MONTEREY BAY AQUARIUM

2009
Juvenile White Shark Project
Press Kit Index

Click on headings below to go directly to a specific release within the press kit.

NEWS RELEASE

FOR IMMEDIATE RELEASE

For information contact:
Ken Peterson (831) 648-4922; kpeterson@mbayaq.org
Karen Jeffries (831) 644-7548; kjeffries@mbayaq.org
Angela Hains (831) 647-6804; ahains@mbayaq.org
Alison Barratt (831) 647 6856; abarratt@mbayaq.org

MONTEREY BAY AQUARIUM PUTS ITS 5TH YOUNG GREAT WHITE SHARK ON EXHIBIT

The only institution to exhibit the ocean's top predator has successfully returned four others to the wild

For the fifth time, the Monterey Bay Aquarium has placed a young white shark on exhibit, bringing her from Malibu to Monterey this afternoon (Wednesday, August 26) just 14 days after she was collected by aquarium staff off the southern California coast near Malibu.

Monterey Bay Aquarium remains the only institution in the world to exhibit a white shark for more than 16 days, and has documented the successful return to the wild of each animal kept on exhibit.

As with the other white sharks brought to the aquarium since 2004, the aquarium hopes she'll remain on exhibit for several months, as a way to change public attitudes and promote stronger protection for this magnificent and much-maligned ocean predator.

The young shark, a 5-foot, 3-inch female weighing 79.8 pounds, was brought north on Wednesday in a 3,000-gallon mobile life support transport vehicle. She was collected August 12 by aquarium staff with the help of a spotter plane and a commercial fishing crew using a purse seine net. She was quickly transferred to a 4-million-gallon ocean holding pen off Malibu, where she remained for almost two weeks. Aquarium staff observed her swimming comfortably and feeding in the pen nearly a dozen times before she was brought to Monterey and placed in the million-gallon Outer Bay exhibit.

An additional four young white sharks were tagged and released in the field this summer as part of the aquarium's ongoing Juvenile White Shark Project.

Since 2002, the aquarium and its partners have collected DNA samples, tagged and tracked 26 young sharks in the wild, and – on five occasions – brought a white shark to Monterey for exhibit.
All four sharks previously kept at the aquarium were tagged and tracked after their release. The latest, released near Santa Barbara in September 2008 after 11 days at the aquarium, remained in waters near the Channel Islands off Santa Barbara. Data from her tag, and observations from a fisherman who later accidentally caught and released her, showed she was doing well.

In 2004, the first female white shark exhibited in Monterey became "the most powerful emissary for ocean conservation in our history," according to aquarium Executive Director Julie Packard. The shark was part of the aquarium's Outer Bay exhibit for six and a half months and was seen by more than a million people between September 15, 2004 and March 30, 2005. In follow-up surveys, visitors reported coming away with a deeper understanding of the need to protect white sharks and their ocean homes as a result of seeing the shark on exhibit.

Collectively, the four sharks exhibited at the aquarium have been seen by more than two million people. Since 2002, the aquarium has allocated more than $1 million toward field studies of adult and juvenile white sharks – research unrelated to the effort to put a white shark on exhibit.

Data from tracking tags placed on adult and juvenile white sharks are providing new insights into their far-ranging travels in the eastern Pacific, according to Dr. Barbara Block of Stanford University, a marine biologist and principal with the Tagging of Pacific Predators (TOPP) – one of the aquarium's key research partners. Real-time tag data and published research can be found at www.topp.org.

The aquarium collaborates with the TOPP team and other researchers to tag young white sharks in southern California waters, and to collect DNA samples for analysis of the population structure of white sharks in California and Mexico. Data from young white sharks tagged since the field project began in 2002 have been published in the scientific press, documenting the sharks' use of nearshore waters in California and Mexico as "white shark nurseries."

In the Monterey Bay Aquarium project, exhibiting white sharks has been the subject of a focused multi-year effort. This approach, developed in consultation with a panel of independent shark experts, is designed to minimize the stresses of collection, holding and transport.

Before bringing a white shark to Monterey, members of the aquarium's field team monitor its behavior to see if it has adjusted to swimming in an enclosed space. The team offers salmon, mackerel and other fish, and confirms that the shark is feeding consistently before bringing it to Monterey.

The aquarium's million-gallon Outer Bay exhibit was designed for pelagic (open ocean) animals like white sharks. It is home to Galapagos and scalloped hammerhead sharks, as well as large bluefin and yellowfin tuna, barracuda, and other species.

With the first four white sharks, visitors saw the animals face-to-face, and learned about shark conservation issues in conversations with staff and volunteer guides; through an auditorium program devoted to the white shark project; and through exhibit graphics that address the threats facing white sharks.

"I can't overstate the impact of this single animal on advancing our mission to inspire conservation of the oceans," Packard said of the first white shark the aquarium had on exhibit.

The aquarium is open daily through Labor Day from 9:30 a.m. to 6 p.m.; and on Saturdays and Sundays until 8 p.m. (through September 7). Starting September 8, regular aquarium hours are from 10 a.m. to 6 p.m. daily. For more information and tickets, visit www.montereybayaquarium.org.

White sharks are in decline worldwide, in part because they're slow to reproduce and because of growing fishing pressure that is decimating all shark species. White sharks are protected in California and other U.S. coastal waters, as well as in South Africa, Australia, Mexico and other nations. Their fearsome reputation has also made them a target of trophy hunters and the curio trade.

In October 2004, white sharks were granted additional protection by the 166 nations that are parties to the Convention on International Trade in Endangered Species of Flora and Fauna (CITES).

The aquarium encourages the public to get involved in shark conservation by using its "Seafood Watch" consumer pocket guide to sustainable seafood. The guide highlights "Best Choice" fisheries, including those that harm fewer animals – including sharks. Details are online at www.seafoodwatch.org.

Through its Center for the Future of the Oceans, the aquarium works with other institutions and public agencies to develop best strategies for white shark conservation policy in California waters. It also supports creation of a network of Marine Protected Areas (MPAs), including fully protected marine reserves where fishing is prohibited, along the entire California coast. The public can voice support for the federal Shark Conservation Act of 2009, which would protect sharks from shark finning, by visiting www.oceanaction.org.

In 2009 the Monterey Bay Aquarium celebrates 25 years of inspiring ocean conservation.

– 30 –

EDITORS: High-resolution digital images and downloadable HD footage will be available through Public Relations at approximately 7 p.m. (August 26) and on Thursday, August 27. Contact Jenny Slafkosky at 831-644 7522 or jslafkosky@mbayaq.org or Karen Jeffries at 831-238-0514 or kjeffries@mbayaq.org to request images or footage.

Back to Index

White Shark Species Information

At the Monterey Bay Aquarium: The Monterey Bay Aquarium has placed five juvenile white sharks on exhibit in the past five years. The fifth shark, a young female, was brought to Monterey on August 26, 2009, measuring 5 feet, 3 inches long and weighing 79.8-pounds.

What's unusual: There are no other white sharks on exhibit at any aquarium in the world. Only the Monterey Bay Aquarium has succeeded in keeping a white shark longer than 16 days, and there is only one other record of a white shark feeding while kept at an aquarium. By taking a cautious and methodical approach, developed in collaboration with shark experts and aquarium colleagues from around the world, the aquarium has introduced four white sharks to the Outer Bay exhibit and successfully returned all four of those sharks back to the wild.

In the wild: The white shark (*Carcharodon carcharias*) is a legendary hunter, immortalized in the book and motion picture *Jaws*. Dating back 50 million years or more, it is the world's largest predatory fish, averaging 15 feet (4.7 meters) in length at maturity and weighing more than two tons (1,800 kilograms). Pups average around 3.6 feet (1.1 m) in length, and adults can grow up to 21.5 feet (6.5 m) long, with females generally larger than males.

It is an apex predator—the animal at the top of the food web, with few natural predators of its own. Young white sharks eat fishes, rays and other sharks. Adults eat larger prey, including marine mammals and sea turtles. They also eat carrion (dead animals that they find floating in the water). They tear their prey, using triangular, serrated, razor-sharp teeth, each up to three inches long.

White sharks are highly migratory animals, difficult to study or observe. They are found worldwide in the continental shelf waters of temperate seas and oceans. They sometimes venture into tropical zones, and can be found anywhere from the surface to depths of up to 4,200 feet (1,280 m). Little is known about their life history. They may live 20 years or more. They can sense minute amounts of blood in the water and faint electrical fields given off by the bodies of prey animals. They can swim at speeds up to 25 miles per hour in short bursts, and have been observed leaping out of the water in pursuit of prey. Females give birth to between two and 14 live pups. The pups swim away from the mother immediately after birth.

Hazards to humans: Of the 360-plus species of sharks on Earth, only a handful are considered dangerous to humans. White sharks are among that number because they are large animals that are capable of inflicting serious injuries to a victim, are commonly found in areas where humans enter the water, and have teeth designed to shear rather than hold. They have been implicated in more attacks on humans—and more fatal attacks—than any other shark species.

Threats from humans: Small in numbers, slow to reproduce and widely distributed around the world, white shark populations are vulnerable to exploitation. Their numbers have been reduced by fishing that feeds the trophy trade, and by inadvertent catch in commercial fishing gear that targets other species. They're protected in California, other U.S. waters, South Africa, Australia, Mexico and some other nations. In 2004 the 166 member-states of the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) added white sharks to a list of protected species.

Updated August26, 2009

Back to Index

Juvenile White Shark Project Fact Sheet

The mission of the Monterey Bay Aquarium is to inspire conservation of the oceans. In May 2002 the aquarium launched a multi-year study of young white sharks off Southern California with two goals: to better understand the biology of these threatened ocean predators; and to determine, systematically, if it would be possible to keep a young white shark on exhibit. In 2005 the white shark program was expanded to include study of adult white sharks along the entire California coast. This research is ongoing, and will contribute to the understanding and protection of this important marine predator.

Shark Conservation

Shark populations around the world are in decline from overfishing, habitat destruction and other human activities. Of the 350-plus species of sharks worldwide, the International Union for the Conservation of Nature lists 79 as imperiled, ranging from "critically endangered" to "near threatened." It considers white sharks "vulnerable." White sharks are top predators that play a vital role in the ocean's food web—and they're already seriously depleted. While over 100 nations fish for sharks, only a handful have adopted regulations to protect them. In October 2004, white sharks were listed under Appendix II by the Convention on International Trade in Endangered Species (CITES).

Field Research

Each summer since 2002, aquarium staff and their research partners have been in Southern California, attempting to capture and hold "young-of-the-year" white sharks, and to electronically tag and release young sharks for scientific study. ("Young-of-the-year" sharks are animals up to 12 months of age.) Aquarium staff obtain young sharks caught accidentally in commercial fishing gear, or catch sharks themselves. On average, about six young white sharks a year have been reported caught in sport and commercial gear in the region.

Over the past five years the white shark research team has successfully tagged and released 18 juvenile white sharks. Published data from the tagging project suggest that in their first year white sharks tend to remain in warm water off southern California and Baja California.

In 2005, with support from a $500,000 grant from the aquarium, the white shark conservation research program was expanded to include adult white sharks along the entire California coast. Dr. Barbara Block of Stanford University leads a consortium of white shark researchers from the Monterey Bay Aquarium, PRBO Conservation Science, the Pelagic Shark Research Foundation and the University of California, Davis as part of the Tagging of Pacific Predators (www.topp.org). Since then, the TOPP team has tagged nearly 143 adult white sharks with electronic tags to document their migrations. Published studies demonstrate that these animals undertake long migrations, traveling as far west as Hawaii, and show fidelity for waters off California's Central Coast.

On Exhibit

Until the Monterey Bay Aquarium placed a white shark on exhibit in September 2004, there had been 37 unsuccessful attempts at public aquariums, dating back to the 1950s. In most cases these sharks did not feed, and were released after a few days or died.

Based on that history, the aquarium took a cautious and methodical approach to exhibiting a white shark. It focused on "young of the year" animals, drawing on years of experience that found younger animals acclimate more readily than adults. Smaller sharks are also easier to handle and transport.

The aquarium deploys an ocean holding pen, similar to those used by commercial tuna ranchers. The 155-foot diameter, 35-foot deep pen provides a controlled environment in which a juvenile shark can be observed for injury or illness, and acclimated to accept prepared food (e.g., salmon fillets, mackerel, etc.). It also allows the shark to get used to navigating in a confined environment, which eases the transition to an exhibit setting.

On July 29, 2003 a juvenile white shark was accidentally caught by a commercial fisherman and brought to the ocean pen, where it began feeding after three days. It remained in the pen for six days before it was tagged and released. (The pen had to be returned to its owner before aquarium staff felt ready to bring the shark to Monterey.)

On August 20, 2004 another juvenile white shark was acquired in the same way. She was held in the pen for more than three weeks, and then brought to Monterey on September 14, where she was placed directly into the 1.2-million-gallon Outer Bay exhibit. The next morning she fed – the first time a white shark had successfully taken food on exhibit. It was the beginning of a remarkable journey.

She stayed on exhibit for 198 days, during which time she grew from five feet in length and a weight of 62 pounds to 6-feet-4 ½ inches and 162 pounds. She was seen by nearly one million visitors – half of whom said they came specifically to see her. Staff presentations at the Outer Bay exhibit and in the auditorium informed visitors about white sharks and shark conservation issues. Surveys found that more than one-third of aquarium visitors felt they had learned something about shark conservation during their visit.

On March 31, 2005, a few days after she showed clear signs that she was hunting other animals in her exhibit; she was fitted with an electronic tag and released in waters just south of Monterey Bay.

As programmed, on April 30, 2005, the tag popped free and was recovered off the Santa Barbara County coast by a scientist from Stanford University. The data stored on the tag showed that she had traveled nearly 200 miles south and had been diving to depths greater than 800 feet. It was clear that she was thriving back in the wild.

No animals were brought back to Monterey during the summer of 2005.

On August 17, 2006, a juvenile white shark was caught by aquarium collectors on hook-and-line tackle, and transferred to the ocean pen. The male shark, 5-feet, 8 inches in length and weighing 104 lbs., was held in the pen for nearly two weeks, and then transferred to the Outer Bay exhibit on August 31. He stayed on exhibit for four-and-a-half months, growing to a size of 6-foot-5 and 171 pounds. On January 16, 2007, he was fitted with an electronic tag and released in Monterey Bay. His tag popped free 90 days later, off the tip of Cabo San Lucas in Baja California -- a journey covering more than 2,200 miles that took him up to 700 miles offshore and to depths more than 1,000 feet below the surface.

On August 4, 2007, a juvenile white shark was caught accidentally by a commercial sea bass fisherman off Ventura and transferred to the ocean pen. The male shark, 4-feet, 9 inches in length and weighing 67 ½ lbs., was held in the pen for 24 days, then transferred to the Outer Bay exhibit on August 28, 2007. He was released on February 5, 2008 after 162 days having grown to 5-foot, 10-inches and 140 pounds, and carrying two types of tracking tags. One tag reported real-time data on the shark's location. In the first 40 days the shark traveled to the Southern tip of Baja California, and then swam halfway up the Sea of Cortez before the tag battery stopped in June. The second tag popped free in June, and data from the retrieved tag will reveal detailed information on the depth and length of the shark's dives.

On August 16, 2008, a juvenile white shark was caught by aquarium collectors in Santa Monica Bay using a seine net. The female shark was held in a 4-million-gallon ocean pen off Malibu and was observed swimming comfortably and feeding in the pen several times before she was brought to Monterey on August 27. The 4 ½ feet long, 55 ½ pound female shark fed only once while at the Monterey Bay Aquarium, therefore our staff decided to return her to the wild after 11 days. Though she looked strong, it was important to put her back in the ocean while she was healthy.

Future Plans

Due to a planned closure of the Outer Bay exhibit for repairs, we will not bring a white shark to the Monterey Bay Aquarium in 2010. However, we will continue to work with research partners and our staff will aid in the tagging of juvenile white sharks off of Southern California.

Should the opportunity arise once the Outer Bay exhibit is re-opened, the aquarium will attempt to place a juvenile white shark on exhibit again. The past successes demonstrate that it is possible to exhibit a white shark for an extended period of time, and to return it successfully to the wild. They also demonstrate that bringing visitors face-to-face with white sharks can raise awareness about shark conservation issues, which supports the aquarium's mission to inspire conservation of the oceans.

Updated August 10, 2009

Back to Index

Juvenile White Shark Project: Frequently Asked Questions

Q: What is the aquarium's white shark project?

A: It's a multi-year study of young white sharks off Southern California that we began in 2002. The project had two original goals, and we've had success with both: First, to better understand the biology of these threatened ocean predators through electronic tagging, and; second, to determine, systematically, whether it was possible for us to keep and exhibit a young white shark. We have succeeded in exhibiting four white sharks in five years: one white shark for six months in 2004-05, a second animal for four-and-a-half months in 2006-07, a third animal for five-and-a-half months in 2007-08, and a fourth shark for 11 days in 2008. We're also working with research colleagues to tag and track young-of-the-year white sharks (white sharks less than one year old) in the wild. In addition, we're collaborating with research partners to tag adult white sharks off the Central Coast of California. We believe that tagging and exhibiting white sharks contribute significantly to public understanding and protection of these magnificent and much-maligned animals—an ecologically important and increasingly threatened species.

Q: What's different from past attempts to put white sharks on exhibit?

A: We believe we have succeeded where others had not because most past attempts involved capturing a white shark and putting it directly on exhibit. We took a more cautious and methodical approach, developed in collaboration with shark experts and aquarium colleagues from around the world, and informed by our own experience during the seven years of our white shark conservation research project. Our demonstrated successes involve keeping a white shark in an ocean pen before proceeding, step-by-step, toward putting it on exhibit. If at any point in the process it appears that a shark isn't doing well, we are ready to release it back to the wild.

Q: Why put a white shark in an ocean pen first?

A: Using a four-million-gallon ocean pen gives the shark a chance to recover from the stress of being caught in fishing gear. By working with juvenile white sharks in the ocean pen, we can also learn how they navigate in an enclosed space—an important step in evaluating whether one would likely do well on exhibit at the aquarium.

Q: Why put a white shark on exhibit at all?

A: Our mission is to inspire conservation of the oceans. We know that bringing people face-to-face with living marine animals is a powerful way to move people to care about the oceans and ocean life. White sharks are among the most maligned animals on Earth, and one of many shark species worldwide threatened by human activities. In fact, they're protected under the Convention on International Trade in Endangered Species (CITES). We believe there's no better way for us to raise awareness about the threats white sharks face than to let people see for themselves what magnificent and fascinating animals they are, tell the story of the threats they face in the wild, and offer ways to take action that will protect white sharks. Aquarium Executive Director Julie Packard said that the first white shark we exhibited in 2004-05 was "the most powerful emissary for ocean conservation in our history."

Q: Where do you keep the shark at the aquarium?

A: We house white sharks in our 1.2-million-gallon Outer Bay exhibit, which was designed for pelagic (open-ocean) animals and engineered with sharks in mind. (For example, we dampened as much electrical field interference, created in the exhibit by the life-support equipment, as

possible.) The Outer Bay is home to other open ocean species, including bluefin and yellowfin tunas, bonito, barracuda, and sharks.

Q: How do you collect white sharks?

A: Two methods. Sometimes our husbandry staff collects young white sharks directly, by hook-and-line or seine net. We also rely on commercial fishing crews in Southern California, who occasionally catch juvenile white sharks accidentally while fishing for halibut. We've asked crews to contact us if they capture a young white shark that's alive and healthy. We have a rapid response team standing by to work with any sharks that are caught by commercial fishermen. Team members assess the sharks' health and either transfer them to the ocean holding pen, or tag them and return them to the wild. There are many unknowns with sharks obtained as bycatch from a commercial fishery. We don't know long they've been in the net, and to what degree their health might have been compromised as a result. For that reason, we have much more confidence that we're starting with a healthy animal when our own team does the collecting.

Q: How do you know if a shark on exhibit is healthy?

A: One of the best indicators of how an animal is feeling is its feeding behavior. If an animal is ill or stressed, it will typically stop eating. We'll be watching carefully to see how often and how much the white shark eats, and we can respond immediately if there are any signs of any problems. We also look at for relaxed swimming patterns, with calm tail-beats, and monitor the shark's overall physical appearance.

Q: What do you feed it on exhibit?

A: We feed our young white sharks wild-caught salmon, mackerel and sardines, supplemented with specially formulated vitamins. We've also added albacore tuna to the menu. Juvenile white sharks eat sharks and other fishes, only switching to marine mammals when they grow larger and have increased needs for an energy-rich diet from the mammals' blubber.

Q: Will a white shark eat other animals on exhibit?

A: Although these incidents aren't unprecedented, they are rare, and we try to keep them to a minimum—primarily by ensuring that all the animals in our care are all well fed. The first white shark we kept on exhibit bit two other sharks, though it wasn't clear that she was hunting them. When her behavior changed and she began actively hunting other sharks in the exhibit, we returned it to the wild within four days.

Q: What do you do if a shark gets too big for an exhibit?

A: We've successfully released other shark species, as well as the four white sharks, when they outgrew our exhibits. When we've been able to tag and track these animals, we've found that they continue to thrive in the wild, despite their time on exhibit. Data from electronic tags on all the white sharks we've released show that they survive and thrive during the months after release.

Q: What will you do if it doesn't eat? Will you release it? Where?

A: If we find that a shark is not eating, but otherwise appears to be in good health, we'll return it to the wild. Our fourth white shark ate only once while at the aquarium. Since she did not eat again for a week, we returned her to the wild after only 11 days on exhibit to ensure that she was

healthy when she went back to the ocean. If a shark appears to be sick or injured, and is unlikely to survive after release, it would be humanely euthanized and a necropsy performed so we could learn as much as possible.

Q: What about your tagging project? What do you hope to learn from tagging sharks?

A: Working with Stanford University scientists, through our collaboration in the Tuna Research and Conservation Center (TRCC), and with other research partners, we are learning about the lives of juvenile white sharks in the wild: where they go and what they do. We want to gain insights into how they fit into the ocean ecosystem in the first year or so of their lives. Little is known about the lives and migrations of juvenile or adult white sharks.

Q: What have you learned so far?

A: We've found that the juvenile white sharks we've tagged tend to remain in coastal waters, although some traveled more extensively than others during the one to five months they were tracked. Juvenile white sharks traveled from Southern California down to the Baja Peninsula, and then up into the Sea of Cortez. They spent most of their time in shallow waters but also were tracked making 1,000-foot dives. In studies of nearly 143 adult white sharks tagged off the coast of northern California, we've learned that they make long journeys into the central Pacific, ranging as far west as Hawaii. Papers detailing the findings about juvenile and adult white sharks have been published in the scientific press, and can be found online at www.topp.org.

In addition to our tagging work, we're collecting tissue samples from young sharks killed in Baja California fisheries. By working with researchers in the U.S. and Mexico, we hope to use DNA to document genetic diversity within the Mexican shark population—perhaps throwing light on how many female sharks are birthing pups in the region.

Q: How does this help white sharks?

A: Juvenile sharks are caught accidentally in commercial and sport fishing gear. Whatever we learn about their movement patterns can play a role in developing management strategies to further protect them. By learning what habitats juvenile white sharks use, and how much they travel, resource managers will better understand the risks white sharks face and be able to conserve these rare animals more effectively.

Q: How are the white sharks tagged?

A: We use both a "pop-up archival tag" (PAT tag) and a "smart position-only tag" (SPOT tag). The pop-up tags are attached externally to a shark, where they collect data on temperature, depth and light (used to estimate position). They store the data in a tiny computer and on a pre-programmed date, the tag releases from the shark and floats to the surface. The data are then sent via satellite back to the laboratory, where they can be analyzed. If our staff is able to collect the tag floating in the water, they can obtain even more information. The SPOT tags provide near-real-time information about where the sharks go, and send the data to researchers via satellite until the batteries expire.

Q: Are white sharks threatened?

A: Yes, they're considered a threatened species, and their numbers have declined greatly in recent decades. They're protected in many parts of the world, including the United States,

Mexico, Australia and South Africa. They're slow-growing, late to reach sexual maturity, and they produce relatively few offspring. This makes them highly vulnerable to exploitation. They're killed accidentally in fishing gear and are targeted by trophy hunters. As a result of this trophy hunting, they're now protected under the Convention on International Trade in Endangered Species (CITES).

Q: What are your plans for the future?

A: Due to a planned closure of the Outer Bay exhibit for repairs in autumn of 2010, we will not bring a white shark to the Monterey Bay Aquarium in 2010. However, we will continue to work with research partners and our staff will aid in the tagging of juvenile white sharks off of Southern California.

Updated: August 10, 2009

Back to Index

Shark Milestones at the Monterey Bay Aquarium

September 10, 1984 – A 4-foot, 10-inch male **white shark** (*Carcharodon carcharias*) caught by a fisherman off Bodega Bay, is placed in the Monterey Bay Habitats exhibit a little over a month before the aquarium's grand opening. The young shark, which weighed around 100 pounds, navigated the 90-foot-long exhibit well but it never fed. It died on September 20.

July 24, 1990 – The largest **sevengill shark** (*Notorynchus cepedianus*) ever exhibited at an aquarium, and the largest ever recorded, was placed in the Monterey Bay Habitats exhibit. The 9-foot, 10-inch female, nicknamed "Emma," was at first thought to be pregnant because of her size and girth. She never delivered pups, but she was a popular exhibit animal for nearly four years until she was tagged and released in Monterey Bay in June 1994. She swam back to her home waters off Humboldt County, where she was caught by a sport fisherman in October 1996.

July 31, 1990 – A rarely seen **prickly shark** (*Echinorhinus cookei*) was briefly part of the Monterey Bay Habitats exhibit when a 7-foot female was collected by aquarium staff off Moss Landing. The deep water shark was the first ever to be kept outside the wild. She did not appear to be thriving, and was returned to Monterey Bay on August 6. A second prickly shark was exhibited briefly in July 1994, and also returned to the wild.

November 29, 1995 – The first **blue shark** (*Prionace glauca*) is placed in the aquarium's million-gallon Outer Bay exhibit, in preparation for opening the multi-species open ocean exhibit in March 1996. The 6-foot, 6-inch female survived only three months until she was humanely euthanized on February 14, 1996, and a smaller male blue shark dies just over a week later. Aquarium biologists ultimately conclude that these open ocean predators are not good candidates for exhibit, and further attempts to exhibit blue sharks are dropped.

March 20, 1999 – Aquarium visitors had an opportunity for a first-hand experience with **filetail catsharks** (*Parmaturus xaniurus*), a deep sea species not commonly exhibited at aquariums. The bottom dwelling sharks, which grow to about two feet in length, were kept behind the scenes for seven years as the aquarium researched and prepared its pioneering "Mysteries of the Deep" exhibit of deep sea animals. Many mated and laid eggs, though no young were born. The catsharks found homes at other aquariums when the exhibit closed in September 2003.

October 6, 2000 – The aquarium became the first in North America and one of the few in the world ever to exhibit an **oceanic whitetip shark** (*Carcharhinus longimanus*) when it added a 5-foot, 50-pound female to the Outer Bay exhibit. The open ocean shark, considered one of the most dangerous to people, thrived for more than three years before she succumbed to a persistent bacterial infection in late December 2003. During her time at the aquarium, she grew to a length of 6.3 feet and a weight of 93.5 pounds. She was originally collected by aquarium staff off Baja California, transported to Monterey and placed directly on exhibit.

March 7, 2001 – Male and female **scalloped hammerhead sharks** (*Sphyrna lewini*) were added to the Outer Bay exhibit after being raised behind the scenes for eight months until they had grown large enough to compete for food with more aggressive tunas in the exhibit. The sharks, collected by researchers at the University of Hawaii's Hawaii Institute of Marine Biology in Oahu, have grown significantly from their 3-foot 3-inch size when they were placed on exhibit. They're found worldwide in tropical and subtropical waters. Smaller scalloped hammerheads

were part of the "Sharks: Myth and Mystery" special exhibition; several were then introduced to the Outer Bay exhibit after they outgrew their exhibit.

April 2, 2004 – Though they're common in tropical waters, **Galapagos sharks** (*Carcharhinus galapagos*) had never been exhibited outside Hawaii until they became part of the aquarium's "Sharks: Myth and Mystery" special exhibition. Although the animals were only about four feet long, they were too large to navigate the exhibit they shared with scalloped hammerhead sharks without scratching their noses. They were subsequently transferred to the Outer Bay exhibit where they're doing well.

September 14, 2004 – As part of its multi-year white shark conservation research project, the aquarium placed a 5-foot **white shark** (*Carcharodon carcharias*) on exhibit in the 1.2-million-gallon Outer Bay exhibit. The female shark thrived on exhibit for six and a half months and was seen by nearly a million people. She was released a record 198 days later, on March 31, 2005 over concerns that she had grown to a point that would soon make it more difficult to handle her and safely return her to the ocean, and based on new observations that she was beginning to hunt other sharks in her multi-species exhibit.

August 31, 2006 – For the second time, the aquarium placed a young **white shark** (*Carcharodon carcharias*) in the Outer Bay exhibit. The 5-foot, 8-inch male weighing 104 pounds was caught in Santa Monica Bay. After 137 days, on January 16, 2007 he was returned to the wild after being fitted with an electronic tag to track his movements during his first 90 days back in the wild. The tag popped free on schedule, documenting a migration to the southern tip of Baja California – a journey of more than 2,200 miles that took him up to 700 miles offshore and to depths more than 1,000 feet below the surface.

August 28, 2007 – For the third time, the aquarium placed a young **white shark** (*Carcharodon carcharias*) in the Outer Bay exhibit. The 4-foot, 9-inch male weighing 67 ½ pounds was caught in a commercial sea bass net off Ventura County. He was released on February 5, 2008 after 162 days carrying two types of tracking tags. In the first 40 days the shark traveled to the Southern tip of Baja California, and then swam halfway up the Sea of Cortez.

August 27, 2008 – The aquarium placed a fourth **white shark** in the Outer Bay exhibit. The 4 ½ feet long, 55 ½ pound female shark fed only once while at the Monterey Bay Aquarium, therefore our staff decided to return her to the wild after 11 days. Though she looked strong, it was important to put her back in the ocean while she was healthy.

June 10, 2009 - A **prickly shark** (*Echinorhinus cookei*) was placed on exhibit in Monterey Bay Habitats. The rarely seen deep-water shark was in Monterey Bay – only the 2nd time that one of these animals has ever been seen alive outside the wild. The shark was released 15 hours later, as staff biologists monitoring its condition on exhibit observed that it appeared to be too buoyant to swim easily, and decided that it was in the shark's best interest to return it to the wild as quickly as possible. The only other prickly shark exhibited anywhere in the world was exhibited at the aquarium in July 1990 and returned to the wild seven days later.

Updated August 10, 2009

Back to Index

Outer Bay Exhibit Species List & Comparative Sizes

Giant Pacific bluefin tuna: Range from 3 feet to 6 feet, and 40 pounds to 300 pounds.

Yellowfin tuna: Range from 3 feet to 5 feet, and 30 to 250 pounds.

California barracuda: 3 feet; range from 8 to 12 pounds.

Pacific bonito: Range from 18 inches to 24 inches, and 8 to 12 pounds.

Pacific mackerel: 8 to 12 inches; 1 pound.

Pelagic stingrays: Range from 2 to 3 feet (disk width) and 60 to 80 pounds.

Scalloped hammerhead sharks: 6 feet, 90 pounds.

Galapagos sharks: 6 feet, 125 pounds.

Pacific sardines: 6 inches

Updated August 19, 2009

Back to Index

White Sharks: Worldwide Exploitation, Worldwide Decline

Many nations around the world, including the United Stages, have enacted laws to protect white sharks from directed fisheries, and have outlawed the practice of shark finning.

Despite this, white sharks continue to be exploited in oceans around the world. The United Nations Food and Agriculture Organization (FAO) believes that "the greatest threat to this [white shark] species, irrespective of region, is indirect commercial fisheries."

White sharks, along with all other sharks and their skate and ray relatives are frequent victims of accidental catch in fisheries. It is estimated that of the 100 million sharks and rays killed each year, over half are caught as bycatch in non-shark fisheries. Although it's illegal to retain white sharks or white shark body parts in many countries, trade in white shark teeth and jaws continues.

In an attempt to combat this trade, Australia and Madagascar, supported by the U.S., proposed that white sharks be listed under Appendix II of the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES). When a species is listed on Appendix II of CITES, trade in the animal (and body parts) is tightly regulated. White sharks were listed to Appendix II in 2004, despite objections from several nations. A proposal to set the quota to zero (i.e. to prohibit all trade) was not successful.

Despite this new regulation in trade, white shark "souvenirs" are still freely available on the market. The World Conservation Union (IUCN), which lists the white shark on its Red List of Threatened Species notes that, "notoriety of this shark as an ultimate Hollywood monster encourages inflated values for white shark products, and encourages illicit trade in white shark parts that is difficult to assess and control."

Sharks are an integral part of the ocean food web and white sharks are apex predators: at the top the food web, controlling populations of other predators such as sea lions. Populations of such predators, if left unchecked, can alter the food web and deplete food sources vital to other species.

What can we do to help white sharks?

- Follow the recommendations of Seafood Watch regional pocket guides to find shark-friendly "Best Choices" - www.seafoodwatch.org.
- Don't eat shark meat or shark-fin soup.
- Avoid products containing shark liver oil and shark cartilage. Look for shark-free alternatives, such as chondroitin from bovine sources.
- Avoid buying shark souvenirs such as teeth and jaws, except for replicas or fossils.
- Support legislation that prevents overfishing and encourages fisheries managers to consider whole ecosystems, rather than focusing exclusively on managing a species for fishing.
- Go to www.oceanaction.org to sign up for the aquarium's ocean action alerts and take action today to stop shark finning by supporting the Shark Conservation Act of 2009.

Updated August 10, 2009

Back to Index

History of White Shark Protection Worldwide

1991: **South Africa** announces protection of white sharks within its exclusive economic zone (EEZ). The legislation makes it illegal to catch or kill any white shark, or to sell or offer for sale any white shark, body part or product from white sharks.

1993: **Namibia** announces protection for white sharks, by banning fisheries that specifically target white sharks.

1994: **California** introduces a temporary law that prohibits the catch of white sharks in state waters, and landing white sharks caught outside state waters in California ports.

1997: **California** adopts permanent legislation to fully protect white sharks in state waters, and outlaws all directed efforts to attract white sharks. White sharks may be collected under a permit issued for educational and scientific purposes. Accidental catch in gill net fisheries is also allowed, as its impact is deemed minimal.

1997: The U.S. National Marine Fisheries Service (NMFS) outlaws all directed fisheries for white sharks in East Coast waters, including **Florida** and the **Gulf of Mexico**. White sharks caught accidentally must be released with minimum injury and without taking the animal out of the water. Possession of white sharks is prohibited, due to being identified as highly susceptible to overexploitation.

1997: **Australia**'s government protects white sharks throughout its waters.

1998: **Brazil** gives white sharks the status of endangered species

1999: **Malta** declares the white shark a protected species in its territorial waters.

2000: The World Conservation Union (IUCN) adds white sharks to the Red List of Threatened Species as "vulnerable to extinction" but notes that "a global status of "Endangered" may be proven accurate for this shark as further data is collated."

2000: The **U.S**. enacts a Shark Finning Prohibition to ban any person under U.S. jurisdiction from: engaging in shark finning; possessing shark fins aboard a fishing vessel without the shark carcass; and landing shark fins without the shark carcass. The Shark Finning Prohibition Act defines finning as the practice of taking a shark, removing the fin or fins from a shark, and returning the remainder of the shark to the sea.

2002: During the Convention on Migratory Species, participants demand better international protection for the white shark. Close to 70 nations agree that the white shark should be listed on CITES Appendix I and II to control trade in white shark parts, and that all countries with white shark populations should take legal measures to prevent poaching and directed and accidental catch in fisheries.

2004: White sharks are listed on Appendix II of CITES.

2007: **Mexico** introduces new regulations and protections for sharks, including a shark finning ban, an extension of the moratorium on new commercial shark fishing permits, and extensive protections for several shark species, including white sharks.

2007: **New Zealand** announces that white sharks (known as white pointer sharks) will be fully protected within its exclusive economic zone (EEZ), and that fishing by New Zealand-flagged boats will be prohibited outside its EEZ. The regulations make it illegal to hunt, kill or harm a white shark, or to possess or trade in any part of a white shark. Accidental catch must be returned to the water intact and alive, if possible. It's still legal to use shark nets to protect swimmers around beaches however; and fishermen who accidentally catch and kill white sharks will not be prosecuted, provided they register the death with authorities.

2009: The **U.S**. House of Representatives passes the Shark Conservation Act of 2009. The bill seeks to close the loopholes in the Shark Finning Prohibition Act of 2000.

Updated August 10, 2009

Back to Index

White sharks and the U.S.

In 1994, California passed a temporary law to protect white sharks in state waters. This law was permanently upheld in 1997. At the same time, protection was also afforded to white sharks on the East Coast by the National Marine Fisheries Service.

However, research shows that white sharks do not reside permanently in specific locations, or even in one region. Tagging studies undertaken by scientists with the Tagging of Pacific Predators (TOPP) program (www.topp.org) show that white sharks are far more migratory than scientists had previously believed. Scientists from the Food and Agriculture Organization of the United Nations (FAO) also note that "there is good evidence that individuals return seasonally or more regularly to particular locations, resulting in predictable areas of concentration that can be exploited by commercial and recreational fisheries."

The Magnuson-Stevens Fishery Conservation and Management Act is the primary law governing marine fisheries management in federal waters. Magnuson-Stevens was first enacted in 1976 and amended in 1996. In 2006, it was reauthorized and many of the recommendations of the Pew Oceans Commission and the U.S. Commission on Ocean Policy were incorporated, one of which was to end overfishing. In 2006, the National Marine Fisheries Service added six new species to the list of U.S. fish populations that are experiencing overfishing or are already overfished, including several shark species.

The FAO believes that the greatest threat to the future survival of white sharks is indirect commercial fisheries. Where overfishing occurs, it is likely that more animals, such as white sharks, will continue to be accidentally caught. Overfishing in the U.S. is therefore a continuing threat to white sharks that feed or migrate through U.S. waters.

How can you help?

The Monterey Bay Aquarium has an online community of people dedicated to ocean conservation. Alerts are sent via e-mail when new actions are needed, including issues affecting sharks such as of shark finning, overfishing and establishment of Marine Protected Areas.
You can support the Shark Conservation Act of 2009 on our website which seeks to bring an end to shark finning in U.S. waters. Visit www.oceanaction.org to learn more and to sign up for e-mail alerts and the aquarium's monthly e-newsletter.

The aquarium also encourages the public to get involved in shark conservation by using its "Seafood Watch" consumer pocket guide to sustainable seafood. The pocket guide, as well as supporting materials for restaurants and retailers, highlights fisheries that are "Best Choices," including those that accidentally catch sharks. Learn more at www.seafoodwatch.org.

Updated August 10, 2009

Back to Index