# underwater naturalist

Vol. 23, No. 3

## AMERICAN LITTORAL SOCIETY 1997 FIELD TRIP SCHEDULES

Here is a headstart on next year's field trips, some going early in the year:

**February 6-9**
**DELMARVA WINTER WILDLIFE**
From Bombay Hook in Delaware to Chincoteague, Virginia, learn about refuges in winter.

**March 1-8**
**BONAIRE DIVE/SNORKEL**
Great diving in the southern Caribbean plus iguanas and flamingos.

**April 17-23**
**SHARK ENCOUNTER WEEK**
Swim with lemon sharks in Bimini in the Bahamas and help with the research of Dr. Samuel Gruber.

**April 22-28**
**CULEBRA SNORKEL/ TURTLE WATCH**
Help the Turtle Conservancy with its night nesting patrols, and snorkel these Puerto Rican Islands.

**April 26-May 4**
**SOUTH FLORIDA/DRY TORTUGAS**
The Everglades, Marathon Key, and a three-day trip to Tortugas.

**April 29-May 6**
**BELIZE ECOLOGY WEEK**
Rain forest, Mayan ruins, and the second largest barrier reef in the world.

Consult your 1997 Field Trip Brochure or phone or write for full description, summary of the trip, costs, and registration deadlines.

## GENERAL STORE

Here is a list of books the Littoral Society keeps in stock at discount prices, plus other items for sale. All prices listed include cost of postage.

### BOOK SHELF

**Anglers Guide to Sharks,** by Jack Casey. A classic field guide to the sharks that inhabit the waters from Maine to the Chesapeake Bay. $3.

**Fisheries of Raritan Bay,** by Clyde MacKenzie. Life and history of Raritan Bay told in careful detail. The drawings and photos help depict what the life of the fisherman was like, and how it has changed over the past 300 years. $15.

**Life in the Chesapeake Bay,** by Alice & Robert Lippson. A guide that is not only informative but enjoyable to read about marine animal life, habitats, and plants which make up the bay. Perfect for beachcombers from Cape Cod to Cape Hatteras. $14.

**New Jersey Coastwalks,** by D. W. Bennett. Take this with you as you begin your journey from the Kearny Marsh to Cape May and around the bend to the Delaware Bay. Great illustrations and good reading. Your knowledge of the Jersey shoreline will be much enriched. $5.

***One Square Mile On the Atlantic Coast,*** by John Quinn. If you live on the Jersey coast or are fascinated by any coastline this artist's view will inspire you to visit and find pleasure in the smallest tide pool or the life that goes on under a dock. A must to add to your collection. $14.

### AMERICAN LITTORAL SOCIETY BOOKS

By Lyons & Burford, Publishers

**Seaside Reader.** Edited by D. W. Bennett. A coastal anthology mixing nature writing and other casual coastal musings. $20.

**The Underwater Naturalist,** by Dave Bulloch. A beautifully illustrated guide to life beneath the sea from the coral reefs of Florida to the cooler waters of Maine and Puget Sound. $20.

**The Whale Watcher's Handbook,** by David Bulloch. If you are just starting to learn about whales, dolphins, and porpoises or are an advanced watcher here is the perfect guide to have with you. $12.

### OTHER ITEMS

**Crab T-shirt:** Crab on the front - explanation of "littoral" on the back. 100% cotton, beige w/navy blue printing. M, L, XL. $15.

**Zippered Sweatshirt:** 50/50 hooded jersey, navy blue with Society's original logo in white on front. L, XL, XXL.$28.

**Fish Tagger T-Shirt:** Back by popular demand. Heavier 50/50 jersey in navy blue with small tagging logo on pocket. L & XL only. $14.

**SHIPPING CHARGES:**
$30.01 to $ 50.00-$5.00
$ 5.01 to $15.00-$3.00
$50.01 to $ 75.00-$7.00
$15.01 to $30.00-$4.00
$75.01 to $100.00-$8.00

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**Bulletin of the American Littoral Society**

**Volume 23, Number 3**



COVER ILLUSTRATION
by WAYNE DAVID BARLOWE

*Sac-Back*, inhabitant of the littoral zone on a fictional planet in the year 2358, from the book *Expedition* by the illustrator.



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Note: Past volumes of Underwater Naturalist and individual articles are available on microfiche from UMI, Ann Arbor, MI 48106.

## To the editor

### About the Tagging Issue. . .

Congrats on your special tagging issue. Also congrats on 20 years of great work! I wish we could get more grouper tagged down here (boy do they come back fast). Better send me a couple dozen tags.

John Clark
Ramrod Key, FL

*(Clark helped start and was a long time president of the Society. Ed.)*

. . . Loved the new Naturalist, especially page 11, what a handsome devil.

Things are fine here on Marco Island, the winter has been very cool and we have had an extensive "Red Tide" fish kill going on. Millions of fish are all through the waterways and shores. So far 98 manatees are reported dead. Hope the bloom leaves us soon.

Joe Della Porta
Swampscott, MA

. . . Your tagging anniversary issue of the Underwater Naturalist looks great! I could use up to 5 more copies and have enclosed stamped, self addressed envelope.

John Waldman
New York, NY

### Plaudits for Klepper

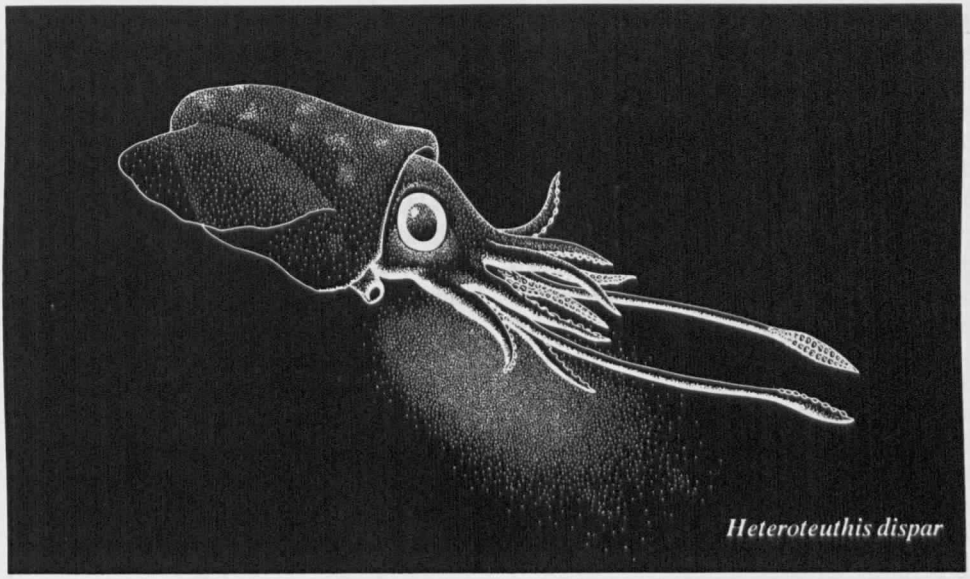
. . . In your book review of the Complete Folding Kayaker, you come down pretty hard on a great boat. I have paddled this "bulky, unresponsive Klepper" for 45 years, in sometimes heavy seas. It always got me through.

Irv Gordon
Far Rockaway, NY

### Marine Hitchhikers

. . . I just finished reading Robert Bachand's article on non-native critters. I was particularly interested in the Japanese shore crab Hemigrapsus sanguineus. This pretty little immigrant did not skip over New York on its way to Bridgeport, CT. In June, 1994 Alison Tews, Director of the South Shore Nature Center, East Islip, NY, asked me if I could identify a pretty little crab she collected in Fire Island Inlet. It was easy to get the genus Hemigrapsus. From there the fun began. Finally, Dr. Austin Williams gave us the identification as H. sanguineus. Thus, the critter did not escape New York on the way to the Sound. You'll note from the enclosed newspaper photocopy that we expected it to be found in the Sound. I expect the next record will be from Rhode Island. It is interesting to note the thought that at Sherwood State Park, CT, that the Japanese crab may be displacing the green crab. Alison noted that in her display tank green crabs "regularly munch on their foreign cousins." I wonder which crab will eventually win this war of survival, the European shore crab (that's what the green crab is called over there) or the Japanese shore crab. While a trip in a ship's ballast may have brought the Japanese crab here, they are so attractive looking that I would not be surprised if what we have proved to be an escapee or a release from the aquarium trade.

Philip T. Briggs
East Setauket, NY




# The Mystery and Miracle of Bioluminescence

by Richard Ellis

In the blackness of the abyss, a virtual firmament of tiny lights flickers incessantly, marking the location and activities of the myriad creatures that inhabit this sunless world. A great majority of deep-sea fishes have light-generating capabilities; William Beebe estimated that of the fishes he caught down to 13,000 feet in Bermuda waters, more than 95 percent were bioluminescent. Some species have glittering rows of photophores along the sides; others are equipped with filaments that glow; there are some with light organs in their eyes, some have them on their tongues, one species has a glowing rectal gland, and on one occasion, a deep-sea fish was observed to be feeding by shining a two-foot beam of light into a swarming school of euphausiids. Bioluminescence has intrigued biologists for years, but there is still no agreement on its function, or why so many different creatures (not only fishes, but also certain sharks, squid, starfishes, sea-cucumbers and crustaceans), should have developed these structurally similar mechanisms.

*Richard Ellis is the author of many books on marine subjects, among them "The Book of Sharks," "The Book of Whales," and "Sea Monsters." The material in this article was extracted from "Deep Atlantic: Life, Death, and Exploration in the Abyss," published October 1996 by Alfred A. Knopf.*

Most deep-sea fishes are dark brown or black since there is obviously no need for bright coloration in a lightless world. (There are several species, particularly the whalefishes, that are red, but with no light to illuminate them, they appear black.) In most circumstances, the only part of the fish that can be seen in the darkness is that which lights up. There are three ways marine animals can generate "living light." The commonest is intracellular, where certain cells are organized into special structures such as lanterns and photophores. In the cells of these organs, energy is released in the form of light when the oxidization of a substance known as luciferin is stimulated by the catalytic activity of an enzyme known as luciferase. (Because hardly any heat is generated by the luciferin-luciferase reaction, the "cold light" of chemoluminescence has be-

come a subject of great interest to physicists concerned with the preservation of energy.) The organs that produce the light range from a simple luminous element surrounded by a layer of black pigment cells, to cups with a reflecting layer, and even some complex structures with lenses and color filters. In some instances, the light is produced extracellularly, and can result in the discharge of a luminous cloud into the water.

Some fishes harbor luminescent symbiotic bacteria that provide a light source that glows from the fish's body, but is not actually produced by the fish. Two strains of luminous bacteria are currently recognized, *Photobacterium* and *Beneckea*. In the deep-sea anglers, bacteria are usually maintained in the lure (also known as the esca), but in addition, the "sea-devils" (*Ceratias* and *Cryptopsaras*), have additional bacterial bulbs in the form of caruncles, which are modified dorsal fin rays. One of the most intriguing problems in biology is that luminous bacteria must be transferred from generation to generation, or, as Peter Herring of the Institute of Oceanographic Sciences at Wormley, Sussex has written, "the light organs of successive generations must be reinfected with the appropriate strain." Since the bacteria cannot exist outside the host, they must somehow pass to the offspring internally, but how this might work has not been explained. Herring — perhaps the leading authority on bioluminescence — wondered "where the bacteria come from to reinfect successive generations of host. We know they can leak from the host into the surrounding sea water, but do they survive there? Adult and juvenile anglerfishes live at different depths; how does a larval female acquire the right bacterium, even if it is leaked by the adult, if the adult lives several hundred metres deeper?"

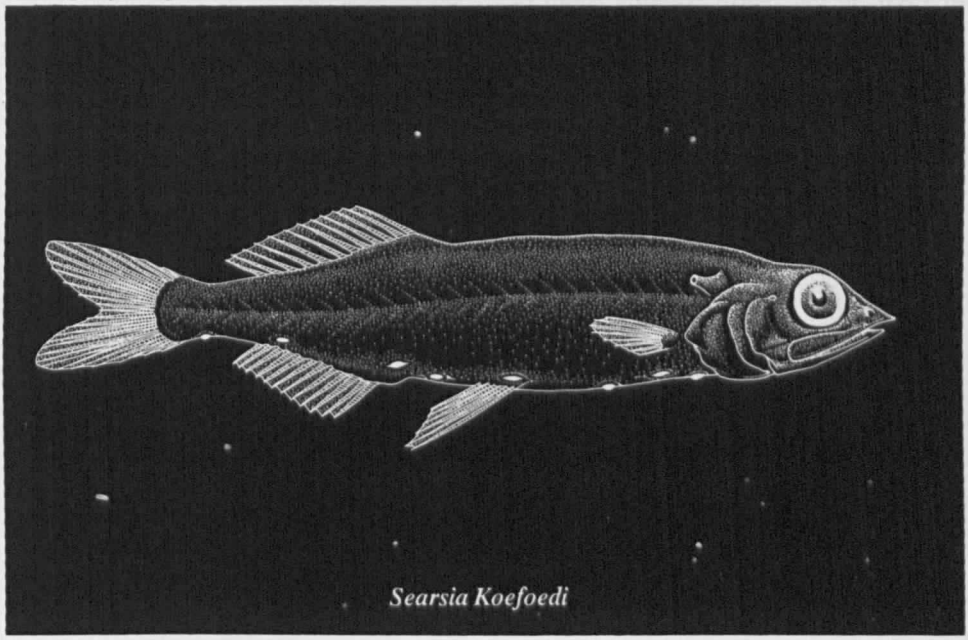
Much research has gone into the bioluminescence of different marine creatures," wrote James Hamilton-Paterson, "a subject made more complicated because the light has no unitary function." Many species of deep-sea fishes have bioluminescent organs, but depending on their location, size, brilliance and structure, they probably serve different purposes for different species. D.E. McAllister listed the functions of photophores for members of the same species, and for members of different species. In intraspecific interactions, he wrote, lights might be useful to attract potential mates, to serve as recognition signs for members of the same species, to indicate the sex of the possessor, to use in courtship displays, and to allow individuals to distribute themselves in space that provides no fixed reference points. The luminous organs might serve to lure prey within range, illuminate the items of prey, startle or divert predators, reveal predators to larger predators, or mislead predators through mimicry.

Given all these possibilities, it is obvious that more than one explanation might be applied, and that the light organs probably have multiple functions. The lighted lures of the ceratioid anglers serve to attract prey items to the mouth of the predator, with the "mousetrap" arrangement of *Thaumatichthys* being the most sophisticated variation on this theme. Light organs around the eyes of some species of lanternfishes probably function as "headlights" to illuminate prey items immediately before they are consumed, but the illumination, even from a photophore the size of a pea, cannot show the fish where to go, but only what to do when it gets there. One of the most unusual demonstrations of bioluminescence has been observed in *Searsia*, a black, bathypelagic fish that can discharge a luminous secretion into the water from a subcutaneous gland just behind its head. (Members of the family are commonly known as "tube-shoulders.") *Searsia* appears to be the only fish that bioluminesces outside its body, but the squid *Heteroteuthis dispar* is also known to emit luminescent ink clouds; it is the only cephalopod to do so.

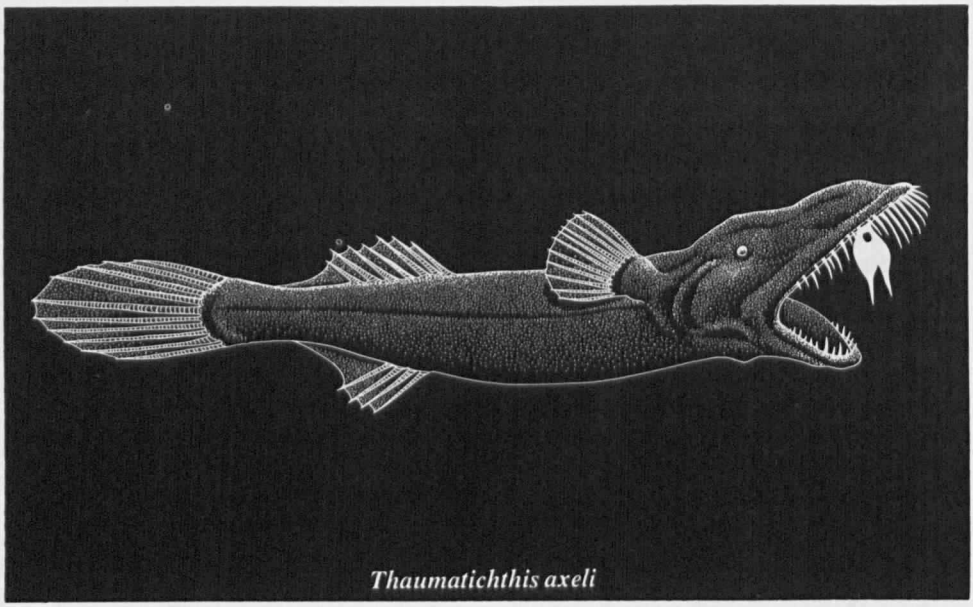
In addition to photophores, the stomiatoids *Stomias*, *Idiacanthus*, and *Chauliodus* can envelop themselves in a sheath of luminous, gelatinous tissue that glows bright pink when stimulated. As O'Day wrote, this kind of luminescent silhouetting does the opposite of camouflaging the fish, and "may aid in mating, spacing themselves out as they hunt, maintaining conspecific aggregations, warning potential predators of their own formidable size, or perhaps allowing them to escape from predators by temporarily blinding them." He concludes by saying, "These functions, however, remain speculative."

Ostracods are tiny animalcules with a bivalved shell, from which fewer legs protrude than in any other crustacean — only two pairs — along with the antennae. They inhabit the bottom sediments where they feed on detritus. Although most species are blind, many emit a luminous secretion whose chemistry is the best-known of any such system. The Pacific ostracod *Cypridina hilgendorfi* gives off brilliant blue sparks when disturbed, and can repeat the act many times. (Other species emit green or yellow light.) So powerful are the substances that engender this light, according to Waldo Schmitt, "that in water a proportion as minute as one part per 700,000,000 parts of water will still give off a visible light." During World War Two, Japanese officers were able to read documents in the dark by the low intensity light given off by a bit of dry *Cypridina* powder moistened in the palm of a man's hand. Larger ostracods live in deeper waters; *Gigantocypris* (also said to be luminescent) is a globular orange creature about the size of a cherry with paired eyes facing forward like the headlights of a car. It has been collected at depths of 600 fathoms.

Even though the reasons for such arrangements are not clear, many echinoderms possess bioluminescent capabilities. Peter Herring examined two species of ophiurids, six asteroids, nine holothurians, and two crinoids. All were bioluminescent. Why an eyeless creature that hugs the bottom and feeds on animals of the sediment would need to draw more rather than less attention to itself is a mystery. As Herring wrote, "the functions of the bioluminescence of echinoderms remain a matter for conjecture. It may be that these animals are



*Searsia Koefoedi*



*Thaumatichthis axeli*

unattractive prey by nature of the spines or poisonous secretions which many possess, and the bioluminescent response merely advertises the fact to a potential predator."

Because copepods are numerous and so important to life in the sea, it is not surprising to learn that they exist in great profusion at every level. From the Alvin in 1968, in the North Atlantic south of Woods Hole, G.D. Grice captured several copepod species (genus *Xanthocalanus*) that he described as "planktobenthic;" they seemed to occupy a zone that was near but not on the ocean floor. Some were found in the gut of tripod fishes, which stand clear of the bottom on elongated fin spines. Although most species are transparent — perhaps with a faint iridescence or occasional spots — some of the deep-water varieties assume different colors, such as *Euchaeta*, which is a clear red, and *Candacia*, which is black. Some of the benthic copepods are light-producing, such as *Gaussia princeps*, which has a profusion of light glands that can produce a luminous blue discharge which lasts for 1 to 3 seconds, probably permitting the animal to escape from predators. In a series of experiments on the luminescence and behavior of *Metrida lucens*, it was seen that the copepod luminesced only when threatened by a predator (the euphausiid *Meganyctiphanes*, itself bioluminescent), and emitted a large flash when trying to escape, and a series of smaller flashes during its struggle to escape from the euphausiid.

Very few octopuses have bioluminescent structures, but most squids have light-producing organs known as photophores. There are two distinct types of luminescence: symbiotic (also known as bacterial), and intrinsic (intra-cellular). In symbiotic luminescence, the light organs contain symbiotic luminous bacteria that glow inside the glands of the animal, but most teuthids have, as Malcolm Clarke has written, "special photogenic cells, often equipped with a reflector that can point the light in one direction, redirect it to an area remote from the source, or spread it out over a surface... These devices can impart a variety of effects, from an overall dull glow or a bright wooly, ethereal effect, to sharp pinpoints of light or a torch-like beam." (The light organ of *Heteroteuthis*

*dispar* consists of a large sac-like gland situated on the ink sac; this species can eject a bioluminescent cloud of ink, a process that has been called "fire-shooting.")

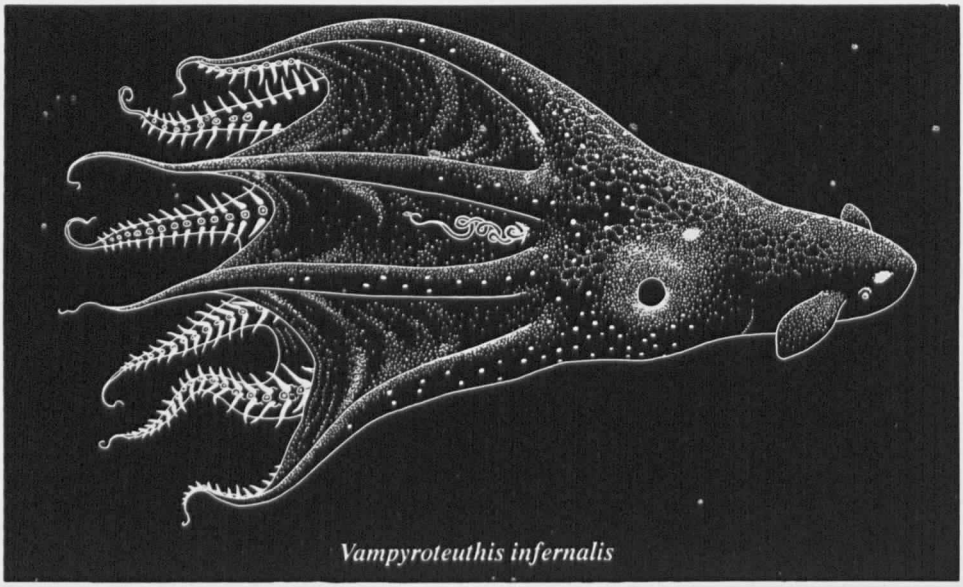
Depending upon the species, the photophores of squids can range in size from tiny pinpoints of light to a glowing disc the size of a quarter. Sometimes the photophores are simple structures, but in other cases, they are almost unbelievably complex. According to Frank Lane, "some have reflector mechanisms, pigment cups, lenses, mirrors, and color screens," and there is at least one species (*Histioteuthis*) that has mirrored searchlights. Photophores appear in every imaginable location, sometimes distributed all over the mantle and arms, sometimes appearing only on the ends of the tentacles. Some species have eyes that light up, and in the transparent squid *Megalocranchia*, the photophores are on the liver.

Animals with lights are truly extraordinary. Aboard the *Valdivia* expedition in 1899, the German teuthologist Carl Chun was observing some individuals of the small squid *Lycoteuthis diadema* in a container on deck:Among the marvels of coloration which the animals of the deep sea exhibited to us nothing can be even distantly compared with the hues of these organs. One would think that the body was adorned with a diadem of brilliant gems. The middle organs of the eyes shone with ultramarine blue, the lateral ones with a pearly sheen. Those towards the front of the lower surface of the body gave off a ruby-red light, while those behind were snow-white or pearly, except the median one, which was sky-blue. It was indeed a glorious spectacle.

But, as with so many aspects of teuthid biology, luminescence is still poorly understood. In 1977, Herring wrote, "Any purpose that is fulfilled by colour or pattern in the illuminated terrestrial or coastal environment can also be achieved by luminescence in the dark of the deep sea. The cephalopod inhabitants of this environment almost certainly make far more extensive and varied use of their impressive luminescent abilities than we can presently envisage."

Roper and Young list some of the possibilities in a 1976 article on bioluminescent countershading, including "camouflage [which] would seem especially important in the open ocean, where an animal has no holes in which to hide. An opaque animal in the dimly lit midwaters, silhouetted against the highly directional downwelling light, will be visible to predators below." To investigate this phenomenon, they placed several specimens of the midwater species *Abraliopsis* in a tank with rheostatically-controlled overhead lighting: The silhouettes of the squid were distinct when the overhead light was on and when the photophores were not yet lighted. With photophores dimly glowing, the contrast between silhouette and background was greatly diminished, and the squid was difficult to see. A squid would disappear from view completely when it swam beneath light of the same intensity as its luminescence. On one such occasion a glowing squid flashed its armtip photophores brilliantly, revealing its location, although nothing but the flashing lights could be detected.

To accomplish this ventral bioluminescent countershading, all cephalopods are equipped with light-sensitive organs known as "extra-ocular photoreceptors," which enable them to respond to ambient light in the water, even at depths where very little light penetrates. The actual function of these photoreceptors is not clear, but since they are found in all octopuses and all squids, they must be a part of the animals' modus operandi. Richard Young of the University of Hawaii has studied these photosensitive vesicles in various cephalopod species, from the deep-water squid *Bathyteuthis*, to the mysterious *Vampyroteuthis infernalis*, a brown, soft-bodied creature with bright blue eyes, that is neither squid nor octopus. Hardly



*Vampyroteuthis infernalis*

anything about *Vampyroteuthis* conforms to the cephalopod norm — if there is one — and its photoreceptors are designed to read its own bioluminescence, in what Young suggests is a device to respond to the glowing of the prey it is consuming, to insure that the vampire squid does not emit any light that would attract predators.

In the other teuthids, the light-sensitive photo-receptors, usually located near the optic lobe, transmit information to the brain via the optic nerves. Translucent "windows" in the skin enable the dorsal and ventral surface receptors to "see" daylight from above, or luminescent organisms — including themselves — from below, in order to adjust their own luminescence accordingly. In his discussion of these receptors, K.N. Nesis (1982) has written:There is no doubt that the functions of the light-sensitive vesicles in cephalopods are diverse and probably differ in different species, but it is most probable that their main function is to give the animal an idea on the general level of illumination in the surrounding water and of long-term changes (seasonal, for example) of illumination.

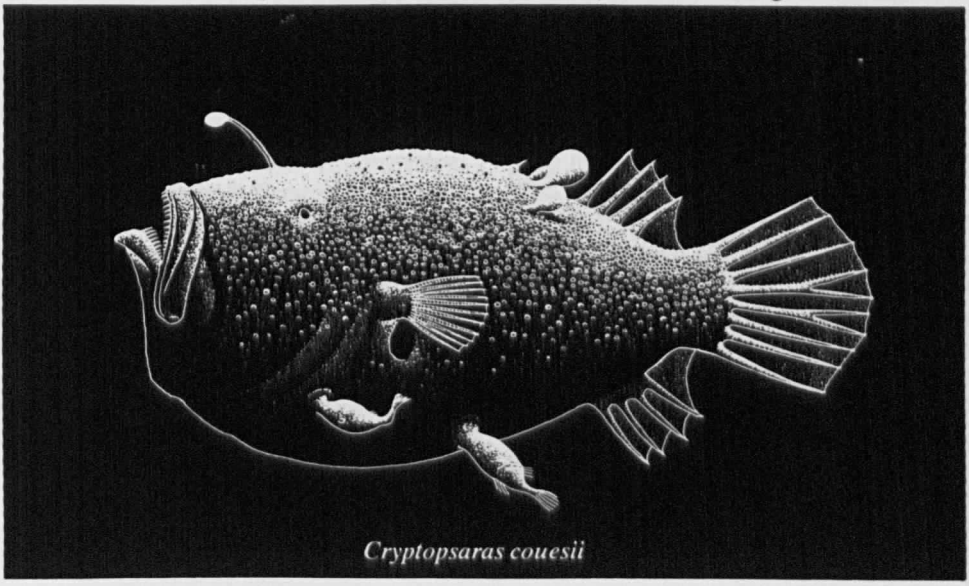
In his 1983 overview of the general functions of bioluminescence, R.E. Young is careful to identify the possible dangers of lighting up under water. He writes, "attracting a mate with luminescence has a number of inherent drawbacks. An animal hoping to lure a mate may attract a predator instead, or an animal searching for a mate may be attracted to a predator instead." Furthermore, wrote Young, "even in the clearest oceanic water, fine detritus (marine snow) is abundant and light scattering by such molecules may well alert potential victims before they are exposed by the beam." Young concludes, "I view life in this dark environment as a peculiar battle in which stealth and luminescence are major weapons. It is a struggle unlike any found elsewhere on this planet.... While the complex rules of combat in this environment will be difficult to unravel, they should be entertaining and frequently surprising, and hopefully, their unique features will provide new insights into the ways nature operates." In an imaginative — and perhaps too convoluted — discussion of "a possible function of bioluminescence," M.D. Burkenroad suggested that the flashing might serve as a sort of "burglar alarm," and attract not only the first predator, but another predator to prey upon the first, thus protecting the prey.

The quintessential bioluminescent

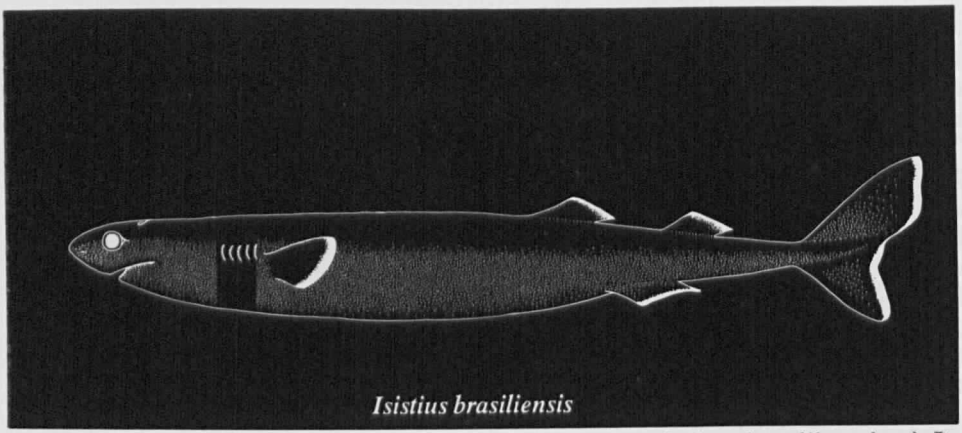
fishes are the lanternfishes, their common name derived directly from their ability to light up. (Collectively and technically, they are known as myctophids.) They are all small fishes, ranging in size from two to six inches, with a large head and large eyes. The diagnostic character is the arrangment of 50 to 80 photophores on the head, belly and sides. Lanternfishes are usually silvery, and the photophores emit a startlingly bright blue light, which has been likened to an electric spark. In addition to the photophores, some species have bioluminescent structures on the dorsal and ventral surfaces of the caudal peduncle (the tail stock), known as the supracaudal and infracaudal luminous glands. These glands have been nicknamed "sternchasers," because it is thought that the myctophids flash them to make a predator lunge for the tail as the fish darts away. Other myctophid genera have specialized luminous tissues located in particular locations, such as at the base of the fins, on top of the head, and in the front part of the head, like tiny automobile headlights.

With most having gigantic heads all out of proportion to their tiny bodies, the deep-sea anglerfishes look more like childrens' bad drawings of evil fishes. But few children would equip their fishes with fishing rods, and even fewer would give them the ability to luminesce. Some globular, some elongated, some pear-shaped, the *Ceratioids* are grotesquely formed creatures that are among the most fantastic of all the deep-sea fishes. Were it not for the fact that most of them do not reach a foot in length, they most certainly would be listed among the most horrifying of sea monsters.

The deep-sea anglers are so-called because of their habitat and their fishing equipment. Each species is equipped with a lure (illicium) that is a modified dorsal fin arising from the top of the head. Like the chin barbels of the stomiatids — and presumably functional in the same fashion — these lures come in all shapes and sizes, from short, stubby little buttons, to elaborate whiplike structures. (The luminous tip of the illicium is known as the esca — Latin for "bait.") Also like the barbels, the lures are decorated with filaments, tassels, branches, and of course, lights. As far as we know, members of the genus *Linophryne* (which means "toad that fishes with a net"), are unique in having two distinct lighting systems: the esca harbors luminous bacteria, while the multi-rayed chin barbel generates its own



*Cryptopsaras couesii*



*Isistius brasiliensis*

light. Consider the tackle of *Linophryne arborifera*, a miniature ogre that is coal-black and about the size of a baby's fist, with a gigantic mouthful of frightful fangs. On the top of its head it sports a plumed lantern, and beneath its chin is a hanging garden (hence the name arborifera) of branching filaments.

There are even some fishes that are not supposed to luminesce, but do anyway. The extensive literature on deep-sea anglers contains many references to luminescent lures and barbels, but no mention of the entire fish glowing. In their 1977 study of bioluminescent countershading, Young and Roper examined various cephalopods and shrimp, and two specimens of *Cryptopsaras couesii*. They wrote, "*Cryptopsaras couesii* is a small, jet-black anglerfish whose luminescence was thought to be limited to its esca and caruncles. To our vast surprise, this specimen was capable of luminescent countershading... We could not detect the source of the luminescence, but it appeared to originate from the skin; where the skin was abraded or purposely cut, there was no luminescence. Except for the anteriorly placed, blunt lower jaw, all of the black skin, including that on the fin rays and on the dwarf male, luminesced."

A bioluminescent shark is the widely-distributed *Isistius brasiliensis*, the cookie-cutter shark. (It is also known as the "cigar shark" because of its elongated shape, and perhaps because of the dark "band" that circles the gill region.) Its curious common name comes from its habit of taking large, circular bites from much larger animals, including billfishes, tuna, large sharks, and even whales. The source of these "crater wounds" was long a mystery, but biologist E.C. Jones solved the mystery by holding the open mouth of a dead *Isistius* up to a nectarine and twisting it as he imagined the shark would do as it bit a larger animal. The result was perfect plug-like core removed from the fruit, exactly like the piece that would have been removed from the living victim. (It evidently preys — or attempts to — on non-living victims as well, as evidenced by the appearance of the same bites on the rubber coating of the sonar domes of submarines.)

The entire lower surface of *Isistius* is covered with luminous organs which glow with a bright, ghostly green light, making it "the most luminescent of all sharks." These little sharks may use bioluminescence to locate each other in the dark, or it may serve a more devious purpose, to entice larger species to attack it, at which point it turns the tables and takes a bite. One of the earliest descriptions of this luminescence can be found in Frederick Debell Bennett's "Narrative of a Whaling Voyage Around the World," published in 1840. When a specimen was brought aboard at night, "it afforded a very extraordinary spectacle. The entire inferior surface of the body and head

emitted a vivid and greenish phosphorescent gleam, imparting to the creature by its own light a truly ghastly and terrific appearance."

One of the curious aspects of counterillumination is that it has never been observed from submersibles. "Indeed," wrote R.E. Young, "submersible observations suggest that counterillumination does not occur." In Beebe's dives, he could easily see various fish species that were supposed to be rendered invisible — or at least hard to see — against the ambient light source. It may be that the presence of a large, strange, light- producing object in the fish's environment interferes with its coloration-control mechanisms.

While most luminous organs are located on the ventral surfaces of the fish, no simple explanation readily springs to mind as to why this location is so heavily favored. It has been proposed that ventral bioluminescence serves as a sort of "countershading" (although "counterlighting" might be a more appropriate term), in which the light organs offset the shadow that would be cast on the fish from surface illumination. (The characteristically dark coloration of the dorsal surface of most fish enable them to match the background when lit from above.) Many species of squid are equipped with an "extra-ocular receptor," and there is a possibility that some fishes have a comparable apparatus, as J.V Lawry suggested in 1974 with regard to the myctophid *Tarletonbeania* which "may see downwelling light and bioluminescence from a supra-orbital photophore and adjust the output of its ventral photophores to match environmental illumination." In order for such a system to work, the fish has to be able to switch its photophores off at night, since in darkness, instead of camouflaging the fish, the luminous organs would draw attention to it. (In the above experiments with *Tarletonbeania*, Lawry observed that captured specimens kept in total darkness did not luminesce, but when they were illuminated from above, the photophores emitted a bluish light that was extinguished whenever the light source was.)

Marshall (1954) has suggested that piscene photophores are ventral so that they will not reflect sunlight when illuminated from above, but again, this would apply only during the day. Numerous authors have suggested that the ventral photophores disrupt the silhouette of the fish, but this occurs only when the predator approaches from below, and does not explain why dorsal light organs would not serve the same purpose. In his discussion of the function of bioluminescence, W.D. Clarke suggested that since most fishes are nearsighted, they cannot see the photophores as separate lights, but from a distance, they appear as an indistinctly-glowing monochromatic cloud. In his survey, McAllister wrote, "As the specific functions attributed to bioluminescence do not seem to require a predominately ventral position, one must look elsewhere for explanations of this pattern." It is clear that we, like the bearers of the light organs, are in the dark, and more in situ observations of living luminous fishes are necessary before we can understand the mysteries and miracles of bioluminescense. □


*Linophryne aborifera*

# Sea Strider Skull and Littoralope

by WAYNE DAVID BARLOWE

*(Editor's note: Littoral zones are where you find them. The following is an excerpt from the science fiction book, "Expedition," by writer/illustrator Wayne David Barlowe, from Workman Publishing, 192 pages.*

*The year is 2358. Earth is badly polluted. The narrator grew up listening to his grandfather's tales of Earth before mankind destroyed the environment, and brought mass extinction to most of the wildlife. Few species, wild or domestic, remain outside of zoos and those that do (Norway rats being one prominent exception) bare little resemblance to anything we would recognize. He has been chosen to be wildlife artist on a scientific mission to the planet Darwin IV, 6.5 light years from Earth. To limit damaging contact, observers and scientists make their observations from one-man, cone-shaped, sealed, hover craft, a "hovercone."*

*One of six planets in the Darwin binary system, Darwin IV is somewhat smaller than Earth. Seen from space the predominant color is a dusky ochre with minor patches of mottled red and two crisply defined polar caps. Darwin IV is orbited by two moons, its year is equal to two Earth years and its day is 26.7 hours long. It has an oxygen-rich atmosphere and low gravity.*

*The equator is home to a mountain range that almost completely encircles the planet. Since there are no true seas or oceans most of Darwin's water is in its polar caps. Only five percent of the planet's vegetation is forests, but fossils indicate they were wide spread in Darwin's warmer, moister past.*

*The dominant plant life is a variety of succulents. The plains are blanketed by succulent tube-grass. Approaching the mountains, the succulents give way to brush, vines, and eventually forests. Near the polar regions, low, ground dwelling lichen-like plants cover the almost frozen soil. The planet's atmosphere is home to seemingly limitless numbers of tiny air plants.*

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*Wayne David Barlowe is the author/illustrator of two previous books, "An Alphabet of Dinosaurs" and Barlowe's Guide to Extraterrestrials." His latest book is "Barlowe's Guide to Fantasy," published by Harper Collins, October 1996.*

*Most of Darwin's species live in great open grasslands that were once ancient seabeds. Vertebrates fall into five classes: floaters and flyers, monopedaliens, bipedaliens, tripedaliens, and quadpedaliens. Many of the floaters and flyers feed by sifting the tiny air borne plants from the atmosphere. The land creatures range from small ground-burrowing scavengers to large predatory bipedaliens.*

*Darwin's largest and most famous lifeform is the Amoebic Sea which isn't really a sea but a gelatinous, ten-meter-deep organism that covers almost five percent of the planet's surface. Beneath the rubbery surface of the "Sea" are unthinkable numbers of symbiotic organisms living within a matrix colony. Peering down one can discern many layers of luminous creatures suspended in the gel. The Amoebic Sea is home to one of the planets most interesting creatures, the Emperor Sea Strider. The Emperor Sea Strider is a huge bipedalien, larger than any known creature. As it strides along the smooth surface of the Amoebic Sea, sending off shock waves for great distances; sharp teeth ringing oral tubes in the soles of its feet shave off thin layers of gel which are sucked up through the tubes and digested. Here our narrator examines a different type of Littoral Zone.)*

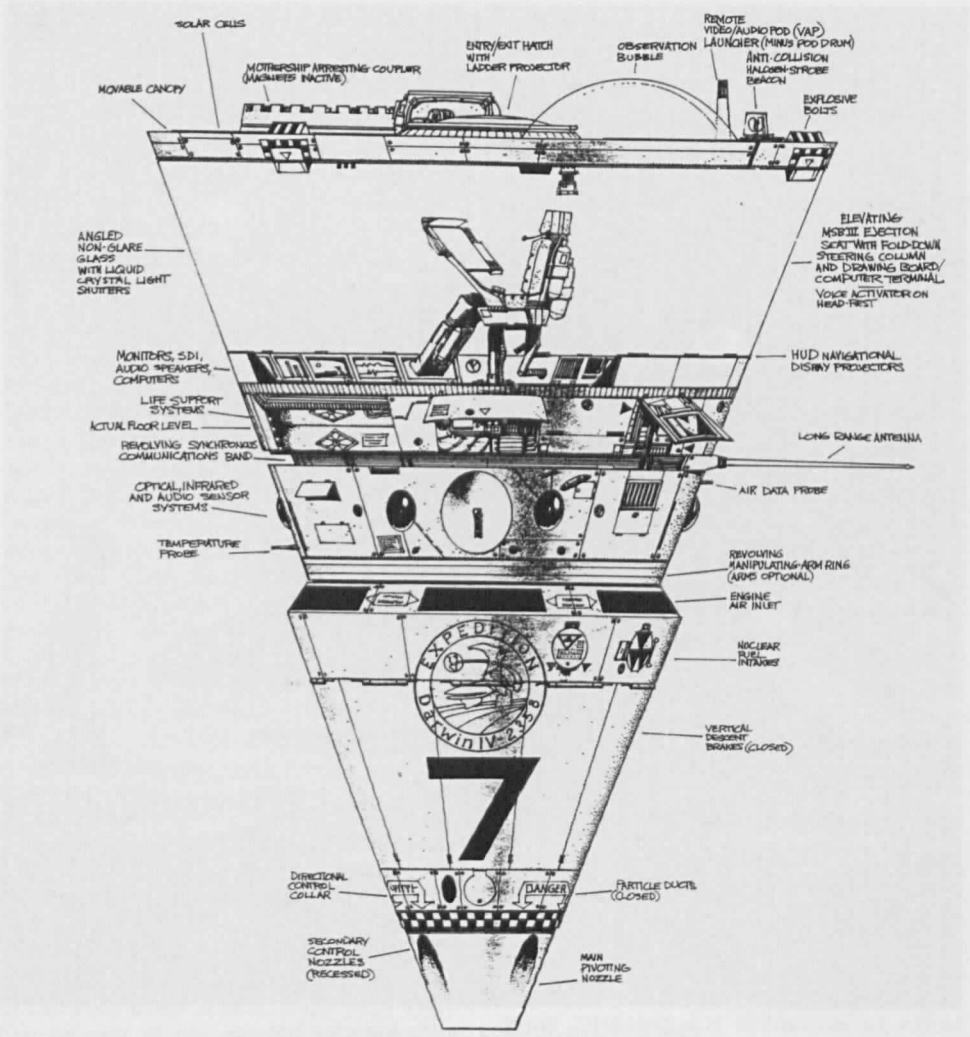
Darwin's single, unbroken littoral zone stretches for thousands of miles around the northern hemisphere's Amoebic Sea. It is by any standard a strange beach, with neither sand nor tidepools nor even waves lapping at its edge. Instead, one finds a constant slow expansion and contraction of the gelatinous matrix which sits about a meter atop the underlying beach. There is a genuinely surreal quality to this region: to the one side lies the vast expanse of the "sea" itself, rippling and undulating its jelly surface to winds that do not always exist; to the other side, sunken more than a meter, is the beach, so flat and still that it seems artificial. It is here that a silent war is waged between the colony creature we named the Amoebic Sea and the in-

*Emperor Sea Striders on the Amoebic Sea*

dividual creatures of Darwin IV. The littoral zone is an ecological no-man's land, a place of flux and conflict between two silent armies, and the land bears their marks.

It would seem that the "sea" has been losing ground over the last few millennia. Evidence to support this includes the percentage of flattened beach ground that has either fresh plant growth or older, more established plants. Some of the contested areas have only the barest traces of fuzzy plant growth, while other, long-ago-fallen salients are heavily covered with lavender, pink, and brown beachfingers, an extremely slow growing and lovely succulent. The "sea's" recession is not a result of vegetable encroachment, however, but is the end product of the innumerable, specialized animals that dine on the vast, gelatinous colony's flank.

The apparent recession of the "sea" may be a cyclical process involving surges in the population of peripherals — the various species living around and dependent on the colony. Most of these species spend many hours a day tearing at the gel's edges. They live quieter lives than their plains cousins, though there is




*"Hovercone"*

still some threat from a small number of beach predators, for their ecosystem centers on the defenseless, protein-rich resources of the "sea." Their uses for the jelly-like matrix are many and varied. Most peripherals siphon up the morsels they collect for immediate nourishment, while others liquify pieces for storage either for themselves or their mates. Still others lay eggs on or in the resilient biomass, taking full advantage of the nourishment to their hatchlings and the protective insulation of the matrix. Finally, there are those creatures who make their home within the matrix and never set foot upon dry ground.

The variety of lifeforms in the littoral zone provided me with hours of enjoyable observation. My inner aesthetics responded positively to the soothingly flat terrain and the strange creatures around me, and I found myself spending a greater amount of time in this region than was, perhaps, justifiable. It seemed to me that the beach was important; that I would not find another area where life had specialized to such an extent.

So I drifted above the beach zone with

a quiet sense of contentment, that feeling that I imagine countless wanderers before had experienced during their explorations of the wilderness. It was good to be alone, to see things no one had ever seen, to feel like a small part of some vast and universal scheme. Enjoying this sense of wonder, I traveled for many days around the edge of the Amoebic Sea.

On one of these days I saw, from a distance, an immense and imposing artifact, the cracked and bleached skull of an Emperor Sea Strider. It lay partly submerged in the boggy ground with its gigantic crest pointing skyward, looking like some bizarre organic cathedral. As I drew closer I saw that its whitened surface was riddled with innumerable nerve holes and sutures; in many of these, small animals had made their homes, leaving behind nests of peaty vegetable matter and droppings that stained the ivory surface in long brown streaks. These exterior nests seemed to have been abandoned for some time, as I found no evidence of current occupation.

I circled the skull and entered it through one of its vast gill openings, finding myself floating in considerable gloom. For all its size, the skull's walls were remarkably thin, and all about me I could see huge panels of bone in the process of flaking off; below me, the floor of this artificial cavern was covered by a layer of shed bone flakes. Suspended from the "ceiling" was the huge and primitive braincase, which appeared to have been eaten away in many spots. As I studied it, I thought I could see tiny pinpoints of moving light, and so I decided to sweep it with my infrared scanners. I was immediately rewarded with sight of hundreds of flyers squeezing their way in and out of the braincase. I flipped on my speakers and was nearly deafened by the cacophony of their chattering sonar; I flipped them off and resumed my explorations in silence.

I never did get a clear view of these creatures, for as I was circling within the skull a sudden jolt threw my 'cone off balance. An alarm klaxon went off, and as I sought to regain verticality I could see a large flake of bone tumbling toward the ground. This close call warned me of the dangers of a prolonged stay within the skull, and I hurriedly exited through the same opening I had entered.

As I was emerging I noticed that it was beginning to rain, and that a small herd of short-legged quadruped-aliens had gathered at the skull's base. They were placid, slow moving beasts, smooth-skinned and white. As they hobbled through the spongy beachfingers toward the skull's opening, I again turned on my audio system; this time against a faint backdrop of flyer calls, I heard their soft mewing pings.

Within a few minutes the entire herd of about twenty individuals was safely sheltered by the overhanging lip of the skull. I "parked" in the gill opening and was again forced to shut off my speakers, as their pinging was drowned out by the noisy flyers' calls. As they settled themselves in the gloom, I saw that their entire bodies glowed with a greenish lambency, a characteristic I had not seen before on Darwin IV. I named the creatures Littoralopes.

Suddenly my attention was directed towards a flock of small flyers that had taken wing with amazing rapidity. Within seconds the flock was circling crazily in the dark confines of the skull, their tiny orange biolights looking like the embers of some wind-whipped fire. I was engulfed in their streaming radiance as they flew past me and out the gill opening with incredible speed. By the time I had spun my chair around, they were nowhere to be seen, having been swallowed by the rain-laden clouds.

The Littoralopes were quietly waiting out the rain, and took little or no notice of the flyers' departure. With the noisy flyers gone, I switched my speakers back on. As before, the creatures were pinging and nodding their arrow-shaped heads; their exchanges seemed almost conversational. Beyond this impression,

though, I had no evidence of intelligence among them.

The rain gradually tapered off and the small herd got to their feet and wandered out toward the open beach. It soon became obvious that they were headed for the "sea," which was in a state of moderate agitation with two- to four-meter pseudopodal waves on its surface. From past experience I knew this to be a reaction to the storm; but unlike watery seas, this reaction was always delayed about thirty minutes. The Expedition later learned that the agitation was a reaction to the introduction of water into the matrix.

As the Littoralopes approached the "sea," I noticed its edge shrink back a meter or so in a parody of sentient apprehension. The herd gathered itself in a line along the edge and began, with broad, side-to-side swipes of their heads, to shave off long strips of clear matrix, which were quickly sucked lengthwise into the creatures' bellies.

After about an hour, the satiated Littoralopes marched off down the beach and out of sight, their bellies distended, and I floated down to inspect the damage. An area of newly-exposed beach some forty meters by two gave evidence of the quantity of matrix consumed by the herd. The "sea's" edge looked torn and raw, with partially shaved strips of matrix scattered about the beach. I hovered for about an hour doing studies of the surrounding terrain, and by the time I left the once ragged-edge was completely healed by new matrix.

Hidden about thirty centimeters beneath the soft soil of the littoral zone are rafts of communal hunters - the Beachquills. Often numbering in the scores, these dart-shaped creatures lie in wait for the unwary passerby to tread on the soil directly above them. As they rely primarily on their sensitive pressure receptors, their sonar is nearly nonexistent. These short-range attack hunters are able to propel themselves with enormous velocity over short distances. They launch themselves by means of a folded, muscular "foot" that snaps the individual animal through the concealing ground towards its target. After a kill, the Beachquills will instinctively regroup and bury themselves, leaving no visual evidence of their existence. Their immobility and silence are perfectly evolved hunting techniques on a sonar-based planet. As the Beachquill's range is limited by the density and composition of the soil it lives in, it is found exclusively in the littoral zone.

On one occasion I followed a Beach-loper (a distant peripheral cousin of the Emperor Sea Strider) into a bed of Beachquills. It was not a pleasant scene: fifty or so Beachquills suddenly burst from the ground around the peripheral and within seconds had punctured it mercilessly. The force of their attack was so great that the creatures that missed the Beach-loper bounced harmlessly off my 'cone some twenty meters from their launch-bed. The Beach-loper was dead before it hit the ground. A bizarre feast followed, with those Beachquills that had struck home eating their way out of the carcass, and those that had missed eating their way in. An hour later the Beach-loper's bones lay exposed on the ground and the Beachquills had vanished, leaving no trace. □



Field Note

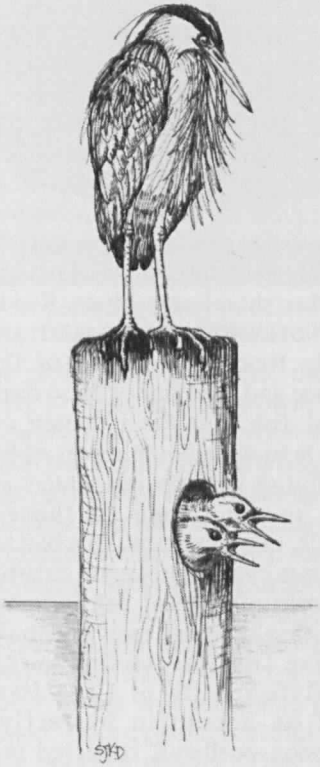
# Wharfside Woodpeckers

by DAVE GRANT

Flickers have the widest range of all our woodpeckers and are the most conspicuous, so its not surprising that many people take notice of them. Frank Chapman (Birds of Eastern North America) calls them a "bird of character" and reports that people throughout the country have given them no less then thirty-six aliases. Although they could not be labeled "friendly" towards people, flickers are nonetheless tolerant of us, are adapting to our modifications to the landscape, and seem to be holding their own better than other members of their tribe.

One flicker nick-name is "high-hole," in reference to their need for secure and isolated nest sites, usually out of view of people; but this year I discovered a pair that is exceptionally tolerant of fishermen, and perhaps a bit smarter and more adaptable than the average flicker.

On my early morning forays to the Atlantic Highlands Marina, on the Raritan Bay shoreline of Monmouth County, NJ, a large and bustling fishing port, I regularly observed a flicker sitting on an isolated piling doing its territorial "flicka-flicka-flicka" call. Flickers are a fairly excitable bird and tend to bound off at the first sign of trouble, so it was a surprise to see it in the midst of so much commotion at the harbor as exuberant fisherman jostled for space on the party boats. I was also puzzled by the immensity of the territory this one was claiming, since it was presumably at the fringe of that territory. The piling it staked out is about fifty yards from the shore and hundreds of yards from any suitable nesting trees. By midsummer the mystery was solved when two youngsters fledged from a nesting cavity the parents had hacked into the seaward side of the piling. The hole was not visible from the dock, but eye-level to, and within a yard of, the faces of hundreds of fisherman, who in June and July had boarded the party boat that was secured to the piling.



Like their neighbors at the wharf, the barn swallows and starlings, these adaptable birds have found a unique and secure home for their nestlings that is immune to predation from land creatures. It will be interesting to see whether these waterfront woodpeckers choose a similar location next year. □

*Dave Grant is the Society's Chief Naturalist and is on the faculty of Brookdale Community College here at Sandy Hook. He has written widely in this journal. The artwork is by Sue Draxler, a naturalist at Huber woods, part of the Monmouth County Parks System, and a frequent illustrator in* UNDERWATER NATURALIST.


# On the Rarity of Banded Butterflyfish In The Mid-Atlantic

by RICHARD McBRIDE

Observing brightly-colored coral reef fish is a passion for many naturalists, and it has never required an expensive trip to tropical latitudes. A carefully planned trip to the mid-Atlantic coast during late summer can reveal dozens of exotic fishes such as halfbeaks, coronetfish, bigeyes, angelfish, tangs, damselfish, and others swimming near jetties, piers, and other shoreline habitats. Readers of the UNDERWATER NATURALIST are frequently treated to stories of the appearance and behavior of these displaced tropical fish, but the intention of this article is to dispute the report of banded butterflyfish in temperate waters and, in doing so, challenge all those with snorkels, minnow traps, or a bait seine - and a keen eye - to prove me incorrect.

Records of tropical fish in temperate waters first appeared over a century ago. Theodore Gill was the first to report a butterflyfish north of Cape Hatteras, based on a spotfin butterflyfish, Chaetodon ocellatus, collected prior to 1861 at Newport, Rhode Island. This species is by far the most frequently observed butterfly fish in the mid-Atlantic and notes on its occurrence in the Hudson River recently appeared in UNDERWATER NATURALIST (Vol. 18, No. 2, p.35). The foureye butterflyfish, Chaetodon capistratus, also occurs in this region, but so rarely that it is a special treat for only careful observers. But the definition of rarity must be reserved for the banded butterflyfish, Chaetodon striatus. This species was reported by Henry Fowler, in his efforts to catalogue New Jersey fishes at the turn of the century, as being collected only once, in 1830, near Delaware Bay and no verifiable record has occurred since.

The fate of all butterflyfishes in temperate waters appears to be the same. Despite their regular occurrence as far north as Cape Cod during late summer months, they are regarded as misdirected waifs from subtropical spawning grounds. Butterflyfishes, as do many other marine fishes, broadcast their eggs into the seemingly chaotic climate of the open ocean. While this can result in dispersing their young broadly, which might be advantageous for the average larva in a patchy environment, there is no guarantee that any individual larva will settle in a favorable habitat. Such is the case, on a large scale, for those butterflyfish that are dispersed by coastal currents from tropical or subtropical spawning areas to temperate waters. In the course of my graduate studies at Rutgers University in New Jersey, I observed butterflyfish in estuaries from early July to early November. These fish grew about one millimeter per week, which is a reasonable rate for a young coral reef fish. I monitored some individual fish and found that they could survive for several weeks, swimming within a range of only a few meters. However, they never showed an inclination to migrate south during the autumn, and consequently at the onset of winter they would die from cold water temperatures at only a few months of age.

While I was at Rutgers I collected over 400 butterflyfishes in southern New Jersey. About 95% were spotfin butterflyfish, the remaining 5% were foureye butterflyfish. This observation turned my thoughts to the report of a single banded butterflyfish, collected over 150 years ago, in the mid-Atlantic. It

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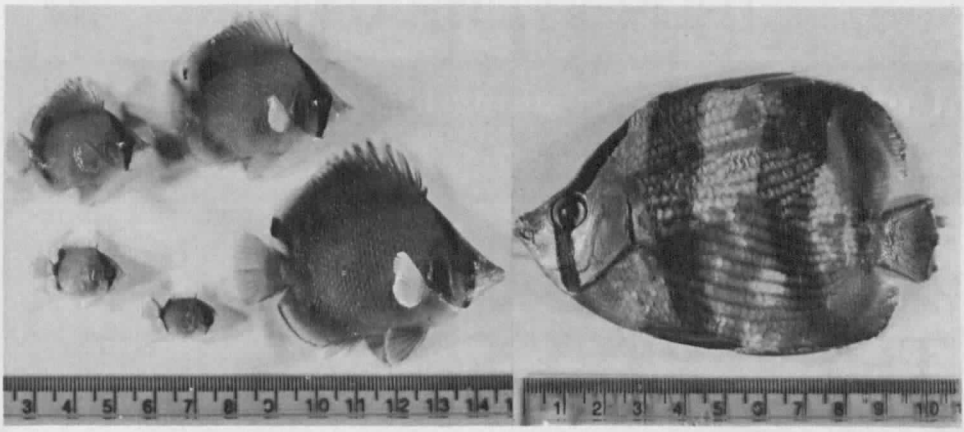


*A series of spot fin butterflyfish (left) collected from Little Egg Harbor in 1993 and a banded butterflyfish collected from the Delaware Bay in 1830.*

seemed to be only good fortune that the actual specimen had been preserved and was still available at the Academy of Natural Sciences in Philadelphia. However, inspection of this specimen revealed few clues that had not been published earlier. The details of the collection were in fact, quite vague. A tag included in the specimen jar revealed the locality as simply Delaware Bay. The size of the specimen, over four inches total length, was quite surprising. It was much larger than any other butterflyfish collected north of Cape Hatteras, which are a maximum size of about three inches, so it was not likely to be less than a year old. This raised the question of how it had survived the winter to be collected in its second year in the temperate zone. Since this specimen was described by Henry Fowler about seven decades after it had been collected, the true origin of this specimen is dubious.

There are a few other reports of banded butterflyfish from the mid-Atlantic states, but none that saved "voucher" specimens to confirm presence of this species in temperate waters. Because small butterflyfish can be easily confused, there is room to doubt that the banded butterflyfish ever occurred in mid-Atlantic waters. In general, pigmentation is a good characteristic for distinguishing butterflyfishes, but it can change rapidly due to stress, naturally from day to night, or with growth. Especially problematic is that foureye butterflyfish and banded butterflyfish, when they are only one or two inches long, can both be observed with vertical bars and a white circumference around at least one false eyespot. Vertical bars observed on young foureye butterflyfish are, however, typically faint compared to the bars of banded butterflyfish. Experienced coral reef divers will recognize that an "ocellated" false eyespot is useful to distinguish between species. They should also know that fish can - and do - change their colors. For both species, the ocellated eyespot at the posterior of the dorsal fin is eventually lost. At this point, you might ask yourself which species bears the scientific name of Chaetodon ocellatus? Looking back to the beginning of this article when the common and binomial names were introduced, you might be surprised to learn that Chaetodon ocellatus does not, in fact, have an ocellated eyespot! Aquarium hobbyists in particular may dispel my doubts by collecting some banded butterflyfish this summer or in the future, and sending a voucher specimen to a local ichthyologist. Those who might observe a banded butterflyfish north of Cape Hatteras can be assured that they have seen a rarity among local fish fauna. □

# TAGGING REPORT

compiled by PAM CARLSEN

Fish tagging produces many amazing stories. Michael Kearns, Tiverton, RI, returned 26 ALS tags removed from small stripers in the month of May 1996. They were all caught in his fish traps at the mouth of the Sakonnet River, in Rhode Island. These fish ranged from 15 - 24" and were all tagged in the last seven months. The farthest traveller was a 24" bass of Charlie Kennedy's, tagged at Cape May Pt., NJ, on 12/15/95. The closest was a 16" bass tagged by Everett Petronio, Jr. at Newport, RI, on 11/10/95. Kearns stated that he had six USFWS tags also.

Things happen in pairs..Rivers: On 5/3/96, Tim Shaheen tagged a 16" striper in the Navesink River, NJ. On 6/10/96, this fish had found its way to the Lyme area of the Connecticut River.

..Fishermen: Ozzie Van Helmond, Sayville, NY, tagged a 28" striped bass, 10/24/89 at Peconic, NY, and a 32" striped bass, 11/2/92 at Montauk, NY. Both were recaptured by Steven Mello on 7/8/96 in Block Is. Sound, RI. The first fish was 40", 39 pounds and the second 39", 32 pounds.

..Friends: Tom Rinaldi and Steve Kellner tag stripers at Mattituck, NY. Steve tagged one on 6/29/93 at 27" and Tom a 28 1/2" fish on 6/5/94. Both fish were recaptured in June of 1996 in Jamaica Bay, Queens, NY. Steve's was 34", 13 pounds and Tom's was 34", 15 pounds.

The fish that got away—everyone has one. John Jandinski, Madison, NJ wrote, "Tonight, I caught my first real keeper bass. It was 36". I took the hook out immediately, (something I never do when I tag a fish); however, I was thinking about keeping this fish. I got to my tackle box and decided to tag this one like all the rest. Suddenly, several people started shouting,'there goes your fish!.' Three flops later, the fish was gone. My lesson—I will never, ever, even think of keeping a bass."

## TAGGING RETURNS

| Species / Lgth | Tagger | Place Tagged | Date | Recapturer | Location | Lgth | Date |
|---|---|---|---|---|---|---|---|
| **Atlantic Cod** | | | | | | | |
| 17 | A Alosso Jr. | Offshr., MA. | 09/07/94 | R Kohl | Nantucket Shoals, MA | | 05/03/95 |
| 16 | T Stanik | Offshr., MA | 07/07/94 | Yankee Patriot | Offshr., MA | | 06/24/95 |
| 18 | A Alosso Jr. | SE Stellwagon Bank, MA | 09/11/94 | B Gillis | Offshr., Gloucester, MA | 20 | 07/06/95 |
| 18 | E Petronio Jr. | Offshr., Coxes Ledge, RI | 07/10/95 | D Peer | Offshr., Coxes Ledge, RI | 18 | 07/15/95 |
| 17 | E Petronio Jr. | Offshr.,Coxes Ledge, RI | 07/10/95 | S Safford | Coxes Ledge, RI | 18 | 07/23/95 |
| 11 | E Petronio Jr. | Offshr., Coxes Ledge, RI | 07/10/95 | S Steniger | Coxes Ledge, RI | | 08/08/95 |
| **Black Sea Bass** | | | | | | | |
| 12 | B Balmer | Shrewsbury Rocks, NJ | 11/04/95 | Ukn Fisherman | Sea Girt Reef, NJ | 12 | |
| 10 | T Surgent | Deal, NJ | 09/19/94 | A Quinones | Elberon, NJ | 11 | 10/22/94 |
| **Bluefish** | | | | | | | |
| 25 | B DeCray | Offshr., Avalon, NJ | 06/19/93 | A Schneider | Fort Pond Bay, NY | | 11/15/93 |
| 27 | W Panzenhagen | Offshr., The Farms, NJ | 06/04/95 | R Johnson | Offshr., 17 fathoms, NJ | 30 | 06/07/95 |
| 30 | C Jazmin Jr. | Great Egg R., NJ | 05/22/95 | L Ferris | Offshr., 17 fathoms, NJ | | 06/11/95 |
| 23 | A Schweithelm | Montauk, NY | 10/10/94 | A Michaelson | Montauk, NY | 25 | 06/17/95 |
| 30 | F Heal | Staten Island, NY | 06/08/95 | C Esperon | Rockaway, NY | | 07/20/95 |
| 23 | M Barrett | Old Orchard Lt., NY | 06/05/95 | P Sidor | Flynn's Knoll, NJ | | 07/24/95 |
| 30 | W Panzenhagen | Offshr., The Farms, NJ | 06/04/95 | J Larson | Offshr., Barnegat, NJ | | 08/01/95 |
| **Fluke** | | | | | | | |
| 12 | S Fries | Coney Is., NY | 06/15/94 | J.H. Lea & Sons Inc. | Landed-Hampstead, NC | | 01/21/95 |
| 13 | L Gordon Jr. | Lynnhaven R., VA | 08/27/94 | J.H. Lea & Sons Inc. | Landed-Hampstead, NC | | 01/21/95 |

**Species**

| Lgth | Tagger | Place Tagged | Date | Recapturer | Location | Lgth | Date |
|---|---|---|---|---|---|---|---|
| **Fluke (cont.)** | | | | | | | |
| 13 | FA Marchesani | Absecon Inlet, NJ | 07/22/94 | F/V Courageous | Offshr., Absecon Inlet, NJ | 16 | 01/29/95 |
| 13 | P Migliaccio | Sea Bright, NJ | 08/27/94 | NC Div. Mar. Fish | Offshr., New R.Inlet, NC | 15 | 03/15/95 |
| 14 | B Goodman | Reynolds Chan., NY | 06/26/94 | T Hutton | Amityville, NY | 15 | 05/21/95 |
| 13 | P Donnelly | Spring Lake, NJ | 05/15/94 | A Grayford | Island Park, NY | | 06/06/95 |
| 12 | Holmdel H.S. | Sandy Hook Bay, NJ | 06/01/95 | J Boyko | Sandy Hook Bay, NJ | | 06/07/95 |
| 9 | JC Wright | Lynnhaven R., VA | 05/26/95 | B Capps | Lynnhaven, VA | | 06/16/95 |
| 11 | W Filce | Mantoloking, NJ | 05/23/95 | B Madden | Point Lookout, NY | | 06/17/95 |
| 12 | M Stankiewicz | Lindenhurst, NY | 06/09/95 | W Young | Massapequa, NY | | 06/17/95 |
| 12 | P Migliaccio | Sea Bright, NJ | 08/27/94 | Sea Pigeon IV | Sandy Hook, NJ | 12 | 06/20/95 |
| 12 | A Wolenter | Sandy Hook, NJ | 06/06/95 | A Wolenter | Sandy Hook, NJ | 12 | 06/20/95 |
| 18 | D Dixon | Chincoteague, VA | 05/24/95 | G Flohr | Chincoteague, VA | 20 | 06/21/95 |
| 13 | E Feret | Moriches Inlet, NY | 08/28/94 | R Arendt | E of Ponquogue Brdg., NY | 16 | 06/21/95 |
| 12 | M Stankiewicz | Lindenhurst, NY | 06/02/95 | A Accardi | Great South Bay, NY | | 06/22/95 |
| 13 | B Shillingford | Ocean City, NJ | 07/11/94 | W Tomko | Sandy Hook, NJ | 14 | 06/24/95 |
| 12 | B Shillingford | Ludlam Bay, NJ | 07/13/94 | J McQuarrie | Pt. Judith, RI | 16 | 06/24/95 |
| 14 | W Filce | Manasquan R., NJ | 08/08/94 | M DePasquale | Freeport, NY | 15 | 06/25/95 |
| 10 | D Pinther | Sandy Hook Bay, NJ | 05/31/95 | E Corcoran | Sandy Hook Bay, NJ | 10 | 06/25/95 |
| 10 | F Rupp | Raritan Bay, NJ | 06/14/95 | Sea Pigeon IV | Sandy Hook, NJ | | 06/26/95 |
| 11 | D Obropta | Shrewsbury R., NJ | 06/23/95 | K Branin | Shrewsbury R., NJ | | 06/27/95 |
| 11 | S Knapik | Pt. Lookout, NY | 06/24/95 | A Guglielmo | Baldwin, NY | 11 | 06/30/95 |
| 11 | J Tirpak | Shark R. Inlet, NJ | 05/27/95 | J Lunski | Sandy Hook Bay, NJ | 11 | 07/01/95 |
| 14 | R Haug | Moriches Inlet, NY | 08/26/94 | J Boucher | Pt. Judith, RI | 18 | 07/02/95 |
| 12 | A Autieri | Robert Moses Brdg., NY | 06/16/95 | T Powers | Fire Is. Inlet, NY | 12 | 07/02/95 |
| 10 | F Rupp | Raritan Bay, NJ | 06/14/95 | T Riesz | Sandy Hook Bay, NJ | 11 | 07/03/95 |
| 13 | C Fiorillo | Long Branch, NJ | 10/07/94 | L Romaine | Jones Inlet, NY | 14 | 07/04/95 |
| 13 | R Wolfskeil | Monmouth Beach, NJ | 09/21/94 | J Parisi | Leonardo, NJ | 14 | 07/04/95 |
| 13 | R Anderson Jr. | Fire Is. Inlet, NY | 06/05/94 | R Mihalko | Moriches Bay, NY | 14 | 07/05/95 |
| 14 | R Paganini | Long Beach, NY | 06/04/95 | A Neaman | Long Beach, NY | 14 | 07/07/95 |
| 12 | C Fiorillo | Long Branch, NJ | 06/16/95 | M Guimond | Sea Bright, NJ | | 07/08/95 |
| 11 | A Hagovsky | Chincoteague Inlet, VA | 07/04/95 | B Lyttle | Chincoteague, VA | | 07/10/95 |
| 13 | S Carlsen | Shark R., NJ | 09/27/94 | B Kulka | Bradley Beach, NJ | 14 | 07/13/95 |
| 13 | B Shillingford | Corson's Inlet, NJ | 07/03/95 | S Glaze | Strathmere, NJ | | 07/14/95 |
| 12 | C Wilcox III | Moriches Inlet, NY | 09/11/94 | J Bonelli | Shinnecock Bay, NY | 15 | 07/19/95 |
| 13 | J Carlson | Great Kills, NY | 07/08/95 | R Weckesser | Great Kills, NY | 15 | 07/20/95 |
| 10 | M Barrett | Great Kills, NY | 07/01/94 | D Montano | Fire Is. Inlet, NY | 13 | 07/20/95 |
| 13 | M Mucha | Greenwich, CT | 07/10/95 | F Seppell | Cos Cob, CT | | 07/22/95 |
| 13 | J Timmermann | Pt. Lookout, NY | 06/18/95 | J Vatalaro | Jones Inlet, NY | 15 | 07/23/95 |
| 13 | M Daniewicz | Sea Bright, NJ | 06/05/94 | B Evers | Flynn's Knoll, NJ | 17 | 07/23/95 |
| 16 | A D'Amato | Cape May, NJ | 09/09/94 | D Cole | E. Matunuck, RI | 17 | 07/24/95 |
| 20 | W Anderson | Provincetown, MA | 05/25/95 | M Karavolis | Provincetown, MA | | 07/24/95 |
| 13 | B Shillingford | Strathmere, NJ | 07/13/95 | J Levengood | Ludlam Bay, NJ | | 07/25/95 |
| 12 | R Anderson Jr. | Fire Is. Inlet, NY | 07/27/94 | G Kanalski | Race Point, MA | 17 | 07/26/95 |
| 13 | R Joyce | Pt. Judith, RI | 06/30/95 | M Derose | Pt. Judith, RI | | 07/26/95 |
| 13 | B Goodman | Sandy Hook Chan., NJ | 07/31/94 | H Sundermann | Jamaica Bay, NY | 14 | 07/28/95 |
| 12 | B Shillingford | Corson's Inlet, NJ | 07/07/94 | R Valoucik | Perth Amboy, NJ | 15 | 07/28/95 |
| 13 | F Haimes | Merrick Bay, NY | 06/10/95 | R Eckardt | Jones Inlet, NY | 13 | 07/30/95 |
| 10 | F Rupp | Sandy Hook, NJ | 07/12/95 | J Aimone | Leonardo, NJ | 11 | 07/30/95 |
| 10 | F Rupp | Sandy Hook, NJ | 06/29/95 | A Sargente | Sandy Hook Bay, NJ | 13 | 07/30/95 |
| 13 | F Waltzinger III | Leonardo, NJ | 07/06/95 | K Miles | Raritan Bay, NJ | 13 | 07/30/95 |
| 10 | F Waltzinger III | Asbury Park, NJ | 06/13/94 | B Foster | Long Branch, NJ | 15 | 07/31/95 |
| 14 | W Filce | Pt. Pleasant, NJ | 07/16/95 | H Viglone | Manasquan Inlet, NJ | 14 | 07/31/95 |
| 10 | J Hickey Jr. | Deal, NJ | 06/17/95 | J Nicosia | Sandy Hook, NJ | 13 | 07/31/95 |
| 13 | M Frawley Jr. | Shinnecock Bay, NY | 07/14/95 | R Finalborgo | Southampton, NY | | 08/01/95 |
| 11 | B Shillingford | Corson's Inlet, NJ | 07/07/93 | J Dever | Wildwood, NJ | 19 | 08/01/95 |
| 13 | S Kmiotek | Pt. Lookout, NY | 07/10/95 | J Caso | Jones Inlet, NY | | 08/03/95 |
| 10 | B Shillingford | Corson's Inlet, NJ | 07/06/95 | D Reisser | Ocean City, NJ | 11 | 08/03/95 |
| 11 | W Filce | Manasquan R., NJ | 07/16/95 | T Krause | Manasquan R., NJ | | 08/03/95 |
| 11 | R Anderson Jr. | Fire Is. Inlet, NY | 07/16/94 | F/V Dan Mullins | Nantucket Sound, MA | 14 | 08/03/95 |
| 11 | R Dykas | Monmouth Beach, NJ | 07/22/95 | G Pstrak | Shrewsbury Rocks, NJ | | 08/05/95 |
| 13 | L Gordon Jr. | Lynnhaven R., VA | 07/16/95 | D House | Lynnhaven Inlet, VA | 14 | 08/05/95 |
| 12 | B Shillingford | Corson's Inlet, NJ | 07/04/95 | M Kenville | Corson's Inlet, NJ | 13 | 08/05/95 |
| 11 | W Filce | Mantoloking, NJ | 05/31/95 | S Posten | Sandy Hook Chan., NJ | 11 | 08/05/95 |

| Species / Lgth | Tagger | Place Tagged | Date | Recapturer | Location | Lgth | Date |
|---|---|---|---|---|---|---|---|
| **Fluke (cont.)** | | | | | | | |
| 13 | C Frey | Haunt's Creek, NY | 08/21/94 | A Munter | Buzzards Bay, MA | 19 | 08/06/95 |
| 13 | W Filce | Manasquan R., NJ | 07/31/95 | K Wedel | Manasquan Inlet, NJ | 13 | 08/08/95 |
| 12 | W Filce | Manasquan R., NJ | 08/03/95 | T Van Bell | Manasquan R., NJ | | 08/09/95 |
| 13 | W Filce | Manasquan R., NJ | 07/31/95 | W Filce | Manasquan R., NJ | 13 | 08/09/95 |
| 11 | R Anderson Jr. | Captree, NY | 05/21/94 | R Lakretz | Jones Beach, NY | 16 | 08/12/95 |
| **Sea Robin** | | | | | | | |
| 12 | M Barrett | Annadale, NY | 10/24/94 | R Miccio | Reynolds Chan., NY | | 07/05/95 |
| **Striped Bass** | | | | | | | |
| 23 | S Keiper | Indian River Inlet, DE | 08/25/94 | T Tippett Jr. | Mouth of Breton Bay, MD | | |
| 32 | F Stunkel | Darien, CT | 07/10/92 | P Miller | Darien, CT | 36 | 06/18/94 |
| 26 | N Jalbert | Bonnet Shores, RI | 06/19/93 | G Medeiros | Bonnet Shores, RI | 30 | 07/11/94 |
| 22 | J Karolides | Danvers, MA | 06/13/94 | P Donahue | Plum Is., MA | 23 | 07/23/94 |
| 18 | R Pearson Jr. | Croton Bay, NY | 04/15/90 | D Mahon | Breezy Pt., NY | | 08/17/94 |
| 22 | A D'Amato | Cape May Pt., NJ | 05/06/93 | M Munay | York R., VA | | 01/11/95 |
| 24 | T Rinaldi | Mulford Pt., NY | 09/04/92 | J Coppage | Choptank R., MD | | 02/15/95 |
| 19 | R Nystrom | Devon, CT | 01/20/95 | R Picheco | Devon, CT | 20 | 02/19/95 |
| 23 | G Kerkhan | Provincetown, MA | 10/14/92 | M Page | Thames R., CT | 29 | 03/21/95 |
| 31 | A Anderson | Block Is., RI | 06/19/94 | K Washington | Norwich, CT | 32 | 03/22/95 |
| 24 | R Vogel | Sea Bright, NJ | 11/28/90 | E Green | Nyack, NY | 16 | 04/06/95 |
| 21 | S Fries | Sandy Hook Chan., NJ | 11/12/93 | M Pierce | Maurice R., NJ | 25 | 04/06/95 |
| 13 | K Gomolson | Corson's Inlet, NY | 09/11/94 | A Busnardo | Fairton, NJ | 14 | 04/08/95 |
| 21 | W Sharpe | Sandy Hook Bay, NJ | 10/01/94 | W Sharpe | Sandy Hook, NJ | 22 | 04/18/95 |
| 38 | A Cordts | Vineyard Haven, MA | 11/08/93 | J Lewis | Big Choptank R., MD | | 04/26/95 |
| 17 | T Nowell | Plum Is., MA | 10/08/94 | J Dawes | Montville, CT | | 04/29/95 |
| 14 | S Klimek | Hudson R., NY | 05/12/94 | A Tantillo | Port Ewen, NY | | 04/30/95 |
| 18 | T Marburger | Northport, NY | 04/07/92 | W Hebert | Westport R., MA | 32 | 05/11/95 |
| 21 | M Berger | Debs Inlet, NY | 07/31/93 | N Savene | Atlantic Beach, NY | | 05/15/95 |
| 10 | T Lake | Danskammer Pt., NY | 10/19/94 | V Sbrilir | Bayonne, NJ | | 05/16/95 |
| 28 | A Anderson | Block Is., RI | 10/28/94 | B O'Connor | N. Falmouth, MA | | 05/16/95 |
| 16 | K Kyker | Norwalk, CT | 04/29/94 | P Raymond | Mt. Hope Brdg., RI | | 05/20/95 |
| 14 | K Kyker | Cos Cob, CT | 10/09/95 | D Kwasnicki | Troy Dam, NY | 16 | 05/27/95 |
| 16 | R Pearson Jr. | Croton Bay, NY | 04/19/94 | M Burke | Plum Is., MA | | 05/29/95 |
| 33 | F Strmiska | Fishers Is., NY | 10/22/94 | G Gozda | Fishers Is., NY | 33 | 05/31/95 |
| 22 | R Chmiel | Westerly, RI | 06/04/93 | B Mastro | Eddyville, NY | | 06/01/95 |
| | F Tenore | Sandy Hook, NJ | 04/29/95 | P Actieri | Newburyport, MA | 28 | 06/03/95 |
| 22 | J Mettler | Fishers Island, NY | 11/02/91 | W Hebert | Assonet R., MA | 31 | 06/04/95 |
| 21 | O Van Helmond | Peconic, NY | 11/15/94 | M Brightman | Buzzard's Bay, MA | | 06/05/95 |
| 34 | P Grippo | Tobay Beach, NY | 06/05/94 | M Swierczynski | Madison, CT | 37 | 06/05/95 |
| 25 | H Rego | Providence R. RI | 05/30/93 | G Paolino | Narragansett Bay, RI | 35 | 06/06/95 |
| 24 | J Della Porta | Boston, MA | 09/08/94 | R Podesta | Quincy Bay, MA | | 06/06/95 |
| 21 | A Marsello | Swansea, MA | 05/19/95 | R Ermond | Swansea, MA | 22 | 06/06/95 |
| 22 | W Gundersen Jr. | Sandy Hook, NJ | 11/08/94 | P Easterbrooks | Middletown, RI | | 06/06/95 |
| 29 | F Heal | Staten Island, NY | 10/07/93 | F Coronato | Old Orchard Lt., NY | 30 | 06/06/95 |
| 23 | J Reiches | Davids Is., NY | 08/16/94 | A LoCascio | Hart Island, NY | 25 | 06/07/95 |
| 27 | J Della Porta | Boston, MA | 09/01/94 | A Lehmann | Boston Harbor, MA | 30 | 06/07/95 |
| 20 | T Shaheen | Navesink R., NJ | 05/19/94 | F Urban | Highlands Brdg., NJ | 24 | 06/07/95 |
| 21 | A Dangelo | Charlestown, RI | 10/11/91 | D Pinckerton | Great Egg Harbor R., NJ | 26 | 06/07/95 |
| 33 | M Favale | Boston, MA | 10/22/94 | WS Simmons | Boston Harbor, MA | 34 | 06/07/95 |
| 25 | R Conklin | Moriches Inlet, NY | 05/25/95 | J Gregory | Moriches Inlet, NY | 25 | 06/08/95 |
| 19 | G D'Amato | Stratford, CT | 11/09/94 | B Babcock | Newburyport, MA | | 06/08/95 |
| 24 | W Sharpe | Sandy Hook Bay, NJ | 05/17/94 | T Melanson | Merrimack R., MA | 28 | 06/09/95 |
| 27 | T Lynch | Stamford, CT | 08/10/94 | G Pugliese | Cold Spring Harbor, NY | 28 | 06/09/95 |
| 17 | J Karolides | Beverly, MA | 06/15/94 | F Ryan | Darien, CT | 20 | 06/09/95 |
| 30 | A Anderson | Block Is., RI | 11/08/94 | T Libertini | Martha's Vineyard, MA | | 06/09/95 |
| 34 | O Van Helmond | Stony Brook, NY | 06/23/94 | C Russo | Mid-L.I. Sound, NY | 37 | 06/09/95 |
| 34 | R Anderson Jr. | Fire Island Inlet, NY | 06/28/92 | T Ruggiero | Robert Moses Brdg., NY | 28 | 06/09/95 |
| 26 | P Chowansky | Long Branch, NJ | 07/31/94 | W Bertsch | Deal, NJ | 29 | 06/10/95 |
| 30 | P Grippo | Jones Inlet, NY | 11/03/94 | B King | The Race, L.I. Sound | 31 | 06/10/95 |
| 19 | T Rinaldi | Mattituck, NY | 10/09/92 | T Ronaldi | Mattituck, NY | 26 | 06/10/95 |
| 15 | K Lohraff | Sandy Hook, NJ | 11/28/93 | T D'Anna Sr. | Sandy Hook, NJ | | 06/10/95 |
| 30 | F Strmiska | Fishers Is., NY | 07/12/94 | W Matyka | Fishers Is., NY | 31 | 06/10/95 |
| 29 | A Anderson | Block Is., RI | 11/03/94 | T D'Anna Sr. | Sandy Hook, NJ | | 06/10/95 |

**Species**

| Lgth | Tagger | Place Tagged | Date | Recapturer | Location | Lgth | Date |
|---|---|---|---|---|---|---|---|
| **Striped Bass (cont.)** | | | | | | | |
| 36 | F Strmiska | Fishers Is., NY | 10/17/94 | W Matyka | Fishers Is., NY | | 06/10/95 |
| 36 | R Kalenka | Orient Pt., NY | 07/25/93 | B Negrelli | Plum Gut, NY | 39 | 06/10/95 |
| 20 | T Marburger | Northport, NY | 04/23/95 | G Darcy | W. Chatham, MA | | 06/10/95 |
| 38 | A Wutkowski | Barnegat Bay, NJ | 04/15/95 | C Russo | Mid-L.I. Sound, NY | 38 | 06/10/95 |
| 20 | D Kelly | Orient Pt., NY | 10/16/94 | S Kellner | Mattituck, NY | 21 | 06/10/95 |
| 31 | A Dangelo | W of Block Is., RI | 10/24/94 | E Dovidio | Barnegat, NJ | 32 | 06/10/95 |
| 26 | M Berger | Atlantic Beach Brdg., NY | 05/30/94 | M Berger | Atlantic Beach Brdg., NY | 30 | 06/10/95 |
| 31 | F Stunkel | Stamford, CT | 06/18/94 | K Bova | Stamford, CT | 33 | 06/11/95 |
| 21 | A Moore | Haverstraw, NY | 04/02/95 | M Montera | Stony Brook, NY | | 06/11/95 |
| 22 | N Fiorillo Jr. | Sea Bright, NJ | 04/28/95 | E Plichta | Shrewsbury R., NJ | 23 | 06/11/95 |
| 24 | W Draesel | Barnegat Inlet, NJ | 07/27/94 | R Bilbrough | Island Beach St. Pk., NJ | 26 | 06/11/95 |
| 30 | J McAfee | Quick's Hole, MA | 07/30/94 | J Micoletti | Old Lyme, CT | 31 | 06/12/95 |
| 19 | R Grobarz | Sandy Hook, NJ | 10/07/93 | A Daniele | Highlands, NJ | 24 | 06/12/95 |
| 13 | A Marsello | Swansea, MA | 05/31/94 | L Vital | Swansea, MA | 21 | 06/13/95 |
| 37 | S Fries | Montauk, NY | 08/10/94 | S Pivarnik | Mamaroneck, NY | 38 | 06/13/95 |
| 31 | P Bombino | Sandy Hook, NJ | 10/19/94 | B Sloat | Rye, NY | 31 | 06/13/95 |
| 20 | D Kelly | Orient Pt., NY | 10/17/94 | R Brodowski | Far Rockaway, NY | | 06/13/95 |
| 25 | D Kelly | Orient Pt., NY | 10/14/93 | A Blott | Narragansett Bay, RI | 28 | 06/13/95 |
| 28 | R Gardrel | Narragansett, RI | 06/19/94 | S Adams | Pt. Judith, RI | 28 | 06/14/95 |
| 17 | D Spring | Buckroe, VA | 06/19/94 | W Olsen Jr. | Southold, NY | 18 | 06/14/95 |
| 20 | A Marsello | Swansea, MA | 06/03/95 | M Vital | Swansea, MA | 22 | 06/14/95 |
| 41 | T Ziobo | Watch Hill, RI | 06/22/94 | J Posh | Watch Hill, RI | 40 | 06/14/95 |
| 32 | M Russo | Water Is., NY | 09/13/94 | T Berlinski | Flynn's Knoll, NJ | 32 | 06/14/95 |
| 30 | B Toohey | E. Rockaway Inlet, NY | 06/13/94 | D Durando | Atlantic Beach Brdg., NY | 34 | 06/14/95 |
| 23 | A Moore | Newburgh, NY | 04/28/95 | A Anderson | Block Island, RI | 24 | 06/14/95 |
| 23 | J McAfee | Monomoy, MA | 10/04/94 | J Hornick | Wellfleet, MA | | 06/15/95 |
| 32 | J Gibbons | Sea Bright, NJ | 09/15/94 | V Watson | Sandy Hook, NJ | 32 | 06/15/95 |
| 30 | J Kane Jr. | Kennebec R., ME | 09/10/94 | M Gamash | Saco, ME | | 06/15/95 |
| 27 | F Strmiska | Fishers Is., NY | 10/17/94 | G Gozda | Fishers Is., NY | 27 | 06/15/95 |
| 21 | S Kellner | Mattituck, NY | 10/31/94 | B Small | Newburyport, MA | 22 | 06/15/95 |
| 18 | J Zaffuto | Democrat Pt., NY | 11/07/93 | J Adley | Bridgeport, CT | | 06/15/95 |
| 30 | F Ryan | Stamford, CT | 07/13/93 | F Stunkel | Stamford, CT | 31 | 06/15/95 |
| 32 | A Stearns | Boston, MA | 06/27/92 | A Lehmann | Boston Harbor, MA | 38 | 06/15/95 |
| 16 | R Kyker | Norwalk, CT | 04/26/95 | B DeMario | Winnapaug Pond, RI | | 06/15/95 |
| 26 | T Thornhill | Windmill Pt., VA | 12/04/93 | T Crowder | Potomac R., MD | 30 | 06/15/95 |
| 19 | R Nystrom | Devon, CT | 02/14/95 | M McGurn | Falmouth, MA | 22 | 06/15/95 |
| 15 | J Karolides | Beverly, MA | 05/23/95 | A Bridges | Gloucester, MA | | 06/16/95 |
| 24 | A Marsello | Swansea, MA | 06/02/95 | L Crompton III | Tiverton, RI | 24 | 06/16/95 |
| 35 | A Anderson | Block Is., RI | 06/07/94 | J Pope | Off Block Is., RI | | 06/16/95 |
| 21 | S Kellner | Hortons Point, NY | 11/13/91 | W Yackel | Rocky Pt., L.I., NY | 28 | 06/16/95 |
| 28 | J McAfee | Quick's Hole, MA | 08/08/94 | G Ruest | Quick's Hole, MA | 28 | 06/16/95 |
| 15 | J Karolides | Beverly, MA | 05/19/95 | J Thwaits | Merrimack R., MA | | 06/17/95 |
| 19 | T McCandless | Jamestown, RI | 10/17/94 | J Christiansen | Swansea, MA | | 06/17/95 |
| 33 | M Favale | Boston, MA | 07/16/94 | M Favale | Boston,, MA | 35 | 06/17/95 |
| 21 | A LoCascio | Manhasset Bay, NY | 05/06/95 | J Cebrowski | Dartmouth, MA | 21 | 06/17/95 |
| 32 | C Wilcox III | Moriches Inlet, NY | 11/16/94 | D Hebert | Block Is., RI | | 06/17/95 |
| 30 | J McAfee | Quick's Hole, MA | 09/09/94 | E Marecki | Offshr., Cuttyhunk Is., MA | 41 | 06/17/95 |
| 11 | G Horvath | Trenton, NJ | 05/15/95 | B Bonomo | Trenton, NJ | 12 | 06/17/95 |
| 13 | J Karolides | Danvers, MA | 05/21/95 | J Wilkins | Merrimack R., MA | 15 | 06/18/95 |
| 19 | G Horvath | Trenton, NJ | 05/08/92 | R Hogy | Yardley, PA | 28 | 06/18/95 |
| 20 | F Stunkel | Darien, CT | 06/13/95 | C Fritzsche | Caumsett St. Pk., NY | 21 | 06/18/95 |
| 30 | F Coronato | West Bank Lt., NY | 11/03/93 | C Esperon | Rockaway Jetty, NY | | 06/18/95 |
| 22 | M Casavillo | Ft. Wadsworth, NY | 08/20/94 | J Foti | Ft. Wadsworth, NY | 23 | 06/18/95 |
| 23 | J Foti | Ft. Wadsworth, NY | 06/20/93 | J Foti | Ft. Wadsworth, NY | 27 | 06/18/95 |
| 22 | J Doyle | Trenton, NJ | 05/24/95 | M Lang | Trenton, NJ | 24 | 06/19/95 |
| 30 | A Schweithelm | Ft. Salonga, NY | 06/07/94 | S Gillis | Cuttyhunk, MA | 36 | 06/19/95 |
| 32 | F Strmiska | Fishers Is., NY | 07/10/94 | F Dyer | Fishers Is., NY | | 06/19/95 |
| 21 | J Karolides | Danvers, MA | 06/03/93 | J Ferrara | Long Beach, NY | 37 | 06/19/95 |
| 26 | F Strmiska | Fishers Is., NY | 07/10/94 | W Matyka | Fishers Is., NY | 30 | 06/19/95 |
| 27 | A Schweithelm | Fishers Is., NY | 06/10/94 | D Roberts Jr. | Watch Hill, RI | 29 | 06/20/95 |
| 34 | E Wargo | Bridgeport, CT | 06/26/94 | J Demarais | Bridgeport, CT | | 06/20/95 |
| 34 | M Favale | Boston, MA | 09/25/94 | J Fahey | Newburyport, MA | 35 | 06/20/95 |
| 31 | A Anderson | Block Is., RI | 10/04/94 | R Luce | Nantucket Sound, MA | 35 | 06/20/95 |

| Species | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Lgth** | **Tagger** | **Place Tagged** | **Date** | **Recapturer** | **Location** | **Lgth** | **Date** |
| **Striped Bass (cont.)** | | | | | | | |
| 30 | A Marsello | Cape Cod Canal, MA | 06/08/95 | T Sefton | Cape Cod Canal, MA | 30 | 06/21/95 |
| 26 | D Sowerby | York, ME | 06/27/94 | B Hall | Mouth of Chester R., MD | 27 | 06/21/95 |
| 36 | F Casey | Boston, MA | 09/26/94 | R Brady | Hull, MA | 37 | 06/21/95 |
| 29 | S Jakubowski | Raritan Reach, NJ | 12/09/93 | M Mastrobuono | Troy Dam, Green Is., NY | | 06/22/95 |
| 21 | R Wellman | Shelter Is., NY | 11/06/93 | R Moses | Charles Is., Milford, CT | 24 | 06/22/95 |
| 26 | B Shillingford | Cape May, NJ | 05/12/94 | Sea Pigeon IV | Sandy Hook, NJ | 28 | 06/22/95 |
| 28 | J Reiches | Davids Island, NY | 11/01/91 | E Wargo | Bridgeport, CT | 31 | 06/22/95 |
| 29 | N Auriti | Sandy Hook, NJ | 07/19/93 | R Baradale | Sandy Hook Bay, NJ | 31 | 06/22/95 |
| 25 | B Finke | Stamford, CT | 07/18/93 | G Pape | Stamford, CT | 30 | 06/23/95 |
| 17 | K Kyker | Norwalk Pwr Plt., CT | 04/29/94 | F Stunkel | Darien, CT | 20 | 06/23/95 |
| 32 | F Tenore Jr. | Sandy Hook, NJ | 07/22/94 | D Nalepa | Flynn's Knoll, NJ | | 06/23/95 |
| 38 | E Wargo | Westport, CT | 10/01/93 | J Bernard | Fairfield, CT | 38 | 06/23/95 |
| 16 | S Gross | City Is., NY | 11/12/94 | G Curran | Stamford, CT | 18 | 06/24/95 |
| 36 | D Kelly | Orient Pt., NY | 08/18/94 | J Doherty | Orient Pt. Park, NY | 39 | 06/24/95 |
| 35 | T Ziobo | Watch Hill, RI | 06/23/94 | T Lombardi | Watch Hill, RI | 38 | 06/24/95 |
| 19 | R Wellman | Hortons Point, NY | 09/24/91 | A Sanseviro | Fire Is. Inlet, NY | | 06/24/95 |
| 25 | E Adams | Sea Bright, NJ | 06/23/95 | W Brown | Sea Bright, NJ | 25 | 06/24/95 |
| 33 | G Kerkhan | Sea Bright, NJ | 06/07/93 | B Biedinger | Sea Bright, NJ | 39 | 06/24/95 |
| 28 | H Fisher | Susquehanna Flats, MD | 05/15/94 | E Downs | Gibson Is., MD | 31 | 06/25/95 |
| 27 | A Anderson | Block Is., RI | 09/24/94 | E Adams | Sea Bright, NJ | 29 | 06/25/95 |
| 30 | R Grobarz | Sea Bright, NJ | 05/25/94 | W Bertsch | Sea Bright, NJ | 35 | 06/25/95 |
| 21 | P Krueger | Atlantic Beach Brdg., NY | 07/29/92 | D Lucas | Montauk, NY | 26 | 06/26/95 |
| 34 | L Molnar | Shinnecock Inlet, NY | 06/15/94 | L Molnar | Shinnecock Inlet, NY | 37 | 06/26/95 |
| 21 | P Johnson Sr. | Charlestown, RI | 10/16/93 | W Clark | Little Compton, RI | | 06/26/95 |
| 27 | R Grobarz | Sea Bright, NJ | 09/28/94 | L Ramos | Sea Bright, NJ | 30 | 06/26/95 |
| 19 | A Schweithelm | Northport, NY | 11/14/93 | J Gregory | Moriches Inlet, NY | 23 | 06/26/95 |
| 27 | C Silva | Tiverton, RI | 06/06/95 | E Tirado | Portsmouth, RI | 29 | 06/27/95 |
| 38 | G D'Amato | Stratford, CT | 07/24/91 | J Paoletti | Stratford, CT | 41 | 06/27/95 |
| 20 | R Comellas | Orient Point, NY | 11/04/91 | T Rinaldi | Duck Pond Pt., NY | 29 | 06/28/95 |
| 25 | W Perlman | Atlantic Beach, NY | 05/22/93 | A Doss | Atlantic Beach Brdg., NY | 32 | 06/28/95 |
| 30 | A Anderson | Block Is., RI | 11/12/94 | L Morse | Cape Cod Canal, MA | | 06/28/95 |
| 31 | W Johnson | Stamford, CT | 06/19/94 | W Johnson | Stamford, CT | 35 | 06/28/95 |
| 16 | A LoCascio | Manhasset Bay, NY | 11/11/93 | B Fay | Fall River, MA | 17 | 06/28/95 |
| 36 | F Coronato | Sandy Hook, NJ | 10/19/93 | R Popp | Moriches Inlet, NY | 36 | 06/29/95 |
| 34 | J McAfee | Quick's Hole, MA | 07/19/94 | S Abdow | Quick's Hole, MA | 37 | 06/29/95 |
| 34 | G Glowinski | Fort Totten, NY | 05/25/95 | S Loecher | Stratford, CT | 36 | 06/29/95 |
| 29 | F Stunkel | Darien, CT | 07/26/94 | F Stunkel | Stamford, CT | 30 | 06/30/95 |
| 36 | J Karolides | Beverly, MA | 06/23/95 | J Karolides | Beverly, MA | 36 | 06/30/95 |
| 34 | J Dotsey | Rockaway, NY | 06/30/95 | R Paganini | Rockaway, NY | | 06/30/95 |
| 28 | G White | Piscataqua R., NH | 06/17/95 | G White | Piscataqua R., NH | 28 | 06/30/95 |
| 29 | D Kelly | Orient Pt., NY | 09/22/94 | D Britt | Eatons Neck, NY | 32 | 06/30/95 |
| 34 | C Lee | Boston, MA | 09/10/94 | E Flanagan | Boston, MA | 37 | 06/30/95 |
| 34 | R Grobarz | Sea Bright, NJ | 06/22/94 | W Bertsch | Sea Bright, NJ | 37 | 07/01/95 |
| 18 | T Rinaldi | Duck Pond Pt., NY | 06/10/93 | B McCaffery | Mattituck, NY | 21 | 07/01/95 |
| 24 | J Foti | The Narrows, NY | 07/17/94 | J Foti | Staten Island, NY | 25 | 07/01/95 |
| 30 | S Maguire | Newbury, MA | 08/25/94 | D Hubbard | Ipswich, MA | 34 | 07/01/95 |
| 21 | J McGuire | Hempstead, NY | 11/10/92 | P Sobolewski | Buzzards Bay, MA | 38 | 07/01/95 |
| 14 | M Matula | Raritan River, NJ | 07/27/91 | S Zomax | Lepreau R., N.B., CDA | 27 | 07/01/95 |
| 19 | J Karolides | Danvers, MA | 08/24/94 | G Lucas | Jones Inlet, NY | 27 | 07/01/95 |
| 17 | GR Gray | Charlestown, RI | 05/26/95 | D Galko | Watch Hill, RI | 18 | 07/01/95 |
| 29 | B Semasek | Indian R., DE | 12/10/93 | B Brown | Conowingo Dam, MD | | 07/01/95 |
| 33 | F Coronato | Sandy Hook, NJ | 08/21/94 | D Lilly | Sandy Hook, NJ | | 07/01/95 |
| 20 | D Zurheide | Ellis Is., NY | 07/24/94 | J Strohmeier | Ellis Is., NY | 23 | 07/01/95 |
| 27 | A Dangelo | W of Block Is., RI | 06/10/95 | V Alvarez | Buzzards Bay, MA | | 07/01/95 |
| 36 | A Lo Cascio | Manhasset Bay, NY | 05/24/93 | R Marston | Popham Beach, ME | 38 | 07/01/95 |
| 29 | C Matuzek | Plymouth, MA | 08/03/94 | G Kinsman | Plymouth, MA | 31 | 07/02/95 |
| 29 | G Kerkhan | Sea Bright, NJ | 07/04/93 | B Biedinger | Sea Bright, NJ | 33 | 07/02/95 |
| 19 | J Samyn | Barker Pt., NY | 12/04/94 | R Nystrom | Housatonic R., CT | 19 | 07/02/95 |
| 31 | G Ruest | Quick's Hole, MA | 08/08/94 | A Malgieri | Quick's Hole, MA | 33 | 07/02/95 |
| 14 | J Karolides | Beverly, MA | 06/01/95 | S Glenn | Salem, MA | | 07/02/95 |
| 28 | G Ruest | Quick's Hole, MA | 08/03/94 | A Malgieri | Quick's Hole, MA | 28 | 07/02/95 |
| 31 | D Mann | Quick's Hole, MA | 07/30/93 | A Malgieri | Quick's Hole, MA | 32 | 07/02/95 |
| 21 | M Matula | Arthur Kill, NJ | 06/26/94 | T Lynch | Rockaway, NY | | 07/02/95 |

**Species**

| Lgth | Tagger | Place Tagged | Date | Recapturer | Location | Lgth | Date |
|---|---|---|---|---|---|---|---|
| **Striped Bass (cont.)** | | | | | | | |
| 31 | M Barrett | West Bank Lt., NY | 11/20/94 | J Sypek | Quick's Hole, MA | 32 | 07/02/95 |
| 33 | S Fries | Montauk, NY | 11/08/94 | R Woods | Watch Hill, RI | 35 | 07/03/95 |
| 32 | A Gumbus | Milford, CT | 10/23/91 | D Beneway | Stratford, CT | 35 | 07/03/95 |
| 20 | D Zurheide | Ellis Island, NY | 07/12/94 | J Strohmeier | Ellis Is., NY | 25 | 07/03/95 |
| 26 | T Rinaldi | Mattituck, NY | 06/29/93 | J Roach | Stamford, CT | 31 | 07/03/95 |
| 18 | T Marburger | Northport, NY | 03/26/95 | D Carveiro | Somerset, MA | | 07/03/95 |
| 24 | A Ganss | Harvey Cedars, NJ | 10/07/92 | B Curry | Sea Girt, NJ | 29 | 07/03/95 |
| 19 | R Conklin | Moriches Inlet, NY | 05/14/95 | B Sheehan | Chatham, MA | | 07/03/95 |
| 28 | G Ruest | Quick's Hole, MA | 06/16/95 | A Belliveau | Vineyard Sound, MA | 30 | 07/03/95 |
| 25 | R Szulczewski | Cape May, NJ | 11/06/93 | W Bazel | Manchester, MA | 34 | 07/04/95 |
| 25 | J McAfee | Quick's Hole, MA | 08/11/94 | P Osmon | Quick's Hole, MA | 30 | 07/04/95 |
| 24 | J Foti | Ft. Wadsworth, NY | 06/17/95 | P Wentworth | Verrazano Brdg., NY | | 07/04/95 |
| 25 | J Foti | The Narrows, NY | 07/07/94 | P Wentworth | Verrazano Brdg., NY | | 07/04/95 |
| 25 | J Foti | Staten Island, NY | 07/01/95 | P Wentworth | Verrazano Brdg., NY | | 07/04/95 |
| 26 | F Tenore | Sandy Hook, NJ | 07/11/93 | V Kelly | Long Branch, NJ | 28 | 07/04/95 |
| 30 | M Rivera | Quick's Hole, MA | 08/13/94 | G Duclos | Cuttyhunk Is., MA | 30 | 07/04/95 |
| 25 | G Thompson | Atlantic Beach, NY | 06/21/95 | L Richards | Atlantic Beach Brdg., NY | 28 | 07/04/95 |
| 25 | J Foti | Staten Island, NY | 07/03/94 | P Wentworth | Verrazano Brdg., NY | | 07/04/95 |
| 29 | E Northey | Barnegat Lt., NJ | 12/03/94 | M Storm | Newburyport, MA | 30 | 07/05/95 |
| 35 | J Demarais | Bridgeport, CT | 06/20/95 | E Wargo | Bridgeport, CT | 35 | 07/05/95 |
| 27 | C Wilcox III | Moriches Inlet, NY | 11/01/94 | E Ciappa | Moriches Inlet, NY | 29 | 07/05/95 |
| 27 | J Brittin | Cape May, NJ | 11/04/93 | G Buono | Sandy Hook, NJ | 32 | 07/06/95 |
| 25 | W Johnson | Stamford, CT | 06/17/94 | V Insinga | Stamford, CT | 26 | 07/06/95 |
| 35 | G Buono | Sandy Hook, NJ | 06/10/95 | G Buono | Sandy Hook, NJ | 35 | 07/06/95 |
| 32 | E Petronio Sr. | The Race, L.I.Sound | 06/17/95 | R Masciarelli | L.I. Sound | | 07/06/95 |
| 30 | S Penta | Boston, MA | 09/07/94 | M Favale | Boston, MA | 32 | 07/06/95 |
| 18 | T Marburger | Northport, NY | 04/24/95 | W Sisti | Northport, NY | 18 | 07/06/95 |
| 32 | M Favale | Boston, MA | 07/02/95 | J Conti | Boston, MA | 32 | 07/06/95 |
| 22 | S Penta | Boston, MA | 09/15/94 | J Conti | Boston, MA | 24 | 07/06/95 |
| 33 | G Kerkhan | Sea Bright, NJ | 06/11/93 | B Biedinger | Sea Bright, NJ | 39 | 07/07/95 |
| 24 | J Krauss | Sandy Hook, NJ | 05/27/95 | S Ahearn | Montauk Pt., NY | 28 | 07/07/95 |
| 30 | A Marsello | Cape Cod Canal, MA | 07/21/94 | L Clark | Cape Cod Canal, MA | 32 | 07/07/95 |
| 32 | G Ministeri | Cape Cod Bay, MA | 08/31/93 | P Swenson | Newburyport, MA | 36 | 07/07/95 |
| 18 | P Grippo | Haunt's Creek, NY | 08/11/87 | P LeCorre | Bayside, NY | 24 | 07/07/95 |
| 35 | A LoCascio | Hart Is., NY | 08/16/94 | J Caputo | Hart Is., NY | 35 | 07/08/95 |
| 28 | C Lienau | Montauk Pt., NY | 10/08/94 | D Kaehrle | Rye, NY | 31 | 07/08/95 |
| 31 | D Mann | Quick's Hole, MA | 08/13/94 | A Malgieri | Quick's Hole, MA | 32 | 07/08/95 |
| 30 | R Grobarz | Sea Bright, NJ | 09/25/94 | J Dix | Deal, NJ | 33 | 07/08/95 |
| 20 | D Zurheide | Ellis Is., NY | 07/12/94 | J Strohmeier | Ellis Is., NY | 24 | 07/08/95 |
| 20 | F Casey | Boston, MA | 10/09/95 | A Minafo | Rockaway, NY | | 07/09/95 |
| 25 | S Maguire | Newbury, MA | 06/22/94 | M Peck | Newbury, MA | 28 | 07/09/95 |
| 31 | T Marburger | Northport, NY | 02/12/95 | W Yackel | Rocky Pt., L.I. NY | 32 | 07/09/95 |
| 41 | B Cotiaux | Plum Is., NY | 06/03/93 | A Letavec | Plum Is., NY | 42 | 07/10/95 |
| 30 | M Barrett | West Bank Lt., NY | 11/12/94 | P Sabine | Sandy Hook, NJ | 30 | 07/10/95 |
| 28 | E Johnson | Plum Gut, NY | 06/29/95 | P DeMarco | The Race, L.I. Sound | 29 | 07/10/95 |
| 26 | F Strmiska | Fishers Is., NY | 07/10/94 | G Gozda | Fishers Is., NY | 27 | 07/10/95 |
| 27 | D Kelly | Orient Pt., NY | 10/09/93 | A Fogal | Plum Gut, NY | 29 | 07/10/95 |
| 28 | D Kelly | Orient Pt., NY | 10/08/94 | C Silva | Middletown, RI | | 07/10/95 |
| 28 | G White | Piscataqua R., NH | 08/16/94 | M Aldridge | Portsmouth, NH | 29 | 07/11/95 |
| 33 | L Molnar | Shinnecock Inlet, NY | 06/27/94 | D DeCoste | Gloucester, MA | 36 | 07/11/95 |
| | J Treat | Nomans Is., MA | 06/10/95 | S Pietruska II | Nomans Is., MA | 34 | 07/11/95 |
| 36 | J Goulart | Newport, RI | 06/12/93 | E Noll | Narragansett Bay, RI | 37 | 07/11/95 |
| 24 | C Fiorello | Long Branch, NJ | 11/27/92 | E Tompkins | Scarborough R., ME | 29 | 07/11/95 |
| 24 | R Soucy | Milford, CT | 06/04/95 | D Wells | Stratford, CT | 25 | 07/11/95 |
| 14 | R Joyce | Nyack, NY | 04/09/93 | J DeJesus | Perth Amboy, NJ | | 07/12/95 |
| 26 | A Anderson | Block Is., RI | 06/13/95 | A Anderson | Block Is., RI | 26 | 07/12/95 |
| 34 | J Karolides | Danvers, MA | 10/09/93 | A Masterson | Boston Harbor, MA | 36 | 07/12/95 |
| 18 | T Marburger | Northport, NY | 06/17/95 | A Discorsi | Nissequogue R., NY | | 07/12/95 |
| 25 | A Dangelo | Montauk, NY | 11/09/94 | D August | Provincetown, MA | 26 | 07/13/95 |
| 19 | E Petronio Jr. | Pt. Judith, RI | 07/11/95 | R Moison | Pt. Judith, RI | | 07/13/95 |
| 22 | A Marsello | Cape Cod Canal, MA | 08/13/94 | L Zanchi | Bourne, MA | 28 | 07/13/95 |
| 24 | W Perlman | Atlantic Beach, NY | 06/26/94 | A Malveto | Atlantic Beach Brdg., NY | 25 | 07/13/95 |
| 25 | D Kelly | Orient Pt., NY | 08/01/93 | R Nielsen | Baiting Hollow, NY | 28 | 07/13/95 |

| Species | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Lgth** | **Tagger** | **Place Tagged** | **Date** | **Recapturer** | **Location** | **Lgth** | **Date** |
| **Striped Bass (cont.)** | | | | | | | |
| 28 | C Silva | Castle Hill, RI | 09/13/94 | G Allen | Brenton Reef, RI | | 07/14/95 |
| 27 | G White | Piscataqua R., NH | 06/22/95 | R Whitten | Swampscott, MA | | 07/14/95 |
| 36 | R Paganini | Tobay Beach, NY | 10/27/94 | J Ordeshook | Newburyport, MA | | 07/14/95 |
| 30 | G Ruest | Quick's Hole, MA | 08/08/94 | J Franklin | Quick's Hole, MA | | 07/14/95 |
| 28 | G Ruest | Quick's Hole, MA | 06/16/95 | D Labrecque | New Bedford, MA | 29 | 07/14/95 |
| 29 | M Barrett | West Bank Lt., NY | 11/20/94 | T Magee | Rockaway, NY | 29 | 07/14/95 |
| 27 | G Ruest | Quick's Hole, MA | 06/16/95 | D Labrecque | New Bedford, MA | 29 | 07/14/95 |
| 27 | G D'Amato | Block Is., RI | 05/27/95 | R Rzepecki Jr. | Block Is., RI | 27 | 07/14/95 |
| 37 | G Ottavio | Cape May, NJ | 11/11/94 | S Pietruska II | Vineyard Sound, MA | | 07/14/95 |
| 26 | A Anderson | Block Is., RI | 05/26/95 | J Morrison | Block Is., RI | 30 | 07/15/95 |
| 29 | D Magnasco | Boston, MA | 09/11/94 | J Conti | Boston, MA | 31 | 07/15/95 |
| 34 | W Perlman | Long Beach, NY | 10/30/94 | G Perschino | Westport, CT | 37 | 07/15/95 |
| 30 | E Petronio Jr. | The Race, L.I. Sound | 06/17/95 | R Jobin | Watch Hill, RI | | 07/15/95 |
| 27 | T Rinaldi | Duck Pond Pt., NY | 06/24/95 | A Granados | Watch Hill Passage, RI | | 07/15/95 |
| 19 | S Penta | Boston, MA | 10/18/92 | B Burns | Kennebec R., ME | 25 | 07/15/95 |
| 21 | S Penta | Boston, MA | 10/06/94 | J Rego | Kennebec R., ME | | 07/15/95 |
| 34 | J McAfee | Quicks Hole, MA | 08/23/94 | J Woodruff | Buzzards Bay, MA | 35 | 07/15/95 |
| 12 | M Aiken | Milford, CT | 10/19/94 | F Brown | Stratford, CT | | 07/15/95 |
| 24 | R Nystrom | Stratford, CT | 10/29/94 | F Brown | Stratford, CT | | 07/15/95 |
| 37 | W Sharpe | Navesink R., NJ | 10/24/93 | R Jones Sr. | Cape Cod Canal, MA | | 07/15/95 |
| 33 | J Samyn | Execution Rocks, NY | 12/04/94 | J Dutton | Middle Ground Lt., NY | 34 | 07/15/95 |
| 16 | J Karolides | Beverly, MA | 06/03/94 | W LeBrun | Salem Harbor, MA | | 07/15/95 |
| 24 | A Marsello | Cape Cod Canal, MA | 05/26/95 | W] Anderson | Brewster, MA | 24 | 07/15/95 |
| 21 | R Canfield | Norwalk, CT | 07/03/95 | F Brown | Stratford, CT | | 07/15/95 |
| 35 | J McAfee | Quicks Hole, MA | 08/08/94 | J Woodruff | Buzzards Bay, MA | 35 | 07/15/95 |
| 36 | P Walther | Chatham, MA | 07/25/93 | A Williams | Manchester, MA | 38 | 07/16/95 |
| 18 | D Zurheide | Ellis Island, NY | 07/17/94 | R Carr Jr. | Bayonne, NJ | 18 | 07/16/95 |
| 38 | K Kyker | Darien, CT | 06/26/95 | B Vesloski | Huntington, NY | | 07/16/95 |
| 34 | P Governale | Moriches Inlet, NY | 11/01/94 | J Sylvia | Martha's Vineyard, MA | 38 | 07/16/95 |
| 33 | J Murphy | Newport, RI | 07/30/94 | J Sweet | Newport, RI | 34 | 07/16/95 |
| 28 | R Grobarz | Sea Bright, NJ | 05/18/95 | V Kelly | Long Branch, NJ | 30 | 07/16/95 |
| 17 | C Wilcox III | Moriches Bay, NY | 08/16/94 | J Gregory | Moriches Bay, NY | 21 | 07/16/95 |
| 28 | F Stunkel | Stamford, CT | 08/11/94 | F Ryan | Stamford, CT | 30 | 07/17/95 |
| 22 | F Stunkel | Stamford, CT | 10/25/93 | M Coulombe | Taunton, MA | 28 | 07/17/95 |
| 21 | M Romano | Kill Van Kull, NJ | 05/29/93 | S Pisano | Gravesend Bay, NY | | 07/17/95 |
| 21 | P Krueger | Atlantic Beach Brdg., NY | 06/15/94 | L Richards | Atlantic Beach, NY | 24 | 07/17/95 |
| 28 | R Allen | Cape Charles, VA | 05/21/95 | B Newton | Ches. Bay Brdg. Tun., VA | | 07/17/95 |
| 30 | A Marsello | Cape Cod Canal, MA | 06/16/95 | D Howshan | Cape Cod Canal, MA | 32 | 07/18/95 |
| 22 | S Kellner | Mattituck, NY | 10/20/94 | C Pinheiro | Fairfield, CT | 28 | 07/18/95 |
| 25 | T Marburger | Shinnecock Inlet, NY | 05/30/95 | S Diaz | Montauk Pt., NY | | 07/18/95 |
| 31 | R Carlson Jr. | Block Is., RI | 06/18/94 | A Anderson | Block Is., RI | 33 | 07/18/95 |
| 27 | S Cunningham | Pt. Lookout, NY | 06/10/94 | G Edwards | Moriches Inlet, NY | 29 | 07/18/95 |
| 30 | K Conway | Hull, MA | 07/18/95 | D McFarland | Hull, MA | | 07/19/95 |
| 34 | G White | Piscataqua R., NH | 08/12/94 | J Savage | Rye, NH | 35 | 07/19/95 |
| 26 | P Chowansky | Sea Girt, NJ | 07/16/95 | M Ritger | Sea Girt, NJ | | 07/19/95 |
| 34 | A Anderson | Block Island, RI | 10/10/94 | A Dangelo | Block Is., RI | 34 | 07/20/95 |
| 34 | F Stunkel | Stamford, CT | 08/06/94 | J LoBianco | Stamford, CT | 37 | 07/20/95 |
| 22 | F Casey | Boston, MA | 05/25/94 | Hbr Exploration | S. Bstn, MA | 22 | 07/20/95 |
| 22 | J Dotsey | Long Beach, NY | 11/18/93 | M Cormier | Phippsburg, ME | 30 | 07/20/95 |
| 29 | F Heal | Staten Island, NY | 05/20/95 | D Schleifer | Montauk Pt., NY | 29 | 07/21/95 |
| 21 | L Quinn | New Haven, CT | 07/11/93 | L Quinn | New Haven, CT | 26 | 07/21/95 |
| 25 | M Berger | Atlantic Beach Brdg., NY | 06/23/95 | D Durando | Atlantic Beach Brdg., NY | | 07/21/95 |
| 19 | T Marburger | Northport, NY | 04/08/95 | J Batte | Provincetown, MA | 19 | 07/21/95 |
| 27 | J Foti | Ft. Wadsworth, NY | 07/07/93 | J Strohmeier | Ellis Is., NY | 28 | 07/21/95 |
| 34 | S Fries | Montauk, NY | 08/10/94 | D Cagno | Montauk Pt., NY | 36 | 07/21/95 |
| 34 | A D'Amato | Cape May Rips, NJ | 11/03/94 | R Coffey | Plymouth, MA | 34 | 07/22/95 |
| 34 | B Shillingford | Cape May, NJ | 11/07/91 | R Johnson | Cape May Pt., NJ | 36 | 07/22/95 |
| 19 | A Marsello | Swansea, MA | 06/22/95 | M Hel Jr. | Swansea, MA | | 07/22/95 |
| 32 | C Flaherty | Boston, MA | 06/20/95 | F Flaherty | Boston, MA | 32 | 07/22/95 |
| 22 | T Lynch | Stamford, CT | 10/30/90 | R Morrissette | Norwalk, CT | 32 | 07/23/95 |
| 11 | J Karolides | Danvers, MA | 05/26/95 | B Pashby | Danvers, MA | 16 | 07/23/95 |
| 27 | G Nigro | Sandy Hook, NJ | 10/21/94 | H Clougher | Shrewsbury R., NJ | 27 | 07/23/95 |
| 38 | H Sweet | Jamestown, RI | 06/17/95 | J Murphy | Narrow River, RI | 39 | 07/23/95 |

| Species / Lgth | Tagger | Place Tagged | Date | Recapturer | Location | Lgth | Date |
|---|---|---|---|---|---|---|---|
| **Striped Bass (cont.)** | | | | | | | |
| 33 | J McAfee Jr. | Quick's Hole, MA | 07/14/95 | E Amaral | Quick's Hole, MA | 33 | 07/23/95 |
| 30 | J Gibbons | Sandy Hook, NJ | 10/09/94 | F Urban | Flynns Knoll, NJ | 30 | 07/24/95 |
| 33 | T Danas | Little Egg Inlet, NJ | 05/08/95 | C DeGennaro | Monmouth Beach, NJ | | 07/24/95 |
| 23 | J Mulkerin | Port Monmouth, NJ | 04/18/94 | D Savastano | Newburyport, MA | 24 | 07/24/95 |
| 33 | C Wilcox III | Moriches Inlet, NY | 12/02/94 | F Seiders | Damariscotta R., ME | 37 | 07/25/95 |
| 20 | R Nystrom | Stratford, CT | 04/23/95 | G de Labry | New London, CT | | 07/25/95 |
| 24 | S Caville | Cape May, NJ | 04/25/95 | B Mow | N. Truro, MA | | 07/25/95 |
| 28 | F Coronato | West Bank Lt., NY | 07/08/95 | B Fernandez | SW Old Orchard Lt., NY | 28 | 07/25/95 |
| 27 | D Sowerby | York Beach, ME | 07/13/95 | M Haney | York Beach, ME | | 07/25/95 |
| 35 | A Schwiethelm | Montauk Pt., NY | 07/12/95 | A Cicinelli | Montauk Pt., NY | 37 | 07/26/95 |
| 34 | A Marsello | Cape Cod Canal, MA | 08/13/94 | D Powers | Cape Cod Canal, MA | 38 | 07/26/95 |
| 31 | L Richards | Atlantic Beach, Ny | 07/03/95 | D Gottlieb | Debs Inlet, NY | | 07/27/95 |
| 29 | P Mareno | Sandy Hook, NJ | 06/29/93 | S Powers | Sandy Hook, NJ | 34 | 07/27/95 |
| 21 | P Hierholzer | Sea Isle Lump, NJ | 12/02/93 | W Beck | Wiscasset, ME | 23 | 07/27/95 |
| 33 | S Penta | Boston, MA | 09/16/94 | S Penta | Boston, MA | 34 | 07/27/95 |
| 30 | F Ryan | Darien, CT | 06/30/95 | R Montgomery | Darien, CT | | 07/27/95 |
| 30 | S Penta | Boston, MA | 09/11/94 | S Penta | Boston, MA | 31 | 07/27/95 |
| 18 | D Zurheide | Ellis Is., NY | 09/03/94 | J Strohmeier | Ellis Is., NY | 21 | 07/28/95 |
| 18 | S Gross | City Is., NY | 11/13/94 | H Cowen | Stamford, CT | | 07/28/95 |
| 27 | B Semasek | Indian R., DE | 07/25/95 | J Krawczyk | Indian R. Inlet, DE | | 07/28/95 |
| 36 | J Karolides | Beverly, MA | 09/02/94 | V Boudreau | Beverly, MA | 36 | 07/28/95 |
| 33 | G Allen | Newport, RI | 07/15/95 | J Falcioni | Newport, RI | | 07/28/95 |
| 16 | S Gross | City Island, NY | 09/27/91 | S Lo Presti | Eastchester Bay, NY | 24 | 07/29/95 |
| 32 | L Molnar | Shinnecock Inlet, NY | 06/27/94 | F Hansen | Montauk, NY | 37 | 07/30/95 |
| 26 | A Anderson | Block Is., RI | 11/13/94 | D Sullivan | Duxbury Bay, MA | 28 | 07/30/95 |
| 31 | J Mettler | Fishers Island, NY | 10/07/92 | R Locke | Provincetown, MA | 36 | 07/30/95 |
| 20 | D Goldberg | Long Beach, NY | 11/09/94 | C Doliber | Cape Cod Canal, MA | | 07/30/95 |
| 21 | R Leja | Bridgeport, CT | 10/22/92 | B Jackson | Chatham, MA | 30 | 07/30/95 |
| 21 | K Bilodeau | Norwich, CT | 01/21/93 | P Catucci | Stonington, CT | 24 | 07/31/95 |
| 18 | J Karolides | Danvers, MA | 09/22/94 | M Bailey | Danvers R., MA | 18 | 07/31/95 |
| 31 | S Fries | Montauk, NY | 11/08/94 | A Petrone | Montauk Pt., NY | 34 | 07/31/95 |
| 17 | D Sowerby | Cape Neddick, ME | 07/03/95 | C Furman | Wells, ME | 17 | 08/01/95 |
| 21 | F Stunkel | Stamford, CT | 11/15/93 | A Hamdi | Stratford, CT | 32 | 08/01/95 |
| 24 | R Chmiel | Fishers Is., NY | 07/18/93 | R Donnley | Orient Pt., NY | 28 | 08/02/95 |
| 22 | J Mulkerin | Sandy Hook, NJ | 11/09/94 | W Richards | Newport, RI | | 08/02/95 |
| 33 | J Posh | Watch Hill, RI | 06/28/95 | W Matyka Jr. | Fishers Is., NY | | 08/04/95 |
| 29 | J McAfee | Quick's Hole, MA | 08/03/94 | C Wyman | Quick's Hole, MA | | 08/04/95 |
| 12 | W Draesel | Barnegat Inlet, NJ | 07/14/95 | D Siegel | Barnegat Inlet, NJ | 13 | 08/05/95 |
| 30 | A Schweithelm | Montauk Pt., NY | 07/12/95 | S Roland | Montauk Pt., NY | 32 | 08/05/95 |
| 34 | A Marsello | Cape Cod Canal, MA | 09/30/94 | A Eugenio | Cape Cod Canal, MA | 36 | 08/05/95 |
| 20 | R Leja | Bridgeport, CT | 06/08/92 | D Becker Jr. | Bridgeport, CT | 31 | 08/05/95 |
| **Tautog** | | | | | | | |
| 16 | G Onnembo | Elberon, NJ | 05/07/95 | W Nemeth | Sea Bright, NJ | 17 | 05/22/95 |
| 9 | J Ziobo | Bridgeport, CT | 06/03/95 | J Ziobo | Bridgeport, CT | 09 | 06/10/95 |
| 9 | J Ziobo | Bridgeport, CT | 06/10/95 | T Ziobo | Bridgeport, CT | 09 | 06/17/95 |
| 10 | J Ziobo | Bridgeport, CT | 06/19/95 | J Ziobo | Bridgeport, CT | 10 | 07/02/95 |
| 9 | T Ziobo | Bridgeport, CT | 06/17/95 | J Ziobo | Bridgeport, CT | 09 | 07/02/95 |
| 11 | D Mann | Middle Ground Lt., NY | 10/05/94 | K Vasiliou | Middle Ground Lt., NY | 11 | 07/09/95 |
| 12 | J Dotsey | Atlantic Beach Reef, NY | 09/29/94 | J Dotsey | SE of E Rckaway Inlet, NY | 13 | 07/22/95 |
| **Weakfish** | | | | | | | |
| 12 | A D'Amato | Cape May Pt., NJ | 07/21/93 | A Thompson | Staten Is., NY | 14 | 08/10/94 |
| 16 | D Haines | Cape May Pt., NJ | 05/28/94 | J McCarthy | Cape May Pt., NJ | 17 | 08/16/94 |
| 17 | A D'Amato | Delaware Bay, NJ | 09/15/94 | A Patterson | Delaware Bay, NJ | | 09/15/94 |
| 13 | B Shillingford | Corson's Inlet, NJ | 10/07/94 | Ukn fisherman | Cape Hatteras, NC | 13 | 03/29/95 |
| 17 | T Surgent | Manasquan R., NJ | 08/20/94 | F Donato | Fulton Fish Market, NY | | 10/03/94 |
| **White perch** | | | | | | | |
| 10 | D Spring | Jamestown Is., VA | 10/23/94 | R Kellam | 7 mi. N of Jamestown, VA | | 01/15/95 |
| **Winter Flounder** | | | | | | | |
| 11 | A Schwartz | Sandy Hook Bay, NJ | 05/25/94 | M Stefanowicz | Spermacetti Cove, NJ | | 04/26/95 |
| 14 | P Westcott | Nantucket Sound, MA | 04/30/94 | G Hatfield | Offshr., Cape Cod, MA | | 07/24/95 |

# Book Reviews

## A NATURALIST ALONG THE NEW JERSEY SHORE

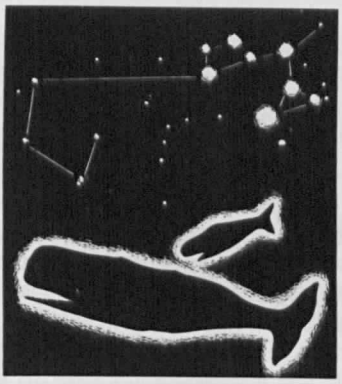
by Joanna Burger

Rutgers University Press,
New Brunswick, NJ
271 p. $18.95 (paper)

This is a model of how to write a book about natural history, primarily because it follows rule #1: learn your subject by going out and looking. Joanna Burger is a terrific observer of wildlife — smart, curious, and thorough. In this volume she has recorded for all of us what she has seen along the New Jersey shore over a quarter of a century (It should be noted here that, in addition, she has written widely in the scientific literature.) The book is highly recommended for readers all along the mid-Atlantic coast.

She is best at coastal birds, a keen recorder of the behavior of laughing gulls, black skimmers, shorebirds like the piping plover, and wading birds — egrets, herons, and ibis. The book follows the seasons on New Jersey beaches and bays, from arrival and nesting in spring to the fall migrations, and it covers a variety of habitats — busy beaches where plovers compete with sun worshippers for space, to secret Barnegat Bay Islands and the wading bird rookeries of the industrial Arthur Kill. There are toads here too, along with monarch butterflies, fishes, horseshoe crabs, and diamondback terrapins, ghost crabs, brant, and snowy owls.

It's worth the price of admission just to read Burger about laughing gulls, obviously one of her favorites. While she writes feelingly about their nesting and chick raising, federal gunners 100 miles north at Kennedy Airport are busy trying to shoot out colonies of laughing gulls in the cause of airplane safety. Go figure.



## THE YEAR OF THE WHALE

by Victor B. Scheffer

illustrated by Leonard Everett Fisher

Lyons & Burford
213 p. $14.95 (paper)

With an introduction written in 1996, Lyons and Burford have reissued this classic originally published in 1969. For 30 years Victor B. Scheffer worked for the U. S. Fish and Wildlife Service as a biologist specializing in marine mammals, so it should come as no surprise that his book is full of interesting details about the lives of many marine creatures. What might come as a surprise though, is his skill as a writer.

The author uses his years of experience and accumulated data to create a fictionalized account of a sperm whale's first year. Scheffer follows the calf, its mother, and the familial herd on their migrations of the Pacific Ocean. He uses this device to touch on the lives of many ocean dependent creatures, from plankton to whales, with man tossed into the mix.

Throughout the book he maintains a pleasant balance of fiction and science, gracefully slipping from the telling of the Little Calf's story to discussions of fact, theory, and opinion. A less talented writer would have been tempted to romanticize his subject, but here the author avoids that trap and the book never becomes sentimental or sappy.

If you missed this book the first time around, read it now. If you read it back then, you might want to pick it up again.

## THE CORPS AND THE SHORE

by Orrin H. Pilkey and Katharine L. Dixon
Island Press, Washington, DC
246 p. $22.95 (cloth).

It must have occurred to the people who run the U. S. Army Corps of Engineers (hereinafter the Corps) and the elected officials who fund Corps projects that the country was quickly running out of rivers to dam and engineers to hire and concrete to pour, so they put their collective heads together and came up with a brand new scheme to move material and spend tax money. It's called shore protection. But there was an early fatal flaw in their decision that the shore needed protection from the sea. It doesn't; it needs protection from illogical — some even call it stupid, insane, or selfish — over development, and the Corps isn't trained scientifically or empowered legally to do the job.

This book by Pilkey and Dixon is a thorough, well reasoned critique of the Corps shore practices. Both authors come well equipped for the task. He is James B. Duke professor of geology Duke University and director of the Program for the Study of Developed Shorelines, and she a research associate there. Both have wide experience in the field, at public hearings, and with the books. Add to that good writing skills and a sense of the ridiculous —you can't conduct a dissection of the Corps' follies without bewilderment — and the book contains all the ingredients for good reading and lessons worth learning. An outline of the book: introductory chapters about beaches, then five examples of Corps shore projects — Folly Beach, SC; Sargent Beach, TX; Presque Isle, Lake Erie, PA; Camp Ellis, ME; and Oregon Inet, NC. and a final chapter, probably the book's most important because it describes the present dismal state of political, scientific, and engineering affairs in the Corps, and suggests some remedies.

Early on, the authors point out certain geological truths that the Corps appears to be ignoring: sea level is rising; beaches tend to move around a lot, usually unpredictably; barrier islands depend on coastal storms for survival. They then recount how current Corps shore thinking is off the mark.

The examples make for fun, enlightened reading: million dollar projects crashing down over the ears of cocksure engineers; nourished beaches washing away almost as fast as Corps' contractors can pump them; scientists flying in the face of evidence; and politicians loading up federal legislation with local pork barrel projects. Listen to the authors:

— "According to our definitions of beach durability, 26 percent of replenished U. S. Atlantic Coast barrier island beaches (from the south shore of Long Island to Florida) were effectively gone in less than one year, while 62 percent lasted between two and five years..."

— "On the basis of our studies of replenished beaches as well as our understanding of modern oceanographic principles, we have concluded that virtually all of the ...design principles that the Corps uses to predict beach durability are wrong."

— "Answering complaints that the public would be denied access to the beaches it helped pay for in Sea Bright, NJ, a corps spokesman said: 'Limited parking and concerns about local traffic bottlenecks will be overcome in part by a state plan to have shuttle buses between Sandy Hook (the national seashore to the north, where parking is already insufficient) and the new beaches.' No such plan existed then or now."

It is the authors' thesis that the Corps won't get any better at beachworks until its science gets better, until it avails itself of local, independent oversight, and until it is freed of the current funding system that pressures it to make self-fulfilling decisions. Add one more: the real culprit here may be Congress which dictates how much money gets spent and where, and there is hardly a beach project that

some Representative doesn't love. Recently, the Clinton administration suggested that the federal share of shore protection funding be cut from the prescribed 65% to 25% with locals picking up a much larger share. This proposal drew predictable responses — elected officials along the seashore moaned, and the Corps, after a careful measure of the political currents, joined the chorus. The authors believe that once the facts are known, it will be obvious to all that the Corp's shore schemes are unworkable, and we can get on with the job of learning to do it right.

This is a highly recommended study of an important coastal issue; it should be read by elected officials, engineers, and a public less and less willing to pay for ill-planned shore projects.

## PETERSON FLASH GUIDES

by Roger Tory Peterson
Houghton Mifflin, New York.
24 panels, $7.95 (laminated).

A series of six foldable, laminated panels to key out birds grouped by habitat or type: backyard, Atlantic or Pacific coastal, hawks, and eastern or western trailside. They are about the size of road maps, so they fit in the back pocket and refold easily after use. The sample we have covers "all the day-flying birds of prey seen in North America...for hiking or biking, or a stroll around the block...the perfect fast and easy reference." That's an accurate description. One or two of these might stir the outdoor interests of a youngster — they are fun to unfold and use.

*(This note is written just two days after the death of Roger Tory Peterson, Sunday, July 28, 1996, at the age of 87. He put birding on the map for good with his field work, writing, and painting. We spent part of that Sunday watching a pair of ospreys tending a delinquent fledgling at Sandy Hook. On this flashcard, the osprey is elegantly illustrated, "a large black and white patterned hawk, common in coastal areas...hovers over water and dives headfirst for fish." It occurred to us that we watch birds primarily because Peterson made it easy. He leaves a long trail of good works, including this new series.)*

**Osprey**
21–24½"
A large, black-and-white-patterned hawk. Common in coastal areas and on inland lakes. Resembles a gull in flight. Hovers over water and dives headfirst for fish. Retreats from most of North America in winter.

## THE SHORESAVER'S HANDBOOK

by Tucker Coombe
An American Littoral Society Book
Lyons & Burford, New York
132 p. $12.95 (cloth).

No, this is not a book about shore protection. This is a citizen's guide to cleaner coastal waters and beaches, ways to attack bad things that float up on the sand or pollute nearshore waters. The author catalogues the threats and their sources, recommends action, and lists local agencies or groups already working on solutions. No matter where you live, there will be a list of things to do and a place to write or phone for more information. The publishers point out that this book coupled with an earlier American Littoral Society publication — THE WASTED OCEAN — makes a convenient pair of handbooks for the seashore advocate. Non-profit coastal groups may want to phone Lyons & Burford to inquire about volume discounts for both books; call 800-836-0510, extension 24.

# *OVER THE RAIL AND INTO THE PAIL, OR YOU CAN'T COOK 'EM IF YOU CAN'T HOOK 'EM*

We have had a lot of questions the past six months about the cooking and eating of seafood. Rather than dribble out the answers over time, below is a collection of questions and answers to fit every culinary desire:

Q: How can I pick out a good piece of fish at the market?

A: Ask the manager if the piece of fish is fresh; if he says yes, buy it. If you spy a whole fish in the market, ask yourself the following questions: Does the fish smell bad? If you poke it does your finger come out the other side? Are there flies on it? If the answer to any two of these questions is yes, don't buy the fish.

Q: Is all seafood good to eat?

A: No. There is a direct correlation between a fish's name and its edibility. For example, orange roughy is not as good as Dover sole. Dogfish is tougher and less flavorful than ocean fresh pompano. But let me ask you: Would you rather eat slime eel stew or braised sea bass? Sea robin or salmon? Goosefish or tuna? I rest my case.

Q: What is the most common mistake made when cooking seafood.A: Undercooking it. There's been a lot of razzmatazz recently about not cooking fish till it dries out, statements that fish should be just past translucent. Tuna is a prime example: people order it seared or scorched on the outside and rare on the inside. Balderdash! Fish must be cooked long and hard to kill parasites, to tone down "fishy" tastes, and to bring out the best flavor that fish has to offer. General thumb rule: boil, fry, bake, or broil any seafood 30 minutes per pound, minimum 60 minutes; that works out to 60 minutes of boiling for a one-pound lobster, 60 minutes of frying for a small bluefish fillet; and two and a half hours on the grill for a five-pound side of salmon. If you are afraid that this much cooking time will dry out your seafood, lather the seafood with mayonnaise before, during, and after cooking. (See receipe below).

Q: Do you have a favorite, foolproof receipe for a seafood dish? And would you share it?

A: Yes and yes. My favorite fish dish is Pastiche of Ling, also known as Broasted Mudbelly. It's a marvelous year-round treat. Here's how you do it: Choose about six whole one-pound ling, rinse and pat dry, but do not clean. Soak the ling for about 30 minutes in a marinade of buttermilk, paprika, salt and pepper, lemon jest, and a pinch of nutmeg. Reserve marinade. Lay the ling side by side, head to tail, in a deep baking dish, cover with thinly sliced onions and potatoes and hefty slices of Velveeta cheese. Sluice in the marinade and top with chopped parsley or chives. Cover tightly with a lid (this is important because the ling bellies will explode during cooking). Bake at 400 degrees until six detonations are heard (about 15 minutes), then reduce oven to 350, and continue baking for about three hours, basting every 15 minutes with mayonnaise. Allow to cool to room temperature, then serve on a bed of lettuce, lime Jello cubes, more mayo, and grated coconut. Yum! (You can substitute several fish for the ling — burbot, carp, sucker, or menhaden.)

D.W. Bennett

# AMERICAN LITTORAL SOCIETY

## REGIONAL OFFICES

The Society maintains regional offices where members may keep up with local issues and events. Call the chapters for newsletters and local field trip information.

**NEW JERSEY**
Highlands, NJ 07732
908-291-0055

**NY/NJ HARBOR BAYKEEPER**
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Fort Lauderdale, FL 33316
954-522-2336

**WESTERN REGION**
P.O. Box 6048 Olympia, WA 98502
360-754-1417

## GUIDELINES FOR SUBMISSIONS

UNDERWATER NATURALIST is the Society's journal. We encourage members to submit articles, pictures, observations, comments, compliments or criticisms. Please follow these guidelines.

**SUBJECT MATTER:** **Feature articles** run 1,500-3,500 words (4-10 double-spaced, typed pages); please refer to back issues for guidance. For **Field Notes** and **Coast Issues**, submit no more than three pages of direct observations of interesting natural history found while walking, diving, or fishing in a coastal area. Topics can be of current interest, such as red tide in the Carolinas, whale deaths in New England, or mangrove preservation in the south; you can also submit a number of short observations or notes regarding a particular area. **Letters to the Editor** expressing thoughts on the magazine and its contents or general food for thought are especially appreciated.

**ART WORK:** For illustrations, black and white prints are preferred, but clear color slides or color prints with good contrast, drawings, maps and charts will also be considered. For **Cover Photos**, we need clear, sharp 35mm color slides or color prints, either horizontal or vertical, of littoral subjects above or below the water. Horizontals can wrap around from front to back. Action is not necessary. (Note: Unless otherwise requested, we keep all accepted art work until it is published).

**HOW TO SUBMIT:** Typed, double-spaced manuscripts, please. It would help, if you have access to a computer, to receive your manuscript saved as a "text only" file on a 3 1/2" double-sided, high-density disk. Use common, not Latin, species names. We do not carry footnotes; incorporate sources in your article. We edit for clarity using Strunk and White's Elements of Style as our guide and favor clear wording over specialized terminology. Send your work with a stamped, self-addressed envelope; we will acknowledge its receipt.

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