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TESTING THE MYTH OF THE GREAT BARRACUDA, *SPHYRAENA BARRACUDA*

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ABSTRACT

The great barracuda, *Sphyraena barracuda*, is the largest of the 26 species in the barracuda family and the only barracuda known to attack humans. There is common myth that if a swimmer wears shiny items in the water, like jewelry, the great barracuda will attack them. This study tested the validity of this myth by observing barracuda behavior to shiny versus dull, and moving versus non-moving objects in the presence of humans. Several other factors—time of day, habitat, water conditions, number of people in the water, and the type of rig and lures used—were also analyzed for their effects on success in attracting barracuda. No attacks were stimulated during the testing period, but our findings suggest that the barracuda is more attracted to shiny objects versus dull objects and prefers motion over-non motion. We also found that barracuda populations (mostly juveniles) were the densest in grass flat habitats, and that the number of people present in the water seems to be the greatest factor inhibiting attraction of barracudas.

INTRODUCTION

The Myth

In January of 2006, author AKA spent two weeks doing field research near the island of San Salvador in the Bahamas. Before this she had never snorkeled or been diving in the ocean, but during this trip she went diving almost everyday absorbing all the beauty the coral reefs offered. One fish, in particular, that she found extremely interesting was the great barracuda, *Sphyraena barracuda*. Before her trip she was told many stories about how scary looking and fascinatingly curious the great barracuda is. At first these stories left her feeling a little frightened about swimming with barracudas, but after her first encounter with one she realized how absolutely stunning and beautiful they are.

On several occasions she was followed and circled by adult barracuda while diving in shallow coral reef areas and deeper (60 ft max) wall dives. Each of these barracuda kept at least a 5-foot distance from her and fled when she tried to push these limits by swimming towards it. Most of the time, once she quit pursuing the barracuda it would return to follow her while still maintaining a minimum distance. She never felt threatened by these adult and juvenile barracuda or had any instances where she felt they might attack. She also had the opportunity to swim with smaller, juvenile barracuda in a tidal estuary, Pigeon Creek. They were not as curious as the juvenile and adult barracuda; they hid in the mangroves or fled from her.

After several encounters with the barracuda she began telling Bahamians about her experiences. With each frightened face she realized how intimidated and scared Bahamians are of the barracuda. Each Bahamian, without fail, would proceed to warn her about the barracuda and how unfriendly and dangerous it is. This warning was always followed by the myth surrounding the barracuda—that if one wore anything shiny in the water the barracuda would attack.

Each time she heard the myth, it was told with great caution and emotion. Yet, each time she heard it, she questioned its validity because each experience she had with a barracuda had

been harmless and non-threatening. This caused her to wonder: Had this myth ever been scientifically tested, and if so, is wearing a shiny object enough to provoke a barracuda attack, or are there other factors that contribute to an attack?

Barracuda Life History

The great barracuda is the largest of the 26 species in the barracuda family, Sphyraenidae, with the largest recorded great barracuda having a total length of 2 meters (6.35 feet) and a weight of 50 kg (110.25 lbs) (Froese and Pauly 2006). The great barracuda, which will now be referred to simply as the barracuda, is found near shore worldwide in tropical and subtropical seas (45° N-35 ° S, 180 ° W- 180 ° E). It inhabits the Western Atlantic Ocean from Massachusetts, U.S. to Brazil, the Gulf of Mexico, the Caribbean Sea, the Eastern Atlantic, the Indo-Pacific, and the Red Sea (Froese and Pauly 2006, Bester 2006).

Barracuda are pelagic non-guarders that produce planktonic eggs by means of external fertilization (MarineBio 2006). Once hatched, larvae settle in shallow, vegetated areas of estuaries for food and predator protection (Bester 2006). Once a barracuda reaches a length of about 1.2 inches it will progress to open waters in the estuary, leave the estuary altogether when it reaches a length of about 5 inches, and then spend the remainder of its adolescence, about 2 years, within mangrove and seagrass habitats (Bester 2006). During the juvenile phase, barracudas will sometimes form loose aggregations for the purposes of feeding and defense, while still holding their own territory and commonly having a system of hierarchy (DeSylva 1963). In a study done at Bimini, Bahamas, the stomachs of young barracudas contained gobiids, atherinids, gerrids, cyprinodontids, and clupeoids (DeSylva 1963).

Once a barracuda reaches adulthood, around age 2, it leaves its estuary to most likely live a solitary existence. Pairs and small packs of adult barracuda have been observed, especially during spawning seasons (DeSylva 1963). Adult barracudas are most commonly found at or near the surface near coral reef habitats, but have been found out to sea at depths up to 325 feet (Bester 2006, Froese and Pauly 2006).

The adult barracuda is an opportunistic predator that feeds on a wide variety of fish, such as jacks, grunts, groupers, snappers, tunas, herrings, mullets, and anchovies (Bester 2006). Common to large predatory fish, the barracuda lacks a protrusible upper jaw with which to suck up prey. Instead it has a less advanced jaw which is fused together to support two sets of razor-sharp teeth, a small row of razor-like teeth along the outside of the jaw and a larger set of dagger-like teeth within these. Due to its fused jaw it is unable to fit large fish in its mouth, but this does not stop it from preying on large fish. Using its numerous sharp teeth, the barracuda will bite large prey into two or more pieces and then circle around to eat it piece by piece (Wilson and Wilson 1992). Its jaw and tooth combination is so powerful that it can cut a mature parrotfish into two pieces with a single bite (Scott 1997).

The barracuda is a diurnal predator that depends primarily on sight to hunt prey and is attracted to fish that flash or show some type of erratic movement (DeSylva 1963). Since the barracuda must hunt during daylight hours, its ability to catch prey may be inhibited by good vision of its prey. To combat this problem, the barracuda will often hunt at twilight when its stealthy attack behaviors make the prey less likely to see the barracuda (Deloach 1999).

The barracuda is a burst swimmer with a body built for speed. With top speeds estimated around 36 mph, its method of attack on prey is quick and fierce (Bester 2006). First, the barracuda moves slowly through the water in search of prey. Once the prey is found, it stalks the prey very slowly. When the time is right it strikes, using its incredible burst speed to ambush the prey (Deloach 1999). With the barracuda's combination of speed and super sharp teeth, the prey has little chance of escaping an attack.

Attacking Humans

Among the 26 species of Sphyraenidae , the great barracuda is the only one known to attack humans (Scott 1997). Barracuda attacks are

very rare but when they do occur they get a lot of public attention. Barracudas are not gentle creatures and injuries from an attack can range from minor to deadly. Injuries have included deep lacerations, some of which led to nerve and tendon damage, loss of body tissue, loss of limbs, and severing of large blood vessels (Scott 1997, DeSylva 1963). For example, in the 1980s a SCUBA diver received minor injuries from an attack in Kailua, HI, but in the 1990s two women, on separate occasions, received major injuries when they were bitten on their heads by barracuda. One of the women had surgery to remove some of the barracuda's teeth from her skull. Both women were wearing shiny barrettes in their hair when the attacks occurred (Scott 1997).

According to DeSylva (1963), from 1873-1960 there were 29 reported barracuda attacks on humans, of which 19 are documented, 2 are probable, and the remaining 8 are possible. DeSylva believed that almost all of these attacks involved the victim provoking the barracuda in some way. He hypothesized that some of the attacks were defensive and occurred only after the human had provoked the barracuda, like the instance in 1955 when a boy was attacked after spearing a barracuda. He also believed that some attacks occurred as a result of the victim making sudden movements in the water which confused the barracuda into believing the human was possible prey. This may explain a fatal attack on a woman in 1922 who was swimming in Florida waters. There was only one case in which DeSylva believed the barracuda attack was, in the strictest sense, unprovoked. This happened in 1960 when a diver, who had not aggravated the barracuda, was not wearing any brightly colored apparel or jewelry, and had not done any spearing, was repeatedly attacked by a 15 pound barracuda (DeSylva 1963).

Bruce Wright (cited in DySylva 1963) did a study in the Bahamas in 1948 aimed at finding possible reasons why a barracuda might attack a human. His results showed that the attack pattern by the barracuda was not released by a man acting quietly in the water or when blood was introduced into the water in the absence of movement. He did find that the combination of blood and jerky rapid movements, as well as jerky rapid movements without the blood released an attack pattern in the barracuda. In DeSylva's studies several years later, barracuda were attracted to shiny objects, easily confused splashing swimmers at the surface of murky waters with potential prey, and were scavenger hunters that followed divers and tried to steal speared fish (DeSylva 1963).

Based on the information presented above, we hypothesized that shiny objects alone will not initiate an attack by the barracuda. Rather, other stimuli, such as rapid movement, are needed to initiate an attack. We further hypothesized that the barracuda will also attack dull objects, as long as rapid movement is involved.

MATERIALS AND METHODS

For two weeks in January 2007, several locations off San Salvador, the Bahamas were snorkeled in search of the great barracuda. For each encounter with a barracuda, location, habitat, environmental conditions (including water visibility, air temperature, tide status, and weather), approximate barracuda size, and number of people present in the testing area were recorded (Appendix A). Once a barracuda was attracted, two separate mobile rigs were used to test the effects shiny versus dull and stationary versus non-stationary lures had on barracuda attack rates in the presence of humans.

Test rigs were set up as follows: A 30-inch dull blue metal bar was secured with 15 inches of 30 lb test fishing line and large swivel snaps to a small float and the tip of a 78-inch telescoping fishing rod. Using 6 lb test line with small swivel snaps, three lures (hook less spinner blades) were attached to the bar so that they hung four inches below the bar; a total of 19 inches from the surface. (Six lb test line was used to allow the lures to break from the bar easily in the event of an attack.). On two occasions, stationary rigs, set up in the same manner except anchored to the ocean bottom instead of attached to the fishing pole, were used. Tests without rigs were also conducted in which two people swam around without any testing gear or shiny objects.

For many tests, one rig had lures painted dull blue and the other had shiny lures. For these tests, AKA and her assistant swam side by side about one meter apart. AKA held the shiny rig at about a 45 degree angle from her head on the right side of her body and the dull rig was held by the assistant at the same angle on her left side. This increased the ability of a barracuda to view both rigs at the same time.

Once a barracuda was attracted, the poles were moved from a 45 degree position to a 30 degree position from the observers' heads so that the barracuda were sure to see both sets of spinners. The poles were held motionless for two minutes and the barracuda's behavior was observed. If it did not attack after two minutes then the poles were waved from left to right for two minutes, covering a radius of 0 to 90 degrees from the observers' heads, causing the spinners to move rapidly. Change in the barracuda's behavior due to the motion of the spinners was then observed. This pattern was repeated for two cycles (eight minutes) or as long as the barracuda remained interested. Variations in number of people present, location and habitat, time of day, rig type, and lure type were evaluated to explore which variables might be responsible for attracting and stimulating certain behaviors in the barracuda.

RESULTS

Attracting barracuda

No attacks were stimulated during the testing period. During 23 attempts to attract barracudas, 15 were successful (Appendix A). Several factors may have contributed to the successful attractions of barracudas.

Time of Day. All tests were performed during daylight. Five of eight tests conducted in the morning (9:15 am to 11:00 am) were successful (62.5%) and ten of 15 tests (66.7%) conducted in the afternoon (1:30 pm to 3:40 pm) were successful (Table 1). A Chi-square test shows no relationship between the test times and success in attracting barracuda (p=.5521).

Test Time	Successful	Unsuccessful
Morning	62.5%	37.5%
Afternoon	66.7%	32.3%

Table 1. Percent success rates in attracting barracuda with respect to time, morning versus afternoon, of tests.

Location and Habitat. All tests were conducted in waters off San Salvador. Habitats and locations included a sand flat (SF) at Rocky Point (RP), grass flats (GF) at North Point (NP), Navy Pier (Nav), and Dump Reef (DR), hard ground habitat (HH) at NP, shallow patch reefs (PR) at Telephone Poles (TP) and DR, and an artificial patch reef (AR) at Nav. Barracudas were observed in all habitat types listed except for the SF habitat at RP.

A total of 34 barracudas were attracted during this study. By habitat, we had 100% success in the HH (n=3 tests) and attracted three barracuda, 73% success in GF (n=15) and attracted 32 barracuda, 50% success in AR (n=2) and attracted one barracuda, and 50% success in PR (n=2) and attracted one barracuda (Table 2). A Chi-square test was performed with respect to habitat type and the success in attracting barracudas. It suggests that there is little relationship between the success in attracting a barracuda and the type of habitat tested (p=.0968). (The GF habitats were tested against the sum of all other habitats due to the low number of tests done in each habitat type with the exception of the GF habitat.)

By location, we had 93% success at NP (n=14 tests), 50% at DR (n=4), 33% at Nav (n=3), 0% at RP (n=1), and 0% at TP (n=1). A Chi-square test indicates that there is a significant relationship between location and the success in attracting barracuda (p<.0001). By total number of barracuda attracted per location, 91% were attracted at NP (n=31), 6% at DR (n=2), and 3% at Nav (n=1) (Table 3). A Chi-square test also indicates that there is a significant relationship between location and the number of barracuda attracted (p<.0001).

Habitat	Successful	Unsuccessful	% Success	# At-tracted
HH	3	0	100	3
SF	0	1	0	0
GF	11	4	73	32
PR	1	1	50	1
AR	1	1	50	1

Table 2. Success rates and number of barracuda attracted by habitat.

Location	# Attracted	% Total Attracted
NP	31	91
DR	2	6
Nav	1	3

Table 3. Number of barracuda attracted and total percentage by location.

Water Conditions. Weather was poor for most of this study, resulting in murky water with low visibility. We had 50% success in attracting barracuda in conditions ≤ 3 m visibility (n=2 tests), 70% success in 6 m visibility (n=10), 70% success in 8 m visibility (n=10), and 0% success (n=1) in 16 m visibility (Table 4). Two Chi-square tests were performed for visibility, one including the 16 m test and one without the 16 m test. Regardless, both tests showed there was a relationship between visibility and the success in attracting a barracuda ($p<.0001$ and $p=.0032$, respectively).

Visibility (m)	Successful	Unsuccessful	% Success
≤3	1	1	50
6	7	3	70
8	7	3	70
16	0	1	0

Table 4. Number of tests in each visibility category and their respective percentage success rates.

Number of People in the Water. With respect to the number of people in the water, we had only 14% success (n=7 tests) in attracting barracuda when there were three or more people, either working on the experiment or in the vicinity of the experiment, in the water. In contrast, we had 88% success (n=16) in attracting a barracuda when only two people were in the water during a test (Table 5). A Chi-square test suggests that there is a strong statistical relationship between the success in attracting a barracuda and the number of people present in the water ($p<.0001$).

Number of People	Successful	Unsuccessful	% Success
2	14	2	88
3+	1	7	14

Table 5. Success rates in attracting barracuda with respect to the number of people in the water either working on the test or in the vicinity of the experiment.

Type of Rig. Stationary and mobile rigs as well as swimming with no rigs were used for this experiment. Stationary rigs were unsuccessful (n= 2 tests) at attracting barracuda, mobile rigs were 69% successful (n=14), and tests without rigs were 80% successful (n=5) (Table 6). A Chi-square test shows that mobile and no rigs were significantly more successful than stationary rigs at attracting barracudas ($p<.0001$).

Rig Type	Successful	Unsuccessful	% Success
Stationary	0	2	0
Mobile	11	5	69
No Rig	4	1	80

Table 6. Rig type and percent success attracting barracudas.

Shiny vs. Dull Lures and Lure Size. For tests performed with two mobile rigs, in which one rig contained all shiny lures and one contained all dull lures, five were successful in attracting barracuda. In these five tests, 16 barracuda were attracted, 11 of which were attracted to the shiny lures, three attracted to the dull lures, and two that could not be determined (Table 7). A Chi-Square test indicates that there is a significant relationship between the type of lure (dull or shiny) used and the barracudas preference ($p<.0001$). Lure size remained fairly consistent throughout the study and was not a factor in barracuda behavior.

Mobile Rigs; one shiny and one dull	
Lures	# of Barracuda Attracted
Shiny Lures	11
Dull Lures	3
Not Determined	2

Table 7. Barracuda attraction to shiny and dull lures.

Behavioral Observations

Barracuda behavioral responses, due to lure motion or lack thereof, were categorized as positive (moving closer to the lures), negative (moving away from the lures), or neutral (no net movement). In the presence of motion there were eight positive responses and six negative responses. When rigs were held still there were four positive responses and five negative responses. There were two neutral responses in the presence of motion and one when the rig was held still (Table 8). A Chi-square test performed on positive, negative and neutral data suggests that there is a relationship between lure motion and behavioral responses of barracudas (p=.014).

Test #	Barracuda Size	Two Minute Still	Two Minute Motion	Two Minute Still	Two Minute Motion
1	1 @ 1.4 m	Neutral	Positive	Negative/left	No Change
4b	1 @ 38.1 cm	Positive	Negative	Positive	Negative
5	1 @ .5 m	Negative/left	No Change	NA	NA
8	1 @ .6 m	Negative/left	No Change	NA	NA
9	1 @ .75 m	NA	Neutral/left	No Change	NA
10	3 @ .75 m each	NA	Positive	Positive	Positive
11	10 @ .6 to .75 m.	NA	Positive	Negative	Positive
14	1 @ .5 m	NA	Negative	Positive	Negative
18a	1 @ .6 m	Neutral	Positive	Negative	Positive
18b	1 @ .6 m, 2 @ 1.1 m	Positive	Positive	Positive	NA

Key

Positive	Negative	Neutral	No Change	NA
Swam closer to lures.	Backed away from lures.	No net movement in either the positive or negative direction.	Barracuda left during last test segment and did not return.	Did not perform that 2 minute sequence.

Table 8. Test number, barracuda size, and response by the barracuda to the lures in the presence or absence of movement (positive, negative, neutral, no change, and NA).

DISCUSSION

Our initial study objective was to test barracuda attack rates in the presence of humans by manipulation of two variables—shiny versus dull lures and stationary versus non-stationary objects. Unfortunately for our study, but auspiciously for people swimming in waters containing barracudas, none of the 23 tests conducted over a 2- week period initiated a barracuda attack. Therefore, our results are on other barracuda behaviors in response to the tests that were conducted.

There were many variables that came into play when observing barracuda behavior in our study—number of people present, location and habitat, water conditions, shiny versus dull lures, lure motion versus non-motion, and stationary versus non- stationary rigs. We manipulated controllable variables while capitalizing on uncontrollable variables, such as weather and water conditions, to test behavior patterns of barracudas.

Attracting Barracuda

Time of Day. Nearly equal percentages of barracuda were attracted in the morning (9:15-11:00 am) and afternoon (1:30 - 3:40 pm), although the number of morning tests was small (Appendix A). The reason we chose day light hours for testing was due to information gathered by DeSylva (1963) who found that barracudas feed on moving organisms and that their predilection was for prey that flash or show erratic movement for which light would be required to see. DeSylva also found, through an experiment done at the Lerner Marine Laboratory in Bimini, the Bahamas, that captive barracudas in aquaria did not eat prey given to them under dark conditions that they otherwise ate in lighted conditions. In addition, during several night dives and snorkels, DeSylva saw only one barracuda.

Location and Habitat. Barracudas were found in all habitat types tested except for the Sand Flat (N = 1, so we do not suggest this to be a true representation of habitat avoidance for the

barracuda in waters surrounding San Salvador). However, adult barracuda off the eastern coast of Florida, north of Cape Canaveral, seldom venture into shallow sandy habitats due to the severe environmental changes (DeSylva 1963). We had the most success attracting barracudas in the Grass Flat habitat (mostly in Grahams Harbor; Appendix A) but this was where most tests were conducted, and we were likely seeing the same fish. Locations for our study were not evenly represented with respect to habitat because the initial objective was not to compare habitats in relation to barracuda abundance, but rather to find barracudas so that we could conduct tests on attacks.

Due to their body lengths and tightly packed individual spaces, we believe all barracuda encountered at NP were juveniles. During the juvenile phase, the barracuda will sometimes form loose aggregations for the purpose of feeding and defense while still holding their own territory and commonly having a system of hierarchy (DeSylva 1963). We believe this to be the reason why so many more barracuda were attracted at North Point versus the other sites, where the few barracuda encountered were adults which usually live a solitary existence.

Water Conditions. According to a study conducted in the Bahamas by Bruce Wright in 1948 (cited by DeSylva 1963), barracuda attacks were initiated by visual stimuli when an object moved in the water, and not by smell when blood was introduced into the water in the absence of movement. This study and the study done by DeSylva (1963) in Bimini, support the idea that barracudas are dependent upon sight for hunting. However, a barracuda will often hunt at twilight when it can still see its prey but the prey are less likely to see the barracuda due to its excellent ability to blend in with its surroundings, especially in murky or low light conditions (Deloach 1999). Our data suggest that there is a negative relationship between visibility and success in attracting a barracuda but we are not confident in this result because our ability to see barracudas was not good in murky waters. It may be that our ability to see a barracuda in murky conditions is much less than a barracuda's ability to see us. For example, during many tests we were startled by a barracuda that seemed to appear out of nowhere. Therefore, it appears that these barracuda were able to see us before we were able to see them.

Number of People. Among the factors we measured, the number of people in the water during a test had the biggest effect on whether or not barracuda were attracted. This does not imply that barracuda were not present during tests where we did not see any, but that they may have been too intimidated to make their presence known when we were in numbers greater than two. For example, before test #1, three people did an hour snorkel at the test site (Dump Reef) without any testing gear and never saw a barracuda. Fifteen minutes later, only two people re-entered the water with one shiny rig and it was less than five minutes before a barracuda.was attracted. Also, test #2, with six people working on the experiment and about 25 others swimming nearby at 2:30 pm, was unsuccessful in attracting barracuda even though several had been reported in the testing area between 9:30 and 11:30 am that morning.

Type of Rig. Our results suggest a strong relationship between success in attracting a barracuda and the type of rig used—stationary, mobile, and none. However, both stationary rig tests involved at least four people at the test site. As discussed above, we believe the number of people had the biggest effect on success in attracting a barracuda. Therefore, the number of people could very well have been the only reason a barracuda was not attracted in tests where stationary rigs were used. Future tests using stationary rigs with only two people could be conducted to test this hypothesis. Interestingly, four out of the five unsuccessful mobile rig tests also had more than two people working on them or in the vicinity of the test. Also, four out of the five tests where only two people swam without rigs or shiny objects were successful in attracting barracudas. In fact, in test #17a we attracted eight barracuda from swimming around without any gear (Appendix A). These results suggest that barracuda are just curious creatures and were interested in us wheth-

er we had rigs or not—as long as there was not too much human activity in the water.

Shiny vs Dull Lures. When two mobile rigs were used, one rig containing all shiny lures and one with all dull lures, most barracuda favored shiny over dull lures. For example, in test #11 we attracted 10 barracuda with our rigs—seven were attracted to shiny lures and three to dull lures. The first seven barracudas we attracted during this test came to the shiny lures and actually bit at each other in order to be the closest to the shiny rig. It is possible that had there not been this aggressive behavior between the barracuda, all 10 barracuda would have shown attraction to the shiny lures over the dull ones.

Once it was apparent that the barracuda were more interested in shiny lures over dull lures, we decided to use only shiny lures for the remainder of the study because the focus of the study was to test factors that initiated attacks.

Behavioral Observations

The majority of barracudas had a positive response when the lures were in motion. Motion of the lures created a great display of shimmer and sparkle in the water, even in murky conditions, that could easily be confused with a fish. Most barracudas were attracted to the lures when we were swimming which caused the lures to have motion. In the beginning of the study, once we attracted a barracuda we stopped swimming and started a testing sequence with two minutes of non-motion followed by two minutes of lure motion. We found that many barracuda lost interest and left during the first sequence of lure non-motion, so we changed the order of testing sequences by starting with two minutes of lure motion followed by two minutes of non-motion. Subsequently, only one barracuda lost interest during the first two minutes of testing.

CONCLUSION

Barracudas appear to be curious creatures, and it did not take much effort to attract them. Although their appearance and size can be quite intimidating, their behavior near us was generally passive and non-threatening. This study was designed to test the limits of this passive behavior by evaluating and exploring which variables might be responsible for attracting and stimulating attack behaviors in the barracuda.

Our findings suggest that the barracuda is attracted to shiny things that have motion, but that this combination of variables is not enough to initiate an attack response in the presence of humans. We also found that juvenile barracudas aggregate in grass flat habitats and that the number of people present in the water seems to be the greatest factor inhibiting barracuda interactions with swimmers.

Therefore, swimmers wanting to minimize interactions with the barracuda should not wear shiny things in the water, swim in groups of three or more, and avoid grass flat habitats. Those who enjoy interactions with the barracuda, but get a little nervous when they seem to stalk us in the water, can relax by knowing that the barracuda is more afraid of us than we are of it and is unlikely to attack just because we may be wearing something shiny or flashy in the water.

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Appendix A. Raw data: test number, date, time of test, location and habitat, water conditions, weather, lures used, rigs used, barracuda encounter, barracuda size, and number of people present in the testing area waters

est #	Date	Time	Location and Habitat	Water Conditions	Weather	Lures Used	Rigs Used	Barracuda Encounters and Size	# of People Present
1	1/5/07	11:00 AM	DR; GF	1-2 ft waves, visibility 8 m, H.T.	Overcast, breezy, mid 70s.	#4 s and g. # 3 dull.	One mobile.	1 barracuda, 4.5 ft.	2
2	1/7/07	2:30 PM	TP; PR	Calm, visibility 18 m, H.T.	Sunny, mid 80s	#6 s, g, and b. #'s 1,3,&5, dull.	Two stationary; one shiny, one dull.	No barracuda	6 on test, 25 in water.
3a	1/8/07	1:30 PM	DR; GF	Strong current, 2-3 ft waves visibility 6 m, H.T.	Mostly cloudy, high 70s, strong winds from the NE	#6 s, g, and b. #'s 1,3,&5, dull.	Two stationary; one shiny, one dull. 1 mobile pole	No barracuda	3 at site, 1 swimming with pole
3b	1/8/07	1:30 PM	DR; GF	Strong current, 2-3 ft waves visibility 6 m, H.T.	Mostly cloudy, high 70s, strong winds from the NE	#6 b,s, and g	One mobile.	No barracuda	3
4a	1/8/07	3:30 PM	Nav; GF	1/2ft to 1 ft waves, visibility 6 m, H.T.	Mostly cloudy, high 70s.	#6 b,s, and g	One mobile.	No barracuda	4
4b	1/8/07	3:30 PM	Nav; AR	1/2ft to 1 ft waves, visibility 6 m, H.T.	Mostly cloudy, overcast, high 70s.	#6 b,s, and g	One mobile.	1 barracuda, 15 inches	2
5	1/11/07	10:00 AM	Nav; GF	Rough conditions, visibility 3 m, L.T.	Overcast, mid 70s, high winds from NE	#6 b,s, and g, three #5 dull	Two mobile.	1 barracuda, 1.5 ft.	2
6	1/12/07	10:00 AM	RP; SF	1-2 ft waves, visibility 3m max, L.T	Mostly cloudy, windy, mid 70s.	#6 b,s, and g, three #5 dull	Two mobile; one shiny, one dull.	No barracuda	2 on test, 25 in water
7	1/13/07	2:40 PM	Nav; AR	Choppy, visibility 8 m, H.T.	Dark clouds, breezy, low 70s	#6 b,s, and g, three #5 dull	Two mobile; one shiny, one dull.	No barracuda	2 on test, 10 in water
8	1/13/07	3:15 PM	NP; GF	Choppy, visibility 8 m, H.T.	Dark clouds, breezy, low 70s	#6 b,s, and g, three #5 dull	Two mobile; one shiny, one dull.	1 barracuda, 2 ft	2
9	1/13/07	3:30 PM	NP; GF	Choppy, visibility 8 m, H.T.	Dark clouds, breezy, low 70s	#6 b,s, and g, three #5 dull	Two mobile; one shiny, one dull.	1 barracuda, 2.5 ft	2
10	1/13/07	3:40 PM	NP; GF	Choppy, visibility 8 m, H.T.	Dark clouds, breezy, low 70s	#6 b,s, and g, three #5 dull	Two mobile; one shiny, one dull.	3 barracuda, 2.5 ft each	2
11	1/14/07	3:00 PM	NP; GF	Choppy with light current, visibility 6 m, Almost H.T.	Partly cloudy, 85 and sunny.	#4 b,s, and g, three #5 dull	Two mobile; one shiny, one dull.	10 barracudas; 2 to 2.5 ft.	2
12	1/15/07	9:15 AM	NP; HH	Calm, visibility 8 m, H.T	Sunny, clear, slight breeze	No lures	No rig	1 barracuda, 1 ft	2
13	1/15/07	9:39 AM	NP; HH	Calm, visibility 8 m, H.T	Sunny, clear, slight breeze	No lures	Two mobile poles with floats	1 barracuda, 1 ft	2

14	1/15/07	10:04 AM	NP; HH	Calm, visibility 8 m, Almost L.T	Sunny, clear, slight breeze	#6 b,s, and g	Two mobile; shiny.	1 barracuda, 1 ft	2
15	1/16/07	10:35 AM	NP; GF	Calm, visibility 8 m, Almost L.T	Sunny, clear, slight breeze	No lures	No rig	No barracuda	2
16	1/16/07	11:00 AM	NP; GF	Calm, visibility 8 m, Almost L.T	Sunny, clear, slight breeze	#6 b,s, and g	Two mobile; shiny.	No barracuda	2
17a	1/17/07	2:56 PM	Nav; GF	Calm, visibility 6 m max, L.T.	Mostly cloudy, rained all morning, slight breeze, low 70s	No lures	No rig	8 barracudas, 3 to 3.5 ft.	2
17b	1/17/07	2:56 PM	Nav; GF	Calm, visibility 6 m max, L.T.	Mostly cloudy, rained all morning, slight breeze, low 70s	No lures	No rig	1 barracuda	2
18a	1/17/07	3:30 PM	NP; GF	Calm, visibility 6 m max, L.T.	Mostly cloudy, rained all morning, slight breeze, low 70s	#6 b,s, and g	Two mobile; shiny.	1 barracuda, 2 ft	2
18b	1/17/07	3:30 PM	NP; GF	Calm, visibility 6 m max, L.T.	Mostly cloudy, rained all morning, slight breeze, low 70s	#6 b,s, and g	Two mobile; shiny.	1 barracuda from test 18a and 2 new barracuda, 3.5 ft	2
19	1/18/07	1:30 PM	DR; PR	Strong current, visibility 6 m, L.T.	Partly cloudy, mid 70s.	No lures	No rig	1 barracuda, 4.5 ft.	3

Key

Location		Habitat		Water Conditions	
North Point	NP	Grass Flat	GF	High Tide	H.T.
Navy Pier	Nav	Hard ground	HH	Low Tide	L.T.
Dump Reef	DR	Patch Reef	PR		
Rocky Point	RP	Artificial Reef	AR		
Telephone Pole	TP	Sand Flat	SF		

Lures

		Shiny			Dull		
Brass	b	ID #	Length (in)	Width (in)	ID #	Length (in)	Width (in)
Silver	s	4	1 5/16	1	1	1 1/8	7/8
Gold	g	6	1 11/16	7/16	3	1 1/4	15/16
					5	1 9/16	1 3/16