

Natural History and External Appearance

Thresher sharks are pelagic species that occur worldwide in temperate and tropical waters. They are most frequently encountered in the open ocean, but also occur in coastal waters and can wander close to shore in search of food. Although these sharks can grow to about 6 m (usually 2-5 m), they have relatively small mouths for their size, but can use their long tails as whips to stun prey. Their depth range extends to 550 m, but they are usually seen near the surface and occasionally will jump clear of the water.

Externally, common thresher sharks have a short, conical snout and rather large eyes. The skin is covered with small, sharp scales called placoid scales. Because these scales contain enamel and dentin, and their shape resembles small teeth, they are also called denticles. When treated and dried, shark skin becomes a type of rough leather called shagreen, which is used like sand paper as a polishing agent. One can easily determine the sex of a shark by examining its pelvic fins. Part of a male's pelvic fin is modified into a fingerlike appendage called a clasper; pelvic fins of females lack claspers.



Thresher Shark Taxonomy

The scientific name of the common thresher shark is *Alopias vulpinus* (Bonnaterre, 1788). Both the genus and species names refer to its fox-like appearance (Greek *αλωπηξ* [Latinized as *alopex*] = fox; Latin *vulpinus* = fox-like) as do synonymous common names such as “fox shark” and “sea fox.” Like most sharks, the thresher has a heterocercal caudal (tail) fin: a crescent-shaped fin in which vertebrae extend into the upper lobe (which is longer than the lower lobe). The common name “thresher shark” notes that the upper lobe of the caudal fin is unusually long (up to half the total length of the body) and gives the entire fin the shape of a grain-threshing flail. Synonymous common names such as “swivel-tail,” “whip-tail,” “thin-tail” and “thrasher” (a corruption of “thresher”) also refer to the tail. Similar, closely related species are *Alopias superciliosus* (bigeye thresher), and *Alopias pelagicus* (pelagic thresher).

For anyone interested in complete taxonomic information about the common thresher shark, the rest of its classification is:

Kingdom: **Animalia**
Phylum: **Chordata**
Subphylum: **Vertebrata (Craniata)**
Class: **Chondrichthyes**
Subclass: **Elasmobranchii**
Order: **Lamniformes**
Family: **Alopiidae**

Brochure prepared by members of the 2007-08:

First-Year Science Learning Community
Honors Program
Texas A&M University-Corpus Christi
6300 Ocean Drive, Unit 5751
Corpus Christi, Texas 78412-5751
(361) 825-5981
<http://honors.tamucc.edu>
Collaboration

TEXAS A&M UNIVERSITY-CORPUS CHRISTI



College of Science & Technology

THRESHER SHARK NECROPSY

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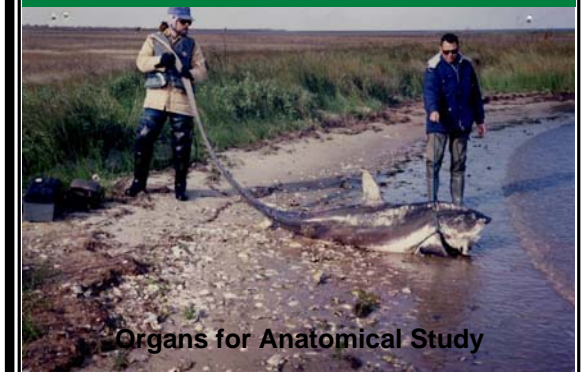
Arranged through programs in the Department of Life Sciences at Texas A&M University-Corpus Christi:

Biology – <http://lsci.tamucc.edu/biol>

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A necropsy is the animal version of an autopsy. (Technically, “autopsies” are only performed by human beings on human beings.) It is *not* just to find out what caused the animal’s death (which we often cannot determine), but rather to gather as much information about the specimen’s structure, function and life history as possible. This necropsy team is directed by ichthyologists and anatomists from Texas A&M University-Corpus Christi, and by practicing veterinarians from Corpus Christi. Undergraduate and graduate students who are familiar with the anatomy of sharks from taking courses such as Vertebrate Biology, Ichthyology, and Functional Anatomy are assisting with the necropsy. To be included in the necropsy team, Honors students in the First-Year Science Learning Community spent two weeks learning the basic anatomy of sharks by dissecting smaller specimens.

This shark beached near Corpus Christi, and was frozen as soon as it was removed from the beach. The initial portion of the necropsy involves collecting the “vital statistics” of the shark (body weight, total length, length of fins, girths at various points, etc.). Though extremely necessary, this is certainly *not* interesting to watch, and will likely be performed before the public necropsy.

Some standard procedures that you probably *will* notice in this necropsy of a shark are to:

- Take samples of the vertebrae. The entire skeleton of a shark is made of cartilage rather than bone. Vertebrae can be analyzed to estimate the shark’s age.
- Collect the contents of the digestive tract to determine the shark’s feeding habits.
- Examine the skin, gills, digestive tract, etc. for parasites.
- Weigh, measure and record everything!

A relatively rare occurrence such as this offers a chance to collaborate with researchers at other institutions:

Heart parasites: We have a specific request from the University of Southern Mississippi to search the cavities of the circulatory system for parasites such as flukes (flatworms). The heart and major blood vessels will be removed, bisected, and washed with a weak preservative. The wash fluid (hopefully containing preserved parasites) will be shipped to Mississippi for analysis. The heart itself will be preserved as an anatomical specimen and kept for study.

Liver and gall bladder: Researchers at the University of Hartford (Connecticut) initially requested several tissue samples. However, when they learned that the shark was frozen, they said “never mind” to all tissues except liver and gall bladder. Why? Ice crystals form during freezing. These are razor-sharp and cut cellular components like millions of tiny knives. (That is also why the shark is oozing blood through her skin; it is leaking out of shredded capillaries.) Usually, unprotected freezing damages cells and tissues so much that they are useless for studying microscopic structural details. Freezing does preserve the gross structure of whole organisms, however, so the gross anatomical specimens and whole parasites should be useful.

Muscle tissue: The Florida Museum of Natural History has requested that we preserve some muscle tissue from which their researchers will extract DNA. Thresher sharks are strong swimmers and have plenty of muscle tissue from which to choose. The main swimming muscles are the rope-like epaxial muscles along the back. They are very thick and are good candidates for taking these samples. Freezing will not damage the DNA, but the formaldehyde-based preservative mentioned above probably would. Therefore, the muscle tissue specimens will be preserved in alcohol.

We intend to harvest a variety of organs as anatomical specimens for future study:

- brain
- digestive tract
- eyes
- heart
- inner ears
- kidneys
- liver
- ovaries
- pancreas
- reproductive tract
- spleen.

Some of these organs (such as the inner ears) are difficult to dissect from the shark, so we may only remove and preserve a large “chunk” during the gross necropsy. Later, in the laboratory, we will take the time necessary to will be dissected time and precision dissection

Taxidermy

A taxidermist will “mount” a shark if a customer wishes to retain a souvenir. The customer identifies the species of shark and provides the taxidermist with measurements of lengths and girths at various locations on the shark’s body. Based on these measurements, the taxidermist orders a cast of the “body” that is made from standard molds. The taxidermist uses spray paint to replicate the coloring, shading and markings of the skin (based on photographs provided by the customer). The eyes in the mount are also replicas. The teeth and jaws taken from the real specimen may be incorporated into the mount if the customer wishes to “personalize” it.

Texas A&M University
Corpus Christi



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