



**Paul J. Diodati**  
Director

# *Commonwealth of Massachusetts*

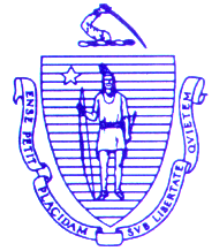
## **Division of Marine Fisheries**

251 Causeway Street, Suite 400

Boston, Massachusetts 02114

(617)626-1520

fax (617)626-1509



**Charles D. Baker**  
Governor

**Karyn E. Polito**  
Lieutenant Governor

**Matthew A. Beaton**  
Secretary

**George N. Peterson, Jr.**  
Commissioner

**Mary-Lee King**  
Deputy Commissioner

### **MEMORANDUM**

**TO:** Marine Fisheries Advisory Commission (MFC)

**FROM:** Paul J. Diodati, Director

**DATE:** March 22, 2015

**SUBJECT: Proposal to Adopt Emergency White Shark Regulations and a Research Update**

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#### Background

Despite a well established presence in the North Atlantic, scientific efforts to study white sharks have been limited until recently. Whereas researchers in the Pacific and Indian Oceans have benefitted from high seasonal abundances of white sharks near seal or seal lion colonies, allowing them to track white shark movement and behavior over fine and broad scales, researchers in the North Atlantic have not been as fortunate. Until recently, most of our knowledge of its life history and ecology has been dependent on analysis of distribution records, as well as opportunistic observations and the examination of dead specimens. However, with the protection of marine mammals and the consequential growth of the North Atlantic gray seal population along Cape Cod, we now have predictable access to white sharks during the summer and early fall months. As a result, we can begin to sharpen our knowledge and understanding of the behavior and movements of these white sharks.

#### Update on Research

Over the last six summers (2009-2014), Division of Marine Fisheries (*Marine Fisheries*) staff have observed and tagged a total of 56 white sharks off the eastern coast of Cape Cod, primarily in the shallow near-shore waters from Orleans south to the tip of Monomoy Island (Figure 1). *Marine Fisheries* uses numerous tagging technologies including: conventional tags; acoustic transmitters; autonomous underwater vehicle transponders; pop-up satellite tags (PSAT), and real-time satellite tags (SPOT). All sharks tagged were between 2.4 and 5 meters in total length (mean of 4 meters).

#### Abundance

In 2014, *Marine Fisheries* staff initiated a multiyear study to quantify the local and regional abundance of white sharks off the coast of Massachusetts. Using a traditional mark-recapture approach, intensive surveys were conducted biweekly from mid-June through October 2014 using a spotter pilot and a small vessel donated by the Atlantic White Shark Conservancy. Individual white sharks were identified from video documentation based on natural color patterns, fin shapes, and scars. Over the course of the summer, a total of 68 (43 males, 25 females) white sharks were identified off the coast of Cape Cod. In addition, 12 sharks tagged in previous years were detected on the acoustic array (see below), indicating that at least **80** white sharks were present off the coast of Massachusetts in 2014.

### Acoustic Monitoring

In 2014, 18 white sharks were tagged with acoustic transmitters and monitored on the *Marine Fisheries* acoustic array (Figure 2). This resulted in over 36,000 detections from 21 different sharks, 12 of which were tagged in previous years. Although detections ranged from June through December, shark presence peaked in September (Figure 4). The greatest number of detections were on receivers off Chatham Inlet and Nauset Beach, which are adjacent to bathing beaches.

### Sightings

A total of 64 white shark sightings were reported to *Marine Fisheries* in 2014. Of these, 24 were predation events primarily involving seals. However, one of these events involved a kayak struck by a white shark off Plymouth, MA (Figure 3); the kayaker was not injured. There was a notable increase of sightings reported from Cape Cod Bay, primarily off the South Shore where acoustic receiver coverage is lacking.

### Management

At present, our only regulations affecting white sharks is a prohibition on the harvest of this species. However, as the presence of - and attention paid to- white sharks in our waters is increasing, there is concern regarding the unconstrained expansion of human interaction with this species. Not only does this put the public at risk, as evidenced by the shark attack last summer, but increased interactions between humans and white sharks may alter white shark behavior.

Specifically, there are two over-riding concerns that put both sharks and humans in danger. First, is that an increase in activity to attract white sharks may alter white shark feeding behavior, and white sharks may begin to associate the presence of humans on the water with feeding opportunities. Second, is that businesses and individuals, whether trained or untrained, may want to become involved in independent white shark capturing and research activities. These concerns were echoed in a recent letter from the Atlantic White Shark Consortium to EEA Secretary Beaton and a 2013 letter to me from 11 Cape Cod municipalities, the Town of Nantucket and the Cape Cod National Seashore, both of which urge the Division of Marine Fisheries to take action and regulate activity around white sharks (attached).

### Proposal

DMF is proposing the Marine Fisheries Advisory Commission support emergency regulations (attached) to constrain activity aimed to capture and attract white sharks to only those persons with a special white shark project permit issued by the *Marine Fisheries*. We proposed similar regulations in the 2013 and have maintained a “wait and see” approach. However, considering the continued near-shore presence of these animals and the substantial interest in this presence, we believe it is important to take action at this time.

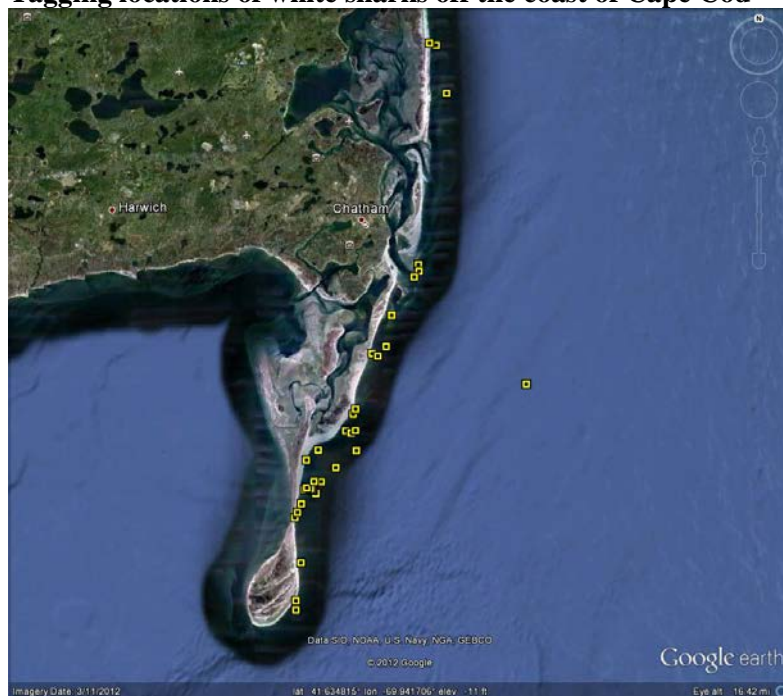
### Attachments:

- 1) Figures 1 – 10;
- 2) Draft emergency regulations;
- 3) Letter from the Atlantic White Shark Consortium to Secretary Beaton; and
- 4) Letter from municipalities and Cape Cod National Seashore

**Attachment 1: Figures 1 - 4**

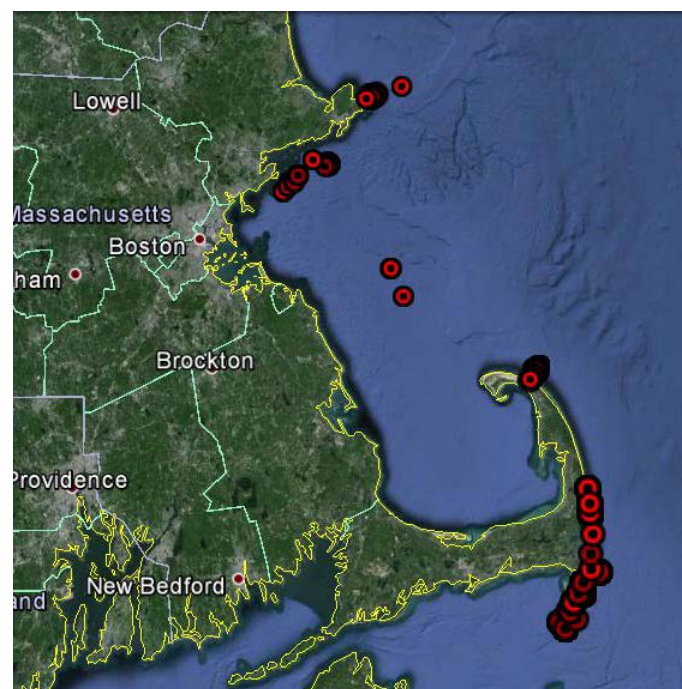
**Figure 1.**

**Tagging locations of white sharks off the coast of Cape Cod**



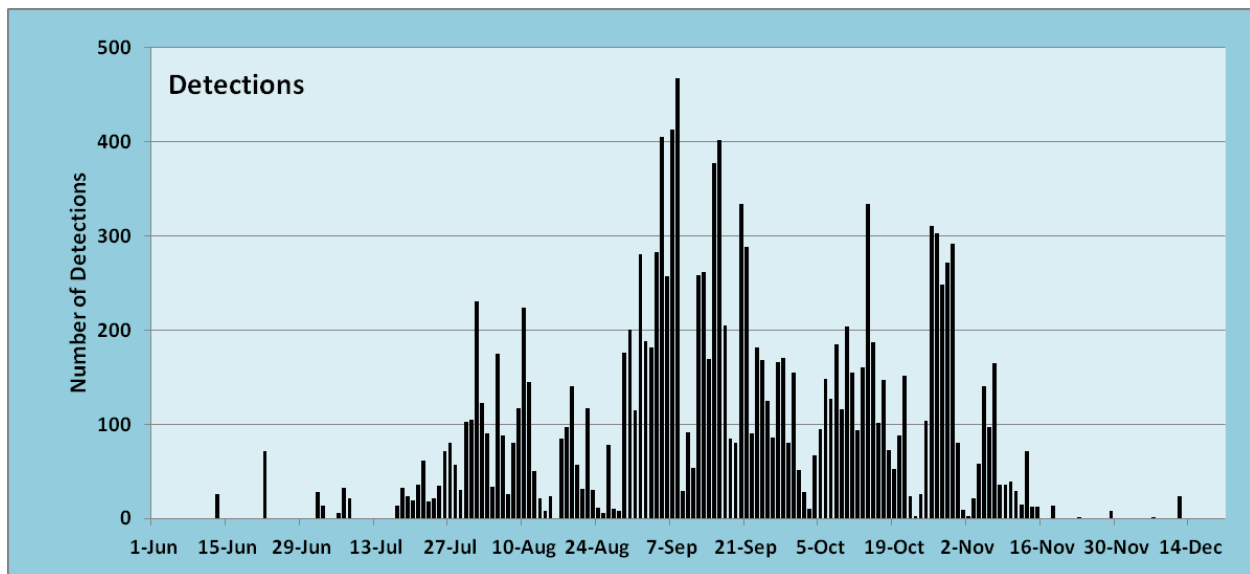
**Figure 2.**

***MarineFisheries* acoustic receivers with white shark detections in 2014.**



**Figure 3.**

**Number of white shark detections off the coast of Massachusetts in 2014; note peak in September.**



**Figure 4.**

**Bite marks resulting from a white shark attack on a kayaker off the coast of Plymouth in 2014.**



**6.37 Coastal Shark Conservation and Management**

- (1) **Purpose.** 322 CMR 6.37 seeks to ensure coordinated state and federal management towards establishing healthy self-sustaining populations of Atlantic coastal sharks. Coastal shark conservation and management is interstate and state-federal in nature; effective assessment and management can be enhanced through cooperative efforts with all Atlantic state and federal scientists and fisheries managers. 322 CMR 6.37 creates two groups of sharks: Permitted Species that are allowed to be harvested, and Prohibited Species that are protected and may not be harvested unless specifically authorized by the Director or NOAA Fisheries.

For purposes of 322 CMR 6.37, coastal sharks do not include spiny dogfish, *Squalus acanthias*, which are managed separately under 322 CMR 6.35.

- (2) **List of Species by Groups.** The following sections contain the species categorized as prohibited or permitted. Each species is listed as its common name along with its associated taxonomic name.

- (a) **Permitted Shark Species.** The following species are allowed to be harvested under the provisions of 322 CMR 6.37(3):

Atlantic sharpnose (*Rhizoprionodon terraenovae*)  
Blacknose (*Carcharhinus acronotus*)  
Blacktip (*Carcharhinus limbatus*)  
Blue (*Prionace glauca*)  
Bonnethead (*Sphyrna tiburo*)  
Bull (*Carcharhinus leucas*)  
Common thresher (*Alopias vulpinus*)  
Finetooth (*Carcharhinus isodon*)  
Great hammerhead (*Sphyrna mokarran*)  
Lemon (*Negaprion brevirostris*)  
Nurse (*Ginglymostoma cirratum*)  
Oceanic whitetip (*Carcharhinus longimanus*)  
Porbeagle (*Lamna nasus*)  
Scalloped hammerhead (*Sphyrna lewini*)  
Shortfin mako (*Isurus oxyrinchus*)  
Smooth dogfish (*Mustelus canis*)  
Smooth hammerhead (*Sphyrna zygaena*)  
Spinner (*Carcharhinus brevipinna*)  
Tiger (*Galeocerdo cuvier*)

- (b) **Prohibited Shark Species.** the following species are prohibited from harvest under the provisions of 322CMR 6.37(3):

Atlantic angel (*Squatina dumeril*)  
Basking (*Cetorhinus maximus*)  
Bigeye sand tiger (*Odontaspis noronhai*)  
Bigeye sixgill (*Hexanchus nakamurai*)  
Bigeye thresher (*Alopias superciliosus*)  
Bignose (*Carcharhinus altimus*)  
Bluntnose sixgill (*Hexanchus griseus*)  
Caribbean reef (*Carcharhinus perezii*)  
Caribbean sharpnose (*Rhizoprionodon porosus*)  
Dusky (*Carcharhinus obscurus*)  
Galapagos (*Carcharhinus galapagensis*)  
Longfin mako (*Isurus paucus*)  
Narrowtooth (*Carcharhinus brachyurus*)  
Night (*Carcharhinus signatus*)  
Sandbar (*Carcharhinus plumbeus*)  
Sand tiger (*Carcharias taurus*)  
Sharpnose sevengill (*Heptanchias perlo*)

Silky(*Carcharhinus falciformis*)  
Smalltail (*Carcharhinus porosus*)  
Whale (*Rhincodon typus*)  
White (*Carcharodon carcharias*)

(3) Regulation of Catches.

(a) Permitted Species Size Limits.

1. Recreational Fishing Size Limits. For recreational fishermen, the size limit for Permitted Species shall be 54" measured from the tip of the snout to the fork of the tail. Exception: there shall be no minimum size for the following species: Smooth Dogfish, Atlantic sharpnose, Bonnethead, Finetooth, and Blacknose.
2. Commercial Size Limits. For commercial fishermen, there shall be no minimum size for any of the Permitted Species.

(b) Permitted Species Possession Limits.

1. Recreational Catch Limits. A recreational shore angler may harvest only one fish among all Permitted Species and one additional Bonnethead, one additional Atlantic sharpnose, and one additional smooth dogfish per trip. A recreational vessel may possess on board or land only one fish among all Permitted Species per trip regardless of the number of recreational fishermen aboard, and one additional Bonnethead, one additional Atlantic sharpnose, and one additional smooth dogfish per person.
2. Commercial Catch Limits. Commercial fishermen shall not retain:
  - a. more than 100 pounds of smooth dogfish per trip or per day, whichever is the longer period of time; or
  - b. any quantity of a Permitted Shark Species after the Director has announced a commercial fishery closure.

(c) Gear Restrictions.

1. Recreational Gears. Recreational fishermen may take coastal sharks only by rod and reel or handline.
2. Commercial Gears. Commercial fishermen may take coastal sharks by rod and reel, handlines, gillnets, trawl nets, pound nets, fish traps, and weirs. It shall be unlawful to fish for, possess on board, or land coastal sharks taken by a longline of any length.

(d) Catch Disposition.

1. It shall be unlawful for:
  - a. any fisherman to fillet sharks at sea;
  - b. any fisherman to remove fins or tails from sharks;
  - c. recreational fishermen to possess on board or land sharks whose heads, tails, and fins are not attached naturally to the carcass;
  - d. commercial fishermen to possess on board or land sharks whose fins and tails are not attached naturally to the carcass. Exception: Commercial fishermen may cut fins as long as the fins remain attached to the carcass with at least a small portion of uncut skin.
2. Commercial fishermen may eviscerate sharks and remove the heads.

3. All sharks caught incidental to fisheries directed toward other species must be released in such manner as to ensure maximum probability of survival.

- (e) Authorization to Possess Prohibited Species. The Director may authorize persons to land and possess certain Prohibited Species for research or other scientific purposes. Commercial fishermen who possess authorization from NOAA Fisheries to harvest certain species from federal waters may fish for, possess on board, or land those species in Massachusetts provided said fish were taken lawfully from federal waters.
- (f) Dealer Measures. All dealers purchasing Atlantic Coastal Shark species from commercial fishermen must obtain a federal Commercial Shark Dealer Permit from the National Marine Fisheries Service.

#### **(4) White Shark Conservation Measures**

##### **(a) Definitions.**

**Attract** means to conduct any activity that lures or may lure any white shark to a person or vessel by using food, bait, chum, dyes, decoys, acoustics or any other means, excluding the mere presence of persons on the water including those persons conducting commercial or recreational fishing activity.

**Capture** means to forcefully gain control of a white shark. Capture includes, without limitation, the restraint or detention of a white shark or any act of intrusive research performed on a white shark. Capture shall not include the incidental catch of white sharks during the course of lawfully permitted fishing activity.

**Chum** means fish, chopped fish, fish fluids or other organic materials disposed of in the water for the purpose of attracting white sharks.

**Director** means the Director of the Division of Marine Fisheries.

**Intrusive Research** means a procedure conducted for scientific research involving a break or a cut in the skin, the application or insertion of an instrument, the introduction of a foreign substance or object onto the animal's immediate environment, or a stimulus directed at animals that may affect white shark behavior.

**Restricted Activities Related to White Sharks**. It shall be unlawful to engage in any activity intended to attract, take, mark, fish for, or capture white sharks in waters of the Commonwealth, or to pursue white sharks for any purpose without first being issued a special white shark project permit by the Director in accordance with 322 CMR 7.01(4).



Mr. Mathew Beaton  
Secretary, Executive Office of Energy and Environmental Affairs  
Commonwealth of Massachusetts  
Boston, MA

Dear Secretary Beaton:

This is an urgent request to you and your agencies to work with local communities and natural resource managers to control activities around great white sharks that we believe are a growing public safety issue.

I am a Board member and financial supporter of a small non -profit based on Cape Cod, the Atlantic White Shark Conservancy. The Conservancy was formed in 2012 to generate funds for white shark research, develop education programs about the importance of white sharks in our eco-system and to promote public safety. The organization has had significant positive impact in its young life in each of these areas.

The urgent matter concerns the lack of any State controls in place to prevent the attracting, capturing or performing research on white sharks without a research permit. Because of this gap in protection it is “open season” on white shark thrill seeking in Massachusetts and as a result our beach users are at an increased risk of being bitten by a white shark.

This is troubling and not a new revelation. Two years ago, the Dept. Of Fish & Game’s Division of Marine Fisheries proposed regulations to control activities targeting white sharks in coastal waters. Those draft regulations were requested in April 2013 by the outer Cape Cod towns (Harbormasters Shark Working Group), the Cape Cod National Seashore and the Atlantic White Shark Conservancy. The request was submitted to the Division of Marine Fisheries. DMF and DFG drafted proposed regulations, but these regulations were never promulgated by the previous administration. I am asking you to take a fresh look at this situation and consider the public safety benefits that will accrue from future action.

The need for these regulations is even more critical now in light of recent research findings that suggests to our experts that there may be more white sharks visiting Commonwealth waters than previously thought during the summer and fall seasons. Research funded by the Conservancy demonstrated at least 68 unique sharks never before seen were identified off Cape Cod last summer.

The challenge is not only facing Cape Cod towns. The kayak incident off of Plymouth last summer alerted South shore communities that the white shark migrants are not just an eastern Cape Cod issue. In a recent gathering in Plymouth of





Public Safety officials, Harbormasters and the Cape Cod Chamber of Commerce there was a strong sense that the risk of a shark/human interaction is more likely than ever.

At the same time we have personal knowledge of business owners who are actively gearing up to solicit “thrill seekers” to go to the outer Cape and see white sharks using seal decoys, fish and animal chum and any other means they can think of to attract sharks to their boats. The prime areas are all near traditional bathing beaches on the Outer Cape. These business owners will invest time and money into a business without any guidance or science driven codes of conduct to ensure practices that will consider the safety of the public and the well being of the sharks. This is a dangerous situation and greatly raises the risk of a tragedy occurring.

A recently published study (Gallagher and Hammerschlag 2015) has shown that shark related tourism operations in the Caribbean, South Africa, Mexico & Australia and elsewhere have changed the natural behavior of sharks. This change in behavior is accomplished by chumming (ie. attracting and feeding) and by simulating prey with decoys in a way that conditions sharks to stay in areas and near boats at specific times once they are “trained” with the reward of food. This “training” last longer than many originally thought with sharks staying in areas they have been fed for many hours after the shark tourist operation has departed. Boaters, surfers, kayakers and swimmers are therefore put at increased risk of an interaction especially near areas where the shark tourist operations are working. In areas outside of Massachusetts where these activities are regulated shark attracting operations occur well away from bathing beaches.

I have traveled to study shark eco-tourism extensively in South Africa, in Mexico and have a planned trip to Australia. I have interviewed many operators and studied their operations, especially in South Africa, particularly about their experience in starting up their industry in some cases more than 20 years ago. There were many challenges especially during the earliest days. Mostly due to unscrupulous operators and thrill seekers. Today the successful operators balance safety, economic opportunity and conservation of the species effectively and the business thrives. Through our efforts these operators are quite aware of the research being conducted in Massachusetts waters. Their advice is to “learn from our experiences and do not make the same mistakes.” They strongly urge the Commonwealth to adopt the proposed regulation now to give experts an opportunity to develop permit criteria and a Code of Conduct (eg. similar to responsible Whale Watching COC) to ensure responsible and safe shark tourism operations in Massachusetts. A similar regulation and the resulting permit process were essential to enabling responsible shark tourist businesses in South Africa.



Permits are also required in the Farallone Islands, (California), Guadeloupe Island, (Mexico) and in the Neptune Islands, (South Australia). Massachusetts has its own unique ecology and therefore will require a thoughtful look at how best to set up our own Codes of Conduct but all agree it is essential and the time is right now.

I hope you agree that there are serious public safety ramifications that would result from uncontrolled activity attracting and pursuing white sharks in near shore waters. We are now only 70 days away from Memorial Day when the first white sharks begin returning to the area. I respectfully request you to have the agencies "resurrect" the proposals drafted two years ago and have them promulgate emergency regulations in advance of the summer shark season.

I am available to come meet with you to discuss these matters as soon as possible, given the time sensitive nature of the situation. However I am leaving the country on March 25 for an extended period, and if a meeting cannot be scheduled before my departure I will make a colleague available to consult with you and your agency experts on the growing problems of managing white shark and human interactions.

Sincerely,

John J King II  
Chatham, MA  
Cell 206-399-1092  
[jjking2@gmail.com](mailto:jjking2@gmail.com)

CC: Senator Daniel Wolf  
Representative Sarah Peake  
Commissioner George Peterson  
Director Paul Diodati  
Cynthia Wigren, AWSC



# Town of Orleans

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**Dawson L. Farber IV**

Natural Resources Manager

Harbormaster / Shellfish Constable

19 School Rd. Orleans, Massachusetts 02653

Telephone (508) 240-3755 – Fax (508) 240-3388

[www.town.orleans.ma.us](http://www.town.orleans.ma.us)

Paul Diodati, Director  
Massachusetts Division of Marine Fisheries  
251 Causeway Street, Suite 400  
Boston, MA 02114

March 26, 2013

Dear Director Diodati:

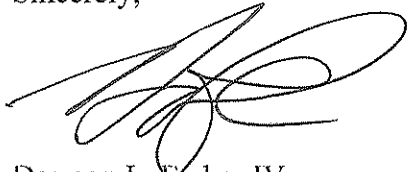
As you may know, the communities of Orleans, Provincetown, Truro, Wellfleet, Eastham, Chatham, Harwich, Brewster, Dennis, Yarmouth, Barnstable, Nantucket, and the Cape Cod National Seashore have formed a regional working group to address the white shark presence in our harbors and along our coastline. This group has been meeting over the last several months in order to develop a regional approach to this issue. We have developed standardized signs advising and cautioning the public of these sharks in our waters. Additionally, we are producing an informational brochure that all of the above communities will use to help educate the public on the presence of these animals. These brochures will be made available throughout the mid, lower and outer Cape communities including the Cape Cod National Seashore. We are also considering engaging an existing regional entity to receive calls from the public when they witness the presence of sharks. That information will then be distributed to local beach managers and harbormasters.

At our most recent meeting, the newly formed Atlantic White Shark Conservancy presented our working group with recommendations on protecting white sharks and regulating commercial eco-tourism activities in our area. While we may support some of the proposed regulations, we feel that it is the responsibility and duty of the Division of Marine Fisheries to investigate the need for and, if necessary, the development and implementation of regulations for the protection of marine species in state waters and the regulation of commercial activities associated with these species. Specifically, we are concerned about eco-tourism businesses operating in near-shore waters that will target the white shark species and pose a risk to the public safety and the welfare of this protected marine animal. We therefore respectfully request that the Division initiate a review of this matter to determine if additional regulations or restrictions on commercial activities involving white sharks are necessary and appropriate. We would welcome the opportunity to work with your agency on this matter of mutual and significant environmental, social and economic concern.

We strongly support the Massachusetts Division of Marine Fisheries' research on the white shark. The program findings are vital in assisting our communities as we struggle to address the impacts of this new phenomenon. We look forward to continuing our cooperative work with you and your agency and hope that the Commonwealth will continue to provide the necessary resources to address the issues associated with white sharks in our waters.

Thank you for your time and consideration in this matter.

Sincerely,

A handwritten signature in black ink, appearing to read 'Dawson L. Parber IV', with a large, stylized flourish at the end.

Dawson L. Parber IV  
Chairperson, White Shark Regional Working Group

A handwritten signature in black ink, appearing to read 'Stuart Smith', with a large, stylized flourish at the end.

Stuart Smith, Chatham Harbormaster  
Vice Chairperson, White Shark Regional Working Group