



MONTEREY BAY AQUARIUM®

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MONTEREY BAY AQUARIUM

NEWS RELEASE

FOR IMMEDIATE RELEASE

September 1, 2006

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

FOR THE 2ND TIME, MONTEREY BAY AQUARIUM PUTS A YOUNG WHITE SHARK IN OUTER BAY EXHIBIT

Earlier success raised public awareness of threats, generated new funds for white shark research

For the second time, the Monterey Bay Aquarium has placed a young white shark on public exhibit, bringing him to Monterey on Thursday evening (August 31), 14 days after aquarium husbandry collectors caught the shark on hook-and-line gear off Southern California.

As in 2004-2005 – when another white shark was on exhibit for a record 198 days before her successful return to the wild – the aquarium hopes to keep him on long-term exhibit 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, 8-inch male weighing 104 pounds, was brought north Thursday in a 3,000-gallon mobile life support transport vehicle. Caught several miles offshore in Santa Monica Bay, he had been held since August 17 in a 4-million-gallon ocean pen off Malibu and was observed feeding in the pen before he was brought to Monterey.

Since 2002, the aquarium through its White Shark Research Project has worked to learn more about white sharks in the wild and to bring a white shark to Monterey for exhibit. During that time, aquarium staff have tagged and tracked seven juvenile white sharks off Southern California – animals either collected by staff biologists or obtained from commercial fishing crews who caught them accidentally in their nets. The first shark kept at the aquarium was also tagged and tracked after her release.

Nearly two years ago, a female white shark 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 – nearly 30 percent more visitors than normal for the

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period. In follow-up surveys, many visitors reported coming away with a deeper understanding of the need to protect white sharks and their ocean homes.

The unexpected boost in attendance prompted trustees of the nonprofit aquarium to provide an additional \$500,000 – for a total of \$840,000 since 2002 – for field studies of juvenile and adult white sharks. In the fall of 2005 alone, researchers funded by the aquarium placed electronic tags on 29 adult white sharks off the Farallon Islands and Point Año Nuevo – the largest number ever tagged in this fashion over such a short period. Researchers with the Tagging of Pacific Pelagics (TOPP; www.toppcensus.org) project have now tagged 66 adult white sharks off the Central coast with data-collecting tags.

Data from the tags are offering new insights into the far-ranging travels of white sharks in the eastern Pacific, according to Dr. Barbara Block of Stanford University, a marine biologist and principal investigator with TOPP.

The aquarium continues to collaborate with other research teams 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.

Aside from the animal that thrived during its 198-day stay in Monterey, no aquarium in the world has ever exhibited a white shark for more than 16 days. There is general agreement in the marine science community that past failures with white sharks at other aquariums resulted from the stress of capture, inability to encourage the sharks to feed, and inadequate exhibit design.

In the Monterey Bay Aquarium project, collecting white sharks has been the subject of a focused multi-year effort involving aquarium husbandry and veterinary staff, scientists and fishermen, said aquarium husbandry curator Jon Hoech. This approach, developed in consultation with an outside panel of shark experts, is designed to minimize the stresses of collection, holding and transport, he said.

Though the aquarium succeeded two years ago in exhibiting a white shark caught accidentally in commercial gear, staff veterinarian Dr. Mike Murray said the husbandry staff prefers to work with sharks it collects itself.

“There are a lot of unknowns with sharks that are bycatch from a commercial fishery,” Dr. Murray said. “We never know how long they’ve been in the net, or to what degree their health is compromised. We have much more confidence that we have a healthy animal to begin with when our team does the collecting.”

During 2006, the aquarium team worked with six white sharks caught accidentally by commercial fishing crews. Three died, one escaped the ocean holding pen, one was released because it proved not to be a candidate for exhibit, and one was tagged in the field and released.

While in the pen, white sharks are monitored to see if they adjust to swimming in an enclosed space. The aquarium’s field team offers food – including salmon filets, mackerel and other fish – and

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confirms that the shark is feeding before any attempt is made to bring it to Monterey.

At the aquarium, the Outer Bay exhibit was designed specifically to accommodate pelagic (open ocean) animals. It is home to Galapagos and scalloped hammerhead sharks, as well as bluefin tuna weighing 400 pounds or more, yellowfin tuna, barracuda, sea turtles, ocean sunfish and other open ocean species.

The first white shark coexisted with the other animals until February 2005, when she killed two soupfin sharks. On March 28, aquarium biologists saw clear signs that her behavior had changed and she has begun actively hunting other sharks. They returned her to the wild three days later.

During her stay, people not only saw a white shark face-to-face, they learned about shark conservation issues in conversations with staff and volunteer guides; through a question-and-answer auditorium program devoted to the white shark project; in other exhibits that address shark conservation; and through exhibit graphics specifically addressing 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.

The public can see the white shark daily through Labor Day from 9:30 a.m. to 6 p.m., and from 10 a.m. to 6 p.m. daily beginning September 5. He can also be viewed online via the aquarium’s streaming Outer Bay web cam from 7 a.m. to 7 p.m. daily (Pacific time), at www.montereybayaquarium.org. (Specific link: http://www.mbayaq.org/efc/efc_hp/hp_obw_cam.asp).

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 now a protected species 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 presents strong shark conservation messages in many of its live exhibits, including the permanent “Vanishing Wildlife” gallery and in “Sharks: Myth and Mystery,” an award-winning special exhibition that closes on Labor Day, September 4.

The aquarium encourages the public to get involved in shark conservation by using its “Seafood Watch” consumer pocket guide to sustainable seafood. The guide, as well as supporting materials for restaurateurs and seafood retailers, highlights “best choices” fisheries, including those that kill fewer animals – including sharks – that aren’t the direct target of the fisheries. Details are online at www.seafoodwatch.org.

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Through its Center for the Future of the Oceans, the aquarium works with other institutions and agencies to develop the best strategies for white shark conservation policy in California waters. It is also part of a coalition working to establish a network of marine protected areas, including fully protected marine reserves where fishing is not allowed, along the entire California coast. Details are available at www.oceanaction.org.

The mission of the Monterey Bay Aquarium is to inspire conservation of the oceans.

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EDITORS: High-resolution digital images and video b-roll are available through Public Relations.

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White Shark Fact Sheet

At the Monterey Bay Aquarium: A male white shark was caught by Monterey Bay Aquarium husbandry staff off Southern California on August 17 and held for nearly two weeks in an ocean pen as part of the Monterey Bay Aquarium's white shark research project. The shark, which is 5-feet, 8-inches long and weighs 104 pounds, was brought to Monterey in a mobile life support transport tank on Thursday, August 31 and placed in the million-gallon Outer Bay exhibit shortly after 6 p.m.

What's unusual: There are no other white sharks on exhibit at any aquarium in the world. Only the Monterey Bay Aquarium, in 2004-05, 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 was able to keep a female white shark for 6 ½ months in 2004-05, and successfully return her to the wild. We now hope to succeed for a second time.

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 two to 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 California, other U.S. waters, South Africa, Australia, Mexico and some other nations. In October 2004 the 166 member-states of the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) will consider adding white sharks to a list of protected species.

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White Shark Research 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, whether it would be possible to keep a young white shark on long-term exhibit. In 2005 the white shark research program was expanded to include study of adult white sharks along the entire California coast. This research will continue until at least 2008, 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 work with fishing crews to receive sharks caught accidentally in commercial gear, and independently to tag sharks. On average, about six young white sharks a year have been reported caught in sport and commercial gear in the region.

Over the past four years the white shark research team has successfully tagged and released seven juvenile white sharks in the wild. Tagging data suggest that in their first year white sharks tend to remain in warm water off southern California, and can venture as far south as Baja California, Mexico.

In 2005, with a \$500,000 grant from the aquarium, the white shark research program was expanded to include adult white sharks along the entire California coast. Dr. Barbara Block from 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 Pelagics (www.toppcensus.org).

In October and November 2005 this team successfully tagged 29 adult white sharks with electronic tags, and will follow their migrations through 2006. Early analysis of data from the 66 adult white sharks tagged in northern California demonstrated that these animals undertake long migrations into the central North Pacific, traveling as far as Hawaii; this research will expand upon those findings and help to define habitat use by white sharks and fidelity of sharks to Central Coast feeding grounds.

On Exhibit

Until the Monterey Bay Aquarium placed a white shark on long-term 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 either died or were released after a few days.

To overcome the obstacles encountered by other institutions, the aquarium took a cautious and methodical approach to exhibiting a white shark. It focused on “young of the year” animals, based on years of experience that found younger animals acclimate more readily than adults. Smaller juvenile sharks are also easier to handle and transport.

The aquarium employed 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 filets, 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 fitted with an electronic tag and released. (The pen had to be returned to its owner and aquarium staff did not feel prepared 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, then brought to Monterey on September 14, where she was placed directly into the 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 remained on exhibit for 198 days, during which time she grew from five feet in length and 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. Presentations at the 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 the white shark demonstrated 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 husbandry 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, then transferred to the aquarium’s Outer Bay exhibit on August 31. He will remain on exhibit as long as he navigates the exhibit well, is feeding and in good health, and is does not display predatory behavior toward other animals in the exhibit.

Future Plans

The aquarium will continue its white shark research program at least through 2008. Early results from juvenile white shark tagging studies are being prepared for publication in 2006, and scientists beginning to get back data from adult sharks tagged in the fall of 2005. Because these studies are the first of their kind in the eastern Pacific, they will play a critical role in shaping our understanding of how white sharks use this ecosystem, and what conservation strategies are needed to protect the species.

Should the opportunity arise, the aquarium will attempt to place a juvenile white shark on exhibit again. The success in 2004-5 demonstrated that it is possible to exhibit a white shark for an extended period of time, and to return it successfully to the wild. It also demonstrated that bringing visitors face-to-face with a white shark can generate increased awareness about shark conservation issues, which supports the aquarium's mission to inspire conservation of the oceans.

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White Shark Research 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 succeeded in exhibiting a white shark for six months in 2004-05, and have just (on August 31) placed a second animal on exhibit with hopes of repeating that success. In addition, we remain focused on tracking young-of-the-year white sharks (white sharks less than one year old) in the wild as well as refining our techniques for keeping and exhibiting young white sharks at the aquarium. We're collaborating with several research partners to tag juvenile and adult white sharks. 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 other attempts to put white sharks on exhibit?

A: We believe we succeeded where others had failed because most past attempts by aquariums 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 since 2002. Our demonstrated success involved 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 appeared that a shark wasn't doing well, we were 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 white shark we exhibited in 2004-5 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 million-gallon Outer Bay exhibit, which was designed to simulate the open ocean environment 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 many open ocean species, including bluefin and yellowfin tunas, bonito, barracuda, sea turtles and other sharks.

Q: How do you collect white sharks?

A: Two methods. Sometimes our husbandry staff attempts to collect young white sharks directly, by hook-and-line. 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 will do you know if a shark is healthy and not suffering from stress?

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 watch 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 its overall physical appearance.

Q: What will do you feed it on exhibit?

A: We've found that our young white sharks on exhibit fed enthusiastically on wild-caught salmon, mackerel and sardines, supplemented with specially formulated vitamins. We later added albacore tuna to the menu. With our new white shark, we'll begin with that diet and continue to experiment with diet as opportunities arise. 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 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 sharks back to the wild 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 an electronic tag on the white shark we released from the exhibit in March 2005 showed that she survived and thrived after release. On another occasion, a sevengill shark spent four years at the aquarium, swam several hundred miles back to its home waters, and survived another two years before she was caught by a sport fisherman.

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. If a shark appears to be sick or injured, and is unlikely to survive a return to the wild, 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 hope to learn more about the lives of juvenile white sharks in the wild. We want to learn where they go and what they do. Basically, 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 seven juvenile white sharks we've tagged thus far tended to remain in coastal waters, although some traveled more extensively than others during the one to two months they were tracked. Juvenile white sharks traveled from Southern California to halfway down the Baja Peninsula, thus inhabiting both U.S. and Mexican waters. They spent most of their time in shallow waters but also were tracked making 1,000-foot dives. In studies of 66 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. In the years ahead, we hope to learn more by configuring tags to collect data over longer periods of time. We'd like to learn whether their behavior changes from season to season.

In addition to our tagging work, we're also collecting tissue samples from young sharks killed in Baja California fisheries. By working with research colleagues, we hope to use DNA to document genetic diversity within the shark population in Mexico—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 a “pop-up satellite archival tag.” It’s attached externally to a shark, where it collects data on temperature, depth and light (used to estimate position) and stores the data in a tiny computer. 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. Some tags wash ashore, and their data are recovered when the tags are found and returned by beachcombers. This year, we deployed the first of our “smart position-only tags” (SPOTs) that can provide near-real-time information about where the sharks go.

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 places where they occur, including California, 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).

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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 are part of the "Sharks: Myth and Mystery" special exhibition; several have been 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 new "Sharks: Myth and Mystery" special exhibition. Although the animals on exhibit are 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 Research Project, the aquarium placed a 5-foot **white shark** (*Carcharodon carcharias*) on exhibit in the 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. She became "the most powerful emissary for ocean conservation in our history," according to aquarium Executive Director Julie Packard.

August 31, 2006 – For the second time, the aquarium places 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. He had been held since August 17 in the aquarium's 4-million-gallon ocean pen off Malibu, where he was observed feeding before he was brought north to Monterey.

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Monterey Bay Aquarium

Outer Bay Exhibit Species List & Comparative Sizes

White shark: 5-foot, 8-inches; 104 pounds.

Giant Pacific bluefin tuna: Range from 3 feet and 50 pounds to 6 feet and 500 pounds.

Yellowfin tuna: Range from 2 feet and 40 pounds to 4 feet and 245 pounds.

California barracuda: 3 feet; range from 15-20 pounds.

Pacific bonito: Range from 18 to 24 inches and 15 to 25 pounds.

Ocean sunfish: 4 feet; 400-700 pounds.

Black sea turtles: 3.5 feet; 310 pounds.

Pelagic stingrays: 4 feet (disk width); 100 pounds.

Scalloped hammerhead sharks: 4 feet; 50 pounds.

Galapagos sharks: 4 feet, 75 pounds.

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