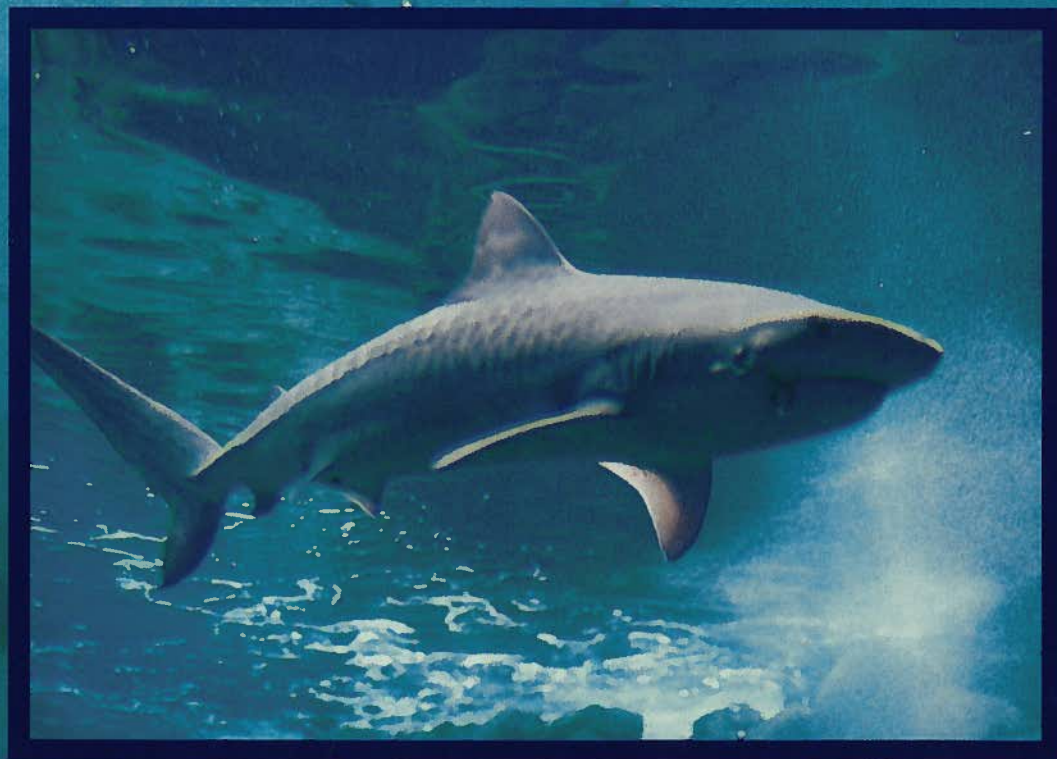


TIGERS OF THE SEA

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HAWAII'S  
DEADLY  
SHARKS



JIM BORG



# THE SHARKS THAT TORE AT THE HEART OF HAWAII

In November 1991, Hawaii was stunned when a huge tiger shark fatally attacked a woman swimming just offshore Olowalu, Maui. But when the state took steps to catch the culprit, some native Hawaiians objected. In the ancient Hawaiian religion, some sharks were *'aumakua* — a type of guardian angel that embodies the spirit of an ancestor. In native ceremonies, the dispute was settled and a thirteen-foot tiger shark eventually caught and killed. But that was only the beginning. In the ensuing months, more shark attacks claimed the life of at least one surfer and plunged Hawaii into one of its most divisive controversies. In this dramatic and thought-provoking account, award-winning science writer Jim Borg looks at tiger sharks — Hawaii's most dangerous near-shore species — from the perspective of surfers, swimmers, scientists, lifeguards, government leaders and native Hawaiians. What emerges is a portrait of the *niuhi* — 'man-eating shark' — that is as fascinating as it is fearsome.

"Exciting reading . . . accurate and comprehensive. It captures an important moment in Hawaii history."

—Leighton Taylor, former director, Waikiki Aquarium



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A young female tiger shark, captured and eventually released by Sea Life Park. Photo by Carl Viti.

# INTRODUCTION

Off the coast of Hilo, HMS *Discovery* was becalmed after a night of strong winds and swells. It was two days before Christmas 1778 and the sailors were disgusted that their leader, Captain James Cook, refused to approach the shoreline. But Cook was adamant. He felt the coast offered little protection from the prevailing wind and waves.

Eventually some natives in canoes came out to the ship to trade "Hogs, fowls, fruit and roots," Cook noted in his log.

In a separate journal, Thomas Edgar, master of *Discovery*, recorded that he "saw three very large Sharks about, the Men & Women Swimming to and from the ship at the same time."

That's when the excitement began.

"About 1/2 past 11 a large shark attackd A man in the water," Edgar observed, making notations in his personal short-hand. "As Soon as he saw him Opening his Mouth & turning on his Side to lay hold of his Thigh he struck him on the Head with his Hand. Immediately the shark swam off. the Man who was rather Elderly seem'd very much alarm'd for a little time altho many Indians saw this and Made a Hallowing at the time, the(y) do not seem to fear them as they Kept swimming abt as if there had been None seen."

The next day the crew hooked the shark, a seven-footer by Edgar's estimate. The intended victim, on board by that time, "shed tears & appeared very much fright'ned," observed Midshipman Edward Riou. "The Shark when it was hooked was fired at three or four times, at which the Indians (tho' they were Close bye) took no kind of notice." A day later, *Discovery's* crew caught two more sharks, one ten feet long. That, too, failed to faze the natives, who continued to swim to and from the canoes.

Those journal entries, brought to my attention by artist and historian Herb Kane, may be the first documented account of sharks in Hawaii. Although the swimmer apparently escaped injury (meaning this wasn't, by strict definition, an attack), it was only by his quick reaction that the tale didn't take a more dire turn. His distress is understandable.

But it's the general attitude of the Hawaiians that may tell the true story. To them, clearly, sharks were not an object of terror but merely of inconvenience, like dogs on a mail delivery route. And the natives didn't seem to care a bit that Cook's men caught and killed a few.

It's impossible to imagine such a scene today. When surfers or lifeguards in Hawaii spot sharks offshore, the beaches effectively close. Warning signs go up. No one goes in the water. And when aggressive sharks are caught and killed, some Hawaiians react angrily out of a belief that sharks — any and all — held some exalted position in the pre-Cook culture and religion.

The Hawaiians had a word for sharks that ate humans: *niuhi*. It may have included great white sharks, which make rare but spectacular appearances around the Islands. More probably it referred to tiger sharks, by far the most dangerous shark species common to Hawaii.

Could Edgar and Riou have been describing tiger sharks? We just don't know. Cook's officers don't give enough details. In fact, tiger sharks weren't identified as a species until 1822. And they weren't formally classified as a unique genus, *Galeocerdo* — Greek for "crafty shark" — until 1837.

Well over two centuries after the voyage of *Discovery*, questions about sharks still outnumber the answers. What are their swimming patterns? Where do they go during the day? How long do they live? Do tiger sharks attack humans deliberately? Do they mistake surfers for turtles? Or do they attack anything on the surface instinctively, simply hoping for a bird, turtle, seal or another favorite meal?

In Hawaii, those questions took on an urgent, personal dimension beginning in late 1991, when a woman was killed by a shark on Maui. Over the next several months, continued attacks — at least one of them fatal — placed the issue at the forefront of the public's attention. Suddenly Hawaii wanted action and answers. The action took the form of bloody shark-catching expeditions that sharply divided both the scientific and Hawaiian cultural communities.

The answers are still coming.

# CONTENTS

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<b>CHAPTER ONE:</b>	<b>A SHATTERED IDYLL</b>	<b>1</b>
<b>CHAPTER TWO:</b>	<b>CATCH A TIGER . . . LET HIM GO?</b>	<b>4</b>
<b>CHAPTER THREE:</b>	<b>CHICKEN SKIN</b>	<b>10</b>
<b>CHAPTER FOUR:</b>	<b>THE GIFT OF MOHO</b>	<b>12</b>
<b>CHAPTER FIVE:</b>	<b>SURVIVORS OF THE ANCIENT OCEAN</b>	<b>16</b>
<b>CHAPTER SIX:</b>	<b>'SOMETHING IS GOING ON'</b>	<b>21</b>
<b>CHAPTER SEVEN:</b>	<b>SEA SENSE</b>	<b>27</b>
<b>CHAPTER EIGHT:</b>	<b>THE INVESTIGATORS</b>	<b>32</b>
<b>CHAPTER NINE:</b>	<b>SHADOWS IN THE SURF</b>	<b>37</b>
<b>CHAPTER TEN:</b>	<b>A SECOND STORM</b>	<b>41</b>
<b>CHAPTER ELEVEN:</b>	<b>PREVENTION BY THE POUND</b>	<b>46</b>
<b>CHAPTER TWELVE:</b>	<b>A DREAM OF ANCESTORS UNMET</b>	<b>50</b>
<b>CHAPTER THIRTEEN:</b>	<b>EYE ON WAIKIKI</b>	<b>55</b>
<b>CHAPTER FOURTEEN:</b>	<b>A NEW AWARENESS</b>	<b>59</b>
<b>APPENDIX A:</b>	<b>ANNOTATED LIST OF SHARK ATTACKS IN THE HAWAIIAN ISLANDS, 1779 - 1993, BY GEORGE H. BALAZS</b>	<b>63</b>
<b>APPENDIX B:</b>	<b>MAPS OF SHARK SIGHTINGS AND REMOVALS</b>	<b>84</b>
<b>BIBLIOGRAPHY</b>		<b>87</b>
<b>ABOUT THE AUTHOR</b>		<b>88</b>

## CHAPTER FIVE: SURVIVORS OF THE ANCIENT OCEAN

In the Pacific about 25 miles northwest of Oahu, U.S. Navy researchers in November 1976 were hauling up two parachute-style sea anchors when they found a fifteen-foot fish tangled in the gear. Had they been versed in Hawaiian mythology, the startled crew could have been forgiven for believing they had snared one of the pups of the giant shark god Kuhaimoana. While its mouth was by no means as big as a grass hut, the creature's gaping jaws assumed huge, almost cartoon like proportions, measuring just over three feet around the outer edges. Recognizing an oddity, the crew winched the flabby, 1,600-pound fish aboard and carried it to the Naval Undersea Center in Kaneohe Bay.

The next morning, Leighton Taylor, director of the Waikiki Aquarium, examined the carcass at Kaneohe and concluded it was a type of shark unknown to science.

Later examinations proved Taylor correct. Not only was the fish a new genus and species — *Megachasma pelagios* (great yawning hole of the open ocean) — it represented an altogether new family. That's like discovering a primate that's neither man nor monkey.\*

The first captured "megamouth," which took up residence in a coffin-like vat at the Bishop Museum in Honolulu, caused a huge stir among scientists. In the fish world, it was the biggest discovery since a coelacanth, an eel-like creature thought to have been extinct for 60 million years, was found alive in 1938. How

could an animal the size of megamouth remain unknown for so long? Were there others like it? What did it eat?

Over the next fourteen years, five more megamouths surfaced. The later specimens confirmed that the bulbous-headed shark fed on tiny-open water shrimp by filtering sea water through its gills. In that sense it behaved like two relatives, the whale shark and the basking shark. But megamouth had evolved a trait unique among sharks: luminescent tissue lining its mouth glowed like fireflies. In the dark ocean depths, the bright cavernous gullet probably attracted shrimp like a porch lamp draws moths.

In the most celebrated catch, in October 1990 off Dana Point, California, a gill net fisherman turned a fifteen-foot megamouth over to Bob Lavenberg, curator of fishes at the Los Angeles County Museum of Natural History. It was alive and healthy. After implanting a tracking transmitter, scientists released the shark back into the Pacific the next day. "This species is at least 10 million years old," Lavenberg remarked, "and it has changed very little."

Megamouth offered a spectacular example of the multitude of forms that sharks can take.

The first shark-like fish prowled the seas around 450 million years ago, meaning they predate the dinosaurs by more than 200 million years. Back then, in the

Devonian Period, Africa and South America were still connected as one huge continent dominated by insects and giant ferns. Sharks may have been on the run from still larger squid-like creatures called cephalopods. Most of today's shark species occur as fossils as far back as the Jurassic Period, between 130 million and 180 million years ago. Sharks also survived whatever wiped out the terrestrial giants and a host of other species 65 million years ago. Along the way, they developed into marvelously efficient eating machines.

Despite their savage image, sharks pose a relatively minor threat to humans. More people die each year from car collisions with deer, allergic reactions to bee stings, and bites from dogs, rattlesnakes or spiders. Nearly all of the 350 species of sharks are harmless. Gill-feeders like megamouth consume tiny sea organisms. Others, like the reef whitetip shark, pursue small fish through forests of coral.

The exceptions to the rule, however, can be deadly indeed. Especially dangerous are large hammerheads, mako sharks and the larger members of a family suitably named after the Catholic mass for the dead: requiem sharks. The formal family name, *Carcharhinidae*, comes from the Greek for sharp-pointed or jagged. All have teeth designed for taking cruel bites out of prey. The formidable family includes the requiem or gray sharks, bull sharks, galapagos sharks, oceanic white tips and tigers. As these meat-eaters lunge in for a bite, a nictitating or "winking" membrane covers the eyes as a protective shield against fish scales, tails, broken bones or other sharp objects that may whip across their snout.

The tiger, named for the gray stripes across its flanks, is a specialized killer with very distinctive teeth — curved, notched and serrated, like tiny saws.

Adult tigers roam virtually fearless, having spent eons at the top of the marine food chain. Nothing in the ocean eats these "apex predators" except other sharks or, in some colder climates, killer whales. But there is another factor that accounts for their astounding lon-

gevity: sharks rarely get sick. They combat germs and disease as efficiently as they devour prey.

From 1981 to 1991 at the Mote Marine Laboratory in Sarasota, Florida, biochemist Carl Luer exposed more than a hundred small nurse sharks and clearnose skates to potent cancer-causing agents. Yet none of them developed cancer.

What's going on?

While some researchers, including Leighton King on Maui, thought the answer might lie in the blood, others focused on the skeleton. With skates, rays and deep-water chimaeras, sharks fall into a general class of fish that have skeletons made of cartilage instead of bone. Cartilage, of course, is the soft tissue that makes up your ears, the tip of your nose and the cushiony ends of your bones. Human embryos have a skeleton of cartilage for much of the gestational period, but it eventually "ossifies" or turns to bone before birth. Since bony fish predate sharks, it is believed that somewhere along the evolutionary line sharks turned off the bone-making process.

Cartilage offered one intriguing characteristic: it resists the formation of small blood vessels called capillaries. The growth of capillaries is necessary for the healing of wounds and other normal bodily functions. But several diseases are marked by an abnormal growth of capillaries: rheumatoid arthritis, blindness due to diabetes, and certain types of cancer. Scientists suspected proteins might hold the answer, but for years the precise biochemical reaction eluded them.

Then, in lab tests at the Massachusetts Institute of Technology, biochemical engineer Robert Langer isolated a protein from cow cartilage that seemed to do the trick. With colleagues Marsha A. Moses and Judith Sudhalter, Langer found that a compound called cartilage-derived inhibitor or CDI turned off capillary growth like a light switch. Their findings, published in June 1990 in the journal *Science*, held out exciting possibilities. If a tumor could be cut off from the body's blood supply, it could be "starved" to death. And there

\*Or, more accurately, man, ape, monkey, lemur, tarsier or tree shrew.

would be no side effects as with chemical or radiation treatments.

Could cartilage explain the resistance sharks showed to cancer? Luer didn't think so. Chemical inhibitors in the shark's skeleton served only to keep the cartilage from developing a blood network, Luer maintained. He didn't believe those chemicals were released into the rest of the body to fight disease. One possibility, he said, was that sharks had developed some way to repair genes damaged by carcinogens.

CDI did show promise when administered to other species in experiments. MIT's Langer demonstrated that shark CDI stopped new capillary growth in the corneas of rabbits. The next and crucial step: tests in humans.

In a 1992 book, *Sharks Don't Get Cancer*, William Lane, a nutritional scientist by training, touted several small-scale studies that suggested shark-cartilage treatments work well against solid tumors, which grow and survive only by generating new networks of blood vessels. Those include cancers of the breast, cervix, prostate, central nervous system and pancreas. Less likely candidates for remission would be lymphomas, Hodgkin's disease and leukemia, not closely associated with new capillary growth, Lane said.

Meanwhile, scientists in Pennsylvania extracted a promising new compound from dogfish sharks. Called squalamine after the species, *Squalus acanthias*, the compound was shown to kill a wide range of bacteria, fungi and parasites. A steroid and close chemical cousin to cholesterol, squalamine may exist in the stomachs of other sharks and may explain how they so successfully fight infection. Later work led to a laboratory synthesis of the compound. That meant tests could continue without killing sharks.

In the biomedical world, this was an exciting time. Sharks were a hot ticket. Studies on several fronts showed that humans stood to reap rich pharmaceutical rewards from these ancient survivors. Clearly, the potential benefits that sharks presented to humans vastly

outweighed the dangers.

That was the big-scale, long-term, intellectual view.

It differed from the immediate, microcosmic emotional picture. Tomorrow's cancer cure offered little comfort to a surfer or swimmer with a requiem in his wake.

**A**t the Honolulu Laboratory of the National Marine Fisheries Service, a white, two-story quadrangle on Dole Street in Manoa, two biologists shared, for different reasons, an intense interest in tiger sharks.

George Balazs, a zoologist, specialized in sea turtles, which tigers are known to eat. As an outgrowth of earlier research at the Hawaii Institute of Marine Biology, Balazs and a colleague in 1979 began compiling a list of all shark attacks — fatal, non-fatal, witnessed, suspected, provoked and unprovoked — in the Hawaiian Islands. It was the first list of its kind for Hawaii. The earliest recorded incident, in 1779, involved a young Hawaiian male named Nu'uuanu-pa'ahu. While surfing at Maliu on the Big Island, he was pursued by a shark, which gashed him on one side of the buttocks. Nu'uuanu-pa'ahu suffered "great pain" from the wound and later died on shore.

Over the next 180 years, by Balazs' count, there were eight more fatalities directly or very likely attributable to shark attacks. In one case in 1926, a man disappeared "with a shriek" while swimming at Haleiwa; his remains were found inside a twelve-foot great white shark caught down the coast at Kahuku. The last of these, in late 1958, was fifteen-year-old Billy Weaver, whose leg was bitten off while he was surfing on an air mattress near the twin islets called the Mokulus. Weaver bled to death. When his body was recovered two hours later, a huge (fifteen-to-25-foot) shark was seen in the vicinity, but there were no other bite marks. A two-year shark-control program was launched in response to the Weaver attack.

In the three decades from 1960 to 1989, there were no witnessed fatalities, but there were two water-related deaths in which sharks may have played a part. In

April 1987, Daniel Kennedy was last seen swimming out to a sailboat anchored off Kailua-Kona. His swim trunks later were found bitten in half. In October 1989, Ray Mehl Jr. disappeared while scuba diving in the late afternoon off Oahu's Kahe Point. Mehl, a novice, and his scuba partner were at a depth of 27 feet, near the Kahe power plant's warm water discharge pipe, about 750 feet from shore. The partner noticed that parrotfish in the area were acting weirdly. When he looked around, Mehl was gone. He searched in vain. Fire/rescue divers the next morning found Mehl's decapitated body about 200 feet away. A large tiger shark suddenly appeared and finished the job.

Over the next two years, two more incidents of that nature occurred. In February 1990, Roy T. Tanaka disappeared while scuba diving for parrotfish off Kaneohe Marine Corps Air Station. His body, minus diving gear and right arm, was spotted the next afternoon by helicopter floating near two sharks, one of them fourteen feet long, in Waimanalo Bay, just off Sea Life Park. And on Maui on November 19, 1991, a week before Marti Morrell's death, S.K. "Steve" Park was swept into the sea while fishing from rocks at Maliko Point. Rough surf kept him from swimming in to shore, so he waved at his son to go for help. The elder Park, reported to be a strong swimmer, never was seen again. Rescue divers the next day found his shorts and shirt on the ocean bottom. Both garments had bite marks consistent with an attack by a twelve-foot tiger.

Were Kennedy, Mehl, Tanaka and Park killed by sharks? Or did they drown before the sharks found them?

Impossible to say. That's why Balazs peppered his report with superscript letters to warn the reader that sharks may not be entirely to blame. To lump them all together into a category called "shark attacks," he recognized, would be to compare apples, oranges, mangos and papayas.

But on a personal level, Balazs was deeply disturbed by his growing list. Even if some of the victims

drowned before they were eaten, the fact remained that sharks were finding them awfully fast. To Balazs that meant there were a lot of sharks out there — a situation he considered contrary to Hawaii's image as a vacation paradise and serene ocean playground. The state's last extensive tiger-shark control program had been in 1967-69, followed by smaller programs in 1971 and 1976. Since there was no big-time coastal fishery in Hawaii, the shark population had been pretty much left alone for the last twenty years. Was it time to thin them out again?

In the weeks after the Morrell attack — case number 93 — Balazs dutifully compiled information from newspaper accounts, personal letters and the autopsy report. Because the shark scraped Sourisseau on the calf with its sandpaper hide, he placed her on the list as well. Case number 94.

A first-floor corner office at the fisheries lab belonged to John Naughton, the agency's Pacific Islands environmental coordinator. It was Naughton who fielded the calls from the newspaper and TV reporters whenever there was a shark attack or sighting. When there was a body or a set of teeth marks to examine, the police would call Naughton. He'd look at the remains or clothing or equipment to try to determine if a shark was involved and, if so, what type and how big.

Born in New York, Naughton moved to Hawaii at age four when his father joined the University of Hawaii chemistry department. Ocean recreation — surfing, diving, fishing — quickly became an integral part of his childhood. As a UH graduate student in marine biology, he worked with zoology professor and internationally renowned shark researcher Albert Tester, who conducted the 1967-69 control program. That's when Naughton became acquainted with sharks. He'd maintained a close relationship ever since, working on shark attack rates on Hawaiian monk seals and spiny lobsters. As environmental coordinator, he had a keen interest in the role sharks play in the coastal ecosystem

of Pacific Islands. He had been recording the stomach contents of sharks — including tiger sharks — for many years.

In reviewing the Morrell case, Naughton was "95 percent" sure a tiger was the culprit. One witness had reported seeing the characteristic gray stripes, but that was unusual. A tiger shark's stripes usually faded or disappeared by the time it became a large adult. The other possibility was a great white, an occasional visitor to Hawaiian coastal waters. But tiger sharks abounded.

"In Tester's program, we took 138 tiger sharks around Oahu in two years," Naughton recalled. "And we estimated at the time — Tester did — that we had reduced the shark population by 60 percent." Nobody knew for sure, of course, how many tiger sharks there were around the Islands. You couldn't exactly take a census. So there was no way to say with certainty that the number had increased over any given period. But most biologists believed tiger sharks reached maturity at about ten to twelve years. Eggs developed inside the mother's body for over a year, producing live-born litters of anywhere from ten to 82 pups. Average number: 34. Naughton felt the population had plenty of opportunity to build up to mature levels around Hawaii.

Naturally, other factors could be at work. Maybe the sharks were moving down from the northwestern atolls and shoals. No one knew how far or how often sharks migrated. There were also more people in the water. "I remember as a kid growing up here, you never surfed off Kaaawa, or Hauula or Punaluu," Naughton

said. "But I drive along that coast now or I'm outside the reef, diving off there, and there's surfers in all those breaks. It's just a tremendous increase in water use by the public. So — increased water usage, increased numbers of sharks — you're going to have more incidents, more contact."



Soon after the 1992 Legislature convened in January, the influential chairman of the House Finance Committee, Joe Souki, whose district included West Maui, introduced a bill calling for a tiger shark eradication program.

The word "eradication" alarmed many scientists, including Balazs, Naughton and Bruce Carlson, who had succeeded Leighton Taylor as director of the Waikiki Aquarium. All three testified against another Tester-type program, which saw hundreds of sharks killed, but in favor of small-scale shark-catching in selected areas.

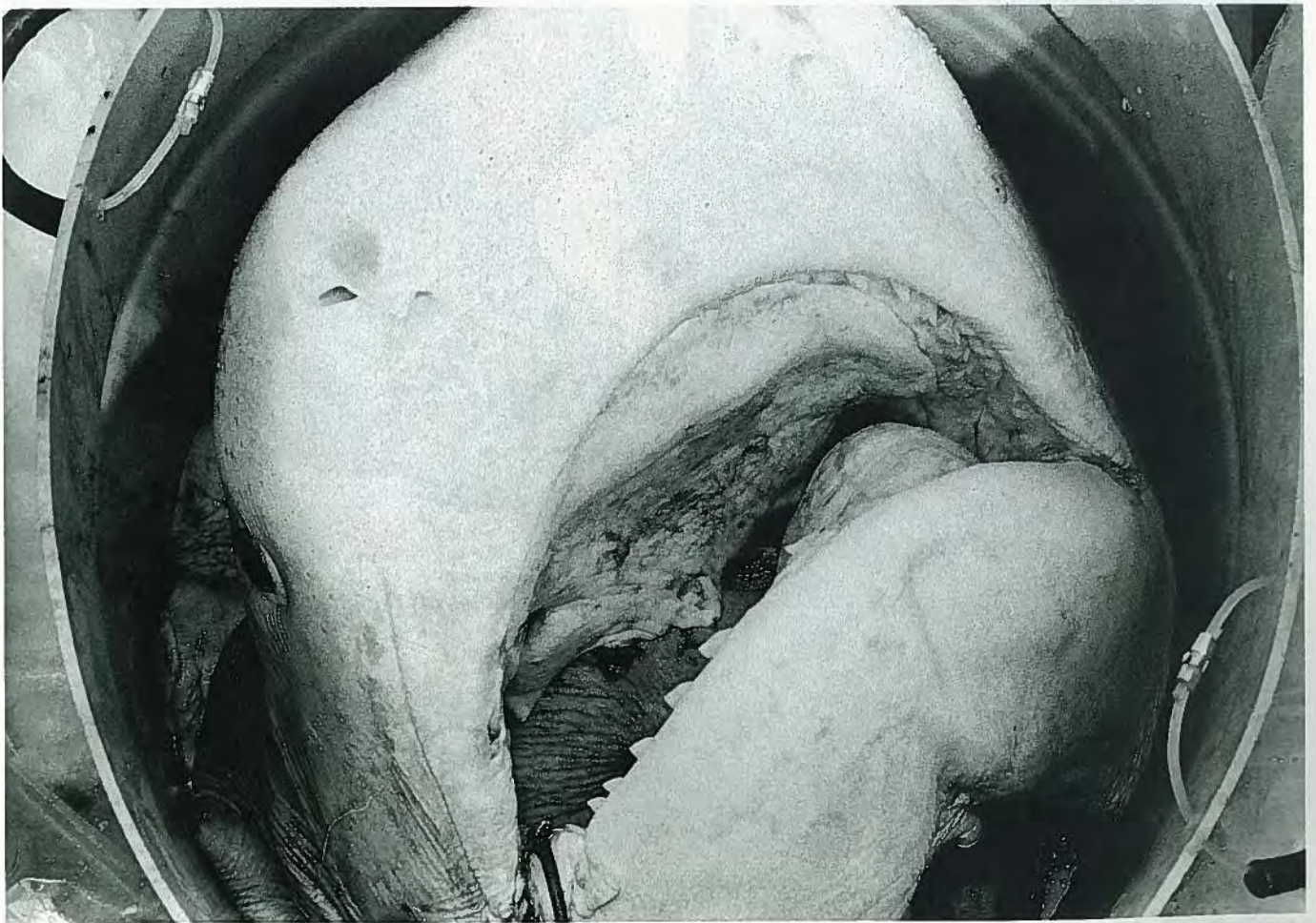
"The prevailing view, shared by tourists and local residents alike, is that Hawaiian coastal waters are safe places where one can swim and relax without justifiable fear of the danger of shark attack," Balazs said in a statement to the House Committee on Ocean and Marine Resources. "Given this perceived sense of well-being, it is my view that even one shark attack in Hawaii, such as recently happened on Maui, is too many."

Let's fish for big sharks now, Balazs urged. Why wait for another tragedy?





*Jagged tears in the shorts and shirt of S.K. "Steve" Park indicate bites by a large tiger shark. In order for the shark to get the necessary purchase to cause these tears, the body would have to have been in the clothing at the time, scientists say. Park, while fishing from rocks, fell into the ocean off Maui in November 1991 and was never seen again. His clothes were found on the sea floor the next day. Photo by George Balazs.*



*Severed head in a bucket, this 13-foot tiger shark was caught off Olowalu, Maui, after the fatal attack on Martha Morrell. Photo by Ed Tanji.*



*A 16-foot shark hangs by its tail at the Kaneohe Yacht Club. A fishing crew that preferred not to be identified caught the huge tiger off Kaneohe's Mokapu Point in July 1993. Photo by John Naughton.*

## APPENDIX A

### ANNOTATED LIST OF SHARK ATTACKS IN THE HAWAIIAN ISLANDS, 1779-1993, BY GEORGE H. BALAZS

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The following list provides a case-by-case factual synopsis of the 104 known shark attacks in the Hawaiian Islands, from the earliest recorded event in 1779 to the most recent one in June 1993. Available information is also summarized here in separate tables covering the activity of the victim, the month of the attack and the species of shark involved.

Prior to the publication of my first assembled shark attack list in 1981 (co-authored with Alan K.H. Kam), no consolidated historical information of this nature was available for Hawaii. Old cases of shark attack were located through comprehensive searches of books, newspaper files and other sources. This is an ongoing process. I am grateful to Gail Bartholomew, Leighton Taylor, John Naughton and others for their continuing assistance in uncovering valid cases from Hawaii's past that warrant addition to the list.

Since 1981 nearly all new cases have been readily identified at the time of their occurrence when they appeared in Hawaii's newspapers and television reports. In many instances I have been able to personally interview the victim, or the last person to see the victim alive, in order to record first-hand accurate information to the extent that it is known. Autopsy and police reports have also been used to contribute meaningful data. A list of the literature and other sources used to document each case, too long to include here, has been deposited in the Pacific Collection of Hamilton Library, University of Hawaii at Manoa.

Forty-four (42.3 percent) of the 104 cases on the following list are tabulated as having involved a fatality. However, nine (20.5 percent) of these forty-four fatalities are considered to have been "likely" due to drowning or other causes, which was then followed by

shark bite, dismemberment, and/or consumption. No cases have been included on this list in which a person was known with certainty to have been dead prior to being bitten by a shark. Cases involving fatality present special challenges to a compiler when there is no first-hand witness to the death, and medical evidence is inconclusive or nonexistent. In each such case I have used the best available information to render a professional judgment in assigning one of four footnoted categories to the fatality. It is recommended that the reader become familiar with these footnotes before studying the list. The inclusion on this list of cases where the cause of death is uncertain or unknown is both valid and consistent with the scientific protocol followed by several other registers of shark attacks compiled elsewhere worldwide, including Australia.

Sixty (57.7 percent) of the 104 cases involve persons who survived the shark attack. For cases occurring during recent years, these individuals have been available to describe the event in detail on a first-hand basis. The circumstances and documentation given by them provide valuable insight that can be used to surmise what may have transpired in fatal cases where no witness was present. For example, read and compare case number 75 with case number 95.

The criteria and style used to compile the list of shark attacks in Hawaii has been patterned after the International Shark Attack File (ISAF), which was first assembled in the late 1950s with funding from the Office of Naval Research. A tabular summary of the ISAF list was published in the 1963 classical reference book entitled *Sharks and Survival*, edited by Dr. Perry Gilbert. Later, in 1973, an analysis of data involving 1,165 cases in the ISAF was published by Dr. David Baldrige in his report "Shark Attack Against Man." The ISAF is currently maintained under the auspices of the American Elasmobranch Society at the Florida Museum of Natural History, with Dr. George H. Burgess as curator. Updated and revised versions of the shark attack list for Hawaii are regularly forwarded by

the compiler for inclusion and use by the ISAF.

Cases of shark attack shown in the following list involve some manner of physical injury to the person that resulted from a shark. Cases in which "only" the person's equipment was attacked (bitten), or aggression was displayed without harmful contact to a person, are not included. In this respect, the list for Hawaii is more conservative and differs from certain other lists compiled elsewhere (including the ISAF). On those registers, attacks solely on boats, surfboards and other items are included even though no injury to a human took place. Significant cases of this nature have indeed occurred in Hawaii. At a later date they will be catalogued into a separate list. An example of one such case is as follows. In October 1990 Greg Filtzer was lying on his nine-foot-long surfboard in Hanalei Bay on Kauai when a twelve-foot tiger shark bit the board and violently pulled it and Greg backwards underwater. In the process the shark ripped off a fourteen-inch-wide piece of the surfboard. Without so much as a scratch, Greg miraculously paddled to shore after the shark released the board. The entire event was witnessed by a companion on a surfboard next to him.

In Dr. Gilbert's book, *Sharks and Survival*, the following notable comment appears on page 466: "Although it is probable that most people would regard a statement of the rarity of attacks in the statistical sense as correct and reasonable, it appears that people in general are less willing to accept a risk involving sharks than greater risks of almost any other kind." This is not

surprising, considering that the two words most commonly used in relation to shark attack are "fear" and "apprehension." Most people gain no comfort from being told they are at greater risk from bee stings and car accidents than from shark attack. Statistics alone have a way of reducing people to simple numbers devoid of the personal tragedies and, in some cases, incredible courage associated with shark attack in Hawaii. The following list speaks for itself in that each case presented is an individual story, not simply a statistic.

In the state of Hawaii's 1972 report covering the last systematic shark control and research program conducted in Hawaiian waters, it is stated that "Sharks normally receive negligible fishing pressure and since they function as apex predators in the sea's food pyramid they can increase to maximum density. A dense shark population coupled with growing popularity of water sports activities increase the probability of shark encounters." Although shark attacks are statistically few in number, the validity of this statement now, twenty years later, appears to hold true. There is no question that sharks must be rationally conserved as a fishery resource and not "eradicated" as some have suggested. But at the same time the issue of public safety in Hawaiian waters, coupled with fear and apprehension among residents and tourists alike, must not be neglected.

George H. Balazs  
June 1993

### SHARK ATTACK CASES IN THE HAWAIIAN ISLANDS BY ACTIVITY

Activity	Fatal	Non-Fatal	Total
Swimming/snorkeling	8	15	23
Spearfishing while snorkeling	1	5	6
Scuba diving	3	1	4
Spearfishing while scuba diving	2	0	2
Hard hat diving	0	1	1
Surfboarding	2	15	17
Body (boogie) boarding	2	3	5
Sail boarding	0	1	1
Body surfing	1	2	3
Surfing on an air mattress	1	0	1
Floating on an inner tube (w/lobsters)	0	1	1
Wading	0	1	1
Fell into sea from shore or swept out to sea	16	0	16
Fell off boat or boat capsized	3	1	4
Net fishing	0	4	4
Crabbing	1	2	3
Removing shark from fishing line or gaff	0	3	3
Dynamite fishing	1	0	1
Fishing (type unknown)	2	1	3
Activity unknown	1	4	5
<b>Total</b>	<b>44</b>	<b>60</b>	<b>104</b>

### SHARK ATTACK CASES IN THE HAWAIIAN ISLANDS BY SPECIES OF SHARK

Shark species	No. fatal	No. non-fatal	Total No. cases
Tiger shark	3	6	9
Great white	1	1	2
Hammerhead	0	2	2
Cookie Cutter	1	0	1
<b>Subtotal</b>	<b>5</b>	<b>9</b>	<b>14</b>
Unknown species, large	20	10	30
Unknown species, small	1	8	9
Unknown species, unknown size	18	33	51
<b>Subtotal</b>	<b>39</b>	<b>51</b>	<b>90</b>
<b>Total</b>	<b>44</b>	<b>60</b>	<b>104</b>

**SHARK ATTACK CASES IN THE HAWAIIAN ISLANDS BY MONTH FOR THE YEARS 1779-1993**

Month	Fatal	Non-Fatal	Total
January	3	2	5
February	2	5	7
March	2	5	7
April	7	9	16
May	2	1	3
June	3	7	10
July	4	2	6
August	4	3	7
September	2	5	7
October	1	6	7
November	4	4	8
December	3	6	9

Note: For 92 cases in which the month of attack is known. Cases occurred during the month of April every year for the 6-year period, 1986-1991.

**GENERAL OUTCOME OF SHARK ATTACK CASES IN THE HAWAIIAN ISLANDS, 1779-1993**

Compiled by George H. Balazs  
(Following categories established by H. D. Baldrige, 1973 in "Shark Attack Against Man")

	No. of cases	%
Non-fatal.	60	57.7
Fatal, body or parts thereof recovered, death considered direct result of shark-inflicted wounds.	10	9.6
Fatal, no details reported.	2	1.9
Assumed fatal, body not recovered, no personal gear recovered.	3	3.0
Fatal, body or parts thereof recovered, not known if death was direct result of shark-inflicted wounds.	17	16.3
Fatal, body or parts thereof recovered, death not considered direct result of shark-inflicted wounds.	9	8.6
Assumed fatal, body not recovered, personal gear was recovered.	3	2.9
<b>Total</b>	<b>104</b>	<b>100.0</b>

**SHARK ATTACK CASES IN THE HAWAIIAN ISLANDS INVOLVING FATALITIES**

Years	Direct fatality (a)	Likely direct fatality (b)	Other causes (c)	Cause of fatality Unknown (d)	Overall		Total no. cases
					No. fatal	No. non-fatal	
1990-present	2	3	2		7	10	17
1980-89		2	3	4	9	15	24
1970-79			1	2	4	8	12
1960-69			1	3	3	5	8
1950-59	3		1	3	7	7	14
1940-49				1	1	5	6
1930-39				1	1	5	6
1920-29	1				1	2	3
1910-19		1		1	2	1	3
1900-09	2		1	3	6	2	8
1779-1899	2			1	3	0	3
<b>Total</b>	<b>10</b> 22.7%	<b>6</b> 13.6%	<b>9</b> 20.5%	<b>19</b> 43.2%	<b>44</b>	<b>60</b>	<b>104</b>

- a = Death directly due to shark attack.
- b = Death likely due to shark attack.
- c = Death likely due to drowning or other trauma followed by shark attack.
- d = Insufficient information upon which to base an opinion as to cause of death.

**ANNOTATED LIST OF SHARK ATTACK CASES  
IN THE HAWAIIAN ISLANDS 1779 - 1993**

(\* = FATALITY INVOLVED)

COMPILED BY GEORGE H. BALAZS

HONOLULU LABORATORY, SOUTHWEST FISHERIES SCIENCE CENTER

NATIONAL MARINE FISHERIES SERVICE, NOAA

Case no.	Date	Location	Victim	Circumstances
1 <sup>*a</sup>	1779	Maliu, Hawaii	Nu'u-anu-pa'ahu	Young male gashed on one side of buttocks after being pursued while surf boarding. Subsequently suffered "great pain" and died at Pololu.
2 <sup>*a</sup>	1828	Lahaina, Maui	Male	"A man out riding surf at 'Uo was killed by a shark which bit off his limbs and left his body floating." Attack witnessed by a number of Hawaiian chiefs.
3 <sup>d</sup>	2 June 1886	Hamakua, Hawaii	Two females	Washed into the sea while fishing from shore; one woman found bitten (fatal), the other woman disappeared.

**COMPILER'S OPINION AS TO CAUSE OF FATALITY**

<sup>a</sup>Fatality *directly* attributed to shark attack.

<sup>b</sup>Fatality *likely* attributed to shark attack.

<sup>c</sup>Fatality *likely* attributed to another cause (drowning, etc.) besides shark attack which was followed by mutilation or dismemberment by shark or sharks.

<sup>d</sup>*Insufficient information upon which to base an opinion as to cause of death, although mutilation and/or dismemberment by sharks had occurred. Fatality may have been directly attributed to shark attack, or may have resulted from another cause. This category also includes an absence of any witnesses or the absence of sufficient body remains to determine cause of death by medical autopsy.*

Case No.	Date	Location	Victim	Circumstances
4 <sup>*c</sup>	14 July 1900	Makapuu Point, Oahu	Emil Uhlbrecht and an unidentified person	Believed to have drowned when carried out to sea while hunting sea shells with companions. "A thorough search was made for the body for several days." Victim's foot with skin and flesh intact "in a fair state of preservation" was found in the stomach of an 11-ft 9-in shark hooked on the night of 8/17/00 off Kakaako, Honolulu, by John Kinipeki. Positive identification of victim made by Mrs. Uhlbrecht, based on an ingrown toe nail. Human pelvis and femur, blackened and totally denuded of flesh, were also recovered from the shark's stomach. These bones were thought to be from a different person, probably one of several Chinese fishermen lost over board in the harbor during past months.
5	Early 1900's	Inter-Island Dry Dock at Kakaako St. Honolulu	Emil A. Berndt	Young boy severely chafed when a large shark swam between his legs.
6 <sup>*a</sup>	8 Aug. 1902	Kalihi, Oahu	Young male	Pulled under while crabbing; both arms amputated.
7 <sup>*d</sup>	1904	Honolulu, Oahu	Male	Partial remains of swimmer who had disappeared two days earlier off Diamond Head found in the stomach of a "monstrous shark." Body was complete from the waist down with the exception of one leg. Shark also contained ducks, tin cans, and wood.
8 <sup>*d</sup>	1907	Pepeekeo, Honomu, Hawaii	Male	Bitten while fishing.
9	8 Oct. 1907	Kalepolepo, Kihei, Maui	Male	Arm amputated at the elbow while retrieving fish caught in net.
10 <sup>*a</sup>	17 Jan. 1908	Mana, Kauai	Male	Pulled under while gathering fish stunned by dynamite.
11 <sup>*d</sup>	10 Apr. 1909	Pauwela, Maui	Mrs. Ah Kim Chong	Nineteen-year old woman reported to have been swept away by waves while gathering opihi along the rocky shore line. Search party saw a large shark

Case no.	Date	Location	Victim	Circumstances
				devour what appeared to be part of the missing woman's body.
12	Apr. 1910	Pearl Harbor, Oahu	Martin Lund	Unprovoked attack on a hard hat diver. Authenticity questioned.
13 <sup>*d</sup>	1910	Hilo, Hawaii	Male	Bitten while fishing.
14 <sup>*b</sup>	3 Mar. 1914	Honomu, Hawaii	Okomoto	Washed into the sea while picking opihi and attacked by two large sharks.
15	28 Sept. 1922	Keawanui, Kamalo, Molokai	Male	Bitten while inspecting wharf.
16	7 Apr. 1926	Hilo Bay, Hawaii	Mrs. Leonard Carlsmith	Severely bitten while swimming 25 yards from shore near the Hilo Yacht Club at 5:30 p.m. "The shark with one bite terribly lacerated her right leg from the heel to the thigh. The calf of her leg was torn nearly to shreds, and the part of her limb above the knee was laid open to the bone." A long necktie was applied as a tourniquet to her leg as soon as she was brought to shore. "Anesthetics" were required twice at the hospital in order to treat the wounds. According to the victim, the shark that bit her "had a mouth about three feet wide".
17 <sup>*a</sup>	18 May 1926	Haleiwa, Oahu	William J. Goins	Gave a sudden shriek then disappeared while swimming at Haleiwa; remains of body found in 12.5-ft great white shark caught off Kahuku.
18	13 June 1931	Pearl Harbor, Oahu	Lieutenant Williamson	End of one of the victim's fingers amputated while using a gaff to bring a 10-ft tiger shark aboard a boat after harpooning it. Shark also bit in half the 2-in oak pole of the gaff. The following items were found in the shark's stomach: hind leg of a mule, two bathing suits nearly digested, soldier's belt buckle, a pint of button's, two horse shoes, corner of a wooden soapbox, anchor chain, two small anchors, and assorted bolts, nails, and copper fittings.

Case no.	Date	Location	Victim	Circumstances
19 <sup>*d</sup>	2 Sept. 1931	Kahala, Oahu	George Gaspar	Swept out to sea by strong currents while fishing; remains of body found in 18-ft shark caught off Barbers Point.
20	16 Feb. 1932	Lahaina, Maui	Male	Sailor from U.S. Navy vessel <i>Saratoga</i> bitten while swimming about 1 mile off Mala Wharf. Two wounds each 6-inches long were inflicted.
21	4(?) Sept. 1936	Lahaina, Maui	young male	Leg "badly cut" requiring 19 stitches at the Lahaina Hospital. Swimming with several other children near the "old wharf" when a shark was sighted. Victim disappeared underwater for a few seconds then came to the surface and "made a frantic effort for land". "A large shark was seen again the following morning".
22	30 Dec. 1936	Honokohau, Maui	John Kekuhi	Bitten on the thigh while diving under water trying to retrieve the body of a drowning victim wedged between two rocks. Three deep gashes sustained which required hospitalization. Shark reported to be 20-ft.
23	4 Oct. 1939	Kaneohe Bay, Mokapu, Oahu	James Akina	Bitten on hand by 5-ft shark while spear fishing in shallow water.
24	1 July 1941	Nanakuli, Oahu	Hisao Shimoto	Bitten on arm while removing 100-lb shark from fishing line.
25 <sup>*d</sup>	5 Apr. 1943	McGregor Point, Maui	Leonard Gant	Disappeared while swimming with three companions after the small boat they were canoeing swamped in high seas. Swamping occurred three miles from shore. Victim vanished shortly before reaching land after he fell behind the other swimmers. On 4/29/43, the "decomposed remains" of the victim's "right forearm" and "brightly colored swimming trunks" were "found in the stomach of a 16-ft shark" caught in turtle nets set out at night "near the Koa house" by Kihei fisherman Alex Akina. Shark's stomach also contained a piece of newspaper dated 3/25/43.

Case no.	Date	Location	Victim	Circumstances
26	1943	Midway, Northwestern Hawaiian Islands	Male	Unprovoked attack, but unable to determine circumstances.
27	1943	Midway, Northwestern Hawaiian Islands	Male	Unprovoked attack, but unable to determine circumstances.
28	27 June 1947	Makaha, Oahu	Valentine Limatoc	Bitten while spearfishing with six other men.
29	19 Sept. 1948	Makapuu, Oahu	Noah Kalama	Bitten on leg while swimming.
30 <sup>c</sup>	16 Jan. 1950	Kahakuloa, Maui	Gilbert S. Hotta	Swept into the sea with two companions by a large sudden wave while fishing at night from the rocky base of an overhanging cliff. Another companion (Wayman Fujimoto) managed to cling to the rocks when the wave hit. The partial remains of Gilbert Hotta were recovered from a "huge shark" caught on the morning of 1/19/50 by rescue workers searching the immediate area. The "badly battered remains" of one of the other missing fishermen (Harold Fujimoto) was also recovered floating nearby. The body of the third fisherman (Hideo Tamura) was never found.
31 <sup>d</sup>	25 June 1951	Kapehu Beach, Laupahoehoe, Hawaii	Alejandro Nodura	Swept out to sea while fishing from shore. Victim seen in shark's mouth.
32 <sup>d</sup>	3 Aug. 1952	Ala Moana, Oahu	Shigeichi Kawamura	Missing while swimming; shark bite found on right side of body.
33 <sup>a</sup>	3 Dec. 1952	Maile, Oahu	Gerbacio Solano	Bitten on arm while swimming from fishing boat; shark reported to be in excess of 22 ft.
34	18 Feb. 1953	Barbers Point, Oahu	James S. Takeuchi	Bitten on hand while removing shark from net.
35	4 July 1953	Kaula Rock	David Crick	Fell off boat while fishing; bitten on leg.
36 <sup>a</sup>	26 July 1953	Maile, Oahu	Harold Souza	Bitten on thigh while spearfishing close to shore; 10-ft shark observed.

Case no.	Date	Location	Victim	Circumstances
37	2 Sept. 1953	Waiau, Pearl Harbor, Oahu	Daniel Gonsalves	Bitten on leg and foot by 5-ft hammer head shark while crabbing.
38 <sup>d</sup>	8 Apr. 1954	Wailupe, Oahu	Gordon S. Chun	Missing while fishing from shore; body recovered in mutilated condition.
39	1954	Molokai	Severino	Unprovoked attack, but unable to determine circumstances.
40	Apr. 1955	Hilo, Hawaii	Kanematsu Oshiro	Bitten on hand while fishing from boat.
41	20 Sept. 1955	East Molokai	Phillip C. Diez	Bitten on arm while swimming.
42 <sup>a</sup>	13 Dec. 1958	Lanikai, Oahu	William S. Weaver	Leg amputated while surfing on an air mattress near Twin Islands; 15- to 25-ft shark (believed to be tiger shark) observed near body when fire-rescue personnel recovered it 2 hours later. No additional bite marks present on the body.
43	1950's	Waikiki, Oahu	David Lloyd	Provoked attack, but unable to determine circumstances.
44	27 Feb. 1960	Makena, Maui	John Benjamin	Severe lacerations obtained while spearfishing.
45 <sup>d</sup>	27 Dec. 1960	Maile Point, Oahu	Harold Riley	Swept out to sea while net fishing; 20-ft shark observed attacking victim; body recovered off Nanakuli.
46	2 Aug. 1961	Pearl Harbor, Oahu	Kazuhiko Kato	Bitten on hand by 8-ft shark while net fishing.
47 <sup>d</sup>	8 Apr. 1963	Hapuna Beach, Hawaii	Roy C. Kametani	Washed into the sea while picking opihi; parts of body recovered.
48	12 Apr. 1963	Awili, South Kona, Hawaii	Aiona Aka	Bitten on leg and foot while surfing; 12- to 15-ft shark observed.
49 <sup>d</sup>	20 Sept. 1967	Kailua Bay, Oahu	Male	Victim lost at sea when boat capsized between Oahu and Molokai; remains of body found in 11-ft tiger shark.
50	9 Mar. 1969	Makaha, Oahu	Licius Lee	Bitten on leg while surfing; identified as great white shark based on teeth marks in surfboard; dead whale recently removed from the area.



Case no.	Date	Location	Victim	Circumstances
51	11 Nov. 1969	Barbers Point, Oahu	D. R. McGinnis	Bitten on tank while scuba diving for lobsters; abrasions on arms and legs and cut on ankle resulting from contact with shark.
52 <sup>*c</sup>	31 Mar. 1970	Waimea Bay, Oahu	Ernie Reathaford	Swept out to sea while body surfing; 15- to 18-ft shark observed.
53	24 Oct 1970	Brennecke Beach, Poipu, Kauai	James C. Mattan	Bitten on shoulder and arm while body surfing.
54	16 Mar. 1972	Waihee, Wailuku, Maui	Adam Gomes, Jr.	Bitten on leg while spearfishing.
55	17 Aug. 1972	Waimanu, Honokaa, Hawaii	Eric Fotherby	Bitten on arm by 8-ft shark while spearfishing.
56	9 Jan. 1973	Hookipa Beach, Paia, Maui	Robert Sterling	Bitten on leg while surfboarding close to shore; 4 to 6-ft shark observed in area; wound required 100 stitches.
57	18 Dec. 1973	Kalama Beach, Kihei, Maui	Gary W. Floyd	Bitten on leg while swimming close to shore.
58	10 June 1976	Kamaole Beach, Park No. 1, Kihei, Maui	Donald Gard	Bitten on foot and leg by 3- to 5-ft shark while swimming.
59 <sup>*d</sup>	16 July 1976	Mahaulepu, Koloa, Kauai	Stephen C. Powell	Missing while scuba diving; lower remains of body recovered.
60 <sup>*c</sup>	1976	Off Lahaina, Maui	Danson Nakaima	Apparently passed out while scuba diving for black coral at a depth of 180 ft. About 30 large sharks seen near partially devoured remains of the body.
61	21 Apr. 1977	Kaanapali, Maui	Ruskin Vest	Bitten on arm by 4-ft. shark while swimming close to shore.
62	27 Nov. 1978	Ewa, Oahu	Wendell Cabunoc	Severely bitten on arm while surfboarding; 8-ft shark observed.
63 <sup>*d</sup>	1979(?)	South Kohala, Hawaii	Elderly male	Disappeared while fishing from shore. Fire Department divers only found a hand and a flashlight. Note: No known literature documentation.

Case no.	Date	Location	Victim	Circumstances
64	4 Aug. 1980	Puamana, Lahaina, Maui	Mark Skidgel	Bitten on left side of body while resting on a body board 40 ft from shore; identified as 14-ft tiger shark; wound required 52 stitches.
65 <sup>*d</sup>	24 May 1981	Haena Beach Park, Kauai	Roger B. Garletts	Missing while scuba diving at a depth of 60- to 80-ft; only diving equipment recovered, including shredded wet suit bearing numerous tooth marks. Victim reportedly spearfishing in murky, choppy water.
66 <sup>*c</sup>	12 June 1981	Honolii Pali, Hilo Bay, (Alae Point), Hawaii	Preston D. Soley	Retrieval of floating body hindered by 4-ft shark. Autopsy showed that death was probably from drowning. One-third of body missing due to bites by at least four sharks.
67 <sup>*d</sup>	24 Aug. 1981	Keaukaha, Hilo, Hawaii	Ernest Watson	Disappeared while fishing from shore. Leg found 7 days later wedged in rocks 150 yd offshore.
68	9 Nov. 1981	Laau Point, Molokai	Leo A. Ohai	Bitten on hand while untangling crab-trap line from propellor. Seven-foot shark had followed the boat for 3 days and reportedly was very unusual looking with a "flat head".
69	13 Dec. 1981	Nimitz Beach, Barbers Point, Oahu	Melvin T. Toma	Severely bitten on right leg by 12-ft tiger shark while swimming at the surface shortly after entering water; site located 300-400 yd from shore over a depth of 20 ft. Looking for fish, but none had been speared when attack occurred; wound required 200 stitches.
70	14 Feb. 1982	White Plains Beach, Barbers Point, Oahu	Lisa Miller	Bitten on left leg while wading in 3 to 4-ft of water; 17 stitches required.
71	14 Feb. 1982	White Plains Beach, Barbers Point, Oahu	Female	Bitten on right foot while swimming in shallow water.

Case no.	Date	Location	Victim	Circumstances
72	13 June 1982	Hookipa Beach, Paia, Maui	Scott Shoemaker	Severely bitten three times on the thigh after falling into water while sailboarding 100 yd outside the breakers. Wounds required 120 stitches.
73	3 June 1984	Kaneohe Bay, Oahu	Susan Buecher	Bitten on the foot while towing her sister on a plastic ski board. Incident happened at 5 p.m. in water 5-ft deep, about 400 yd from shore. Surgery and lower leg cast required to repair damaged tendons. 4-5 ft hammerhead shark believed to have been responsible.
74	12 Oct. 1985	Barbers Point, Oahu	Dominic Dela Cruz	Severe gashes to left arm requiring surgery. Attack occurred off Barbers Point Lighthouse while floating on an inner tube after diving for lobster.
75	18 Oct. 1985	Princeville, Kauai	Joe Thompson	Right hand and portion of forearm amputated by a large shark (likely a tiger shark) while body-boarding. Gash sustained to left hand. Right anterior side of board also cut away during same bite by shark.
76 <sup>*c</sup>	20 Apr. 1986	Kalihiwai, Kauai	Levi Chandler	Fell from rocks and disappeared while fishing at Kalihiwai Point. Pieces of clothing and human flesh were recovered by Fire Department divers who encountered a large shark.
77 <sup>*b</sup>	15 Apr. 1987	Kailua-Kona, Hawaii	Daniel Kennedy	Last seen swimming from shore out to an anchored sailboat. Swimming trunks found bitten in half on the bottom.
78	25 Mar. 1988	Running Waters Beach, Ninini Point, Kauai	Aaron Kawado	Bitten on the ankle while body surfing in waist-deep water. Surgery required to repair severed vein.
79 <sup>*d</sup>	15 Apr. 1988	Waihee, Maui	Avery Goo	Lost at sea when the 21-ft powerboat he was on capsized in rough seas. Pieces of human stomach, intestines, and pancreas believed to be from victim found several days later washed ashore along the Waihee shoreline.

Case no.	Date	Location	Victim	Circumstances
80 <sup>*d</sup>	8 Jan. 1989	Wailua, Kauai	Ken Ahlstrand	Disappeared while swimming in strong current with three other people. A 2-day search by helicopters, Civil Air Patrol, and firemen failed to find any trace of the missing man. Lower part of body found 6 days later on 1/14/89 near seawall by the Wailua Golf Course. X-rays of remains revealed teeth marks in femur and tibia.
81	20 Jan. 1989	Waialua Beach, Molokai	Earl Dunnam	Ten-year-old boy bitten on the foot by a 6-8 ft hammerhead shark while riding a body board 200 ft from shore. Wound required 8 stitches. Bite occurred to a naked foot, and not to the foot wearing a swim fin. Note: No known literature documentation.
82	3 Apr. 1989	Hookipa Beach, Paia, Maui	Sam McLain	Sustained a 4-in long crescent-shaped wound on the calf while paddling on a surfboard in whitewater near rocks 50 yards from shore. A sharp "tug" was felt at the time of injury. 13 stitches were used to close the wound.
83	Apr. 1989	Kekaha Beach, Kauai	William P. Allen	"Tremendous impact" felt on left leg while paddling on a surfboard in glassy water just beyond swells. Impact lifted board and surfer 2-3 ft out of the water. Left thigh raked with a series of scratches believed to have been caused by teeth. Skegs on the board were knocked loose, and a strip of fiberglass 8-in wide by 5-ft long was torn off. Victim convinced he was attacked by a "huge shark".
84	29 June 1989	Anahola, Kauai	Anthony Paden	Severely bitten on the foot after falling off a surfboard about 20 ft from shore. A "big chunk" taken out of victim's ankle, and "bite marks" inflicted all around the foot. Achilles tendon was half-severed, requiring surgery and a cast.
85 <sup>*b</sup>	14 Oct. 1989	Kahe Point, Oahu	Ray Mehl, Jr.	Abruptly disappeared while scuba diving as a novice with his partner at a

Case no.	Date	Location	Victim	Circumstances
				depth of 27 ft, 750 ft from shore near the cooling water discharge pipe of the Kahe Point Power Plant. Unusual behavior exhibited by parrotfish just prior to disappearance. Victim was 10-15 min into the dive with nearly a full tank of air. Dive partner conducted a circle search, but could not locate victim. Time of event was 4:30 p.m., visibility 25-30 ft. Decapitated body with amputated left arm found 200 ft to the west by fire rescue divers the following morning. Large tiger shark suddenly appeared and proceeded to consume rest of body before rescue divers could retrieve it. Small piece of flesh and some dive equipment later recovered.
86 <sup>*c</sup>	12 Nov. 1989	Ehukai Beach Park, Sunset Beach, Oahu	Edward Malek	Knocked down and swept away by large waves while wading close to shore at 6 p.m. Lower portion of body, sheared at waistline, recovered by fire rescue personnel on the morning of 11/15/89, 1.5 miles to the southwest. Note: The rare sighting of a shark was made at Ehukai Beach Park on 11/5/89, at which time all swimmers were cleared from the ocean for an hour.
87	19 Dec. 1989	90 miles east of Hilo, Hawaii	George Sohswel	Crew member of the 51-foot fishing vessel <u>One Ki</u> sustained a 23-cm long bite on his left leg and four 7-cm lacerations to left foot. 3 days hospitalization required. Victim transported to Hilo by Coast Guard helicopter. Wound was inflicted by a shark brought aboard the vessel.
88 <sup>*b</sup>	17 Feb. 1990	Mokapu, Kaneohe Marine Corps Air Station, Oahu	Roy T. Tanaka	Failed to return with his partner (Jake Hernandez) while scuba diving and spearing parrotfish in water 40-ft deep, 200 yards from shore (near firing range) at 9:30 p.m. 22-ft boat nearby had overturned a short time earlier after being hit broadside by a wave. Victim's tank, backpack, dive light, and mask were found on the bottom but not

Case no.	Date	Location	Victim	Circumstances
				retrieved. Body with amputated right arm sighted from helicopter at 3 p.m. 2/18/90 between Makai Pier and Rabbit Island. Two sharks (8 and 14 ft) seen nearby. Larger shark, apparently reacting to the presence of the helicopter, proceeded to consume all but torso and legs before retrieval.
89	1 Apr. 1990	Silver (Silva) Channels, Waialua Oahu	Everett Peacock	Deep abrasion causing profuse bleeding inflicted to 10-in area on lower left leg while sitting on a surfboard. Also sustained two deep 3-in long gashes above left ankle. Event occurred before 7:30 a.m. in murky water 150 yds from shore.
90	3 Apr. 1991	Oneula Beach Park, Ewa Beach, Oahu	Todd R. Wenke	Bitten on the left leg and foot while sitting on a surfboard 350 yards from shore at 5:30 p.m. at a site known as "Shark Country" 1/4-mile east of Oneula Beach Park. Attack resulted in a 5-in long bone-deep wound on each side of the foot, and a 9-in long bone-deep wound on the calf. 30 stitches, tendon surgery, and a cast required. Only about 18 inches of the shark's head was seen and no positive identification was possible. Shark had "a very large girth."
91	26 May 1991	Maili Beach, Oahu	Frank (Scott) Betz	Bitten on the right calf while sitting on a surfboard 100 yards from shore at 4:45 p.m. Attack resulted in 4-in and a 7-in long wound requiring stitches. Shark estimated to be 8-ft long. Event occurred in murky water.
92 <sup>*b</sup>	19 Nov. 1991	Maliko Point, Maui	Suk Kyu (Steve) Park	Swept into the sea by a large wave while fishing from the rocky coastline at 4:30 p.m. Victim's son went for help shortly thereafter when it became apparent that surf conditions were too rough for his father to swim ashore. When last seen victim was treading water signaling the son to go for assistance. Help arrived about 30 min later, but no sign of the victim could be found. Victim's shorts

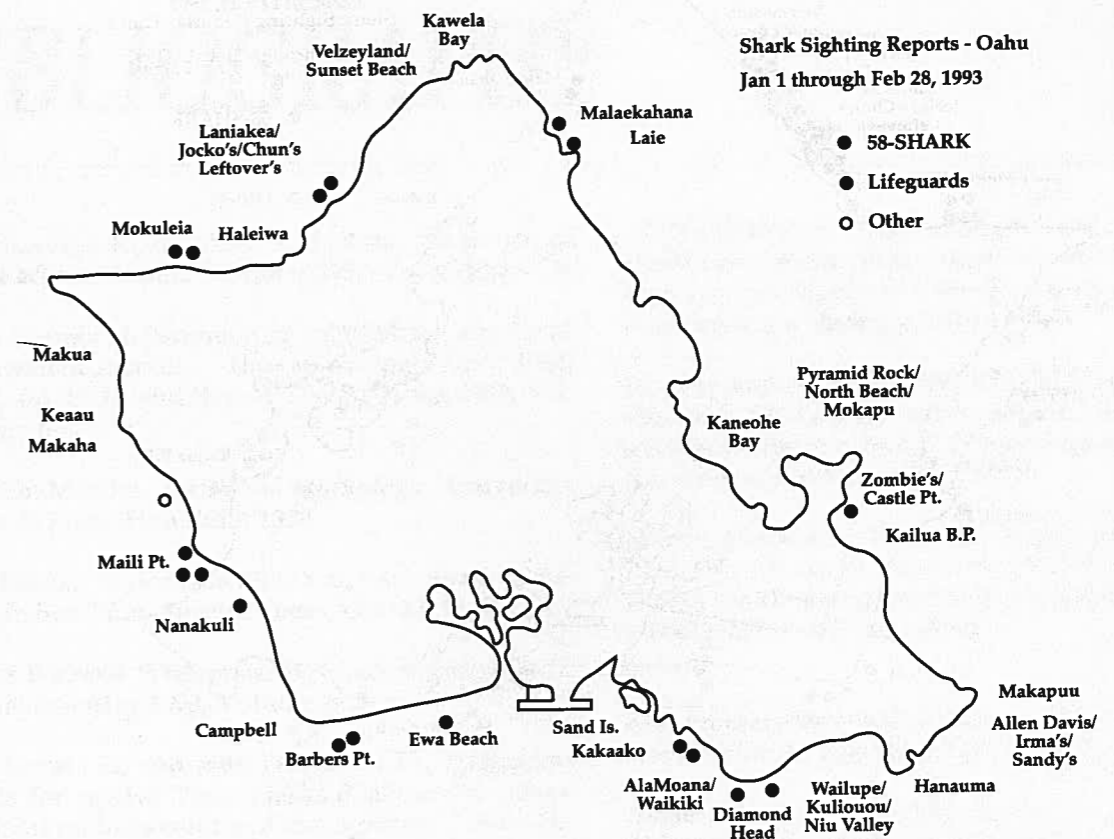
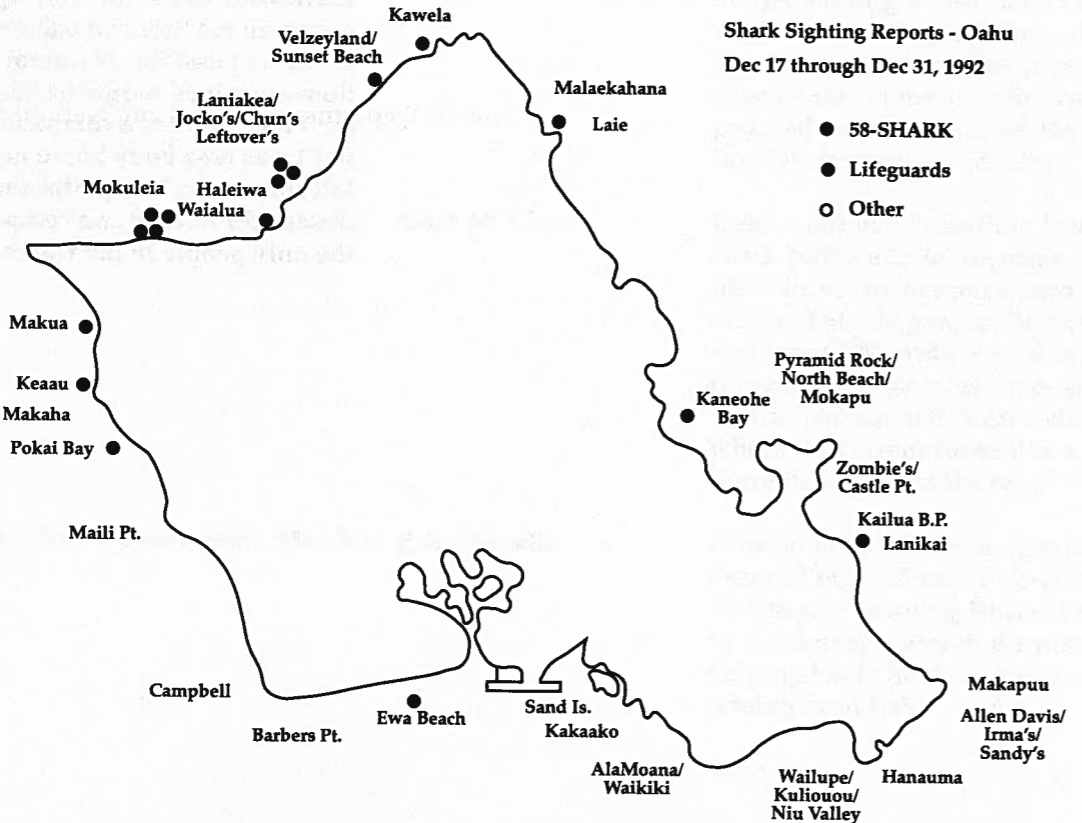
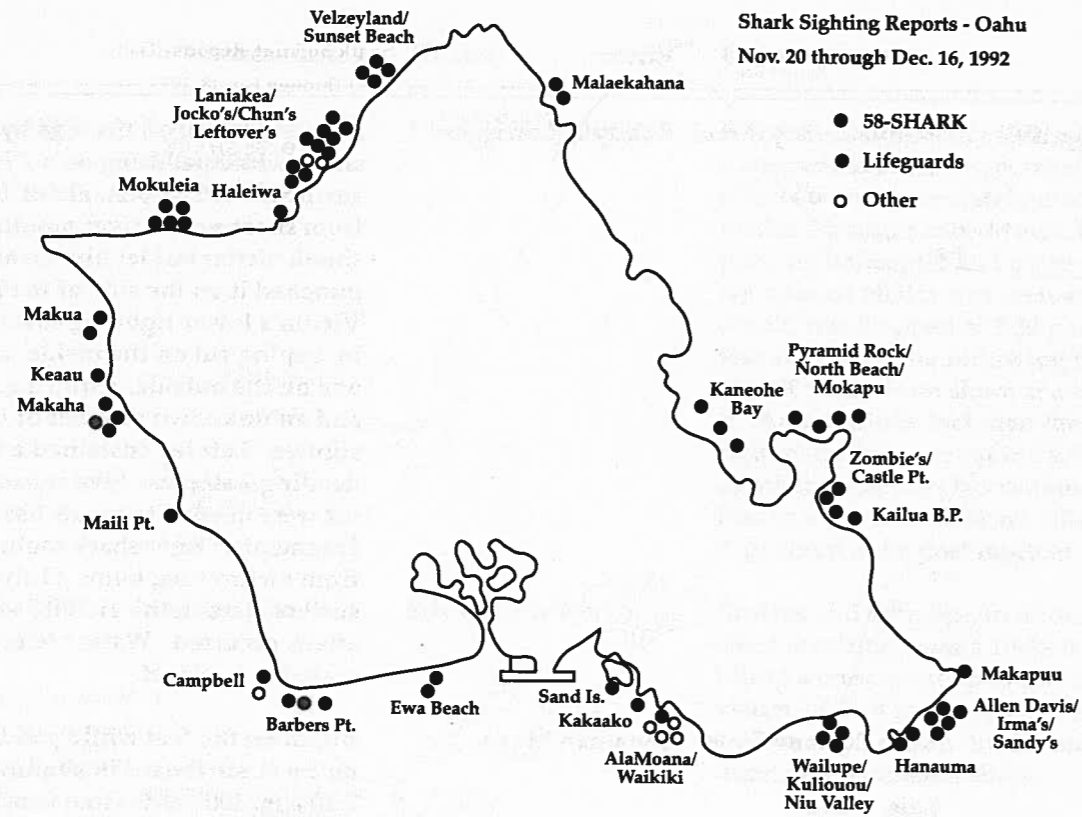
Case no.	Date	Location	Victim	Circumstances
				and shirt were recovered from the ocean bottom the following morning by fire rescue divers. Both garments had large portions missing on the left side. Bite marks present were consistent with attack by a 12-ft tiger shark. Note: Victim was reported to be a strong swimmer in good physical condition.
93 <sup>*a</sup>	26 Nov. 1991	Olowalu, Maui	Martha J. Morrell	Snorkeling with a female companion at 9 a.m. near reef edge in partly cloudy water 10-15 ft deep about 100 yards from shore, and 50 yards from the end of an old pier next to the victim's beachfront home. An 8- to 11-ft shark passed by the companion and proceeded to attack the victim, initially on the right arm. A small boat was used to recover the body a short time later. Amputations included the victim's right leg at the hip joint, the left leg sheared through the femoral neck, the right forearm, as well as numerous bites and tissue loss elsewhere.
94	26 Nov. 1991	Olowalu, Maui	Louise Sourisseau	Snorkeling companion to Martha J. Morrell (see Case No. 93). Abrasion to right calf when large shark rubbed against her in association with fatal attack on Mrs. Morrell. Following the initial attack on Mrs. Morrell the shark estimated to be 8-11 ft, swam slowly under Louise Sourisseau who assumed a motionless position floating on her back. When first seen prior to the attack, the shark was coming from a seaward direction. No other significant marine life was observed in the vicinity prior to or after the attack.
95 <sup>*b</sup>	19 Feb. 1992	Leftovers, near Waimea Bay, Oahu	Bryan Adona	Disappeared while body-boarding late in the afternoon at a surfing site about 1.2 mile southwest of Waimea Bay (near 61-350 Kam Highway). The following morning, 2/20/92, his board was found washed ashore at Waimea Bay with a 16-in crescent-shaped piece missing from

Case no.	Date	Location	Victim	Circumstances
				the anterior left side. Distinct serrations of shark bite were present in board and severed segments of rubber leash still attached to board. Danny Titilah, the last person to see Bryan Adona alive, saw a large shark shortly after he and Adona paddled out toward separate breaks at Leftovers. Others on shore also reported seeing a large shark in the vicinity. Left swim fin, identified as Bryan Adona's, was subsequently found during an extensive search. Strap of fin was severed, but without serrations.
96	28 Mar. 1992	Cannons, Haena, Kauai	Jude Chamberlain	Scratches and small puncture inflicted to foot when a large shark bit her surf board while paddling seaward 10 ft from reef edge (and 85 ft from shore) in clean water about 10 ft deep. 12-14 in. crescent bite marks made in both sides of board. Shark shook board three times then pulled it completely under water and dragged victim by leash for 20 ft before leash severed and shark released surf board. Attack occurred at about 6:45 a.m. after victim had been surfing there for a short time with a friend (Mike Cox), who witnessed the attack at close range.
97 <sup>*c</sup>	23 July 1992	Waianae, Oahu	Zosimo Popa	Victim and his son (Jeffrey Popa) failed to return from an overnight fishing trip in a 14 ft. boat. Body was found 7/23/92 tied to an ice chest floating 15 miles off the Waianae coast. Victim had sustained two cookie cutter shark bites to the lower back. Wounds were 2 inches in diameter by 1.5 inches deep and were "probably post mortem." Cause of death was "asphyxia by drowning." Life jackets and debris were recovered in the vicinity, but victim's son and the boat were never found.

Case no.	Date	Location	Victim	Circumstances
98 <sup>c</sup>	21 Aug. 1992	Twin Arches, Hana Ranch, Maui	Chester N. Shishido	Fell from a cliff while fishing and disappeared in strong current. Rescue efforts were immediately made by the victim's brother and, 30 min. later at 2:30 p.m., by helicopter and a fire rescue unit. No trace of victim was seen and the search was stopped at 5:30 p.m. Body was recovered the following morning (8/22) 200 yards from shore at a depth of 65 ft. Amputations included the left arm, right hand fractured at the wrist, as well as other numerous lacerations and tissue loss consistent with shark bites that "appeared to be post mortem."
99	22 Oct. 1992	Laniakea, Oahu	Eric Gruzinsky	Bruises and scratches to underarm and chest resulting from a 10-12 ft. shark biting a crescent-shaped piece from victim's 6 ft. 4 in. surfboard. Attack occurred at 7:50 a.m. in clear water 15 ft. deep 150 yards from shore.
100 <sup>a</sup>	5 Nov. 1992	Keaau Beach Park, Oahu	Aaron A. Romento	Severely bitten in three places on the right leg by a 10-12 ft. shark. Victim was body-boarding at 9:45 a.m. in clear shallow water 30 yards from shore. Death resulted from blood loss and shock a short time after the victim paddled ashore. Wounds did not involve the removal of tissue.
101	23 Dec. 1992	Chun's Reef, Oahu	Gary M. Chun	Cuts to left hand resulting from 10-12 ft. shark biting a 15 in. crescent-shaped piece from victim's surfboard. Attack occurred at 5:30 p.m. while lying on surfboard 100 yards from shore in the presence of 20 or more other surfers. Victim was surfing "near a channel where the current flows like a river through a break in the reef."
102	28 Dec. 1992	Honomuni, Molokai	Pahu Tanaka	Abrasion and bruise to right leg of 10-year old boy inflicted by 8-ft tiger shark. Victim was standing 50 yards from shore in waist-deep water in the morning helping his father tend a gill net containing dead fish.

Case no.	Date	Location	Victim	Circumstances
103	14 Mar. 1993	Wailuaiki Bay, Maui	Roddy P. Lewis	Severely bitten on the legs by a 12-14 ft. shark while paddling on a 7 ft. 4 in. surfboard at 3:45 p.m. about 100 feet from shore near a river mouth. Shark shook victim but let him go after he punched it on the side of the head. Victim's lower right leg sustained a 14.5 in. gaping cut on the inside, and a 13 in. one on the outside, requiring 145 staples and an unknown number of internal sutures. Left leg sustained a 4 in. cut needing 7 staples. Five separate surgeries were needed to repair tissue damage. Fragment of tiger shark tooth removed from victim's leg bone. Only two other surfers were in the vicinity when the attack occurred. Water visibility estimated to be 5 feet.
104	10 June 1993	Malaekahana State Recreation Area, Laie, Oahu	Jonathan Mozo	Bitten on the feet while paddling on a 6 ft. surfboard in shallow water at 7:10 a.m. 100 yards from Goat Island (Mokuauia). When attack occurred, victim looked back and saw a large shark with its mouth wide open. Victim raised up his legs and paddled to shore as fast as possible. Numerous lacerations sustained requiring 30 stitches to each foot. Victim's companion (Ryan Bell) was on a body board nearby and felt something bump him shortly before the attack. Victim and companion were the only people in the water at the time.

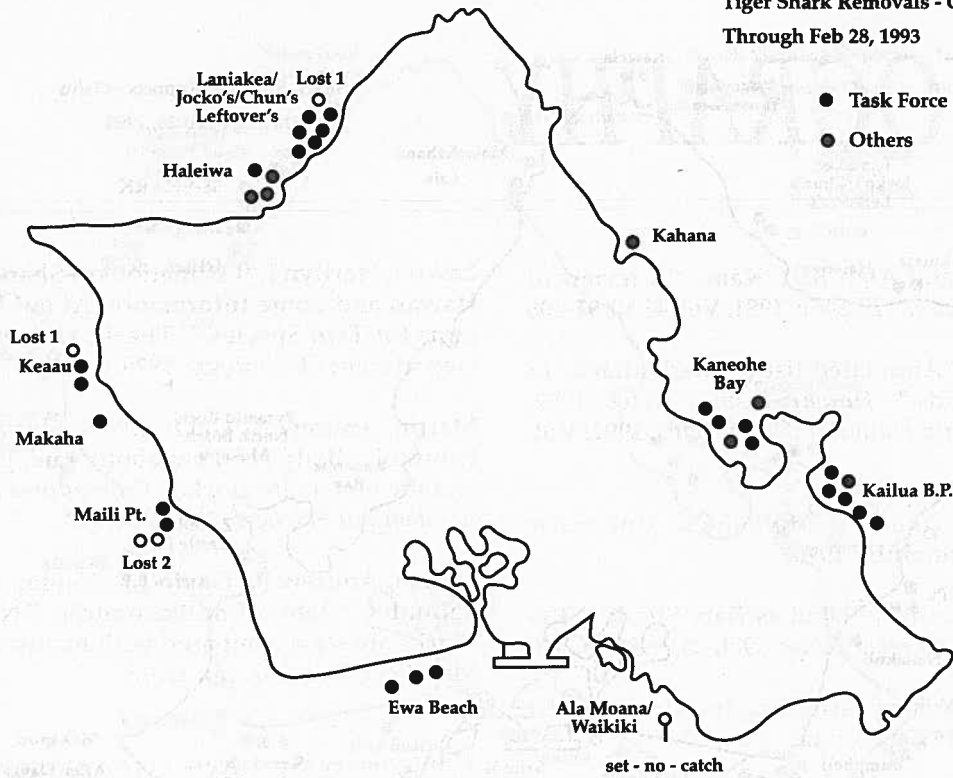
**APPENDIX B**  
**MAPS OF SHARK SIGHTINGS AND TIGER SHARK REMOVALS**



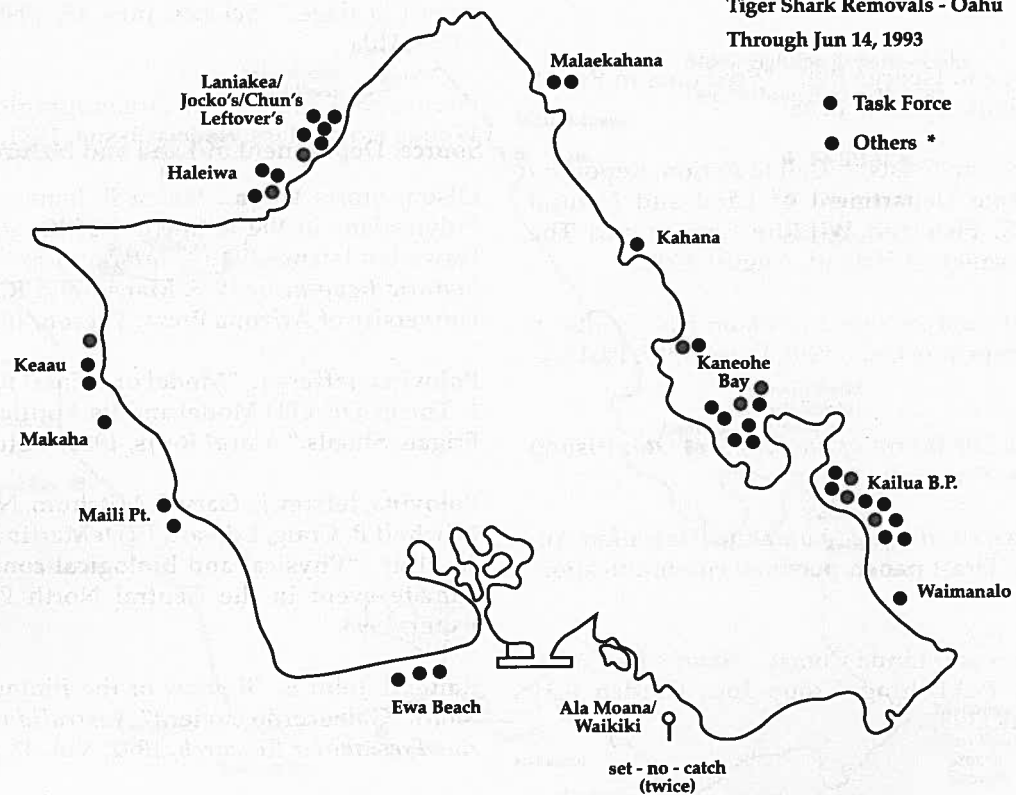
Source: Department of Land and Natural Resources

# SHARK REMOVAL AREAS

Tiger Shark Removals - Oahu  
Through Feb 28, 1993



Tiger Shark Removals - Oahu  
Through Jun 14, 1993



\* Waikiki catches by Kamisugi not included