turtle). In the absence of any legal restrictions, the species was being systematically killed in increasing numbers for commercial use by restaurants catering to tourism. The results of Balazs' efforts culminated in 1978 when the green turtle was listed and protected under the U.S. Endangered Species Act.

Today, green turtles, which take 25 years to mature, are showing some promising signs of population recovery. In addition, turtles are now playing an increasing cultural role in Hawaii's ecotourism. Tourists presently enjoy watching turtles instead of eating them. Existing threats to Hawaiian turtles include entanglement and drowning in gill nets and, at certain locations, death from a mysterious disease called fibropapillomatosis.

Session activities will include a photo lecture, numerous handouts, hands-on displays, and lots of "straight-talk" (including questions and answers) about sea turtles that will be useful for Hawaii's educators.

George Balazs also serves as the Deputy Chairman for the Marine Turtle Specialist Group of the International Union for Conservation of Nature (IUCN). In that capacity, he frequently travels to other Pacific island areas to assist and advise on the research and conservation of sea turtle populations.

NOVEMBER 27, 1996

A Tern *for the* better

There's nothing slow about the birthrate of Hawaiian green sea turtles on Tern Island, where they're hatching in record numbers

BY SUSAN SCOTT
Special to the Star-Bulletin

TERN ISLAND, Hawaii — Autumn isn't usually the time of year we expect to see bursts of new life, but it's happening in Hawaii.

Turtles are bustin' out all over.

Hawaii's green sea turtles, called honu in Hawaiian, have been hatching in record numbers this fall at Tern Island, the main biological research station of the Hawaiian Islands National Wildlife Refuge. Tern is one of several small, sandy islands within French Frigate Shoals, an atoll about 500 miles northwest of Honolulu.

The remote sand islands of this atoll are vital to the survival of the Hawaiian green turtle, because they host the last main nesting sites of this threatened species. About 90 percent or more of Hawaii's green lay their eggs on beaches within this atoll.

On Tern, the atoll's only island inhabited by biologists year round, turtle nests pock the white sand beaches.

Last summer, each time a female turtle laid eggs on the island, workers recorded the date, then marked the spot with a numbered stake.

PLEASE SEE **TURTLES, A-8**

PHOTOS BY SUSAN SCOTT, Special to the Star-Bulletin

Of the estimated 20,000 turtles hatched on Tern Island, only two to 20 are likely to reach maturity. Inset, Steve Barclay, U.S. Fish and Wildlife Service refuge manager of Tern Island, excavates a hatched green sea turtle nest for research. He counts eggshells (foreground) and rescues trapped hatchlings. Story, A-8

TURTLES: Record number of hatchings at Tern Island

FROM A-1

stake. They soon realized that this would be a banner year for turtle nests.

Last year, biologists recorded 152 successful turtle nests on Tern Island; this year 270 nests have hatched so far. The season is drawing to a close but a few late nests will still produce hatchlings.

"This is a big year for turtles on Tern," said on-site refuge manager Steve Barclay.

"We don't know why so many turtles laid eggs here this year, but it follows a general upward trend. Since the U.S. Coast Guard left the island in 1979, the number of turtle nests have increased, probably because the beaches here aren't disturbed any more."

The number of Tern Island's turtle nests has approximately tripled since 1986.

And since sea turtles gained legal protection in 1978 under the U.S. Endangered Species Act, Hawaii's greens have been slowly but surely increasing in number. Federal researchers know this through systematic monitoring of turtle populations at French Frigate Shoals during the past 24 years.

Another possible cause of Tern Island's large increase in turtle nests this year is extensive natural

By Susan Scott, Special to the Star-Bulletin

This turtle was still struggling from its shell when researchers excavated it from its nest, four days after its siblings had left in a group effort. It was later released.

full of rocks or roots and others just don't suit the turtle for some unknown reason.

Of these numerous attempts, each mature female digs three to five successful nests. Into each good nest chamber, she lays about 100 eggs.

The energy these marine reptiles need for such intense reproductive activity is extensive. A female must drag herself above the high waterline of beaches, some strewn with rocks or vegetation, to search for suitable nesting sites. When she finds one, she uses her front flippers to scoop out a body pit and then, with rear flippers, digs a deeper egg chamber, usually in crumbly sand. If all goes well, she then lays dozens of eggs into the hole.

ling predators are frigate birds, numerous on Tern Island. These big seabirds sometimes swoop down and grab turtles caught out during the day, either from getting lost, emerging late or being trapped in vegetation.

Occasionally, frigate birds drop their turtle prizes, and hatchlings may fall into bushes and weeds. If wildlife workers see this happening, they can sometimes rescue the young turtles. Frigate birds are masters of the air but aren't good at picking food from foliage.

Hatchlings that do make it to the ocean still aren't home free. They must dodge marine predators and human entanglements — and do so for a long time. Sexual maturity in green sea turtles can take as long as 50 years.

Even though most sea turtle hatchlings from French Frigate Shoals do make it to the water, a shockingly small number make it to adulthood. Estimates range from one in 1,000 to one in 10,000. This means that of the 20,000 or so eggs that likely hatched this year on Tern Island, only from 2 to 20 of those turtles will reach maturity.

erosion on Whale-Skate Island, another major turtle nesting site in French Frigate Shoals. Whale-Skate, a small figure-eight island, is sometimes connected by a sand spit. Other times, like now, the area is two islands separated by a channel of water. Occasionally, ocean currents shift sand completely away from the island complex, making it smaller than usual.

"Since the U.S. Coast Guard left the island in 1979, the number of turtle nests has increased, probably because the beaches here aren't disturbed."

Steve Barclay
Tern Island's U.S. Fish and Wildlife Service refuge manager

"Whale-Skate has really eroded away this year," said Barclay.

"We don't know for sure, but some females who would have nested there may have found their site underwater and moved to Tern to lay eggs."

The nesting season for Hawaii's sea turtles falls mostly in the summer months. The range, however, is wide. Some females dig nests and lay eggs as early as April, and in some years, as late as November.

During the season, sexually mature females dig numerous pits. Most of these are called false pits and don't function as proper nests. Some collapse, a few are

Turtles can't exert such huge effort each year. Most migrate to French Frigate Shoals to nest only every second or third summer.

Although the average nest contains about 100 eggs, usually only about 60 to 80 percent of these hatch. Some eggs don't develop at all, some develop only partially and a few hatchlings get trapped in the sand hole.

Sea turtles usually hatch from their eggs 65 to 70 days after they're laid. The earliest hatchlings lie still in the sand nest until later siblings hatch and there are enough of them to dig to the surface. Then, in the dark of night, when it's cool, the youngsters burst from the hole in a group and scurry toward the ocean. This dash often means life or death for a hatchling; predators lurk on land and in the sea.

Ghost crabs, also called sand crabs, chase and grab the little hatchlings, crushing their skulls with powerful pincers. After the kill, the crab ladles out the guts of the beheaded turtle through the hole in its neck.

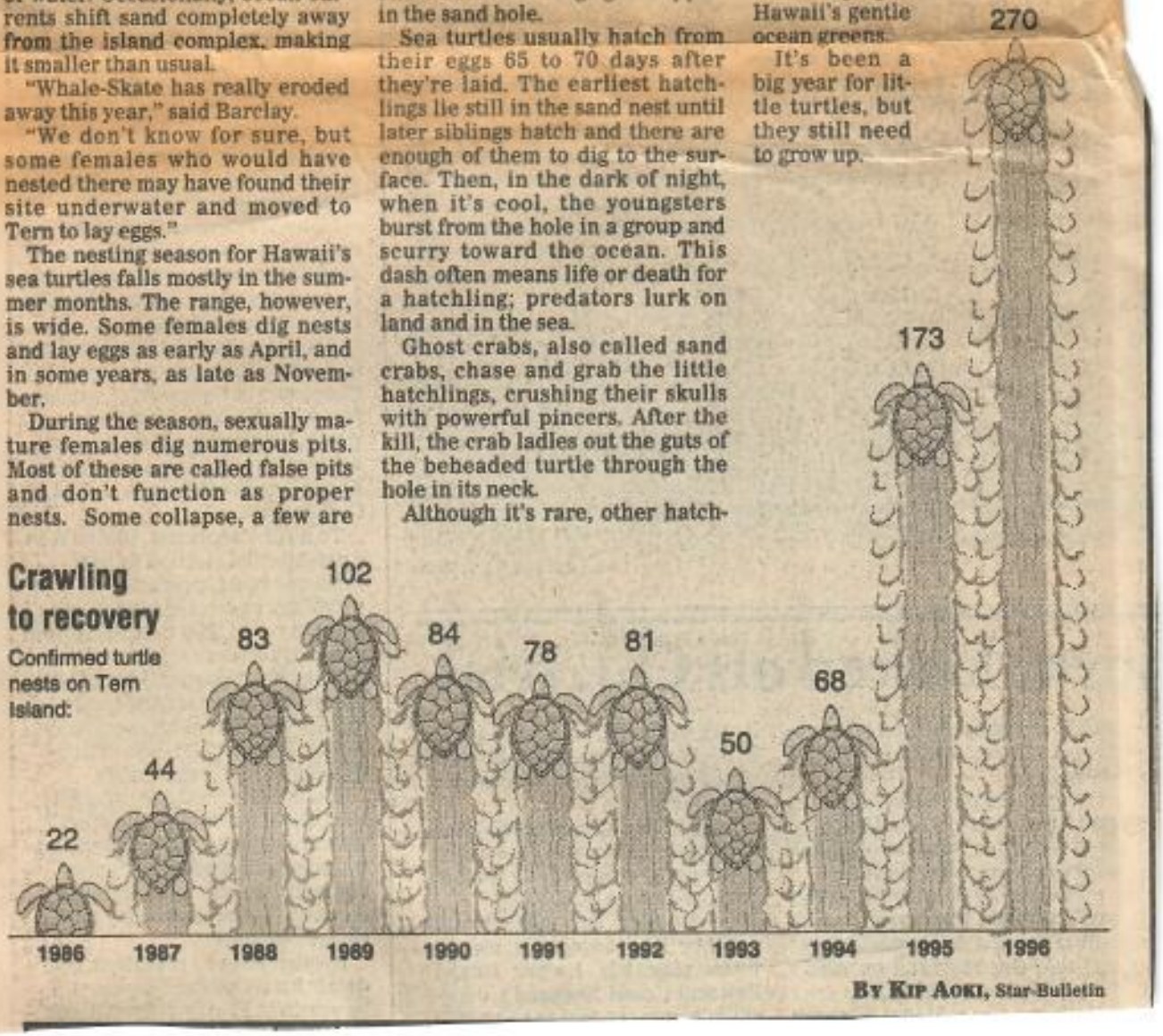
Although it's rare, other hatch-

All of Hawaii's sea turtles continue to be protected by both state and federal laws. It is illegal to harass a turtle or a turtle nest in any way. This includes chasing or touching the animals either in the water or on land.

Turtles had a good reproductive season this year at Tern Island but it doesn't mean they're out of the woods.

Marine pollution, human-induced impediments such as gill nets and persistent, debilitating illness in the form of tumors, continue to plague Hawaii's gentle ocean greens.

It's been a big year for little turtles, but they still need to grow up.



By Kip Aoki, Star-Bulletin

Star-Bulletin

A TERN FOR THE BETTER

Biologists dig hard to gather turtle info

They must excavate the hatched nests on Tern Island to examine them

BY SUSAN SCOTT
Special to the Star-Bulletin

ONE way biologists get information about reproduction of Hawaiian green sea turtles is to excavate and examine hatched turtle nests on Tern Island at French Frigate Shoals. This is easier said than done.

First, workers must find the hatch pit, usually a circular indentation of freshly disturbed sand. Hopefully, the pit is near one of the stakes marking a turtle nest, but this isn't always the case.

Basking Hawaiian monk seals often bowl over the carefully numbered markers, high surf sometimes washes the beach flat and occasionally female turtles lay eggs unnoticed.

But even when someone finds a likely pit, the digging doesn't start. Researchers wait four days before opening a hatched nest, giving trapped turtles their best shot at digging themselves out.

BY SUSAN SCOTT, Special to the Star-Bulletin

This allows the turtles to imprint on their nest area and find the ocean naturally.

Few turtles dig themselves out after four days and without human help, their nest would eventually become their grave.

It is then that workers return to the hatch pit with gloves, knee pads and notebooks. If monk seals are anywhere in the area, a frequent occurrence, the dig is aborted. But when the seals leave, the hard work begins.

Donning rubber gloves covered with a pair of work gloves, two or three people kneel on pads near the alleged hatch pit and start scooping sand. Shovels don't work well here because of the danger of slicing through tiny turtles still trapped in the sand.

The rewards during this hand digging can be exhilarating because it is at this point that little black heads often pop out of t[illegible] moist sand. Careful scooping so[illegible] frees the baby turtle, which i[illegible]

Patty Scifres and Chris Sulzman, U.S. Fish and Wildlife Service volunteers, excavate a hatched nest. They wait for at least four days after the turtles hatch naturally before they dig up a nest searching for trapped hatchlings.

stinctively paddles its flippers like mad in the palms of workers' hands. Rescued hatchlings go into a dark bucket where they soon settle down and become still.

Sometimes, as many as 10 or 15 hatchlings are rescued from one nest. Other times none remain.

Now the labor for the nest diggers begins in earnest. As they continue scooping sand from the cavity, they bend further and reach deeper. Often, the walls of the precarious hole collapse. Other times, the pit was a false call.

Most often, though, the stiff work gloves eventually reach something that makes a distinct scraping-against-leather sound. This [illegible]

But some unhatched eggs remain, some partially developed but dead, some rotten.

Breaking these eggs in the hole is bad form, since they often spew their contents into the digging worker's face. But it's hard picking up rotting eggs from a crumbling hole armpit deep. When the eggs come out, the others separate and count the shells. Unbroken eggs must be opened to check levels of development.

Green sea turtle hatch pits have their own distinct smell — a strong, musty smell.

The job is smelly and dirty; it creates sore knees and strained muscles. But aches and aversions [illegible]

Dale Zarrella: Art to save turtles

LAHAINA

Kihei resident Dale Zarrella has an affinity for many things Hawaiian, especially for the honu, known as the Hawaiian green sea turtle.

When the native of Connecticut came to Maui in 1984 he indulged in his interest in the marine environment. While studying the endless number of of species, he found himself drawn to the gentle honu. His fascination for the green turtle inspired him to become a member of the board of directors of The World Turtle Trust, dedicated to the preservation of turtles and their habitats around the world. Zarrella says the trust works in coordination with The National Marine Fisheries and George Balaz, the foremost turtle researcher in the Pacific.

"The breeding program is necessary," states Zarrella, "because under normal circumstances only one in every 10 thousand hatchlings reaches maturity. These odds are rising due to man's introduction of toxins into the turtles' coastal habitat. These may be the cause of fatal tumors in the creatures and potential threat to their existence." This week members of the non-profit Turtle Trust will be tagging turtles on the Big Island for ongoing studies.

Zarrella also channels his concern for the honu in his artistry. He is currently working on a 4-foot-long bronze monument to be dedicated at Punaluu, a turtle nesting site on the Big Island of Hawaii. The monument symbolizes the Hawaiian mythological sea turtle, the protector of children at sea, who transforms into a girl by day and becomes a turtle again at night. The project is being funded by The World Turtle Trust, the National Marine Fisheries and professors and students in the Marine Options Program at University of Hawaii, Hilo.

His passion for marine beings is captured in other media, which are being exhibited at the Sea Side Fine Art Gallery, owned and directed by another Kihei resident, Stephanie Ansley. Zarrella's Maui-inspired creations include artwork on canvas, precious woods, stone, and bronze that grace galleries and private collections from New York to Hollywood, Tokyo to Europe.

"Dale Zarrella has evolved from a successful sculptor to an acclaimed artist in many media," states Ansley. "Dale has found not only a home on the islands and an outlet for his talent, but a way to combine art, science and education." Ansley adds that Zarrella has released two children's books, three lithographs, multiple images in cards and posters, as well as limited editions of bronze sculptures.

Zarrella is the featured artist April 21st, presenting a wood crafting demonstration from 7 - 10 p.m. at Sea Side Fine Art, 706 Front St. For more info call: Stephanie Ansley at 667-7767.

NOVEMBER 22, 1996

'Shark Bites' is scary stuff

Victims of the ocean hunters tell their tales of survival

BY MARK COLEMAN
Star-Bulletin

GREG Ambrose has done it again. He has written another book that wonderfully reflects his greatest passion (other than his family), the ocean.

Readers of the Star-Bulletin already know that Greg is perhaps Hawaii's foremost surfing reporter. His knowledge is vast, he knows all the top surfers and all the best spots, he's an excellent surfer and his writing is outstanding.

Greg's previous book, which he co-wrote with Sandra Kimberley Hall, was about the great surfing pioneer and Olympian waterman Duke Kahanamoku. His first book was a guide to surf spots of Hawaii. His newest book is about the many sharks that frequently join surfers at those spots.

REVIEW

Shark Bites: True Tales of Survival
By Greg Ambrose (illustrations by Kevin Hand, maps by Bryant Fukutomi), 131 pages, Bess Press, $9.95.

But more than a book about sharks, Greg's new "Shark Bites" is a look at more than a dozen fascinating and extremely lucky individuals who survived shark attacks both here and throughout the Pacific, vividly depicted by the Star-Bulletin's Kevin Hand and Bryant Fukutomi, who provided maps and illustrations.

It's pretty scary stuff.

Like the October 1985 attack near Hanalei Bay, Kauai, in which Joe Thomson lost his right hand to a tiger

PLEASE SEE **SHARK, C-5**

Courtesy Bess Press

Star-Bulletin artist Kevin Hand's drawing illustrates Rod Orr's encounter with a great white shark.

NOV. 19, 1996 D-1 HONOLULU STAR-BULLETIN

STUFFS

What's new, trendy or just plain cool

▲▲▲

When a shark bites you, it doesn't really mean to

California great white sharks and Hawaiian tiger sharks are known to prey on sea turtles, but the ancient Hawaiians knew they, too, could end up as shark bait. They came up with the word "niuhi" to describe man-eating sharks.

This week, "NOVA" explores our coastline, as well as California's, in an attempt to determine why there aren't more shark attacks against humans.

"Shark Attack!" airs at 8 p.m. today on PBS, dispelling a number of shark myths.

PBS

"NOVA" investigates the great white, tonight at 8.

For instance, contrary to the popular idea of a feeding frenzy, after an initial violent attack, sharks feed in a controlled, almost calm manner. A 400-pound meal will be finished in five to 10 bites.

When people are bitten, they are rarely consumed. Researchers believe this may be due to the shark's practice of taking a bite and allowing its victim to weaken through bleeding before eating it.

Human victims and their rescuers perhaps cause more of a commotion than a shark can deal with.

In the case of California great whites, a shark that bites a human may be expecting 6 inches of sea lion blubber, not a mouthful of bones. More than likely, the attacker is a juvenile who simply made a mistake.

Kim Holland of the Hawaiian Institute of Marine Biology offers some parting food for thought, that is, "If these powerful, adaptable hunters wanted to eat people, nothing would stop them."

—

Reported by Star-Bulletin staff

SHARKS: Author respects these predators

FROM C-1

shark.

"One second he was happily anticipating another good ride, and in less than the blink of an eye, his hand had disappeared down the tooth-lined maw of Hawai'i's most deadly ocean predator."

Thomson somehow made it to shore; his life changed forever.

Then there was the March 1993 attack by a huge tiger shark on surfer Roddy Lewis near a Maui spot named, ironically, Paradise.

"Roddy felt something tear through the meat of his right calf and hit the leg bone. He bellowed in fear and pain, and looked over his shoulder to see what in the hell had hit him. . . . The tiger had ambushed him from below, and with an unbearably painful hold on his leg, it was trying to pull Roddy underwater."

Incredibly, Roddy escaped, leg and all, and made it to shore, where later he needed five surgeries, more than 200 staples, and numerous internal sutures to repair the gaping cuts to his right and left legs.

One more story: Jonathan Mozo was paddling back out for another wave at Goat's off Oahu's Malaekahana State Park early one morning in June 1993 when suddenly he felt "a piercing pain and crushing pressure on his feet."

The surfer, Greg writes, "looked back and almost passed out in terror. A huge shark had clamped down on his feet, and as Jonathan watched in horror, clutching his surfboard with all his might, the shark opened its mouth and swam forward to bite again."

Yow!

The good news is Jonathan managed to escape and, with the help of friends, made it to Kahuku Hospital without bleeding to death. It took 30 stitches in each foot to close the wounds and repair a sliced tendon in his right foot.

Beyond the physical injuries, Ambrose explores the psychological damage the attacks imposed on their victims. How did Joe Thomson adapt to losing a hand? Does Roddy Lewis still surf at Paradise? Does he still surf at all? Did Jonathan Mozo or any of the others suffer nightmares?

Not surprisingly, coming from Greg, these horrifying tales yield inspirational lessons, intended to reinforce our love and respect for the ocean and its creatures.

And you can tell that Greg has deep respect for sharks. Not that he likes to hang out with them, but he does describe them as "splendid models of evolutionary efficiency, superbly suited for a life of active predation."

He also worries that "the slaughter of the ocean's apex predator could throw the underwater ecosystem out of balance," so naturally he's against the mindless elimination of sharks just to appease fearful humans.

In fact, he adds, "the fear of sharks is much greater than the actual danger of being attacked."

Even so, I'll be scanning the waters around me as I sit on my surfboard waiting for my next wave.

Especially after reading "Shark Bites."

LETTERS

The Honolulu Advertiser Tuesday, Oct. 1, 1996

Save baby turtles with huge spotlight

So baby turtles don't get confused about which lights to follow after they hatch, we should put in a huge spotlight in the ocean. It could be solar-powered and it could have a sensor that can tell if it is day or night. It gets its energy in the daytime, and uses it at night.

This way, the turtles won't follow the headlights of a car or a truck and get hit.

I think it's a good idea. Do you?

ANDY WHITE
Age 8
Lehua Elementary
Pearl City

THA 1/20/97
C1

Hawaii's Environment

JAN TENBRUGGENCATE

Wildlife unprotected on Kapapa

It doesn't take many people to severely damage a pristine natural area.

Take Kapapa Island, in Kaneohe Bay.

This historic spot — with a fishing shrine and heiau, plus a rich Hawaiian cultural history, like many of the small offshore islands around Hawaii — is a nesting spot for seabirds. The seabirds survive on these islands largely because they lack mongoose, dogs, cats, rats and other predators.

But Kapapa also is within easy reach of humans in the heavily populated areas around the bay. That's the problem.

Campers at Kapapa cut down the vegetation — some of it introduced species such as ironwood, and some of it native like naupaka — for firewood, lean-to supports and for clearing a camp spot.

Other campers appear to have used stones from historic sites to surround their campfires.

People walking through the area sometimes crush the burrows of the nesting ua'u, or shearwaters.

Last Fourth of July, residents brought fireworks there. The evidence of the red firecracker debris was visible for months afterwards. It's not clear what the effect of this might have been on nesting seabirds, but it's hard to imagine that it wasn't severe.

Oahu photographer Jan Becket, researching historic sites, visited the place last year and found an abandoned chick. Apparently a child, picnicking there with the family, had picked it up out of its nest, carried it around, and then put it down somewhere else, he said.

"Having no idea where the chick came from, I left it alone, and am sure it died," Becket said.

Dave Smith, Oahu Wildlife Manager with the state Department of Land and Natural Resources, said Kapapa isn't actively managed as a wildlife refuge, because in 1979, people didn't want it to be. He said public outcry for continued full public use kept Kapapa off the state's seabird sanctuary system, when the state proposed managing it and other coastal islands as refuges.

He said that managing the Mokulua Islands in Kailua Bay and many others as refuges, with warning signs, and limits on camping and destructive uses, has dramatically restored wildlife health.

"There's no question that limiting access and camping has really improved the nesting success," Smith said. Unprotected Kapapa now is a prime example of what happens when such a spot is not protected.

"We can use it to show what the no-management alternative is," he said.

Smith said that if the community wants Kapapa Island protected, it needs to say so.

"It's got to come from the community. We need people to come to us and tell us they want it protected," he said.

Advertiser Kauai Bureau Chief Jan TenBruggencate writes weekly on environmental issues relating to Hawaii. He welcomes your ideas. Call

Maui search called off

2/2/97
THA
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By Linda Aragon
Advertiser Staff Writer

Maui fire rescue crews yesterday ended a search for two tourists who have been missing since Thursday when a wave swept them off a ledge at Keanae peninsula.

Clear waters and light winds helped rescue crews, searching by helicopter, spot a wallet and shredded clothing belonging to one of the missing men, Bhupunda Bhakta, 31, of Georgia.

Clayton Carvalho, Maui assistant fire chief, said the torn shorts, worn by Bhakta, may suggest that the clothing was shredded by sharks spotted in the area where the two men disappeared.

By last night, rescue crews still had not found the bodies of Bhakta and Meghal Shah, 33.

Six tourists from Georgia and Utah were swept into Keanae's pounding 10- to 12-foot swells Thursday. Mitesh Bhakta and Utah fire rescue Capt. Don Arends died during the incident and their bodies were found the same day.

Arends was attempting to revive Mitesh Bhakta after Bhakta's initial fall into the water when a large swell swept them and four others into the ocean.

Two were rescued by Keanae residents and taken to the Hana Medical Center for treatment.

Rescue crews said changing ocean conditions have greatly diminished the chance of finding the men who still are missing.

Arends, the Bhaktas and Shah were part of a tour group that stopped to watch the waves about 3 p.m. Thursday.

The Honolulu Advertiser

OAHU

Covering the districts of Waianae / Ewa / Waialua / Ko'olau Loa / Ko'olau Poko / Honolulu

Windward

Turtle fecal matter suspected in Kailua

State Health Department officials say nodules of fecal matter found along two Kailua beaches Thursday and Friday likely came from sea turtles and posed no health hazards.

Kailua resident Chip Fletcher said he picked up about 15 nodules about an inch in diameter Thursday on the beach off Kaapuni Drive. On Friday, he said a friend gathered about a dozen more on Kalama Beach, which is north of the main Kailua beach park.

Fletcher, a University of Hawaii marine geologist, said he also saw the chunks in the surf.

Health spokesman Pat Johnston said there were no reports of sewage spills and the mouth of Kaelepulu Stream, which empties into Kailua Bay, was blocked by sand and couldn't have been the source of the feces. He said investigators have samples and speculate they originated from turtles.

"This is an ongoing problem at a number of beaches. They tend to show up during periods of kona winds and light onshore breezes," Johnston said. "They're not a health problem, but they are a bit of a nuisance."

By Friday afternoon, the tide had washed the nodules from the beaches, he said.

L.A. TIMES AUG. 11, 1994.

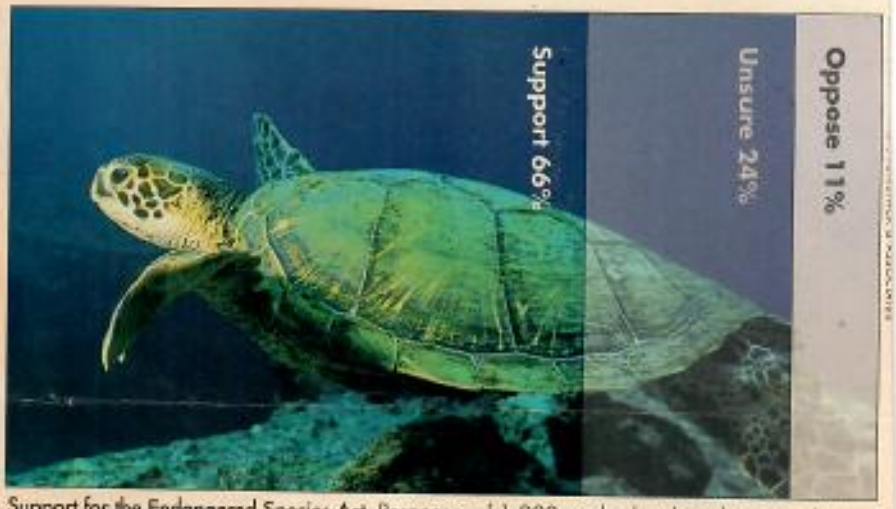
WORLD WATCH

Counterfeiting on the Rise in Russia: Moscow is awash in counterfeit money, much of it cranked out on increasingly sophisticated photocopiers, police say. "At the roughest estimate, at least 400 million in fake ruble notes [about $200,000] are circulating in Moscow," said Yevgeny Tumanov, head of the police economic crimes department. Across Russia, $6,000 in counterfeit rubles were tracked in just one day this week, the Interior Ministry said. Counterfeiting has blossomed since high-quality copiers became available in Russia in recent years, and the paper used by counterfeiters is sometimes indistinguishable from the real thing, Tumanov said.

Venezuela to Rescue Struggling Bank: The government announced a $294-million rescue package for Banco de Venezuela, the nation's second-largest bank, which the government seized Monday. The struggling institution is the 10th bank that officials have taken over since January in a liquidity crisis that has dogged President Rafael Caldera's 6-month-old government and exacerbated Venezuela's already-severe recession. The government also announced at least $253 million in emergency loans to four other banks with liquidity or solvency problems.

U.S. Imposes Ban on Taiwan Wildlife: The import ban on fish and wildlife products, established because of the country's failure to halt trafficking in tiger bones and rhino horns, will go into effect Aug. 19. Heavy demand for the tiger and rhino parts in Asia—where they are used for reputed medical and sexual benefits—has resulted in the virtual extinction of the animals. The U.S. sanctions—the first time the United States has imposed trade penalties for environmental reasons—will affect about $25 million a year in imports of coral and mollusk shell jewelry, snake, lizard and crocodile skin shoes and other leather goods.

From Times Staff and Wire Reports



Support for the Endangered Species Act. Responses of 1,000 randomly selected registered voters nationwide, telephone interviewed December 11-15, 1991. Margin of error 3.1 percent.

Americans Stand Behind Endangered Species

"Who cares about a few spotted owls when loggers' jobs are at stake?" asks a recent article in *Time*. "Who can afford to think about the environment when the economy is the pits?"

The majority of voting-age Americans, that's who, according to a nationwide, bipartisan poll on America's allegiance to the Endangered Species Act. In the December survey, commissioned by the Conservancy and the National Audubon Society, 66 percent of the respondents said they support the Endangered Species Act. And despite the economic hard times, a solid majority sided with protecting wildlife before jobs.

The poll, conducted by Greenberg-Lake: The Analysis Group, Inc., and The Tarrance Group, queried 1,000 registered voters spanning the demographic, political and geographic spectrums of the United States. Despite headlines blaring the abandonment of endangered species with hard times, only 11 percent of those polled opposed the Endangered Species Act.

"The fight to save endangered species has been frustrated by skillful opposition rhetoric framing this issue as a choice between jobs and an owl or a fish," says Celinda Lake of Greenberg-Lake. "These poll results demonstrate, however, that a surprising number of voters are aware of and support the movement to protect endangered species, even at the expense of some jobs."

Another question revealed that nearly three-quarters of the respondents believed a candidate's stand in protecting endangered species is an important reason to support a candidate. "Voters are concerned about the health of the planet, and they extend that concern to wildlife," says Lake. "In the end, voters want a healthy environment that can sustain natural resources and the economy, rather than a short-term view."

"The rhetoric of the Endangered Species Act leading to economic doom is not supported by evidence and voters know it," says Conservancy President John C. Sawhill. "On the contrary, the public recognizes that long-term economic health requires a healthy natural environment."

—William Stolzenburg

YOUR CHOP YOUR SIGNATURE

BY *AWAKE!* CORRESPONDENT IN TAIWAN

"AFFIX your chop here," says the clerk behind the counter in the busy Taipei, Taiwan, post office.

"Affix my chop?" I mutter in total puzzlement. "But excuse me, I am new here. I don't have a chop—whatever that is," I try to explain. "May I not just sign my name?"

"Yes, you may, but why not get a chop made?" responds the postal clerk. "Then you will not have any more trouble."

Wondering what a chop is and where its strange name comes from, I do some digging. From my dictionary I learn that a chop is a seal or an official stamp or its impression and that "chop" comes from the Hindi word *chāp,* meaning "stamp."

How to Acquire a Chop

First, I will need a Chinese name.* For a foreigner the name is often a transliteration of the sound of the name. For example, "John Smith" may become "Shih Mi Sse" or "Shih Yueh Han." Or I can get a Chinese friend to help me choose a name. He will probably choose one that he thinks fits me, but it may not sound anything like my real name.

The next step is to visit the shop of a chop carver. There I select a suitable piece of material from the wide variety available. Then the artisan carves the stylized characters of my Chinese name on my chop.

I am now equipped to do business or make a transaction at a post office, a bank, or other place of official business. For certain legal transactions, the imprint or impression of my chop must be registered at the Household Registry Office. If it is for a corporation, then it is registered at the courthouse.

* Although chops with names in other languages can be made, the beauty of the chop lies in the design of its Chinese script.

But I wonder how a clerk knows whether the chop is genuine. To find out and to see how chops are actually made, I pay a visit to Lin Rongdeh, a chop maker in the city of Kaohsiung, in southern Taiwan. According to Mr. Lin, many people believe that even chops with the same name carved by the same chop maker are never exactly the same. To check if a chop is genuine, an office clerk would fold the impression in half, usually diagonally, and lay it over the impression already on file. The two halves should match exactly.

"Nowadays, though," says Mr. Lin, pointing to a machine in his shop, "there are machines that can carve a chop with the help of a computer. Chops carved in this way could be identical."

"That is amazing!" I respond. "But how do you make a chop with a computer?"

"First, I typeset or draw on a small piece of semitransparent paper or plastic the characters of the name in a form suitable for a chop," explains Mr. Lin. "Then I place it on one rotating head of the machine, which reads the name by means of a laser beam. At the same time, I clamp the chop to be carved on a second rotating head, and a tiny router controlled by the laser beam carves the chop to form the characters I have drawn."

(OVER)

Clockwise: Vermilion imprint of a chop; chops with chain, all carved from one piece of jade; chop maker carving a design; chop inscribed with a poem

Chops: National Palace Museum, Taipei, Taiwan

As this method is quite inexpensive, usually each member of a family has a chop made. These are kept handy in the house to be used by anyone accepting registered mail or other items that would require a signature in Western lands.

Origin of the Chop

The first known use of a chop in China was in the year 1324 B.C.E. But not until the Chou dynasty (1122-256 B.C.E.) did they gain popularity. In those early times, rather than being used as a signature, they were carried, often at the girdle, to show rank or office or just to show that a person was honorable. It represented not so much the person as the position he held. The chop was, as it often is today, turned over to the next holder of the office on the retirement or death of the official. When a nobleman sought an audience with the emperor, he would present his jade chop to prove his identity.

Chop in the form of a turtle

When paper was invented, the chop gradually came to represent the signature. It came to be used more frequently even by ordinary people. Today, everyone here has a chop, even a foreign resident like me, and any transaction involving a person's signature can be completed only with the use of the chop. Although officially a written signature may also be used, for most people it is the chop that makes things legal. This practice has spread to most of the Orient, so that the Japanese and the Koreans also use a chop.

HAWAII
Tuesday, August 2, 1994 ■ Star-Bulletin •

Hawaii pigs out on 'academic pork'

■ Isle colleges, thanks to Inouye, get a big share of federal handouts

BY PETE PICHASKE
Phillips News Service

WASHINGTON — Colleges in Hawaii will get more federal money this year than schools in far more populated states, according to a study by a national education newspaper.

The analysis of so-called "academic pork" by the weekly Chronicle of Higher Education found that Hawaii was one of a handful of states that got far more federal money than would be expected based on their size.

While the study drew no conclusions, other observers — and other studies — agreed the lion's share of federal pork tends to go to states with high-ranking members of congressional appropriations committees. Hawaii's Sen. Daniel Inouye is chairman of the Senate Subcommittee on Defense Appropriations and widely regarded as one of the Senate's most powerful voices on spending matters.

"As with all pork, the states that have representatives in the right place and the right committee tend to bring home the biggest share of largess," said Sean Paige of Citizens Against Government Waste, which annually publishes a "pig book" of pork-barrel spending. "With Sen. Dan Inouye, Hawaii has someone in the right place."

The Chronicle reviewed all 13 federal appropriations bills and found a total of $651 million had been earmarked for specific projects at specific universities. These earmarks do not go through the usual competitive review process and have come under increasing fire in recent years as classic examples of pork-barrel spending.

Typically, the money is earmarked for research, studies or construction.

According to the study, Hawaii received $28.1 million in earmarks during the just-concluded appropriations process for next fiscal year. Some of the money is to be shared with other universities, but the figure is at least twice as high as that for far more populated states such as Alabama, Kansas, Maryland and Minnesota, among others.

Among the larger handouts headed for Hawaii were a couple set aside in Inouye's defense budget: $12 million for the University of Hawaii (to be shared with Georgetown University) for a medical-diagnostic imaging study and $5.4 million for UH for the Hawaii Small Business Development Center.

The state with the most academic pork was Pennsylvania, home to Inouye's powerful counterpart in the House, Rep. John P. Murtha, D-Pa., chairman of the House Defense Appropriations Subcommittee.

The treatment given such states as Pennsylvania and Hawaii did not surprise observers of congressional spending — including those at the Chronicle of Higher Education. It has studied academic pork since 1988, and according to Assistant Managing Editor Scott Jaschik, "Hawaii has always done well."

Barrel bucks

Among top research grants recently approved for projects across the state:

- **Medical diagnostic imaging:** $12 million from the U.S. Army to be shared with Georgetown University.
- **Business center:** $5.4 million from the Army, for the Hawaii Small Business Development Center.
- **Undersea research:** $3.4 million from National Oceanic and Atmospheric Administration.
- **Fish study:** $1.8 million from NOAA for the Joint Institute for Marine and Atmospheric Research to study tuna and billfish management.
- **Medical training:** $1.5 million from the Department of Health and Human Services for training medical officers.
- **Minerals:** $1 million, shared with the University of Mississippi, from the Bureau of Mines for a center on marine minerals technology.
- **Hawaiian monk seals:** $520,000 from NOAA for a study.
- **Serum cholesterol:** $425,000 from the Department of Defense for research.
- **Algae blooms:** $300,000 from NOAA for a study.

Dick Adair is on vacation.

What's best for dolphins?

Honolulu Advertiser 8/1/94 A8

ISLAND VOICES

Ken Le Vasseur
Environmental consultant, dolphin specialist

HAVING been involved in dolphin captivity issues for many years, including recent years as a consultant to Mainland individuals and organizations on captivity issues, I must praise the courage of The Advertiser in addressing questions about dolphin captivity ("Better off captive, or released?" July 4; "Stand-off in dolphin debate," July 5; "Let public appreciate dolphins," Letters, July 17).

It is unfortunate that many of those supporting dolphin captivity choose to misrepresent the points and positions of their challengers. Such strategies serve no one.

Few organizations and individuals seek to stop close human-dolphin interaction. Almost no one trying to protect dolphins seeks to stop research, as long as it is done responsibly. But responsible dolphin research looks out for the best interests of dolphins as subjects of the research.

Currently, Hawaii researchers and dolphin facilities lag behind Sugarloaf Dolphin Sanctuary in their pro-dolphin approaches to solving captivity problems. I have been to Florida and been given a tour of the Sugarloaf Dolphin Sanctuary by Lloyd Good III.

Sugarloaf Dolphin Sanctuary simply wants to retire or release old or surplus dolphins, respectively, from captive enterprises, keeping the dolphins' best interests at heart.

GOOD MAKES the point, and he is correct, that the captivity of dolphins is a fad nearing its end. But those on all sides of the issue need to determine what is best for the dolphins and humans in these newly defined close human-dolphin interactions.

It is encouraging that the Navy is now cooperating in the release of surplus dolphins, even though its prime civilian contractor (SeaCo) still adamantly opposes releases because of its close ties to sectors of the captive dolphin industry.

Much of the Hawaii research on captive dolphins has not been in the best interest of dolphins. Work has either been for national security or captive-dolphin interests. Even Dr. Louis Herman's research at Kewalo Basin is no longer intended to benefit the dolphins, otherwise he would have revived his acoustic (whistled) communication research as his peers consistently recommend.

Rick O'Barry, Rick Trout and many others cited in articles about the captivity issues (the so-called radicals) support the concept that not all dolphins are candidates for release into the wild.

ALTHOUGH SOME research is considered as a rational excuse for the continued captivity of some dolphins by these and other activists, most pro-release positions support the "third phase" form of close human-dolphin interaction. The third-phase format includes the annual or daily opportunity for dolphins to leave close human-dolphin interaction and human control.

Freedom!

A third-phase dolphin facility also allows the public to closely associate with dolphins and uses human whistled language to communicate with them. Any arguments against this position are anti-science and anti-research — simply because the approach has not been adequately tested.

Ingrid Kang Shallenberger once told me that Sea Life Park was designed with Makai Range Pier in mind as a third-phase type release site. Even one of Dr. Herman's corporate brochures speaks of release programs.

Half the dolphins in captivity in North America die every seven years. Most dolphins do not reach puberty until they are past 7 years old. Keeping dolphins in a situation where half of them die every seven years educates the public that it is OK that 500,000 to 1 million wild dolphins die each year at human hands because we are studying it.

1989 File photo

A dolphin trainer interacts with a female dolphin, Akeakamai, at the Kewalo Basin Marine Mammal Laboratory.

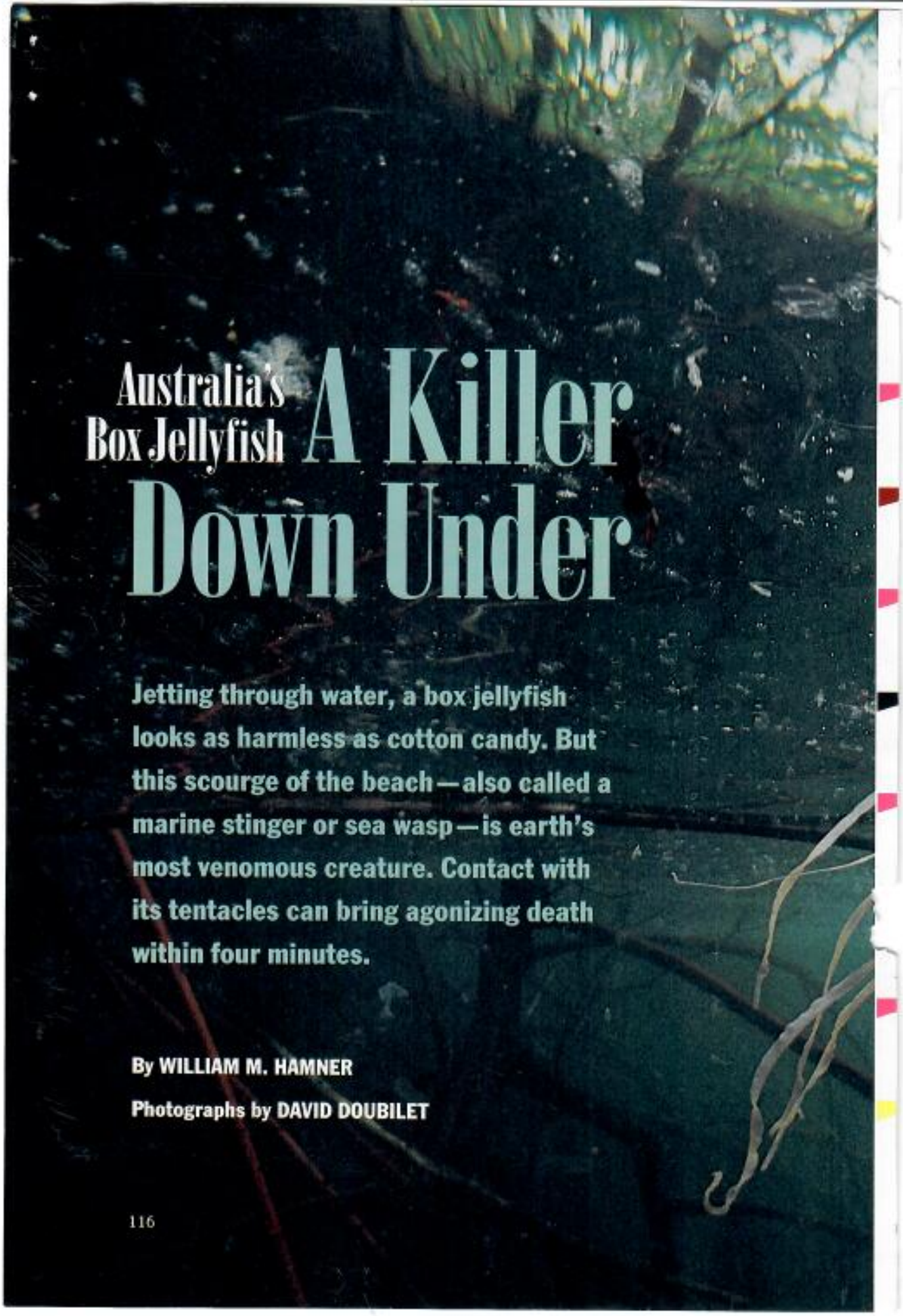
Paranoid attacks against "radicals" who do not exist will not help solve the predicament humanity faces in its treatment of the fellow inhabitants of this planet. We all need to learn to work together for a better life and planet.

□

Editor's note: Ken Le Vasseur and another man made headlines when, as co-workers at the University of Hawaii marine mammal research laboratory at Kewalo Basin in 1977, they took two female dolphins and released them into the ocean. They said they were liberating the dolphins, highly intelligent creatures, from inhumane captive conditions. Both were convicted of first-degree theft and served sentences.

□

Island Voices welcomes community commentary. Send to: Island Voices, The Honolulu Advertiser, P.O Box 3110, Honolulu 96802 (Fax: 525-8037).



Australia's Box Jellyfish A Killer Down Under

Jetting through water, a box jellyfish looks as harmless as cotton candy. But this scourge of the beach—also called a marine stinger or sea wasp—is earth's most venomous creature. Contact with its tentacles can bring agonizing death within four minutes.

By WILLIAM M. HAMNER

Photographs by DAVID DOUBILET

SHIMMERING IN THE GLOW of flood lamps along the pier, two large ghostly shapes undulated just beneath the surface of the dark sea. Webs of long, almost invisibly thin tentacles swept out behind their box-shaped translucent bodies. We had spotted our quarry: *Chironex fleckeri,* the infamous box jellyfish found in the near-shore waters of Australia and southeastern Asia.

Difficult to see, these cubic phantoms have long cast a dreadful shadow over the sun-drenched beauty of the north Australian coast. Known also as marine stingers or sea wasps, box jellies have killed at least 65 people in the past century.

"*Chironex fleckeri* is without question the most venomous animal on earth," says physician Peter Fenner, marine stinger officer for the Surf Life Saving association of Queensland. "No other animal's venom can kill a human in four minutes or less." Australia's most dangerous snake, the taipan, has enough venom to kill 30 adults, but its bite is not very painful, and it can take several hours for an untreated victim to die. A large box jellyfish, however, has enough venom to kill 60 adults, and the pain of its sting is instant and unbearable. Breathing may quickly become distressed as venom is absorbed into the circulatory and lymphatic systems; in some cases, the heart's pumping slows or stops almost immediately.

I knew *Chironex* were dangerous back in 1977 when my wife and research assistant, Peggy, and I were working as marine biologists at the newly founded Australian Institute of Marine Science in Townsville. Intrigued by box jellies, we collected several juveniles with nets and placed them in an aquarium. We put small live shrimp into the tank for them to eat, but they ignored the prey.

We then tried feeding them by hand—using rubber gloves, of course. Only one, whom we named Charlie, would eat the prawns we placed in its mouth. The other jellies died, while Charlie doubled in size within a month. Charlie died two months later when the aquarium sprang a leak, but the scientific literature indicated that we had accomplished something unique: No one had ever kept a *Chironex* alive in the lab before.

Peggy and I decided to try capturing full-grown *Chironex.* We knew that big jellyfish gathered at night beneath the institute's pier to feed on plankton and small fish attracted to the lights. We also knew catching them would be tricky. The monsters we were after might have a bell, or body, as big as a basketball, only square, and 60 tentacles, each 15 feet long.

With colleague Martin Jones we loaded 55-gallon plastic buckets onto a truck. Wearing long pants, long-sleeved shirts, and gloves taped at the wrists

Close encounters are made safe by a clear plastic carousel of circulating seawater, which the author, at right, helped develop to approximate natural conditions. Martin Jones, director of the Great Barrier Reef Aquarium in Townsville, Queensland, and Peggy Hamner observe as minute shrimp ride the artificial current to end as dinner for a pair of young jellies.

Biologist WILLIAM M. HAMNER heads the Marine Science Center at the University of California, Los Angeles. This is underwater specialist DAVID DOUBILET's 37th article for NATIONAL GEOGRAPHIC.

Australia's Box Jellyfish

over our sleeves, we looked like toxic-waste handlers.

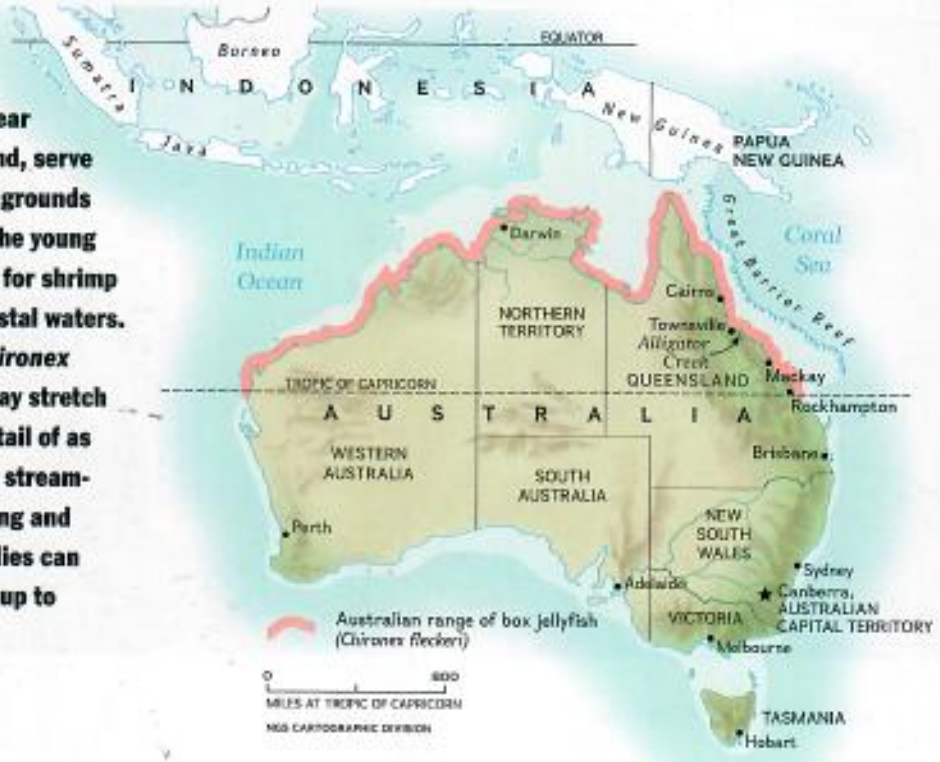
Looking down from the pier, we saw two large *Chironex*. We watched, fascinated, as they maneuvered in and out of shadows, never touching the oyster-encrusted pilings that could easily tear their delicate tissue.

We used long-handled nets to prod them into the buckets, which we then lifted onto the dock. By then I had overheated, and I took off my shirt. While we were hoisting the buckets onto the truck, a breeze caught a single tentacle still dangling outside one of the buckets. It gently blew the tentacle against the inside of my upper arm.

I felt as if I had been branded by red-hot steel. My first instinct was to claw at my skin, but I knew that dropping the bucket would be too dangerous. Wincing with pain, I managed to help lift the bucket onto the truck. Then I examined the damage: a fiery welt, braided with the characteristic bands of the box jelly's tentacle.

I was lucky. Only about an inch of tentacle had stuck to my arm. It takes ten feet or more to deliver a fatal dose of box jelly venom. An inch was enough for me. A hundred times that level of pain was unimaginable.

IN RETROSPECT our night at the pier seems to have been worth the price of a painful sting: Before leaving Australia, we were able to advise two newly arrived researchers at



Sinuous waterways near Townsville, Queensland, serve as summer spawning grounds for adults. In spring the young head seaward to troll for shrimp and other prey in coastal waters. When fully grown, *Chironex fleckeri* (opposite) may stretch 15 feet with a comet tail of as many as 60 tentacles streaming from its bell. Strong and nimble swimmers, jellies can zip along in bursts of up to five feet per second.

James Cook University of North Queensland, Robert Hartwick and Masashi Yamaguchi, how and where to capture adult *Chironex*. They then conducted pioneering studies of box jellyfish.

Yamaguchi and Hartwick wanted to document the life stages of *Chironex*. Other jellyfish begin life as mobile little balls of cells called planulae, which settle on rocks or other hard surfaces and transform into polyps—tiny organisms with a crown of tentacles. But in 1977 no one had ever seen either *Chironex* planulae or polyps. Yamaguchi and Hartwick didn't know what to look for.

However, the night we captured the adult *Chironex* we had noticed that the stress caused them to release their sperm and eggs into the water in the buckets. Yamaguchi and Hartwick theorized that if they mixed water from a bucket containing sperm with one containing eggs, they would get fertilized *Chironex* eggs. They might then learn what the planulae and polyps actually looked like.

The biologists soon had tanks, jars, and plastic dishes brimming with planulae. However, the organisms died soon after transforming into microscopic polyps.

"We knew that the planulae needed to attach to a hard surface," says Hartwick. "We offered them rock, mollusk shells, coral, and mangrove roots, but they rejected them all and died." Then Hartwick and Yamaguchi happened to look at the bottom of a plastic container in one tank. There, for reasons they still can't explain, polyps were thriving.

Now that the men knew what the juvenile forms of *Chironex* looked like, the next step was to find them in the wild. That proved laborious, because of their small size and because

Tortuous welts left by stings mark the trunk of a woman (below) and a girl's legs. Both survived, though they were scarred for life.

Box jellyfish are about 95 percent water—practically invisible in turbid coastal waters. During the summer, says emergency doctor John L. Holmes, "it is quite unsafe to swim in the ocean in tropical northern Australia"—something travel brochures do not stress. Swimmers are urged to use

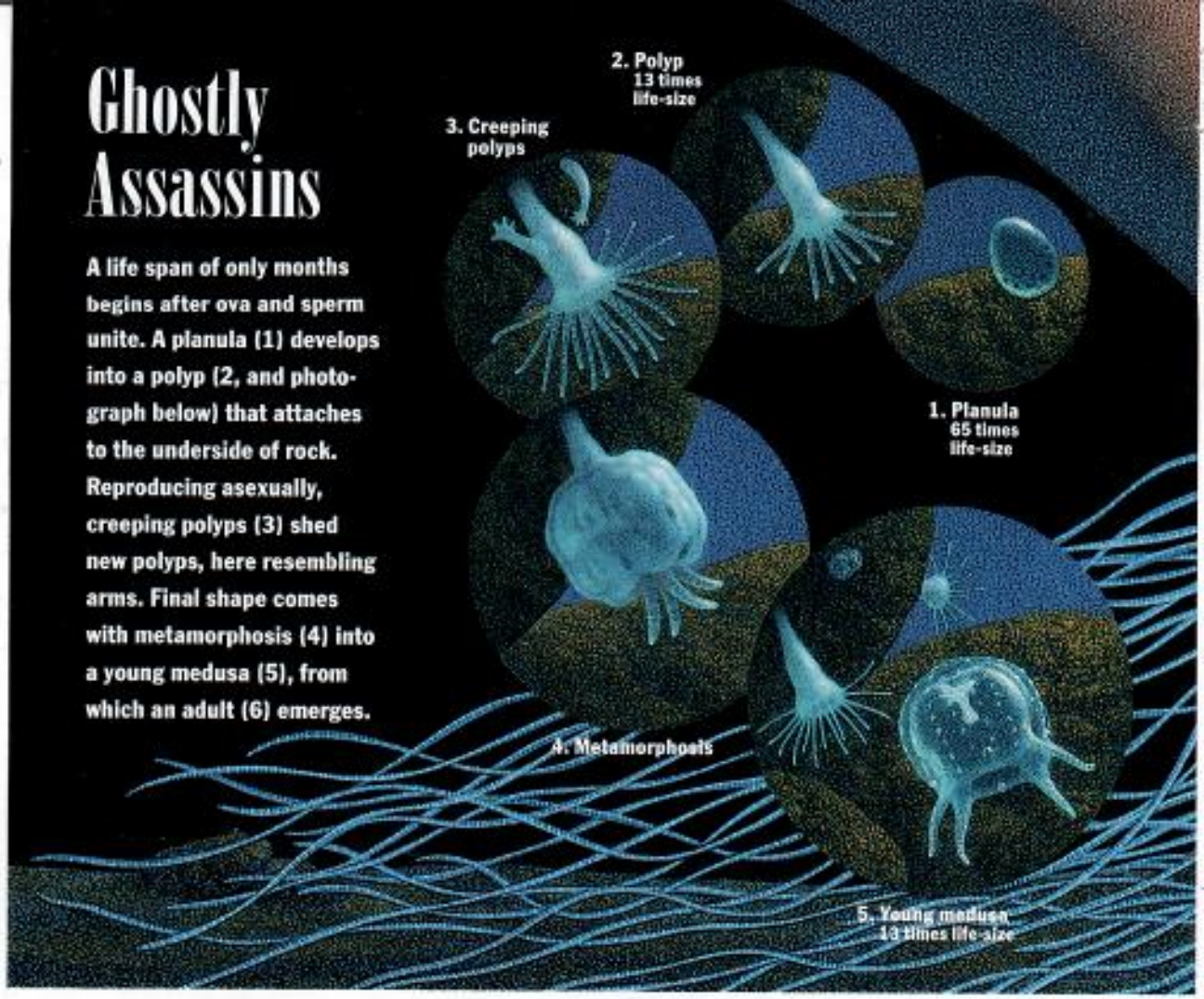
PETER FENNER (TOP); SURF LIFE SAVING QUEENSLAND (ABOVE)

only fenced "stinger resistant" areas and to wear protective clothing such as full-body Lycra suits. In fact, fabric as sheer as panty hose shields the skin.

A Cairns newspaper reported on a swimmer who paid a steep price for going outside an enclosure: stings on his neck, chest, and back and two nights in the hospital. Stingers have killed at least 65 people over the past century. An antivenom developed in 1970 is credited with saving lives.

Ghostly Assassins

A life span of only months begins after ova and sperm unite. A planula (1) develops into a polyp (2, and photograph below) that attaches to the underside of rock. Reproducing asexually, creeping polyps (3) shed new polyps, here resembling arms. Final shape comes with metamorphosis (4) into a young medusa (5), from which an adult (6) emerges.



no one knew where breeding occurred. Since *Chironex* medusae appear only in the Australian summer, some biologists thought they migrated south from New Guinea. However, Hartwick suspected they might spawn between the mainland and the Great Barrier Reef, some 40 miles offshore.

"We went out month after month collecting plankton," he says, "sifting through millions of cubic meters of seawater." They found that the youngest and smallest medusae were closest to the mainland, indicating that spawning grounds were nearby.

Later, Hartwick found small *Chironex* medusae three or four miles into such estuaries and streams as Alligator Creek. In

ROBERT F. HARTWICK; MAGNIFIED 22 TIMES

1980 he began collecting rocks, mollusk shells, and pieces of mangrove roots to examine for polyps under a microscope. For six years he searched in vain.

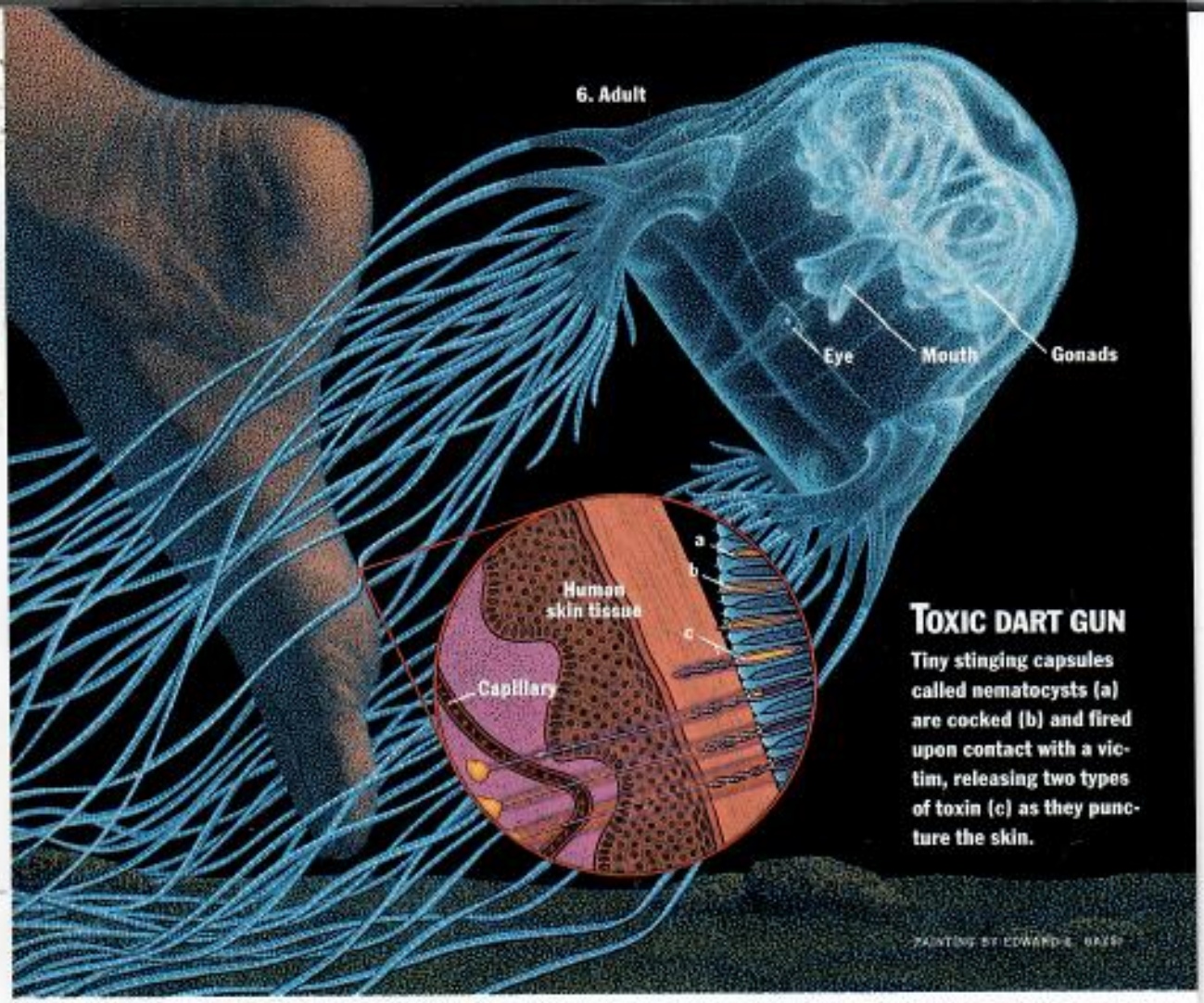
"We looked at thousands of rocks from 14 rivers," says Hartwick, "sometimes taking as long as four hours to carefully examine a four-inch rock. The rocks were typically covered with a dense growth of vegetation and tiny animals. It was like searching for one small shrub in a forest."

One day an assistant came into Hartwick's office, eyes gleaming. "Come take a look," he said.

There, on a rock, Hartwick saw polyps that looked just like *Chironex*.

"I tried not to get too excited," recalls Hartwick. "Polyps often look alike. We had to see what these grew into."

Over the next 12 days, the typical time for box jelly metamorphosis, Hartwick and his team watched eagerly as each



TOXIC DART GUN

Tiny stinging capsules called nematocysts (a) are cocked (b) and fired upon contact with a victim, releasing two types of toxin (c) as they puncture the skin.

PAINTING BY EDWARD R. HAYES

step from polyp to medusa matched what they expected. Finally, the medusae emerged, and they were unquestionably tiny box jellies.

THANKS TO Hartwick and Yamaguchi's work, we can now describe the entire life cycle of the box jelly. Adults aggregate in river mouths and estuaries in late summer to spawn and then die. The resulting planulae settle onto the bottom, where in the

Puffs of venom erupt from wispy nematocysts triggered by alcohol in a laboratory. Contracting like a coil, a tentacle gains purchase on a hapless shrimp.

Australia's Box Jellyfish

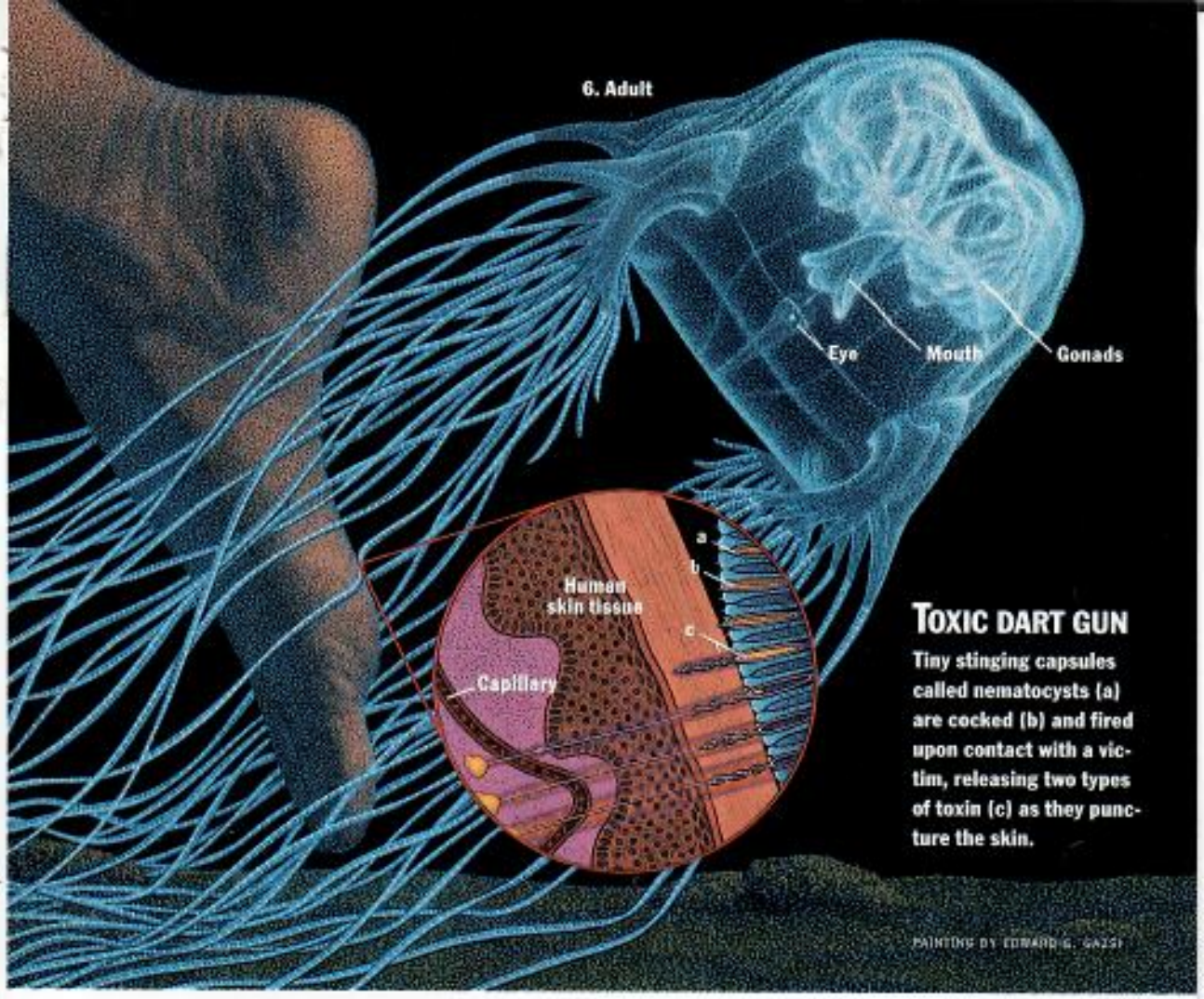
Eerie as a movie monster, a marine stinger peers through one of its four eye groups, at center. Eye groups serve each quadrant of the creature's box-shaped bell, which inspired the species' most common name.

Magnification (right)

DAVID DOUBILET AND ZOLI FLORIAN; NO S

shows a lens and cornea. But researchers have yet to fathom how the creature can see without a brain.

However they sense their prey, box jellyfish do not attack. Fragile and gelatinous, they wait until something blunders into them.



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Australia's Box Jellyfish

fall they transform into polyps and colonize the undersides of stones, creeping along to find a suitable spot to anchor. During this time, new polyps may sprout from existing polyps. In the spring the polyps become little medusae, migrating seaward before monsoon rains set in. At sea they feed on prawns and fish, but their favorite food is a small shrimp that schools close to shore—along the same sandy beaches that Australians find so attractive in the summer.

And therein lies the problem. *Chironex* do not intentionally sting humans, of course, but simply react when their tentacles are brushed. Jellyfish tentacles have specialized stinger capsules called nematocysts, each of which has a mechanical trigger. To fire, however, the nematocysts must be stimulated chemically. That stimulation comes from chemicals found on the surface of fish, shellfish, and, unfortunately, humans.

The slowly pulsing translucent bells are hard enough to see as the medusae troll for prey in northern Australia's murky coastal waters; their tentacles are even harder to see. Fifteen feet long and only a quarter inch thick, they stream behind the bell like invisible fishing lines. In fact, not until 1956 was the species *Chironex fleckeri* actually described and identified as the creature that inflicted such agony. Stories abounded of swimmers running from the water screaming, tearing at lesions on their skin but never having seen their assailant.

Fortunately for tourism, box jellies do not live on the Great Barrier Reef, where about a million visitors swim throughout the year. Nor do box jellies haunt the beaches of Australia's Gold or Sunshine Coasts near Brisbane. But summer beachgoers have had to adjust their behavior to the presence of the lethal jellyfish along the shores north of the Tropic of Capricorn, which passes near the city of Rockhampton in the northeastern state of Queensland.

When people do bathe along vulnerable beaches, they should either swim in safely netted areas or wear protective clothing. Entrants in surfing competitions have been known to wear two pairs of panty hose—one covering their legs, and the other upside down, with the wearer's arms thrust through the pantyhose legs and the head poking through a hole in the seat.

How can the ultrathin pantyhose fabric protect against such potent venom? The stinger capsules are too short to puncture skin covered by the hose. That's fortunate, because although each nematocyst injects only a microdrop of venom, a single tentacle contains millions of the deadly capsules.

"That's one reason why *Chironex* stings can be so difficult to treat," explained marine stinger officer Peter Fenner. "Snakes and spiders generally bite only once, in a single spot, but box jelly venom enters a victim over a large area. Fortunately we now have an antivenom."

The antivenom was developed 24 years ago by scientists at Australia's Commonwealth Serum Laboratories, who injected sheep with nonfatal doses of venom. The sheep then produced antibodies that can be used to manufacture antivenom. Medical personnel in coastal regions of the Northern Territory and northern Queensland carry the antivenom.

"It can be very effective," said Fenner of the antivenom, which is either injected into muscles or administered intravenously. "Normal breathing often begins almost immediately, and pain relief usually occurs within minutes. Later scarring is frequently reduced."

I met Fenner in the Queensland town of Mackay in 1993, after Peggy and I got the chance to go back to Australia to resume research on box jellies. She and I had talked many times of returning to study these animals. Then one day the phone rang. Our former colleague Martin Jones, director of the Great Barrier Reef Aquarium in Townsville, had an irresistible offer. He had managed to keep a box jelly alive for nine months in an exhibit. It had died, but he had procured funds through James Cook University and two local Lions Clubs for a *Chironex* research program. Could we come down and help start the project?

WE WERE EAGER to investigate and photograph the predatory and feeding behavior of *Chironex* medusae, but we faced serious problems. The animals appear and disappear unpredictably in the water. Studying them in nature would be impractical. Moreover, as we'd learned, most box jellies won't eat in captivity.

However, I had recently helped develop a new type of aquarium, called a planktonkreisel—from the German for plankton carousel—for the Monterey Bay Aquarium in California. The planktonkreisel rotates water in a way that prevents jellyfish from becoming trapped in corners or stuck on the drains. The Monterey aquarium's planktonkreisels are spectacularly successful; its jellyfish thrive. The aquarium's curators adapted their blueprints for us, and when we arrived in Townsville, a new planktonkreisel was ready.

We captured several box jellies and placed them in the new aquarium. Immediately they began to swim in the circular current with their tentacles

Lethal lasso snags a banana prawn and draws the meal mouthward. The victim's carapace was instantly punctured by the jelly's stinger capsules, unleashing a multipronged arsenal of toxins that attack breathing and blood cells.

stretched out behind them—something we had never seen in still-water tanks.

We put live shrimp in the tank, and one of the *Chironex*'s tentacles soon touched a spiny banana prawn, which died instantly. Entangled in tentacles, the shrimp was reeled in close to the box jelly's pedalium, a feeding appendage that lifted the shrimp up to the medusa's reaching mouth. We had at last managed to create an environment in which box jellies would demonstrate how they earned a living.

We quickly appreciated why *Chironex* needs to be so lethal. Prey such as banana prawns are covered with sharp spines. If the prawn were eaten alive, just one flip of its powerful tail would tear the jelly's delicate tissue to pieces. Far better to kill quickly.

One aspect of *Chironex* behavior caught Peggy's attention. She realized that jellyfish in a large holding tank swam away from her when the room lights were bright and she wore dark clothes. "I have a strange feeling these jellies see me coming and deliberately get out of the way," she told me.

Such behavior in an animal as simple as a jellyfish was certainly unlikely. It's true that box jellyfish have structures that greatly resemble the eyes of vertebrates; could their nervous system be complex enough, we wondered, to process visual information?

Convinced that the box jellies were somehow seeing her, Peggy sealed off the aquarium room so that no light penetrated from the outside. Then she and Martin began a series of experiments in which she presented the jellies with various targets, painted black to contrast with the white wall of the tank. Each time she displayed the targets, the jellyfish turned away. Even a small target half an inch wide was enough to send them pulsing in the opposite direction.

Peggy's careful experiments demonstrated that box jellies can see very well. No one has any idea yet how they do it.

DURING ONE of our last days in Queensland in 1993 the watchman at the Australian Institute of Marine Science called to report that he'd spotted four box jellies beneath the same pier where the dangling tentacle had stung me

in 1977. We donned our protective suits, loaded the truck with buckets, and drove out at dusk. Almost as soon as we began to search the waters, a shark glided into view among the pilings. We decided not to wade in to catch our quarry.

Soon three large green turtles, each nearly three feet long, appeared, slowly swimming back and forth in the pools of light shining from the pier. Something about the way those turtles cruised through the water made me wonder if they might be looking for jellyfish.

I didn't wonder long. From the darkness came a box jelly the size of a grapefruit, languidly pulsing toward the pier. We watched it dodge the dangerous pilings. This once perplexing behavior now excited us, since Peggy and Martin had proved that *Chironex* can easily see objects the size of pilings.

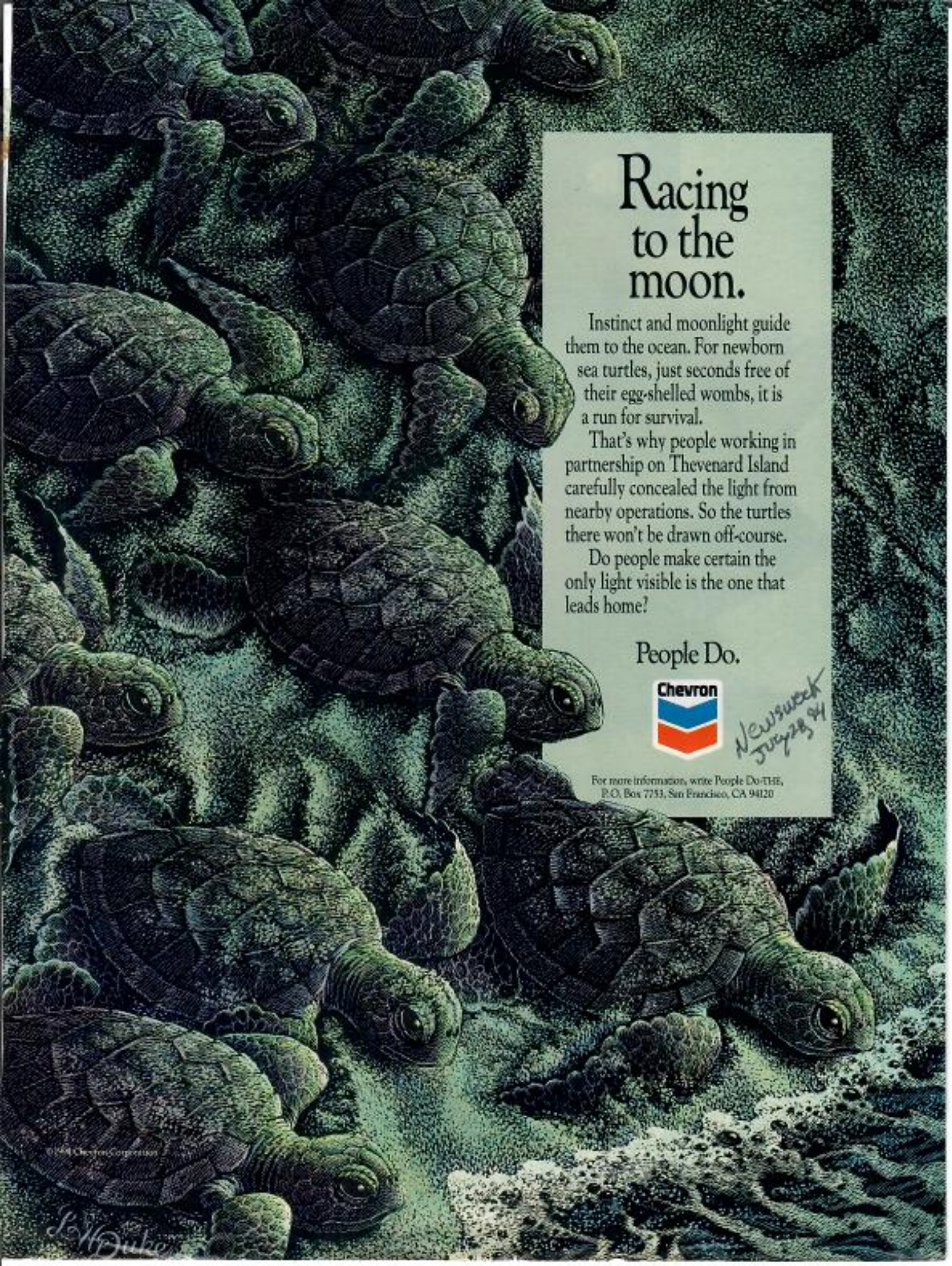
Then, as I prepared to lower my net, out from beneath the pier came the three turtles. The box jelly didn't have a chance. The fastest of the turtles chased it down and consumed it in two quick bites.

The sight was startling. This creature that can kill in an instant was being casually dined on, tentacles and all, by an enemy obviously immune to its defenses. During the next hour two more box jellies appeared. The turtles finished each one off before we could even pick up our nets.

How did the sea turtles do it? No one knows exactly. Perhaps there is some protection afforded by the lining of their digestive system—which may also be what allows them to eat glass sponges with ease. Sea turtles have been found with as much as a pound of the sponges' sharp siliceous spicules in their digestive systems. There may be another explanation, one that science has not yet found.

But now it was time to pack our gear and go home. I lingered for a moment, hoping to catch a last glimpse of a box jelly and marveling at how much we had learned about *Chironex* since the days of feeding Charlie by hand 17 years earlier. Yet we had just discovered that this most venomous of creatures faces its own vulnerabilities. Once again, as it has so often, the unseen life beneath the dark sea had enlightened us in an unexpected way. □

Cast-iron gut may help the hawksbill turtle snack with impunity. Still, the box jelly's stinging capsules are, says biologist Robert Hartwick, "perhaps the most compact, complex, and effective weapons developed by any animal other than man."


Racing to the moon.
Instinct and moonlight guide them to the ocean. For newborn sea turtles, just seconds free of their egg-shelled wombs, it is a run for survival.
That's why people working in partnership on Thevenard Island carefully concealed the light from nearby operations. So the turtles there won't be drawn off-course.
Do people make certain the only light visible is the one that leads home?
People Do.
Chevron
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> *"The act has not been a success in Hawaii.... The terms of the new act will really determine the fate of all endangered species in America."*
>
> **Fred Madiener,** Life of the Land

Advocates: Renew species law

☐ The federal protection act is being reviewed

HSB A3 12/29/93

■ Monk seal birth drop causes concern **A-4**

By Peter Wagner
Star-Bulletin

Native species in Hawaii are far from safe under current terms of the Endangered Species Act, conservationists say.

But things would be far worse without the 20-year-old law, aimed at saving what's left of wildlife and habitat.

"We've gotten to the point where things like monk seals and turtles mean something to people," said Michael Wilson, president of Save Sandy Beach Coalition.

Wilson was among a group of leading environmentalists who gathered at the Bishop Museum yesterday to urge renewal of the federal species law.

The Endangered Species Act, first passed in 1973, is under debate in the nation's capital as Congress considers reauthorizing the law. While some see the law as a threat to development and economic interests, others want it strengthened.

Also on hand yesterday were representatives of the Sierra Club, Life of the Land, Hawaii Audubon Society, Hawaii Green Party, Hawaii Conservation Council, and U.S. Public Interest Research Group.

"The Endangered Species Act has allowed us to get active in saving species," said Stan Michaels, of Hawaii Audubon.

"We urge reauthorization, but also with more funding," he said.

Fred Madiener of Life of the Land said development continues to claim sensitive habitat, despite the presence of endangered species.

"The act has not been a success in Hawaii, but things would have been worse without it," he said. "The terms of the new act will really determine the fate of all endangered species in America."

The U.S. Fish and Wildlife Service has yet to develop recovery plans for 40 percent of the 700 species on the federal endangered species list. And just five endangered species in Hawaii enjoy the benefit of "critical habitat," an added layer of protection intended for all listed species.

Conservationists say about 3,000 endangered species have yet to make it the list.

The Sierra Club and U.S. Public Interest Research Group in recent weeks have joined in a membership drive on Oahu that added nearly 1,000 new members to the Sierra Club. The groups point to the successful drive as a measure of concern for nature among Hawaii residents.

Drop in monk seal births raises concerns

By Peter Wagner
Star-Bulletin

A4 12/28/93 HSB

Federal wildlife officials are concerned about a drop in the birth rate of Hawaiian monk seals at French Frigate Shoal, a foremost breeding ground for the endangered native mammal in the remote Northwestern Hawaiian Islands.

According to the National Marine Fisheries Service, a falling birth rate and a high mortality rate among newborn seals has been noted since 1990 — a reversal of an earlier increase in the island's seal population.

The findings suggest the atolls have reached their carrying capacity as seals — one of two mammals native to Hawaii — struggle for food. The other mammal, the hoary bat, is also endangered.

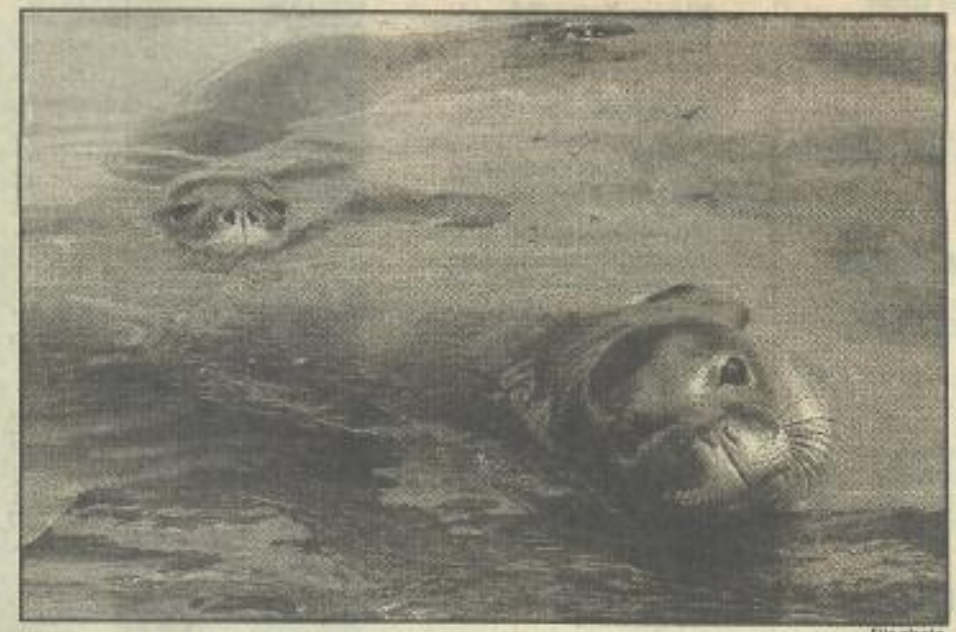
The cause of the problem, an apparent reduction in fish and other sources of food for seals, is under study.

Officials recently developed a management plan focusing on French Frigate Shoal calling for close monitoring of the situation and possible relocation of young seals to better habitat in the Northwestern chain.

According to federal biologists, seal populations increased during the 1960s but dropped suddenly in 1990 at all breeding islands.

But while the birth rate rebounded at other islands in the following year, numbers at French Frigate Shoals continue to decline.

Meanwhile, populations of the green sea turtle — another native marine animal on the endangered species list — continue to increase.



File photo

Birth rates for Hawaiian Monk Seals are dropping, worrying federal wildlife officials.

New estimates show a threefold increase in sea turtles in the past 20 years.

Federal wildlife officials credit the comeback to protection under the 20-year-old Endangered Species Act, which bans the taking of turtles, seals and other listed animals.

Officials say some turtles continue to be killed accidentally in nets or other fishing gear, but that the upward population trend prevails.

The seal and turtle are among hundreds of endangered plants and animals in Hawaii, noted for a high rate of extinction because of development and other human activities.

With less than 0.2 percent of the total land area in the United States, Hawaii accounts for 75 percent of the nation's known plant and bird extinctions, scientists say.

Now under close scrutiny in the nation's capitol, the Endangered Species Act is up for reauthorization. Conservationists say it needs strengthening, while others say it hurts the economy.

THE Honolulu Advertiser 2/21/94 A5

Boat full of Haitians capsizes off Bahamas

By Raju Chebium
Associated Press

MIAMI — A boat carrying 20 to 40 would-be Haitian refugees to Florida capsized in shark-infested waters off the Bahamas yesterday. At least five people died, authorities said.

Only three people were known to have reached the safety of a beach off Green Turtle Cay, northeast of Great Abaco Island, said duty officer Rhonda Whaton of the Bahamas Air-Sea Rescue, a voluntary organization.

"It's very gruesome," she said. "Unfortunately, there are sharks very active in the area."

The known dead were a woman and four children, Whaton said.

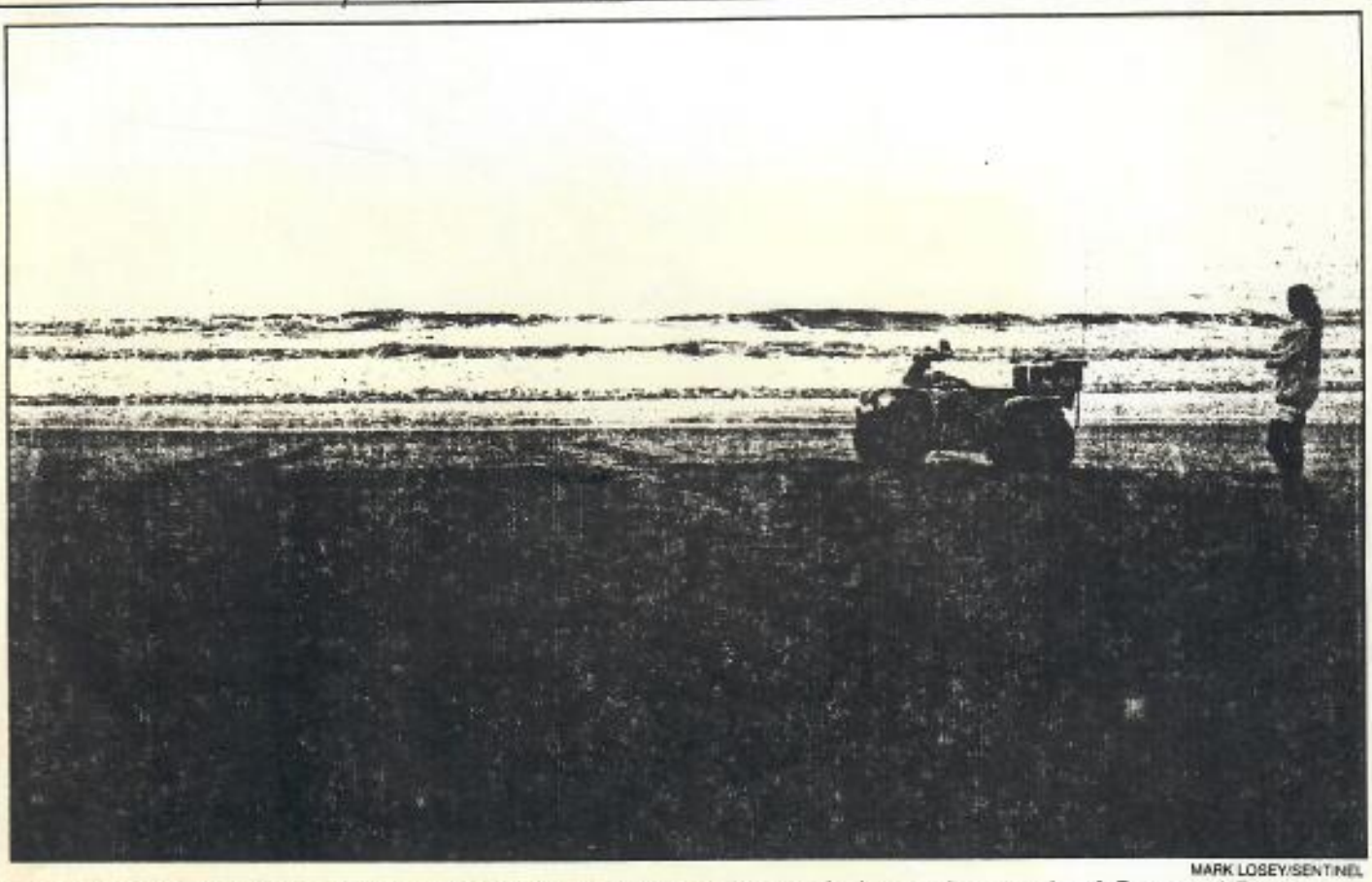
She could not confirm whether anyone was bitten by sharks.

The 23-foot boat capsized during the night and was spotted about midday by an American sailing vessel, she said.

It was found about three miles offshore.

A Coast Guard helicopter and three Bahamian boats searched until late yesterday without finding any more survivors, said Coast Guard Petty Officer Alex Worden in Miami.

7/25/94 The ORLANDO Sentinel



MARK LOSEY/SENTINEL

Beth Libert of the Volusia Turtle Patrol examines tracks made by turtles north of Ormond Beach.

Beachgoers fight restricted hours

☐ Volusia shortened the hours for beach driving to make the shore safer for nesting sea turtles and their hatchlings.

By Cory Lancaster

OF THE SENTINEL STAFF

DAYTONA BEACH — Beach driving restrictions aimed at protecting sea turtle hatchlings have some beachside residents and business people complaining that their rights are being violated.

Volusia County restricted the hours for beach driving this month — from 8 a.m. to 7 p.m. — to make the beach safer for nesting sea turtles and their hatchlings. The reduction, the second since nesting season began in May, means visitors have four fewer hours to drive on that beach than they had last summer.

A group of beachside residents is suing to overturn the restrictions. The residents say county rules guarantee beach access to vehicles from one hour before sunrise to one hour after sunset.

Beach concessionaires say the shortened hours

Please see **TURTLES, A-5**

MARK LOSEY/SENTINEL

Libert checks a nest high in the vegetation of a dune due to release its hatchlings. She fears the turtles will head to the lights of the road.

Shorter hours hurt business

TURTLES from A-1

hurt business. And some local officials complain that sea turtle activists, not the county beach department, are running the beach.

Like the clash between manatees and boaters, this for many is a fight between the environment and lifestyle.

"It's gotten to such a frustrating level," said Sue Burns, president of the Volusia County Beach Concessionaires Association. "What I think is unfortunate is the way this has turned people against the turtle patrols. It's become them vs. us. It shouldn't be that way."

Turtle activists scout the beach at dawn every day, marking new nests and moving ones that could be destroyed by cars or high tides. They requested the new driving restrictions so they could have more time for surveys in the morning and the hatchlings would be protected in the evening when they begin to emerge from nests and crawl to the ocean.

Some officials think the request should have been denied.

"I'm sick and tired of tree-huggers and Bambi-ites," George Locke, a member of the Beach Trust Commission, a county advisory board on beach issues, said at a recent meeting. "We need to have that beach open. We've got an economy we've got to take care of here."

Later he added, "I like turtles. I used to eat them before they were protected."

Sea turtle nesting in Volusia

	Daytona Beach area	New Smyrna Beach area
*1994	186	210
1993	144	195

*Nests as of July 22

Note: The Daytona Beach area includes 25 miles from northern Ormond Beach to Ponce de Leon Inlet. The New Smyrna Beach area includes 10 miles from Ponce de Leon Inlet to Bethune Beach.

Source: Volusia Turtle Patrol and South Volusia Sea Turtle Protection Society.

MARK LOSEY/SENTINEL

The new hours keep concessionaires waiting to set up just before 8 a.m.

Another member, Arthur Byrnes, became so enraged that he stormed from the meeting. He returned and pounded the table, saying, "The turtle volunteers are not the people who run the beach. . . . Turtles live for 150 years. Turtles are not that darn dumb that we have to close the entire mileage of the beach to protect them."

Several Beach Trust members want the County Council to remove the driving restrictions. There may be other ways to protect sea turtles, they argued.

County Council members say that won't happen. In April, the U.S. Fish and Wildlife Service threatened to cite the county for violating the federal Endangered Species Act. The law prohibits anyone from harming loggerhead sea turtles, a threatened species that nests on county beaches at night.

Turtle volunteers provided evidence that cars were driving over hatchlings, smashing eggs and disrupting nesting turtles.

If the county didn't do something, the federal agency warned it might close the beach entirely to vehicles during nesting season from May 1 to Oct. 31, Volusia County Council Chairman Phil Giorno said.

"I don't think there's any way we can overcome this," Giorno said. "They told us we had to do more for turtle protection. There were several items we had to clean up our act on, and cars on the beach was one of them."

Sons of the Beach, a vocal group with a mailing list of 1,000 residents, said it thinks the new restrictions are a ruse. The group filed a court motion a week ago to force the county to allow cars on the beach from as early as 5:30 a.m. to as late as 9:30 p.m. in the summer, the hours listed in the county beach code. .

No court date has been set to hear the request.

"It's important for everyone to remember that the beach is a habitat and not just a recreation area," said Marye Marshall with the South Volusia Sea Turtle Protection Society in New Smyrna Beach. "The rate Florida is growing, we have to set precedents like this if we want to have any habitat left."

Beth Libert with the Volusia Turtle Patrol in the Daytona Beach area added, "People stop us every day on the beach and we haven't heard anything negative [about the driving hours]. I think a lot of this is hype about the inconvenience it's causing for the concessionaires and the Sons of the Beach."

Two beachgoers interviewed in Daytona Beach said they hadn't heard about the restrictions and didn't care. One woman said she supported the change.

"I like animals and I hate to see their habitat disturbed because of humans," said Jackie Parker, a visitor from Ocala. "It's just like the manatees. They're such gentle animals and people hit them with boats and don't even care."

Let Inouye head bake sale to pay for the costly B-2s

Your July 23 editorial "Spare the B-2 bomber" agrees with Sen. Daniel Inouye that it is sensible to spend $150 million next year to keep the B-2 plants open to preserve the option of building more B-2s in the future.

This apparently does not seem sensible to the Clinton administration or to the Defense Department, which did not ask for this $150 million. An amendment was proposed that would have shifted the $150 million from the B-2 to the Base Realignment and Closure fund, which is intended to help communities, including Hawaii, cope with base closings. Regrettably both Inouye and Sen. Daniel Akaka voted against the amendment.

If the Star-Bulletin is so keen to save the B-2, I suggest that it start a campaign and collect donations. Inouye could be the honorary chairman. Perhaps this campaign could have a stealth bake sale. None of the items could be cooked in microwave ovens.

In keeping with the character of the B-2, the baked goods would be priced the same as their equivalent weight in gold.

7/29/94 SB

MICHAEL JONES
Kaneohe

Canoe voyager pursues culture by destroying trees

In reading Greg Ambrose's story about Nainoa Thompson who plans to sail a traditional Polynesian canoe across the South Pacific ("Voyage home," Star-Bulletin, July 22), I was moved by Thompson's words about the crucial importance of environmental sustainability and how "the Earth is just a canoe in space."

I wonder if Thompson was feeling these same sentiments while he was searching the Big Island for the largest remaining koa tree in Hawaii — so he could cut it down for his adventure.

That Thompson did not find a koa big enough to suit his needs is alarming enough; that he was willing to take such a tree had he found one is a disgrace.

The planet suffers enough at the hands — and bulldozers — of those who care about nothing more than next quarter's earnings. But it is a sad day for the future of sustainability when someone with as noble a vision of the past and future as Thompson is willing to destroy one of the world's greatest and most precarious treasures, the last of the Hawaii's ancient koa, so he can re-create the experience of the past "to the max."

I think Thompson's idea of re-creating the Hawaiian past as authentically as possible is a beautiful concept with a huge amount of educational potential. But at what price authenticity?

Because of Thompson's project we are poorer one ancient spruce tree, and in comparison to this the project is a mere extravagance.

True sustainability requires that we sacrifice some things we want in order to preserve the things we really need. If Thompson cannot create canoes as authentic as he would like without destroying 400-year-old trees, he should face the fact that such canoes should simply not be built.

As spokespeople for preservation, Thompson and his sponsors, the Polynesian Voyaging Society and the Bishop Museum, should realize that the Hawaiian people are not the only native Hawaiians struggling for survival. So are the ancient koas.

WILLIAM J. WHITE

Sidewalk cyclists ought to sound a warning bell

Bicycling alert!

Councilman Andy Mirikitani in his View Point column July 22 gives excellent arguments for bike path plans for the future.

For the present, pedestrians have problems with teen-agers riding bikes on sidewalks without any warning of passing. While it may not be possible to keep bikes off sidewalks, the city could require all bikes to have warning bells as cyclists intend to pass pedestrians from behind. Safety first, Andy!

SCOTT D. HAMILTON JR.
Waikiki

Cartoon to the editor by Roy Chang, Honolulu

Star-Bulletin
Wednesday, June 15, 1994 □ A-7

Gray whale no longer endangered

Associated Press

WASHINGTON — The California gray whale, whose population has more than doubled in the last 60 years, was removed from the endangered species list today, the Commerce Department announced.

The whale, which has been on the list since its inception under the Endangered Species Act of 1973, becomes the first marine creature to be removed from its protections, according to officials of the National Oceanic and Atmospheric Administration.

NOAA first announced in November 1991 that it was proposing that the whale be stricken from the list.

"This is a great success story and a cause for celebration," Commerce Secretary Ronald Brown said in a statement.

He credited the Marine Mammal Protection Act and the Endangered Species Act with helping to bring the California gray whale back.

No.

Date

HAWAII
Tuesday, June 7, 1994 ■ Star-Bulletin ●

Kamakahonu Bay ceremony planned

The Ahu'ena Heiau at Kamakahonu Bay on the Big Island will be the site of a special ceremony at noon on Kamehameha Day, June 11.

The event is to highlight the historic and cultural significance of the ancient heiau, believed to date to the 15th century.

A hoolaulea featuring Hawaiian crafts, arts and food will be held from 9 a.m. to 4 p.m. at the grounds of nearby King Kamehameha Kona Beach Hotel.

Proceeds benefit the restoration of the heiau. For information on hoolaulea booths, call 329-2911, Ext. 145.

HSB 6/8/94 A5

Kewalo Basin lab head's legal woes end

By Greg Ambrose
Star-Bulletin

The legal troubles hanging over the head of Louis Herman, director of the Kewalo Basin Marine Mammal Laboratory, are finally over.

On May 25, Diana Josephson, deputy undersecretary for oceans and atmosphere, sided with a federal administrative law judge who last July dismissed all 17 counts filed against Herman in January 1992 by the National Marine Fisheries Service.

Now Herman can press ahead fully focused on finding a new home for the mammal laboratory, being evicted as Ala Moana Beach Park and Kewalo Basin Park are expanded.

The fisheries service and the National Ocean and Atmospheric Administration had charged Herman, who has been studying humpback whales in Hawaii waters since 1976, with harassing and failing to report harassing humpbacks, among other things, in violation of a federal permit to study humpbacks.

Louis Herman

Last July, administrative law judge Hugh Dolan "threw out all charges and admonished NOAA in the strongest terms anybody has come across," Herman said yesterday.

Dolan said last July, "The agency and its counsel violated the standards of common decency and elemental fairness in this case."

NOAA appealed Dolan's decision, and Herman's attorney, Tony Gill, replied to that appeal in August.

"We have been waiting all this time for the results," Herman said.

Josephson last month denied the agency's appeal. "It's a vindication for us and a slap in the face for NOAA and the fisheries service, who are trying very hard to go after researchers trying to understand whales," Herman said.

As a result of this case, the government has streamlined the permit process for studying humpback whales and has made it more responsive to researchers who need to find out about these whales, Herman said.

Ceremony at Big Isle's Ahu'ena Heiau

KAMAKAHONU BAY, Hawaii — Ahu'ena Heiau, where Kamehameha the Great died, will be the site of a *ho'omana'o* (remembrance) ceremony on Kamehameha Day, beginning at noon June 11.

The ceremony will involve several groups and individuals from the Hawaiian community. It will be narrated by Fanny Collins Au Hoy, Hulihe'e Palace curator and pa'u queen for this year's Kamehameha Day Parade in Kailua-Kona.

In conjunction with the ceremony, a *ho'olaule'a* featuring Hawaiian arts, crafts, entertainment and food is planned for 9 a.m.-4 p.m. at King Kamehameha's Kona Beach Hotel.

The heiau dates to the 15th century and was restored and rededicated by Kamehameha I. It also is the site of the breaking of the kapu system in 1819 and was the site where the first Christian missionaries received permission to remain in the islands.

THE NATION

Another cougar killed in a Calif. park

SAN DIEGO — A mountain lion was shot and killed a day after it crouched and bared its claws near a 3-year-old boy camping with his family in a state park, officials said today.

The adult female cougar was shot yesterday, the same day another mountain lion attacked and mauled a boy walking to school on the west coast of Vancouver Island in British Columbia, Canada. Kyle Mussleman, 7, remains in serious condition in a Vancouver hospital with head and neck wounds.

Two weeks ago a cougar was killed after attacking a jogger in the northern California town of Cool. Lt. Robert Turner of the California Department of Fish and Game said the latest incident occurred about 45 miles east of San Diego in the Cuyamaca Rancho State Park.

Ceremony at Big Isle's Ahu'ena Heiau

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THE NATION

Associated Press

In recovery: Heather Boswell recovers from a shark attack at a Seattle hospital. Boswell was swimming off the coast of Chile when the attack occurred on March 23. She lost most of her leg in the attack.

Hilo Tribune Herald Apr 14 63 p3

Shark Attacks On Swimmers Rare In Waters Of Big Isle

Clevis Aka of Hilo, who was bitten by a shark last Wednesday while surfing behind the Keaukaha Hawaiian Village, was the second swimmer to be bitten in waters off the Big Island since the 1880's and the third 15-year-old to be attacked by sharks in the Hawaiian Islands.

Clevis said he was surfing with some friends at about 2 p.m. Wednesday when a 12-foot shark slashed his leg.

He suffered five gashes in his left leg and foot but managed to remain on his surfboard and make it safely to shore.

One of the boy's friends, Iose Ua, 17, said he saw the shark before it made its attack, but at first he thought it was a turtle.

Ua said he saw the shark head for one of the other boys who were surfing, but it flipped over and headed for Aka. Ua said it was then he knew it was a shark, and yelled.

The shark bit into Aka's leg just as he was turning to catch another wave and failed to get a good hold, the boy said.

He caught a wave just as the shark was turning to make another pass and managed to reach a small rock island a few miles offshore.

Island's Hamakua Coast were thrown into the sea by heavy surf and washed out a short distance.

One was bitten by a shark, while the other just disappeared, according to records. It has never been determined whether the second woman was pulled under by sharks or drowned.

Besides the shark attack on Aka, and one on a woman in Hilo Bay in 1922, which was not fatal, only one other swimmer has been reported attacked by a shark.

Billy Weaver, a 15-year-old Lanikai, Oahu youth, was killed by a giant shark, estimated at from 15 to 25 feet long, while he was body surfing with friends on Dec. 13, 1958 in Kailua Bay on Oahu.

At that time three different schools of sharks were sighted around Oahu, and residents armed with rifles opened war on the sharks but apparently weren't too successful, according to reports.

Most of the other victims killed by the marauder have been fishermen.

* * *

A fisherman was killed while fishing from his sampan Dec. 5, 1952 and a 15-year-old youth, Harold Souza of Msile, was killed while spear-fishing.

Besides these deaths and the other cases mentioned, there have been 11 other attacks, all non-fatal. They were:

Sept. 28, 190?—Maui fisherman bitten while diving for fish caught in his net off Kalepolo polo.

Sept. 28, 1922—Territorial surveyor bitten while inspecting Kaunakakai wharf, Molokai.

June 14, 1931—Pearl Harbor fisherman bitten while fishing in the harbor.

Oct. 4, 1939—Spear-fisherman bitten off Makapuu, Oahu by a shark attracted by bleeding ulua the man had just speared.

July 1, 1941—Fisherman bitten while hauling in a shark he had caught on a line.

June 27, 1947—Fisherman bitten off Waianae, Oahu.

Sept. 19, 1948—Fisherman bitten off Makapuu point.

June 25, 1951—The body of a Hilo woman partly eaten by sharks after she drowned.

Aka is the son of Mr. and Mrs. Albert A. Aka of 1120 Kalanianaole Ave.

The Big Island was the scene of the first recorded death believed caused by a shark attack in Hawaiian waters. It occurred in 1886, about 77 years ago.

Since then, four other persons, possibly five, have died as a result of shark bites in waters around the Island chain.

On June 2, 1886, which is as far back as reliable medical and accident records go, two women who were fishing off the Big

The first definite shark-bite occurred on August 2, 1902 when a boy was pulled under a net

water and both arms bitten off while he and other youths were crabbing off Kalihi, Oahu.

On Jan. 17, 1908, another death was recorded when a fisherman was killed while dynamiting fish off Kauai. The shark was apparently attracted by the dead fish. The shark pulled the man under while he was in the water throwing the fis' on shore.

Two more deaths occured in recent years, both of them off Maile, Oahu and about a year apart of each other.

Feb. 18, 1953—Fisherman off Barbers Point, Oahu bitten while cutting a shark free from

July 4, 1953—Kauai fisherman bitten while fishing from a sampan.

April, 1955—Kanematsu Oshiro of Hilo, a fisherman serving on the commercial fishing vessel, Kaimamala, had his right hand and fingers bitten. He later sued the owner of the fishing boat for $15,000 in damages.

The National Geographic Society has estimated that there are about 300 varieties of sharks around the world, ranging from 2 to 60 feet in length.

About a dozen are considered particularly dangerous. The "maneater" white shark has been known to upset small boats, maiming or killing occupants. Among other sharks of ill repute are the tiger, hammerhead, mackerel and grey nurse.

One of nature's most sinister prowlers, the shark is equipped with a powerful jaw and mouth, studded with rows of sharp, pointed teeth. It will eat anything. Found in shark's stomachs have been such assorted tidbits as tin cans, bricks, a fur coat, sack of coal, an alarm clock, and a full-grown dog still wearing a collar.

Most sharks favor warm and temperate oceans, but some roam far north. A few inhabit tropical fresh-water lakes and rivers.

Sharks seem to strike as often in clear as well as in cloudy weather, although warm, murky, or night waters apparently present more danger. The color of clothing or skin may be unimportant; yet bright objects do invite shark attention.

Long days, harsh rays greet isles in summer

OCEAN WATCH
By Susan Scott

"SUMMER afternoon — summer afternoon; to me those have always been the two most beautiful words in the English language." (Edith Wharton, 1934.)

The first year I lived in Hawaii, I was heading for the beach one sunny day in January when I ran into a fellow University of Hawaii student who grew up here. "You're not going to the beach?" he asked, pointing to my mask, snorkel and beach towel.

"Sure," I said. "Why not?"

"Because it's WINTER," he answered. "You go to the beach in SUMMER."

I laughed at him and continued on toward the water. You just can't convince a Midwest malihini that Hawaii winters are too cold for beach-going.

But things change. I have been here 11 years now and although I still venture into the ocean in the wintertime, I'm cold during those swims and emerge shivering and covered with chicken skin.

More often, I wait for hot summer days, like those of last weekend, when hitting the water is like a breath of fresh air.

It's not only the air that feels so warm during the summer months in Hawaii; our surrounding waters get warmer too. The following water temperatures (in degrees Fahrenheit) at Kaneohe Bay are representative of water temperatures in all Hawaiian waters:

Month	Maximum	Minimum	Mean
Jan	75	70	73.0
Feb	79	68	73.0
Mar	79	70	73.9
Apr	81	70	75.2
May	82	73	77.4
Jun	82	75	79.5
Jul	84	77	79.5
Aug	84	79	80.2
Sept	82	77	80.1
Oct	84	75	79.3
Nov	82	73	76.8
Dec	79	68	73.8
Overall	84	68	76.8

While typing this chart, I was surprised to see such a wide range, 16 degrees, between summer and winter water temperatures here. It seemed way too much. I was sure I read (and reported in this column) that the difference between summer and winter water temps was only three or four degrees.

After examining the charts a little more, I found the answer: The MEAN low water temp is 74.8 degrees and the MEAN high water temp is 78.6 making the MEAN annual difference only 3.8 degrees.

Because extremes are rare, this 3.8 degrees more closely represents the real difference we experience between winter and summer waters. Still, it only takes these few degrees to turn us residents blue.

Anyway, it isn't official yet but it sure feels as if summer has arrived. The board sailors are moving to the North Shore, the surfers to the south. And the ocean and beaches seem a little lonely now that the humpbacks and shorebirds have taken off for their northern summer homes where the food is plentiful and the days are long.

HAWAII gets longer days in summer, too. While we don't see any like the nearly round-the-clock daylight of higher latitudes, we still get more than the equatorial regions. At the equator, days and nights are equal year-round.

At roughly 19 to 22 degrees north latitude, Hawaii gets just a taste of longish, summer days. The longest day in Honolulu is 13 hours and 26 minutes toward the end of June.

The shortest day is 10 hours and 50 minutes near the end of December. That means we have two hours and 26 minutes more daytime in summer than winter.

Those extra 2½ hours in the hot sun and warm water feel great but they do have drawbacks: The vertical rays of the summer sun burn our skin faster.

Another source of burn is the fact that ultraviolet rays reflect off white sand. Thus lying, even walking, in sand causes a double radiation whammy. Even sitting under an umbrella surrounded by white sand can cause sunburn.

We also get burned while out on the water, but this isn't because water reflects UV rays. UV rays penetrate water.

We get burned on boats and air mattresses because there are no shady obstructions such as trees and buildings out there to shield us even partially from the sun's rays.

Our exposure time, therefore, is simply longer on the ocean than on land.

Susan Scott is a marine science writer and author of three books about Hawaii's environment. Her Ocean Watch column appears Monday in the Star-Bulletin.

KOKUA LINE

By Jane Watanabe

▲▲▲

Call experts to help sick sea turtles

QUESTION: I know that in Hawaii, it's kind of illegal to touch sea turtles. However, I have seen turtles with tumors on both eyes dying on top of seaweed several times. Am I permitted to touch and help these turtles in any way?

ANSWER: If you see a stranded sea turtle, call the National Marine Fisheries Service at 983-5730, 7 a.m.-4 p.m. Monday-Friday; or the state Division of Conservation and Resources Enforcement at 587-0077 on weekends, holidays and after hours.

The numbers pertain only to sea turtles, which are protected under the U.S. Endangered Species Act and state wildlife laws. All sea turtles, dead or alive, are protected.

You are asked not to call 911, the Honolulu Police Department, the U.S. Fish and Wildlife Service, Sea Life Park, the Hawaiian Humane Society or the Waikiki Aquarium.

A stranded sea turtle is defined as an ocean turtle found dead, injured, sick, with a tumor or otherwise abnormal in appearance and out of the water.

You should not touch a turtle unless you are specifically asked to do so by the Fisheries Service or DOCARE.

Be prepared to report exactly where the turtle is, its size, whether it's alive or dead and the extent of its injuries, said Denise Parker, a research associate with the Fisheries Service.

"Then we'll send someone out to pick up the animal," she said. If it's alive, it'll be taken to a veterinarian; if it's dead, post-mortem tests may be done.

If you see someone harming, harassing or killing a sea turtle, call the service's Law Enforcement Branch at 541-2727 or 800-853-1964.

You can also call Marlu Oliphant, president of the nonprofit Save the Sea Turtles group, at 638-2211 for information.

THE PULSE OF PARADISE 50¢ ON OAHU

Scientists and volunteers struggle to save Hawaii's endangered

Green sea turtle

More and more turtles are falling victim to deadly tumors; a nonprofit group plans to open a turtle clinic on the North Shore

BY LORI TIGHE
Star-Bulletin

As a green sea turtle beached himself again and again on the North Shore, his rescuers noticed a large tumor covering half his mouth.

Veterinarians later successfully removed the four-pound tumor. The turtle, who his rescuers named Atlantis, was recently released on the North Shore to join his peers, many of whom are suffering from the same type of tumor.

"Tumors are killing them. Once it covers the eyes and mouth, it's a death sentence," said Marlu Oliphant-West, president of the nonprofit group Save the Sea Turtles International, which she founded in 1988.

In response to the growing number of sick turtles, Oliphant-West's group has be-

PLEASE SEE **TURTLES**, A-9

To raise money

- **A fund-raiser:** The first benefit to raise money for a sea turtle hospital and research center on the North Shore will take place at 7 p.m. tomorrow at Pizza Bob's and the Row Bar at Restaurant Row.
- **Performers:** Coconut Joe, Backwash and Palolo Jones.
- **Admission:** $7 per person.

For more info

- **Call:** Save the Sea Turtles International at 637-2211.

BY CRAIG T. KOJIMA, Star-Bulletin

Marlu Oliphant-West displays a musical instrument made in the Philippines. The instrument's sound box is a turtle shell.

FROM PAGE

Turtle-factory owner's daughter opened her eyes on a trip to Hawaii

The founder of Save the Sea Turtles grew up eating turtles and turning them into leather goods

By Lori Tighe
Star-Bulletin

By Craig T. Kojima, Star-Bulletin

Save the Sea Turtles International members include, left to right, John MacKenzie, Marlu Oliphant-West, Juan Oliphant, Jeannine Thompson, Hollie Gardner, and Uncle Johnnie Garau.

THE founder of Save the Sea Turtles International grew up turning turtles into leather goods and eating turtle eggs abundantly.

Marlu Oliphant-West's father owned a turtle factory in Mexico City.

"It was a very successful factory. I viewed turtles as endless. You could walk on turtles and not touch the sand on almost any beach in Mexico, there were so many of them," Oliphant-West said.

"We ate turtle eggs like eating ahi."

She came to Hawaii in 1974 and met George Balaz, the foremost authority on turtles at the National Marine Fisheries Service.

While releasing turtle hatchlings on the beach, Balaz educated her about how most of the sea turtle species on the planet are either endangered or threatened because people kill them before they reproduce.

"All turtles take 25 to 30 years to reproduce. It's probably the most unknown fact there is about sea turtles," she said. "I didn't know."

Oliphant-West learned that sea turtles are the nomads of the ocean, living 50 to 70 years. They swim great distances in the ocean as they mature.

"People see so many of them and think they're OK now, but the turtles are all young juveniles," she said. "We've got years to go. Let's take care of this resource."

The older sea turtles get, the friendlier they get, because not much in the ocean can hurt them by that point, she said.

Oliphant-West became engrossed with the sea turtles' plight, and founded the group Save the Sea Turtles International in 1988.

The nonprofit group falls under the Conservation Council for Hawaii and works with the National Wildlife Foundation. It's dedicated to preserving endangered sea turtles and educating people, primarily children, about their plight.

ONE...

'People see so many of them and think they're OK now, but the turtles are all young juveniles. We've got years to go. Let's take care of this resource.'

Marie Oliphant-West
FOUNDER, SAVE THE TURTLES INTERNATIONAL

▲▲▲

TURTLES: Tumors restrict motion, breathing

FROM A-1

gun raising money to create a sea turtle hospital and research center on the North Shore.

Turtles suffering from tumors are becoming increasingly common in Hawaii and throughout the world, said Denise Parker, research associate with the National Marine Fisheries Service in Honolulu.

Hawaii has seen more than 200 turtle strandings a year in the past five years, and 60 percent of those turtles had tumors, called fibropapiloma.

Veterinarians need federal authorization to even touch an endangered sea turtle. Many who volunteer to help them risk being jailed, Oliphant-West said.

"We need a safe place for turtles to be cared for," she said.

The North Shore is an ideal spot because of the large number of injured sea turtles found there, said Hallie Gardner, vice president of Save the Sea Turtles.

The tumors are from a herpes virus, but scientists don't know the cause, said Sue Schaf, animal and education coordinator for the Turtle Hospital on Marathon Key, Fla. The Turtle Hospital will help Oliphant-West's group establish the North Shore facility.

"We can say for sure warm water is a cause. We don't see turtles with the tumors north of the Florida-Georgia border. And we see the tumors growing back in warmer waters," Schaf said.

The Turtle Hospital on Marathon, working with University of Florida scientists, are close to isolating the cause, Schaf said.

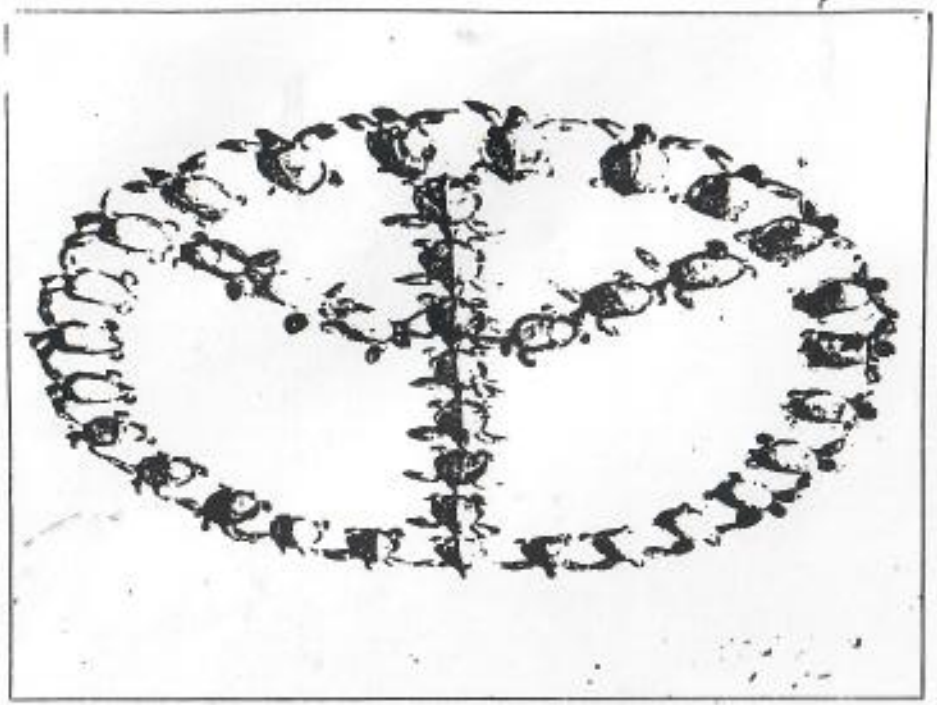
Turtles around the world have been infected with the tumors since 1938, but in the past 20 years numbers have dramatically increased, Gardner said.

Scientists estimate 50 percent of the world's sea turtles have the tumors. They are commonly found on green sea turtles, but also infect loggerhead and olive ridley turtles.

The tumors are benign but can affect motion, vision, swallowing, breathing and eating, ultimately causing death.

"A turtle hospital benefits the animals," Schaf said. "People know when they see a turtle in trouble, they can take it there."

Save the Sea Turtles aims to open the hospital by the spring of 2000.



In support of the Year of the Sea Turtle, Big Island artist Terry Tjube created a "peace turtle" for the South Pacific Regional Environment Program.

'Peace turtle' a tribute to sea creatures

In support of the Year of the Sea Turtle, Big Island artist Terry Taube has created a "peace turtle" for the South Pacific Regional Environment Program, a regional environment and conservation agency for 22 island governments in the South Pacific.

Twenty-seven turtle sculptures were presented to environmental officials of South Pacific nations at a recent conference in Tonga. These peace turtles will act as important reminders of the need for turtle conservation and a nuclear-free Pacific, said Taube, a Kona resident.

Sixteen peace turtle sculptures also were presented to the Hawaii-based Honu Project to be used locally to promote turtle awareness and conservation.

Guardians of the isle sea turtles

"What a great night on Kamehame Beach," exclaimed hawksbill sea turtle volunteer Pui San Leong, from Honolulu. "We saw an adult turtle lay eggs, and hatchlings emerge from their nest in the sand and scurry to the ocean, all at the same time! Now is an exciting time to be working on this project."

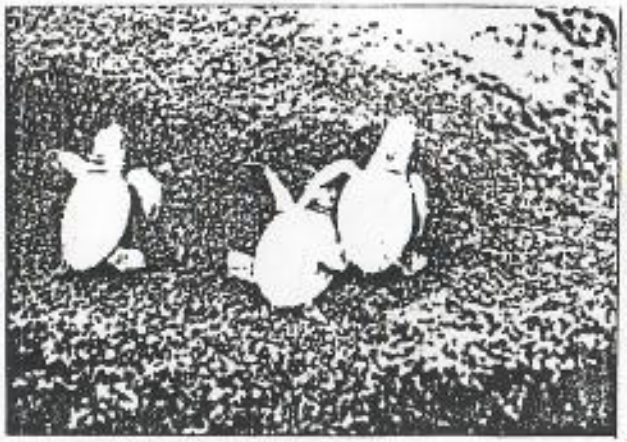
Leong was one of 16 volunteers monitoring Hawaii's hawksbill nesting beaches at night.

The most common turtle that people see while fishing or swimming is the Honu (green sea turtle). This species feeds in shallow waters on limu (seaweed) but when it matures, it swims to French Frigate Shoals in the Northwest Hawaiian Islands to breed and nest, some 700 miles from here.

On the other hand, Honu'ea, the hawksbill, which feeds primarily on sponges, is rarely seen in near shore waters but it nests here on the Big Island at night on a few of our beaches. Nesting occurs at Kamehame, Apua, Punalu'u, Kawa, and Ninole.

This year the nesting season for Honu 'Ea began in late May, when adult females started coming up to lay eggs, which take about 60 days to hatch. In November, emergence of hatchlings from nests began, explained Larry Katahira of Hawaii Volcanoes National Park.

Volunteers perform many duties, including tagging of adult female turtles, rescuing hatchlings which get stuck in nest vegetation on their way to the ocean, and controlling predators such as mongooses, feral cats, rats, and feral pigs.



Hawksbill (Honu 'Ea) hatchlings emerge at Kamehame Beach.

The ongoing study of the hawksbills on the Big Island is organized and run by Katahira.

"We have used volunteers extensively since 1993 to collect data on nesting turtles," Katahira said. "Knowing the size of our nesting population, understanding their life history, protecting nests and hatchlings by controlling predators, and informing the local folks and visitors will all help us to better protect them. This year our volunteers protected 59 nests, which we anticipate will produce between 7,000 and 10,000 hatchlings."

Both Honu 'Ea and Honu 'Ea are protected under the federal and state Endangered Species Acts.

"There are only 31 nesting hawksbills on the island of Hawaii and a total of perhaps 35 in all of the main Hawaiian Islands," Katahira pointed out. "The hawksbill is one of the most endangered sea turtles in the world."

Sea turtles face many threats to their existence worldwide. "Natural mortality is high. Biologists estimate that only one out of every 1,000 hatchlings ever lives to grow up and reproduce, and this is before humans interfere," stated Donna O'Daniel, environmental education specialist for the project.

"The threats are compounded when turtles nest on beaches with unregulated public access, such as Punaluu," O'Daniel said. "Trucks

See TURTLES, Page 8

cc: Pacific West Field Area Office, PIO
PISO
HAVO, PIO
Donna O Daniel
from: Supt, HAVO

TURTLES

From Page 5

and cars driving on Punaluu's sandy beach could run over a female turtle on her way to nest, as has happened twice on Maui."

Vehicles could also crush eggs if they run over a nest. Hatchlings have been known to get trapped in tire tracks on their way to the ocean. Other hazards posed by humans at Punaluu include cross nets and lights — from lanterns, flashlights, campfires, street lights, and cars — which can disorient that mongooses, rats, and feral cats will not be attracted to our beaches, and report any nesting or hatching activity to the park," said Katahira. "If you are interested in helping to save the Honu 'Ea, please call Hawaii Volcanoes National Park at 967-8226."

Norton Chan, a biologist at the Waikiki Aquarium, shows a green sea turtle on loan from Sea Life Park. Some Native Hawaiians want to resume cultural uses of the turtles.

Cory Lum / The Honolulu Advertiser

Hawaiians want turtles back on cultural menus

By Bunky Bakutis
Advertiser Leeward Oahu Bureau

WAIANAE — For 20 years, native islanders reluctantly lived with federal protection for the green sea turtle. But now, as numbers of the *honu* improve throughout the Pacific, islanders want to resume harvesting the turtle, restoring its multi-faceted role in local culture.

"Over the past five years, I've seen turtles everywhere around Oahu," said Native Hawaiian fisherman William Aila. "It's time to take a look for establishing a protocol for bringing turtles back into our culture.

"I can remember my uncles catching turtles and my aunties preparing them. But that has been lost over several generations."

Currently there is no comprehensive count of turtle populations. But tagging programs and nesting studies indicate dramatic rises in green sea turtle populations of

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FROM PAGE ONE 6-7-98

all ages since they were placed on the federal threatened species list in 1978.

The Endangered Species Act of 1973 bans killing certain wildlife listed either as "endangered" (those on the verge of extinction) or "threatened."

According to state aquatic biologist Bill Puleloa of Molokai, "the green sea turtle is not in imminent danger of extinction." A Molokai tagging program that began in 1981 has placed plastic identification tags on the flippers of 2,000 turtles of all sizes "with no end in sight," Puleloa said.

Tagging not only allows marine biologists to establish rough estimates of stock, but also tracks migratory patterns and growth rates of turtles.

A 25-year survey of nesting female turtles at French Frigate Shoals (about 20 acres of sand beaches northwest of Hawaii's main islands) has shown an increase from 50 to 500. Northern shoal turtles migrate to the main Hawaiian islands and are said to make up the majority of Hawaii's breeding stock. However, there are no total nesting counts at main Hawaiian islands.

George Balazs, who heads the Marine Turtle Research Program for the National Marine Fishery Service at its Honolulu laboratory, said the increase in nesting females is "extremely promising. This is the first time we've seen numbers like this since 1969. There are very few places in the world where stocks have regenerated like this."

Although increases may be highest among juvenile turtles, Balazs said adult numbers also have gone up, which "is a clear indication that survival is good." Green sea turtles are estimated to begin reproducing when they reach between 25 and 30 years of age.

Off menus in 1974

In 1974, state officials took the first action to curb overharvesting by banning commercial sales. However, family consumption was permitted. The action effectively took turtle off menus at restaurants such as the former Tiki Top in Kaneohe or Old Sally's in Pokai Bay.

In 1978, federal officials put green sea turtles on the "threatened" list following the documented depletion of stock from Florida to Polynesia. The ban removed the prized, lean meat from Hawaii family dinner tables or luau.

One of the main causes cited for protection was that beachfront development had adversely affected turtle nest-

Turtles: Tradition limited fishermen to harvest for family

Hawaiian green sea turtle

Chelonia mydas
Hawaiian name: Honu

A migratory reptile that becomes sexually mature at an average of 25 years old. Although individual breeding does not occur every year, a female may produce 100 eggs up to six times per season. A record weight was recorded in Kaunakakai at 410 pounds. Mature turtles are herbivores feeding on algae and sea grasses.

Michael Bergen/The Honolulu Advertiser

ing sites.

Green turtles have had a prominent position in Hawaiian culture since islanders first migrated here. Turtle was not only a rich source of protein, but also was used for medicine, functional tools and adornment.

According to Bishop Museum officials, use of decorative turtle shell was reserved only for *ali'i*. Polished shell was used to ring the staff of *kahili* (markers of *ali'i* presence), and Kamehameha I drank medicine from a round, two-quart turtle shell container, said Dr. Roger Rose, head of the museum collection department.

Bracelets — and more functional items such as fish hooks — were made from turtle shell. Tough upper carapace was used as a scraping tool in making cordage from plant fiber, Rose said.

From the late 1800s up until the 1970s, decorative hair combs, pendants, earrings, fishing lures and even buttons were commonly used by all Hawaiians.

Hawaiians consider turtles a demigod, because it linked the land and sea. Honu is one of numerous animals that Hawaiians traditionally honor as *'aumakua* (a family guardian). That status does not bar others from hunting the turtle. But tradition holds hunters to taking only what an individual may need to feed his *ohana*, and in that way protect the resource.

Turtle meat was prepared in numerous ways: steaks were cut from flipper connecting muscle and either grilled or dried; also meat was chopped for stews or soups. The green fat, for which the turtle got its name, was boiled and the remaining oil used as a healing salve for burns or wounds.

Marianas seek new policy

Recently, the U.S. commonwealth of the Northern Marianas has taken the lead in efforts to restore a limited cultural take of turtles.

Under the auspices of an educational exemption, one of five such categories in the Endangered Species Act, a report was completed in December detailing cultural use of turtles by two indigenous groups, the Chamorros and Saipan Carolinians.

The National Marine Fisheries Service and U.S. Fish and Wildlife Service has scheduled a workshop early this fall on their exemption request. Many Hawaiians are watching developments closely.

Limited turtle take also has become an increasingly hot topic among other Pacific islanders under U.S. jurisdiction, said Don Schug, a staff member for the Native and Indigenous Rights committee of the Western Pacific Regional Fishery Management Council.

"The council will want to do studies in Hawaii and American Samoa to look at the cul-

See Turtles, Page A3

Turtles: Recovery of species sparks

FROM PAGE A2

tural importance of turtles and possible legal exemptions to the law," Schug said.

Rights committee chief Isaac Harp of Maui said the 17-member panel will keep up pressure for a possible exemption, especially in the light of limited take allowed for long-line fishing vessels.

"I've talked to a lot of kupuna (Hawaiian elders) who want turtle returned as a food source before they pass away," Harp said. "And why are long-line fishermen allowed to kill so many, and we can't take any?"

One of the five exemptions to the ban is "incidental" turtles caught by long-line fleets. Boats operating northwest of the main Hawaiian Islands are allowed an annual take of 18 green turtles out of 129 total caught, according to Schug. When turtles are pulled up dead on hooks, fishermen must throw them back.

The Navy also receives a limited exemption at a bomb-target island in the Northern Marianas.

Children 'brainwashed'

Waianae fisherman and Native rights committee member William Aila said traditional Hawaiian culture is losing an understanding of what the turtle represents.

"There are generations who have lost the knowledge of how to catch, clean and prepare turtle," Aila said. "And I resent the singular 'warm and fuzzy' representation of turtles being made in some educational efforts. Our children are being brainwashed. Turtle primarily was a respected and required part of our menu."

Turtle numbers now demand analysis of how to control the population, Aila said. But Gene Nitta of the National Marine Fisheries Service disagrees.

"By no means have turtle populations recovered enough to be taken off the threatened species list," he said. A limited-take program would only heighten enforcement and poaching problems, which, in turn, would slow turtle recovery, Nitta said.

Declining to speculate on what size population might allow a limited take, Nitta referred to the federal recovery plan. Among a number of requirements, the plan states that area turtle stocks must average 5,000 females estimated to nest annually over six years before it qualifies to come off the protected list.

Another problem cited by federal officials is a virus, fibropapilloma, which causes life-threatening tumors to grow on turtles. The disease was reported to affect 42 percent of turtles captured, examined and released in Kaneohe Bay between 1991 and 1995.

Molokai's Puleloa said that he first discovered a turtle with the disease in 1986. Many juvenile turtles have been found since then with tumors.

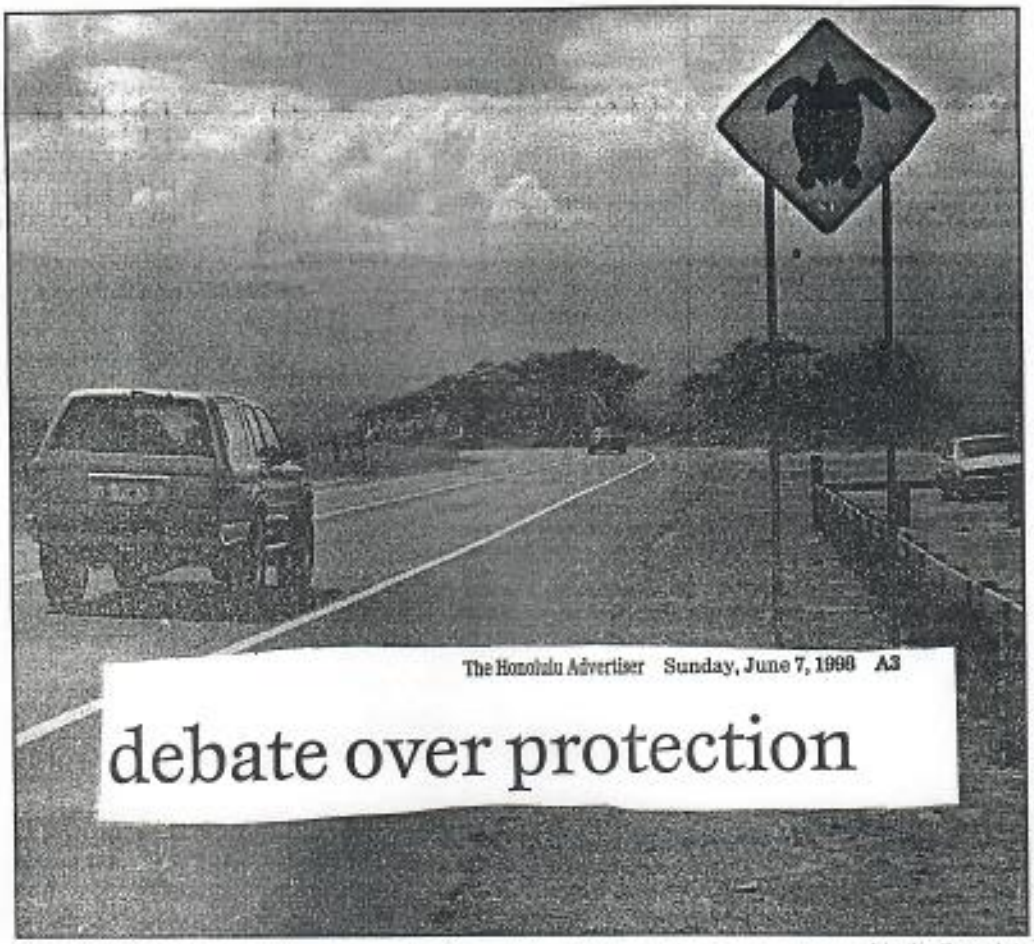
"We're looking for it now. Some (turtles with tumors) get worse and some get better. We can't make heads or tails of it," he said. "It's not contagious. We think it's something latent in the turtles that is allowed to surface as tumors because of changes in the environment," Puleloa said.

Balazs said the disease counteracts some of the recent good news.

"Possibly, it could cause a large decline," he said. "It is necessary to manage turtles in a conservative manner, as everything (such as turtle reproductive age) is so protracted."

But there's another reason why turtles have flourished again here, Balazs said.

"There's over 1,000 miles of coastline here with huge fields of benthic algae (which turtles consume). I see the carrying capacity of these fields for turtles as many times greater."



The Honolulu Advertiser Sunday, June 7, 1998 A3

debate over protection

Advertiser library photo

Maui motorists are warned they may encounter green sea turtles on this coastal highway. The once-threatened species has recovered significantly since being protected by federal law in 1978.

Buffalo Keaulana tells of turtle hunt

MAKAHA — Trade winds first brought a strong "*limu* (seaweed) smell" of turtle from outside Kaena Point.

Buffalo Keaulana, then 35, looked north from his Boston Whaler, following his sense of smell. The algae-covered back of a 300-pound turtle bobbed on the ocean surface some 100 yards away. These days in the mid-1960s was when turtle could be sought openly, and Keaulana was one of several Leeward fishermen who caught them to share with other residents.

As he approached, the turtle dived and Keaulana quickly donned his diving mask to check under what reef crack the turtle would hide. Mentally marking its position, he put on fins and a scuba tank before heading down some 80 feet.

When the turtle was cornered in a dark reef cave, Keaulana blocked the entrance. As it attempted to elude him, he grabbed both sides of its shell when it tried to escape, holding tight to each edge. Spinning wildly, the turtle took off so fast, Keaulana had to press his face mask against its back lest water pressure tear it off.

"I had to hold on until he got tired," said Keaulana. "Then, I placed my knee near the back of his shell, pushed down and steered him to the surface. Once we got to the surface, I held the turtle down under so it couldn't catch its breath. No breath and the turtle gets weaker."

His fishing partner, the late Homer Barrett, brought the boat around while Keaulana held the turtle upside-down on the ocean's surface. "Once you let the turtle turn right side up, you're in for another ride," he said.

The two men hoisted the turtle onto the boat and returned to Makaha Beach, where Keaulana lived with his family.

On the beach, he killed and cleaned the turtle.

"One upper flipper shoulder weighed about 75 pounds. That's a lot of turtle steaks. This is how I'd feed my family and friends. The meat is delicious, a delicacy," Keaulana said. "And my freezer was always full."

Keaulana is now 64 years old, and hopes to some day teach his grandchildren how to harvest turtle.

— *Bunky Bakutis*

HUNTING

No cultural right to green sea turtles

Regarding the June 7 article on the push to legalize hunting of green sea turtles, a threatened species:

The "Hawaiian culture" argument is almost ludicrous. Just because it was popular in the past to kill the turtles for their meat and body parts does not mean it is OK today. Cultures evolve; methods of gathering food change. Like it or not, in today's Hawaii, there is no need to kill turtles to feed oneself or one's family.

Some Pacific cultures used to practice cannibalism. Should we now legalize murder so that these cultures can return to cannibalism?

As the sidebar story regarding the killing of a turtle illustrates, these harmless animals are easy to corner, easy to drown, easy to kill. Is this really the type of activity we want to pass along to future generations?

I, for one, am more proud to be human when I see a turtle in the water and know that we have a law to protect it so that it can always be out there.

Clay W. Valverde

EDITORIALS

Tuesday, June 9, 1998

Don't rush returning turtles to the table

The inevitable result of any successful program to save endangered plants or animals will be pressure to once again permit human use of the species.

That's the emerging reality of what appears to be a successful 20-year program to improve survival chances for the endangered green sea turtle.

The turtle, long an important part of the traditional Hawaiian diet and cultural practices, has been on the federal threatened species list since 1978. Except for a few rare exceptions, that means the turtles cannot be captured legally for human use.

As staff writer Bunky Bakutis reported Sunday, some Hawaiian groups and others are pressing for a return to at least limited "cultural" harvesting of the creatures.

The first formal step toward such use happens this fall. That's when the National Marine Fisheries Service and the U.S. Fish and Wildlife Service will conduct hearings on exemption requests from indigenous groups in the Northern Mariana Islands.

The Western Pacific Regional Fishery Management Council may conduct follow-up studies on the cultural importance of turtle harvesting to Hawaiians.

Ideally, the effort to save the turtle will be so successful that some limited harvesting of these creatures can be allowed. The turtle was long part of the Hawaiian diet, and there is no reason, ideally, why it cannot be so again. Given advances in the science of mariculture, perhaps a system of turtle "farming" could eventually be developed.

But the simple increase in the turtle population measured in recent years is not enough to take the restrictions off. These animals take 25 to 30 years to reach reproductive age. So the current ban barely spans the time for one generation to reach sexual maturity. The survival of these creatures, then, is far from assured.

It makes sense, however, to begin talking now about how the turtle figured in traditional Hawaiian diet and culture and to get a sense of what kind of harvest would support that use. It is also time to begin developing strict protocols that would prevent limited taking from blossoming into widespread commercial exploitation of the creatures.

This wonderful animal is climbing back from the brink. It would be a tragedy if the ultimate result of this preservation effort is a slide back toward extinction.

Students volunteer

HPA student takes project to international turtle symposium

Jill Quaintance has seen her share of head scales-make that turtle head scales-as part of her research project on green sea turtles in Hawaii. But the Hawaii Preparatory Academy sophomore takes it all in stride. She recently returned from the Twenty-First Annual Symposium of Sea Turtle Biology and Conservation in Philadelphia, where she was the only high school student to present a paper.

The five-day conference, held this year at the Adams Mark Hotel, attracts about 1,000 of the world's top researchers and conservationists and features more than 450 oral and poster paper presentations.

Quaintance presented "Monitoring turtle basking behavior with remote cameras." The project involved observing green sea turtles at the Big Island's Turtle Beach using remote cameras for 27 days last June. The cameras "stream" video back to the school, allowing students-and others throughout the world-to monitor the turtle population and study the turtles' basking behavior.

The project also examined how long the turtles basked and their average basking time.

Quaintance authored her paper under the direction of Marc Rice, director of the Cooperative Sea Turtle Research Project, and George Balazs, leader of Hawaiian Marine Turtle Research for the National Marine Fisheries Service, Honolulu Laboratory. The paper will appear in the Proceedings of the Twenty-First Annual Sea Turtle Symposium.

Quaintance's participation at the conference was made possible through a unique partnership with the NMFS, which includes symposium travel assistance for deserving students. Since 1987, students in HPA's marine science program have worked with NMFS on a turtle research and monitoring project in West Hawaii. The work has grown over the years in scope, magnitude, and importance to overall species conservation. The newest addition to the program is a volunteer sea turtle rescue team.

The symposium project consumed Quaintance's "spare" time for about eight months. After observing the turtles on video from the remote cameras, she recorded what time each turtle came out from the water and when it went back in.

She identified the turtles using a variety of methods including carapace numbers, which are lightly etched on the turtle shell; natural scars or marks; and head-scale patterns.

"It was difficult to identify all the turtles," she said. "We take pictures of the head scales, which are like fingerprints. I basically had to memorize all the turtles' patterns. We're still trying to come up with a better way to sort through all the pictures so we can find the turtles faster."

She entered the information on 24 turtles using several databases and concluded that on average, the turtles bask 2.2 hours. She also found that head-scale identification can be used at Turtle Bay and confirmed that the remote cameras are a good option for observing turtles in a non-intrusive manner.

Quaintance was impressed with her symposium experience. "There are so many people doing so many different things with other turtles," she explains. "It was really interesting to see what other people are doing."

Likewise, people who saw her presentation were surprised to learn that turtles bask throughout the Hawaiian chain.

Several symposium events caught her attention, including a workshop on the new Arc View software, which HPA has started using to map areas

•SEE **STUDENT** PAGE 9

for sea turtle rescue

PHOTO COURTESY OF HPA

The HPA Sea Turtle Rescue Team (l. to r): Marc Rice, marine science instructor and director of the Cooperative Sea Turtle Research Project; Jill Quaintance, Jessica Sanders, Garry Burns, Laura Morgan, and Katie Harrington.

School also sets up turtle hotline

Five students at Hawaii Preparatory Academy have formed a volunteer sea turtle rescue team for West and North Hawaii in partnership with the Marine Turtle Research Program, Honolulu Laboratory of the National Marine Fisheries Service. Under the supervision of Marc Rice, director of the Cooperative Sea Turtle Research Project and HPA marine science instructor, the team will respond to reports from the general public of stranded sea turtles along the Big Island's west and north shores-from Honokohau Harbor to Pololu Valley.

The HPA team is one of

•SEE **TEAM** PAGE 9

Friday 3/8/02

HONOLULU STAR-BULLE

A hike reveals treasures along East Oahu coastline

OCEAN WATCH

Susan Scott

Wawamalu. Kaloko Inlet. Ka Iwi coastline. These places, which lie roughly between Makapuu and Sandy Beach, have been in the news the last few years because of controversy over what to do with them.

And until last week, that's about all I knew about the area. The region was far from my home, and when I did go there, I drove right past.

Then some graduate students and their professors from the University of Hawaii's Geography Department invited me to meet them there for a hike. They are studying the area, and I jumped at the chance to learn about the place from knowledgeable people.

course across the highway. The geographers and I stood on a rocky outcrop overlooking this inlet and watched turtles graze.

These turtles are noteworthy because they are free of the tumors plaguing turtles in other areas. Also, the Wawamalu turtles eat unique seaweeds growing near the mouth of the inlet. Further inside is the "bedroom," a quiet-water haven where the turtles like to sleep.

Unfortunately, poachers also know about the turtles' preference for this place. One turtle worker there spotted some men loading a turtle into the back of a pickup truck. When the poachers saw the worker, they released the turtle and drove off.

Usually, however, there's no one watching.

Clearly, this last of Oahu's wild, open coastlines needs help. And progress is occurring. The former landowner, Kamehameha Schools, wanted to develop the area, but conservation-minded citizens pushed the state to buy it and preserve it.

And knowledgeable they are. We weren't there 10 minutes when one professor found a rare native fern called Marsilea. This unusual fern looks like four-leaf clovers.

Native plants, I soon learned, were everywhere. Some stubbornly poked up through litter and broken glass; others crept down rutted tire tracks. And in spite of years of human abuse, native growth still holds together a row of ecologically important sand dunes.

Native animals inhabit this area, too. While I was there, flocks of shorebirds pecked the beach for invertebrates, humpback whales spouted offshore, and red-footed boobies skimmed the ocean's surface.

And then there were the turtles of Wawamalu. I've heard stories about these turtles, a distinct population from those of nearby Hanauma Bay, but didn't know where to look for them. Now I do.

Wawamalu is the area around a narrow cove called the Kaloko Inlet, a body of water running from the ocean to the golf

The state, however, used federal highway money in the purchase and must now comply with federal rules, which include building parking lots with safe turnouts.

Blacktop isn't what some conservationists had in mind when they lobbied to save the place. But my experience made it clear that in order to appreciate this rare wilderness, I had to get out of my car. And having native plants and animals pointed out to me was a bonus that made the visit far more enjoyable.

Parking lots may not be natural, but they're the reality of our times. People drive places. If we don't build parking lots, people drive there anyway and wreck the place.

And as we direct cars, so too must we direct feet. Leading from the lots should be sign-guided nature trails to teach people what's special about the place.

I know, I know. They paved paradise and put up a parking lot. But welcoming people to Ka Iwi in a controlled manner, and educating them while they're there, is a good way to respect and protect one of Oahu's last and best wild shorelines.

Susan Scott
can be reached at
www.susanscott.net

[WHAT EVER HAPPENED TO ...]

A2 6/28/03 HSB

Ex-lawmaker Chong is interim administrator of St. Joseph High

Question: What ever happened to former legislator Anson Chong?

Answer: Chong, of Kurtistown, Hawaii, was named interim administrator of St. Joseph High School on June 13.

On June 4 he received the Peace Corps' Franklin H. Williams Award on June 4, which recognizes outstanding community service by minorities who have served as Peace Corps volunteers.

Chong was a Peace Corps volunteer from 1964 to 1966, serving as an economics professor at the University of Nigeria when it was new and had no textbooks, according to a Peace Corps news release.

The Peace Corps recognized Chong for his legislative work, being active in the designation of bikeways on Oahu public roads and keeping Hawaii a nuclear-free state.

From 1972 to 1974, Chong was a member of the state House of Representatives. He was named Outstanding Legislator of the Year in 1973. And he served as state senator from 1974 to 1980.

From 1982-1985, he served as the director of the Micronesia Economic Development Authority. He moved back to the Big Island, where his family is from, and lived in Tokyo and New York.

Anson Chong: *He received an award from the Peace Corps for community service*

Big Island Mayor Harry Kim appointed Chong last year to the county appeals board for Hawaii County's Planning and Public Works Department.

Chong also serves as an adjunct faculty member with the University of Hawaii at Hilo, lecturing in economics and as an assistant faculty adviser to Global Hope, a student organization promoting awareness of global issues.

Chong also volunteers with the Food Bank of Hawaii, making monthly trips to remote areas to provide families with basic needs.

Ever wonder what happened to a person, event or issue that has been in the news? We'll find out for you if you e-mail us at cityeditors@starbulletin.com, call us at 529-4747 or write 7 Waterfront Plaza, Suite 210, 500 Ala Moana, Honolulu, HI 96813. "What Ever Happened to ..." runs Saturdays. This update was written by Leila Fujimori.

PHOTO COURTESY OF HPA

HPA sophomore Jill Quaintance stands in front of her poster paper at the 21st annual Symposium of Sea Turtle Biology and Conservation in Philadelphia. Quaintance was the only high school student to present a paper at the symposium. With Quaintance are George Balazs (left), leader of Hawaiian Marine Turtle Research for the National Marine Fisheries Service and Marc Rice, HPA marine science instructor.

• Student CONTINUED FROM PAGE 8

above the school. "We'd like to use this software to map Turtle Beach," Quaintance said.

Another interesting presentation was the "Critter Cam," where a researcher suction-cupped a video camera to a leatherback turtle. "This guy had 30 hours of tape and he watched every second of it!" Quaintance says. "He had footage of other turtles knocking the camera around."

One of the most interesting moments for Quaintance was meeting Ursula Keuper-Bennett and Peter Bennett, who pioneered turtle head-scale identification. "I'd heard of them because of their work with turtles on Maui," explains Quaintance. "I met them very briefly, and it turned out Mrs. Keuper-Bennett had been watching our video on-line at the same time I was and she identified all the turtles I did." Quaintance also gave high marks to Peter Bennett's oral presentation on tumor regression, which was done in collaboration with Keuper-Bennett and Balazs. "They found that by looking at a turtle's eyes, you might be able to determine if that turtle will develop a tumor, if it had a tumor, or if its tumors are regressing. It was really interesting."

Quaintance itook her project to the Hawaii State Science and Engineering Fair on Oahu April 2. She recently won Third Place overall at the Hawaii District Science Fair in Hilo. When she returns, she is looking forward to preparing for next year's symposium.

"We'd like to get another school on the mainland involved and do a video thing back and forth," she said. "We'd like to teach other students to do what we're doing." For now, Quaintance is taking everything one step at a time. "Next year, Mr. Rice wants me to do an oral presentation at the symposium." No doubt, she'll be ready.

• TEAM CONTINUED FROM PAGE 8

four in the State of Hawaii-and the only team of high school students-working and training with George Balazs, leader of Hawaiian Marine Turtle Research for NMFS. HPA is providing program funding and NMFS is providing all tools for the program, including stretchers and animal carriers, as well as shipping and veterinary services.

According to Rice, the school set up a turtle hotline (phone: 808-881-4200) in January, which is open from sunrise to sunset. After-hour emergency calls will be taken at 987-6903.

Callers should provide their name and phone number, location, and a brief description of the turtle's location and condition. A member of the rescue team will return the call within an hour.

A stranded sea turtle is any ocean turtle found injured, sick, tumored, deceased, or otherwise abnormal and sometimes even "normal" in appearance and out of the water, usually along the shoreline.

All sea turtles, both dead and alive, are legally protected under the U.S. Endangered Species Act and wildlife laws of the State of Hawaii.

Once a report is received, Rice directs the student volunteers throughout the process. The students-Garry Burns, Jessica Sanders, Laura Morgan, Jill Quaintance, and Katie Harrington-contact NMFS experts for advice on what should be done for the turtle. The animal might be sent to Oahu for veterinary evaluation and any required treatment.

If a turtle is deceased, the rescue team will pick up the animal, freeze it, and ship it to Oahu for necropsy.

The team already has responded to calls in Puako. Rice said students airshipped an injured turtle to Oahu for treatment; the team assisted a second turtle entangled in a fishing line, after consulting with NMFS.

"We're very excited about the opportunity to offer this service to the West and North Hawaii areas," said Rice. "We hope residents and visitors will use our hotline anytime they observe a turtle in need."

Rice notes that turtles are being observed "basking," or resting, on shore for extended periods of time.

This is happening more often, and residents should not be alarmed.

If a basking turtle is observed it is best to leave the animal alone.

HPA students have been working with NMFS since 1987 to assist the federal agency's investigations of turtles in West Hawaii.

For more information about HPA's marine science program, visit the school's web site at www.hpa.edu.