



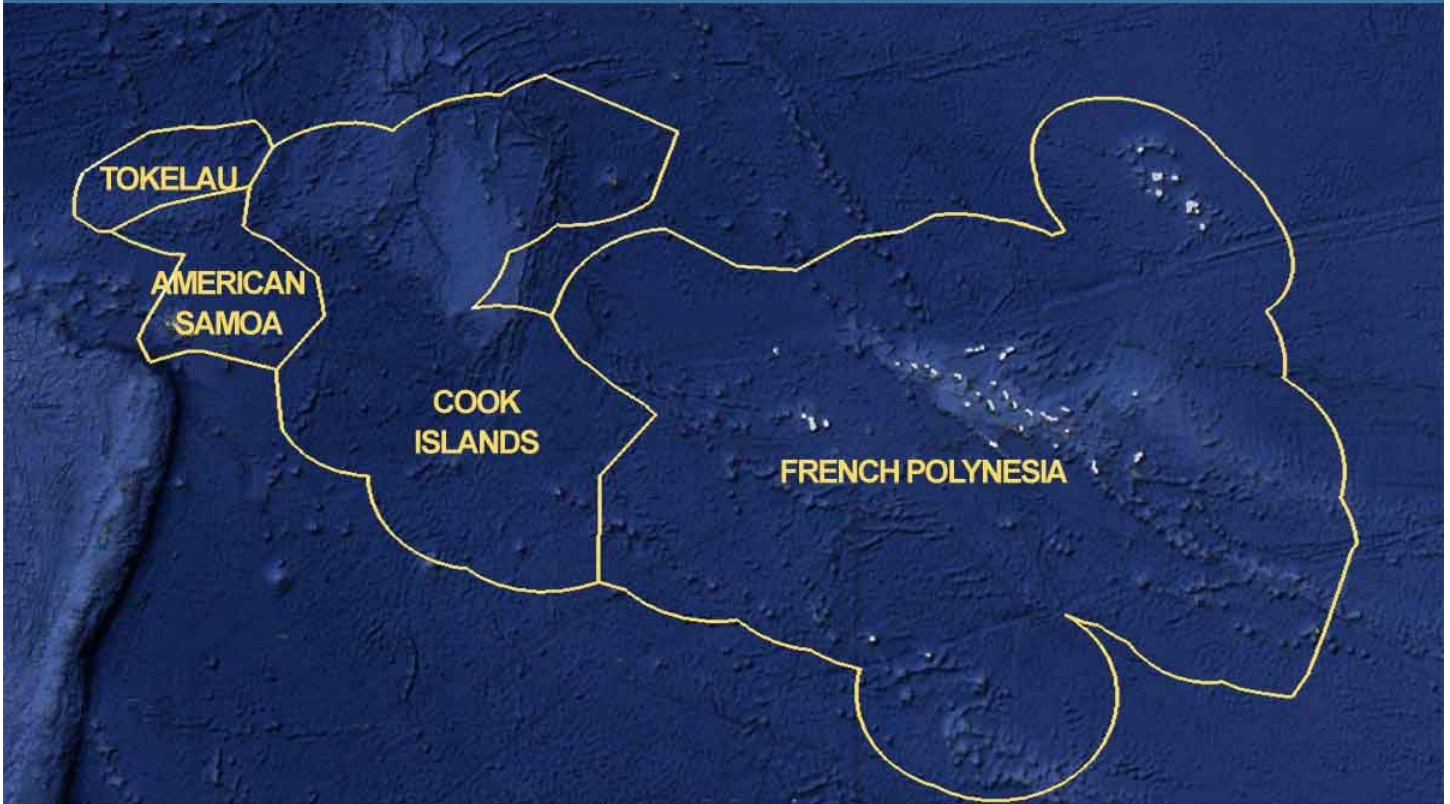
WINTER 2012

SHARK RESEARCH INSTITUTE

Newsletter

Shark Research Institute Global Headquarters
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Closed to Shark Fishing!



French Polynesia and the Cook Islands have created adjacent shark sanctuaries that span 2.5 million square miles of the Pacific Ocean, closing the area to shark fishing. On December 6, 2012, French Polynesia — which includes five major archipelagoes with more than 100 islands, including Tahiti — created the world's largest shark sanctuary of 1.5 million square miles of sea. On December 19, 2012, the Cook Islands designated its own sanctuary of 756,000 square miles, which equals the size of Mexico.

Traditionally, French Polynesians rarely ate shark meat which kept the country's annual shark catch low. The demand for shark fins rose in the late 1990s, and by the early 2000s, French Polynesia was exporting tons of fins to Asian markets, and shark populations plummeted. In 2006, French Polynesia established a moratorium on shark fishing and finning, but it exempted mako sharks as a compromise to local fishing interests. In the last few months, American Samoa and the Micronesian state of Kosrae have banned shark fishing off their shores, and the European Union and Venezuela have both prohibited the practice of cutting off a shark's fins while discarding the body at sea.

Before French Polynesia's declaration, six countries — Palau, Maldives, Honduras, Bahamas, Marshall Islands and Tokelau — created shark sanctuaries.

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The Shark — A Golden Goose?

- **Australia** (Queensland): Up to 25 percent of travel expenses from visitors attributed to shark tourism. (Martin, et al, 2006); (Western Australia), whale shark tourism valued at US\$3.1 million (Davis, et al, 1997), rose to US\$7.8 million during the two-month season (West Aus. Land Mgmt, 2002)
- **Bahamas**: Shark-related tourism has contributed more than US\$78 million to the local economy (Cline, 2008).
- **Belize**: Whale shark tourism generated US\$3.7 million during 6-week season at Gladden Spit, with \$1.35 million to five communities. Each living whale shark was valued at US\$2.09 million over its lifetime; US\$34,906 annually (Graham, 2004).
- **Canary Islands**: Shark and ray diving were estimated to generate US\$22.9 million to the local economy per year (De la Cruz Modino, et al, 2010).
- **Maldives**: In 1993, a dead reef shark was worth \$33.50, while a live reef shark generated \$33,500 per year to the economy (Anderson & Ahmed, 1993). Thirteen years later, shark tourism was valued at US\$38.6 million (Martin, et al, 2006).
- **Palau**: Shark diving brings approximately US\$18 million annually to the economy. The annual income in salaries paid by shark-diving industry was estimated US\$1.2 million and the annual tax income generated was approximately 14 percent of all business tax revenue. The annual value of one reef shark to tourism and the government is US\$179,000, and its lifetime value (based on a 16-year lifespan) is US\$1.9 million. (Vianna, et al. 2012).
- **Donsol, Philippines**: In 2005, whale shark tourism created 300 jobs and generated annual income and economic return of US\$623,000 (Quiros, 2005).
- **Seychelles**: Shark diving contributed \$4.5 million to the economy (Topelko & Dearde, 2005). Whale shark tourism alone generated \$US4.5 million (Rowat & Engelhardt, 2007).
- **South Africa**. White shark tourism valued at US\$4.2 million (Hara, et al, 2003), and in 2008 tiger shark tourism was valued at US\$1.7 million (Dicken & Hosking).
- **Thailand**: In 2003, whale shark diving in Thailand generates an estimated US\$110 million according to Pew., and the global value of whale shark tourism alone was conservatively estimated at US\$47.5 million annually (Graham 2004).

Shark Fin Soup in China

China is the world's biggest importer and consumer of shark fin where a dish of shark fin is regarded as a status symbol, particularly at business dinners and weddings. A survey conducted by Green Beagle Environment Institute, a Beijing-based NGO, found six percent of luxury hotels in three major Chinese cities have stopped serving shark fin. The survey was carried out in Beijing, Shenzhen in Guangdong province and Fuzhou in Fujian province, cities selected as representative cities to collect basic data on shark fin consumption nationwide.

In Beijing, of 132 hotels, only 12 reported that they do not serve shark fin. A survey conducted a year ago found only a single hotel that did not serve shark fin. In Shenzhen, four of 85 four- and five-star hotels surveyed have stopped serving shark fin, accounting for about five percent. In Fuzhou, only one of the 40 hotels surveyed no longer serves shark fin. On average, about 6.61 percent of the hotels in the three cities did not serve food. International hotels are the most proactive with regard to shark conservation: Shangri-la, Peninsula, JW Marriot, Accor and Starwood are among the hotels no longer serve shark fin.

In June, the Chinese government announced that shark fin soup would be banned from being served at official banquets, but that the regulation could take up to three years to implement.

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- **Josip Zeko**

Whale Sharks in the Arabian Gulf

The Ministry of Environment of Qatar has conducted the first aerial survey of whale sharks in the Arabian Gulf. The survey was made in collaboration with the Qatar Air Force and Maersk Oil. Air Force rescue helicopters were used to count the sharks, and more than 50 individuals were seen close to the offshore platforms of the Al-Shaheen oilfield, operated by Maersk Oil on behalf of Qatar Petroleum. "Aerial surveys are important in order to get a population count of whale shark and other species that live far from the coast," said Mohamed al-Jaidah, from the Ministry of Environment and leader of the Qatar Whale Shark Research project.

Whale sharks visit Qatar waters from May to September. "It was a great experience to observe the whale sharks from the air," said al-Jaidah. "It was much easier to count them than from a boat and we could cover a larger area. Mass gatherings of whale sharks are only seen in a few places in the world and the project is in the process of identifying the importance of the Al-Shaheen area for this charismatic ocean giant. Of interest is the lack of juvenile whale sharks in Qatar waters; most of the whale sharks observed average 30 to 33 feet in length.

The project team has been deploying acoustic transmitters on the sharks that signal a receiver on the seabed whenever the sharks comes within range, as well as satellite tags, In addition, they are utilizing photo ID and spot pattern identification of individual sharks, and have already had a match between a whale shark seen in Qatar on May 27, and resighted in the Musadam on October 21. The scientists are also gathering fish spawn, believed to be the whale sharks' primary food source in Qatar waters, for species identification and DNA samples to SRI in order to assess relationships to other whale shark populations.

Whale Sharks of Donsol *by Jennifer Schmidt*

This spring I traveled to the Philippines to help census whale sharks in the Bohol and Philippine Seas. My trip began in the town of Jagna, on the eastern coast of Bohol island. The small resort Paseo del Mar - with its thatch-roofed cabins and a communal outdoor work space - is the home of Dr. Ale Ponzo and his students. Ale heads the conservation and research organization Physalus. Initially formed to study marine mammals, the group has recently incorporated whale sharks into their research agenda. Our first day in Jagna took the form of strategizing - Ale's promised new boat had not yet been delivered and we found ourselves shark researchers without a boat. Since we had planned to visit the nearby island of Pamilacan anyway, we decided to head there immediately and see about hiring a boat. Pamilacan is a lush island with healthy reefs and rich marine life, and during several days on the water we saw Risso's and Fraser's dolphins, but did not spot the blue whale that had recently been seen. Whale sharks proved more elusive - it was early in their season and we saw only one animal - but a few weeks after my return I heard that the whale sharks were now frequenting Bohol in large numbers.

From Pamilacan we traveled to Donsol, on the island of Luzon, where whale sharks support a large ecotourism industry. Whale sharks have frequented Donsol as long as anyone remembers, feeding in the shallow, plankton-filled bay between March and May of each year. Donsol is a sleepy little town, reached by flying from Manila to Legazpi, then an hour-long drive over the winding Luzon roads to reach Donsol. This was my third trip to Donsol, and the second aimed at collecting tissue samples for our ongoing whale shark genetics study. Meeting up with whale shark researcher Elson Aca, we checked into the Amor Farm Beach Resort, one of several locally-owned resorts along the beach north of town.

Amor is just down the road from the Whale Shark Interaction Center, where tourists congregate each morning to arrange whale shark tours. To swim with the whale sharks the visitors pay roughly US\$15, while Filipinos pay slightly less. Everyone participating in the interaction must view a video presentation about proper behavior while near the sharks. The guidelines in place to protect the sharks include 1) only one boat may interact with a whale shark at any time, 2) only six swimmers may be in the water, 3) swimmers must stay 3 meters from the shark, and 4) they cannot touch the shark or impede its movement. Finally the visitors are taken out in bancas (outrigger boats) to look for sharks; each boat carries a whale shark guide called a Butanding Interaction Officer, two shark spotters, and up to 6 tourists. The boats may stay on the water for 3 hours, after which they must return to allow the next boat in the rotation to have a turn. Since our first trip to Donsol in 2008 we have observed whale shark interactions under a variety of conditions. When the sharks are numerous the interaction rules are well observed. Whale sharks come and go as they please, however, and when shark numbers are low the guidelines are often disregarded. Many boats will surround one animal, and have been observed "herding" a shark to keep it from leaving the area. These boats often drop far too many swimmers in the water, many of whom will touch the shark (intentionally or by accident). In these cases the sharks will often dive, and may not return for some time, or not at all.

This year there have been few sharks in Donsol, often only one or two animals are seen each day. Over the past 15 years the Donsol economy has become highly dependent on the whale sharks, with many people employed as boat captains and crew. These jobs have provided increased wages and a better lifestyle for the former fishermen of this rural area. With whale sharks suddenly scarce this livelihood is in danger, and the effects reverberate from the boat owners down to the tourists coming to see the sharks. Tourists traveling to Donsol this year were disappointed and sometimes angry that they were not able to see the sharks, and the boat crews are under pressure to make certain that their group sees the occasional animal that does show up. Interaction guidelines fall by the wayside. A lone shark surfacing in the bay may find itself surrounded by as many as 25 boats and dozens of swimmers. The situation in the water can be so chaotic that we saw returning tourists visibly upset by their interaction.

Our research has also been impacted by the shark decline. Working outside of the tourist area we

encountered only two sharks during an entire week on the water. We were able to obtain tissue biopsies from these two animals, one a 4 meter juvenile, and the other an 8 meter female nearing reproductive age. These samples are valuable additions to our global whale shark genetic study, but as with everyone else in Donsol we were hoping for larger number of animals.

Why are there so few sharks in Donsol this year? There may be many contributing factors, such as changes in weather patterns and/or ocean currents, but the effect of increasingly heavy tourist pressure cannot be discounted. More than 25,000 people came to Donsol last year to swim with the whale sharks. While this years' decline might appear to be sudden, we have seen subtle changes during previous visits. In 2008

we found many sharks that stayed on the surface for long interactions. By 2010 there were fewer sharks and those found were more skittish - the sound of a boat pulling near was enough to cause the shark to dive. There is a great deal of blame being placed for the current situation, with water temperatures, ocean currents, and researchers being named as the cause --- anything but the ever increasing tourist pressure. Our team quickly became a target of this frustration, and we spent much of our time justifying our work and providing data to show that biopsy sampling does not alter whale shark behavior.

It was a fascinating and frustrating trip, one that generated both hope and concern for the whale sharks of the Philippines. Surveys throughout the Philippines suggest large numbers of animals use these waters, yet anthropogenic effects on the sharks and their habitat are numerous. The absence of whale sharks from Donsol may be temporary, and the animals may return next year or the following. The rich waters of the Philippines provide many places for whale sharks to feed, however, and the Donsol animals may have found a more hospitable environment. The people of Donsol must acknowledge and modify their treatment of these animals if they hope to maintain a viable whale shark tourist industry.



Whale shark research team Elson Aca, Ale Ponzo and Jennifer Schmidt in Donsol

Shark Culls as a Response to Shark Attacks

Between June 2010 and July 2012, five people were killed by sharks at Western Australia beaches. As result, Western Australia decided to hunt a shark if it approached a popular beach or if it is deemed a threat.



A study led by Dr. Rick Fletcher, research director of the WA Department of fisheries, hypothesized that a record heat wave off the coast of Western Australia may have resulted in declining fish stocks and forced sharks close to shore. "If there is a relatively smaller area of cooler water inshore, then the sharks could be concentrated in that smaller area," said Dr Fletcher. According to the department, a marine heat wave occurs when areas of the ocean rise to 30°C (86°F), causing fish stocks to relocate to cooler waters. "It may be the sharks are coming in with the colder water or it may be that the things they're feeding on are coming in with the colder water and the sharks are following them," said Stuart Smith, Fisheries director general. "If we understand what conditions are more or less likely to have concentrations of white sharks or tiger sharks, then we can inform the public about what the conditions are likely to be, said Smith.

From 1980 to July 2012, 18 people were killed by sharks at Reunion Island, but after the fatal attack on Fabien Bujon on August 5, 2012, the government killed 20 sharks. "If you are a local politician and you are suddenly confronted with a flurry of shark bites, particularly if some of them are fatal, and if you are heavily reliant on tourism, then you find yourself in a difficult position. On one hand, you may have biologists telling you there may be nothing going on here and nothing that you can do. On the other hand, you are an elected official and your job is to do something. I think the political need to take some kind of positive action drives these culling efforts," says University of Hawaii scientist Carl Meyer.

Incidents have risen in Hawaii as well. On average, there are three or four unprovoked incidents each year, but in 2012, there were 10 unprovoked incidents (see www.sharkattackfile.net/incidentlog.htm). In most cases, tiger sharks were involved, which may be due, in part, to the recovery of the sea turtle populations. Juvenile tiger sharks feed primary on reef fishes and invertebrates. When the shark reaches a length of about eight feet, it feeds on larger prey including birds, sea turtles, and carrion. While sea turtles have increased dramatically during the past 20 years, the increase in shark bites is likely to be due to increased human use of the sea. Some 60% of shark bites in Hawaii occur between 10 am and 4 pm, which correlates to human preference for water sports.

Hawaii periodically had shark culls in response to shark attacks. However, an in-depth analysis of Hawaii's shark control programs from 1959 to 1976 indicated that the culls *did not* have any measurable effect on the rate of shark attacks in Hawaiian waters¹. Then, Kim Holland and his colleagues tracked 10 tiger sharks and found during a 24- to 48-hour period they moved from Honolulu across open ocean to the island of Molokai, indicating the sharks are highly mobile, and a shark involved in an incident in one area would likely be long gone from the area shortly afterwards².

Further, from a statistical perspective, the increase in numbers of incidents (and fatalities) over a span of a few years is so low that it is simply not scientifically possible to determine if any spike is indicative changes in the sea ecology or shark behavior. But distinct patterns emerge when a large number of incidents — such as those in the GSAF — spanning a century and longer, are studied.

¹ B. Wetherbee, C. Lowe and G. Crow.1994. *A Review of Shark Control In Hawaii with Recommendations for Future Research*. Pacific Science. 48(2): 95-115.

http://www.uri.edu/cels/bio/wetherbee/pubs_files/sharkcontrol.pdf

² Holland KN, Wetherbee BM, Lowe CG, Meyer CG. 1999. *Movements of tiger sharks (Galeocerdo cuvier) in coastal Hawaiian waters*. Marine Biology 134: 665-675.

A New Species?

PHILIPPINES — A weird-looking shark locally named the "bubble shark" is energizing a campaign to preserve the Verde Island Passage Marine Corridor (VIPMC), a vital marine corridor straddling five provinces in the Southern Tagalog region. The species was one of the new species of fish discovered during the 2011 Philippine Wildlife Expedition, a 42-day expedition, spearheaded by the California Academy of the Sciences.



Other swell sharks have dark round spots, but the species found in the Philippines, based on pictures, have white or lighter spots.

The VIPMC, which covers parts of the coastal waters of Batangas, Oriental Mindoro, Occidental Mindoro, Marinduque and Romblon, is said to have the largest concentration of marine life in the world, with more than 1,700 marine species recorded within a 10-square-kilometer area in the habitat.

Christened locally as the "Bubble shark", it is thought to be a new species of swell shark, species that can inflate their body when danger threatens. Unlike its relatives in other seas, however, the shark found in the VIPMC has a very distinctive camouflaged color pattern. At present, very little is known yet about this species, as to whether it is really a new species, how large the population is, and whether it is endemic to the area or just migrating, said Lynette Laroya, assistant director of the environment department's Protected Areas.

The discovery boosts efforts to save the VIPMC, a bustling sea-lane for ships and a pathway for migratory wildlife such as dolphin and tuna, which are threatened by overfishing, pollution and climate change. It is both a highly productive fishing ground for traditional and commercial fishers and a development area for coastal and marine tourism, according to the Department of Environment and Natural Resources (DENR).

Shark Fin Trade Bans

Dec-2012	Cook Islands	Possession and sale of shark products banned.
Nov-2012	American Samoa	Shark fishing banned in its territorial waters, and the sale, possession, and distribution of fins and other shark parts prohibited.
Oct-2012	Costa Rica	Import and trade in shark fins banned.
Jul-2012	Illinois, USA	Possession, sale and trade of shark fins prohibited. The bill becomes effective January 1, 2013.
Jul-2012	Bahamas	All shark fishing, sale and trade in shark products banned.
Oct-2011	California, USA	Possession, sale and trade of shark fins prohibited.
Aug-2011	Oregon, USA	Possession, sale and trade of shark fins prohibited (with an exception for dogfish).
May-2011	Washington, USA	Possession, sale and trade of shark fins was prohibited.
Mar-2011	Guam	Possession, sale and trade of shark fins and ray parts prohibited (with an exception for subsistence fishing).
Mar-2011	Marshall Islands	Moratorium on the export of shark fins and the possession and sale of shark products,
Jan-2011	Commonwealth of the Northern Mariana Islands (CNMI)	Possession, sale and trade of shark fins prohibited (with an exception for subsistence fishing).
Jul-2010	Hawaii, USA	Possession, sale and trade of shark fins is prohibited.

Mark your Calendars



December 29, 2012: 1,000 Kids, One Message 2012. Venue: Resorts World, Singapore. 1,000 children are taking a pledge to never eat sharkfin soup. <http://www.1000kidsonemessage.org/>



January 10-12, 2013: Surf Expo. Venue: Orange County Convention Center, North/South Hall A, Orlando, Florida. <http://www.surfexpo.com/TheShow/ScheduleofEvents.aspx>



March 3-15, 2013: CoP16: *Convention on International Trade in Endangered Species (CITES) 16th Conference of the Parties*. Venue: Bangkok, Thailand. With 177 member nations that agree to abide by its decisions, CITES is the UN treaty organization that regulates international trade in specimens of wild animals and plants and ensures the trade does not threaten their survival. At CoP16, proposals to protect seven species of sharks and rays will be considered by the delegates.



March 22-24, 2013: Beneath the Sea. Venue: Meadowlands Convention Center, Secaucus, New Jersey — only 10 minutes from New York City. BTS is the world's largest consumer dive show. Booths, workshops, film festival, Ocean Pals and imaging competitions. Visit SRI at Booth 221, meet some our staff, hang out and talk shark. Tickets are available at www.beneaththesea.org



March 31-April 1, 2013: London International Dive Show (LIDS). Venue: ExCeL Centre, London, England. www.diveshows.co.uk

Field Expeditions

WHALE SHARKS — Cancun, Mexico

August 6 to August 10, 2013.

At present, this is the only open SRI expedition. Dr. Jennifer V. Schmidt, Director of SRI's DNA study and the project leader, will once again be taking swimmers and snorkelers to the Afuera Whale Shark Aggregation. (Note: no scuba; bubbles frighten the sharks). Cost is \$1400 per person (double occupancy). If you'd like to come along, please call SRI HQ at 609-921-3522 as soon as possible -- half the spots are already filled.



Hundreds of whale sharks gather at the surface in the Afuera

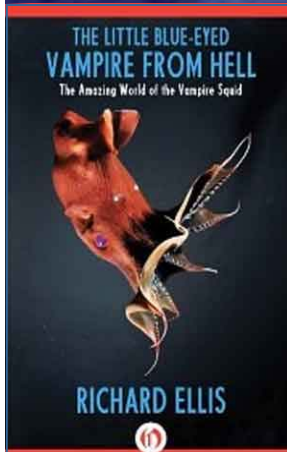
Watch our website for expeditions to the Bahamas (oceanic whitetip sharks)

Thinking of Buying an Electronic Shark Deterrent?

AUSTRALIA, October 9, 2012: A dramatic video shows the ineffectiveness of electronic shield devices in deterring sharks, contrary to the claims of manufacturers. Filmed off the Neptune Islands in South Australia and off the coast of South Africa, the video shows large sharks will still take a static bait and even brush against the deterrent devices which manufacturers claim alarms sharks by interfering with their prey-detecting senses. Thousands of recreational and professional divers rely on the devices worldwide.

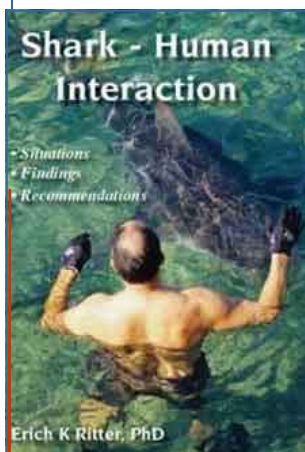
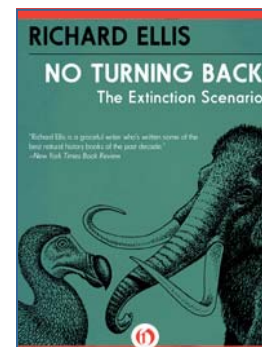
The tests were carried out by Australian government researchers to determine the effectiveness of the commonly used protection devices, which cost about \$800, and are said to deter sharks by the manufacturers. Dr Charlie Huvneers from Flinders University said there were 116 trials using a static bait at the Neptune Islands, 49 with the deterrent turned off and 67 with it on. "The bait was taken within the 15-minute period in 78 per cent of the trials, with the deterrent not affecting the likelihood of the baits being taken," the study concluded. "There was *no* significant difference between the proportion of bait taken when the deterrent was turned off or on."

Members' Bookshelf



The Little Blue-Eyed Vampire from Hell, by Richard Ellis, \$1.99 for Kindle edition through Amazon.com. Renowned marine conservationist Richard Ellis gives a fascinating account of the vampire squid. Named *Vampyroteuthis infernalis* ("the vampire squid from Hell") by its nineteenth-century discoverer because of its sinister appearance, it is neither a vampire nor a true squid, and lives in the deep ocean where few humans ever catch sight of it. A unique, stunning creature, it is sometimes called a "living fossil," and it can light up or turn inside out at a moment's notice. Ellis's narrative of the vampire squid's history, evolution, and characteristics is brought into context by his broad knowledge of other squid, octopus, and marine species. More than thirty dazzling images illustrate the book. *The Little Blue-Eyed Vampire from Hell* is an exhilarating journey into the ocean's abyss, boldly illuminating one of the earth's most elusive creatures.

No Turning Back, by Richard Ellis. \$16.99 (paperback) through Amazon.com. Ellis conducts a masterful and engrossing investigation of one of the world's most harrowing inevitabilities: Extinction. Taking a concentrated look at a variety of species he discusses the five great mass extinctions in history, and how extinction shapes the evolutionary process. He also outlines the steps we can take to ensure that today's endangered species can be pulled back from the brink. This is an invaluable read for anyone seeking to understand the past, present, and future of life on our planet.



Shark-Human Interaction, by Erich Ritter, Ph.D. (paperback) \$24 through Amazon.com. This is the first shark book focused on what to do when facing a shark and interacting with it. What to do if a shark comes too close, how to read a shark and what to look for, what it means when a shark flickers, tilts, yawns, chafes, bumps, or approaches in a frontal manner rather than a lateral one, why inner and outer circles matter, and much more. This book summarizes what is known about shark-human interaction, written by the world's authority in this field, shark behaviorist Erich K Ritter, Ph.D. Written in a very concise manner, packed with factual knowledge, explanations of behavioral patterns, tested recommendations and interception rules, a guide of how to act with the 30 shark species worldwide, and more than 200 pictures, drawings and bullet lists. It is a valuable book for marine resource users.

Available at SRI Headquarters

Aquariana and the Golden Pearl, by Penny Dabestani (signed by the author). \$25, plus S&H. This book speaks to the heart of every young girl who loves the sea and strives to stop the damage being done to it by humans. It is an enchanting book!

Sharks: A Love Story by Jupp Kerckerinck zur Borg. \$18, plus S&H. "I recommend it as a quick and well-illustrated introduction to sharks, suitable for people seeking a viewpoint other than the media-induced fear of sharks that is so lucrative and misleading." ... LJ V Compagno, Ph.D.

The Fragile Edge, by Julia Whitty. \$15, plus S&H. A mesmerizing, scientifically rich portrait of teeming reef and sea life in the South Pacific.

New Jersey Coastwalks, by D.W. Bennett, illustrations by Marie Levine. \$20, includes S&H. Published by the American Littoral Society in 1978, with the exception of the Shark River walk (condos have since been built on that site), the walks are still 'walkable' — despite Hurricane Sandy.

Basking Shark Tracked from Ireland to the Cape Verde Islands

In July, a satellite transmitter was deployed on a five-metre female basking shark off Malin Head, Donegal, Ireland, by the Irish Basking Shark Study Group. The transmitter was just released west of the Cape Verde Islands, more than 5,000 km from where the shark was originally tagged.

The majority of basking sharks tracked in the northeast Atlantic have shown a seasonal onshore-offshore migratory pattern, moving one or two hundred miles offshore to the edge of the continental shelf in winter, and returning to coastal waters in summer.

The shark, named Banba, is one of five basking sharks tagged by the Group. Her movement from temperate to tropical waters is similar to that of the basking sharks tracked by Dr. Greg Skomal in the Western Atlantic. In Dr. Skomal's study, satellite tags were deployed on 25 basking sharks off coast of southern New England. The study found the sharks traveled to the Bahamas, the Caribbean Sea and to the coast of South America, swimming at depths of 600 to 3,000 feet (200 to 1,000 metres) for several weeks or months. Results of the study were published in the June 2009 issue of *Current Biology*.

"We are awaiting the pop-off of the remaining three satellite transmitters attached this summer; recovering five complete basking shark tracks will allow us to compare the data and make informed conclusions," says Emmett Johnston, co-founder of the group. "Until then there is not much we can say other than this is a highly unusual place to find a species that is presumed to inhabit temperate waters". The satellite transmitter tags used to track the basking sharks incorporate pioneering Fastloc GPS technology coupled with depth and water temperature sensors which will allow researchers to recreate the track of the shark in three dimensions.

The basking shark (*Cetorhinus maximus*) is the second largest living fish, after the whale shark. Males mature at less than 18 feet (5.7 m), females at 26 feet (8 m). The total length of the largest accurately-measured specimen was 40.3 feet (12.27 m), a giant caught in a herring net in the Bay of Fundy in 1851. A slow-moving plankton feeder, the basking shark is considered harmless to man, although it occasionally bumps boats.

Basking sharks were once hunted off the coasts of Ireland, but they are now classed as endangered in the North Atlantic. The species is listed on CITES Appendix II. Malin Head was recently been recognized as one of the world's top summer hotspots for the basking shark.

