Lake Erie Shark!

Nick Zarlinga
Cleveland Metroparks Zoo, 3900 Wildlife Way, Cleveland, OH 44109
njz@clevelandmetroparks.com

Okay, we know that sharks can't live in freshwater, right? So why do we still get a bit uneasy about swimming in a lake in which you can't see the bottom? Is there some irrational fear that sticks in our heads as a result of seeing *Jaws* (and all of its really bad sequels)? Actually, there are some sharks that can tolerate fresh water for a considerable period of time. Bull sharks (*Carcharhinus leucas*) are known to make their way up rivers hundreds of miles from the ocean. And what about that shark population in the freshwater Lake Nicaragua in Central America? They're bull sharks, too, suspected of having an underwater passage to the ocean. But how about in Lake Erie? Are sharks found in Lake Erie? Don't think so? Well, read on . . .

July 29, 2002, was just an ordinary day. Well, the morning was, at least. In the afternoon I received a call from the Marketing Director of the Cleveland Metroparks Zoo. Here is how the conversation went:

MARKETING DIRECTOR: Hey Nick, did you hear about the shark that they caught in Lake Erie yesterday?

NZ: (*snickering*) No, must have missed that one.

MARKETING DIRECTOR: Well, I have so and so on the phone from Channel 3 News and they would like to do an interview with you on the story. So, what kind of shark do you think it can be? They called it a sand shark.

A sand shark is a common name that can refer to a couple of different species of sharks, most notably a sand tiger shark (*Odontaspis taurus*), the ones with the gnarly teeth at most public aquariums, or a sandbar shark (*Carcharinus plumbeus*), also known as a brown shark.

It seems every summer brings several stories about anglers catching some exotic fish, usually a "piranha." So the first thought that came to mind was that the Lake Erie shark was actually any one of the commonly named "freshwater sharks" popular with aquarists—iridescent sharks, bala sharks, and other similarly named catfish and minnows native to Asia and Africa.

NZ: If it's a true saltwater shark, it could be a nurse shark, or a cat shark, both of which are common in the aquarium hobby. I'll do the interview only if I could see pictures of the shark first.

The Marketing Director talked to the reporter and got back to me a little later.

MARKETING DIRECTOR: Nick, they'll be here at 1:30. They have a video of the shark. I mentioned to her that it could be a nurse shark since they are common in the hobby, as you said. She said that she's positive that it's not a nurse shark because she sees them while SCUBA diving.

My curiosity heightened. This reporter seems to know what a real shark looks like, so in the back of my head I am thinking, "What if … ?" One-thirty quickly rolls around and for the first time in my life I am early for an appointment. I meet the reporter and she tells me what happened:

NEWS REPORTER: Well, Nick, apparently this guy was fishing in Lake Erie down by Edgewater [a popular beach area in Cleveland] and he feels something brush against his leg. He looks down and sees this shark. He wigs out, grabs it by the tail, whips it on shore and his friends proceed to beat it silly with sticks. Then they call DNR and they come down and they ID'd it as a sand shark.

While she's talking the video plays and, sure enough, it's quite obvious that it's a real shark, almost three feet long! I didn't believe it but I guess that I have been waiting for the day for this to happen.

Not being too familiar with smaller sharks, my first inclination was to tentatively identify it as a smooth hound shark

Fig. 1.
The "Lake Erie shark," provisionally identified as a Brazilian sharpnose shark, *Rhizoprionodon intermedius*.

(*Mustelus* sp.) since I had recently seen them for sale at some of our local pet stores. It also seemed to fit the scenario that it was a release by an aquarium hobbyist who either thought he would be doing the shark a favor by releasing it into the "wild" because it had outgrown its tank, or was trying to capitalize on the recent snakehead frenzy that permeated the news so recently. When I got the specimen in my possession, I quickly examined it. It measured 32 inches long and was a mature male, easily determined by the large claspers (reproductive organs) just behind the pelvic fins. I snapped a few photos and sent them to many of my friends and colleagues.

After a bit of research, it was suggested to me that it was a carcharinid species, possibly an Atlantic sharpnose shark (*Rhizoprionodon terraenovae*), a blacknose shark (*Carcharhinus acronotus*), or a finetooth shark (*Carcharhinus isodon*). Carcharinid sharks are the fish that we most commonly think of when we think of a shark. They are torpedo-shaped, always moving, and have the erect dorsal fin that tends to stick out of the water as it swims near the surface. Knowing that these are not species kept by hobbyists, I was a bit befuddled. I now had a whole new story on my hands!

That weekend just happened to be the North American Native Fishes Association's annual meeting, this time in Ann Arbor, Michigan. The "Lake Erie shark" was quite the topic of conversation during the conference. We spent one evening at the University of Michigan's Museum of Zoology at the University of Michigan. The Museum's fish collection, dating back to the late 1800s, boasts a whopping collection of over three million specimens and has served as a prominent research facility for generations of ichthyologists. While there I checked out some specimens of the Atlantic sharpnose shark, and acquired a key for the genus *Scoliodon* (an earlier name for the genus *Rhizoprionodon*) from the Museum's library.

Returning to Cleveland, I found that my photos had been forwarded to Dr. John Morrissey, Associate Professor of Biology at Hofstra University. Dr. Morrissey serves on the Board of Directors of the American Elasmobranch Society and has been studying sharks for 20 years, so obviously I was

Fig. 2.
A closer view of the "Lake Erie shark."

very interested in his opinion. Based on the photos, he also identified the animal as an Atlantic sharpnose shark. Dr. Morrissey told me to look for two anal ridges emanating from the anal fin approaching the cloaca. Although the anal ridges were not very pronounced, he helped confirm that the specimen belonged to this genus *Rhizoprionodon*, but the species was still in question. Using crude measuring methods and comparisons of the eye diameter, labial furrow lengths, and length of fins, I keyed the specimen to the Brazilian sharpnose shark (*Rhizoprionodon intermedius*) instead of the Atlantic species. The precise identity of the shark remains unresolved.

How did the shark end up in Cleveland? There are several possible explanations. A simple explanation is that the shark simply swam from the Atlantic Ocean, up the St. Lawrence Seaway, through Lake Ontario and into Lake Erie. (Yes, I know, it's about a thousand miles.) Obviously, this is a highly unlikely scenario. Although sharpnose sharks can be found in waters with lower salinity, it is safe to say that it is exceedingly doubtful that one could survive in fresh water for the extended period of time that it would take to swim from the Atlantic to Lake Erie. Furthermore, the sharpnose shark is primarily a tropical species that seldom occurs north of Manhattan (although Leim and Scott's *Fishes of the Atlantic Coast of Canada* reports that was one specimen was caught as far north as New Brunswick in 1857).

Another possibility, albeit a slim one, is that the shark was captured in the ballast water of an ocean-going vessel. Not knowing what's involved with a ship's uptake of ballast, I contacted our local Coast Guard station and spoke to Lt. Williams of the Marine Safety Division. According to Lt. Williams, a typical Lake Erie ship takes on ballast through a pipe that's from 2.5-4.0 inches in diameter. Shipping regulations require foreign ships to dump their ballast water before entering the St. Lawrence Seaway and uptake new water at sea. When they enter the Great Lakes, they can dump the seawater and uptake new freshwater ballast. This is to prevent the spread of aquatic animals from location to location. Although the shark could possibly have squeezed through a 4-inch diameter pipe head on, my experience with fish has shown that they will quickly dart away when near a strong suction. Assuming that a ship's ballast uptake requires a very strong suction, I believe the shark would have been sucked broadside to the pipe and therefore would not have survived.

A third possible explanation is that a vacationing angler caught the shark in the Atlantic, transported it back to Cleveland alive, and let it go as a publicity stunt. Atlantic

sharpnose sharks are common along the mid-Atlantic Coast of the United States and are regularly caught on hook and line. The problem is that the transport of "ram ventilators" (fish that rely on swimming action to force water over their gills) is a rather difficult task, especially for a three-foot long mature shark. It is extremely unlikely that a person without experience in transporting these types of fish would be able to get the shark home alive after a minimum six-hour drive.

The most likely explanation is that a vacationing angler caught the shark and immediately preserved it in a cooler of ice. I asked the park ranger who took the call about the shark if he saw the animal alive. He said he did not, but that "about 30 witnesses" swore the shark was alive as they saw it lazily swimming up into the rocks. Was the shark really alive, or was this an example of witnesses seeing what they wanted to see? Consider this tale—told to me by Jay Hemdal, curator of fishes at the Toledo Zoo—of a bull shark that was caught on hook and line by an angler in Lake Michigan a few years back. Many witnesses saw the angler catch the shark and land it. But the angler later confessed that he had recently returned from a fishing trip on the Coast, where he caught the shark and transported it home, dead, in a cooler. He woke up early one morning and made it to a popular fishing spot before anyone else arrived. He hooked the shark and threw it into the lake. Some time after the usual crowd of anglers arrived for the day, he "checked his line" and felt that there was something on it. He "played" the shark as if it were alive. When he got it near the shore he jumped in the water and "killed" it, then hauled it on land for everyone to see.

Later, when I examined the Lake Erie specimen, I saw two small holes about a centimeter apart in the corner of the mouth. I made every attempt to see if the holes penetrated the jaw into the inside of the mouth, a pretty sure sign they had been made by a hook. Although the holes did not penetrate the jaw, they were spaced closely enough that if the shark indeed had taken a bait, the hook could have entered in the outside of the "lip" hitting the jaw and exited back to the outside of the jaw, effectively hooking the shark in the lip. My guess is that an angler caught this shark somewhere in the Atlantic and brought it home to Cleveland, perhaps with the intent of having it mounted. However, upon learning how much the taxidermist would charge, he instead dumped it into Lake Erie for "entertainment value." As the shark drifted along the bottom to the rocky shore (sharks do not have swim bladders and do not float), the gentle sway of the waves could have given the appearance of the shark "lazily swimming" into the rocks, leading people to believe that it was alive.

Whatever the explanation for its appearance, the Lake Erie shark made the summer of 2002 a lot more interesting. I thank everyone who helped me identify it and figure out how it got there. It's too bad the shark didn't have a gut full of round gobies and yellow perch. Imagine how much more interesting that would have been!