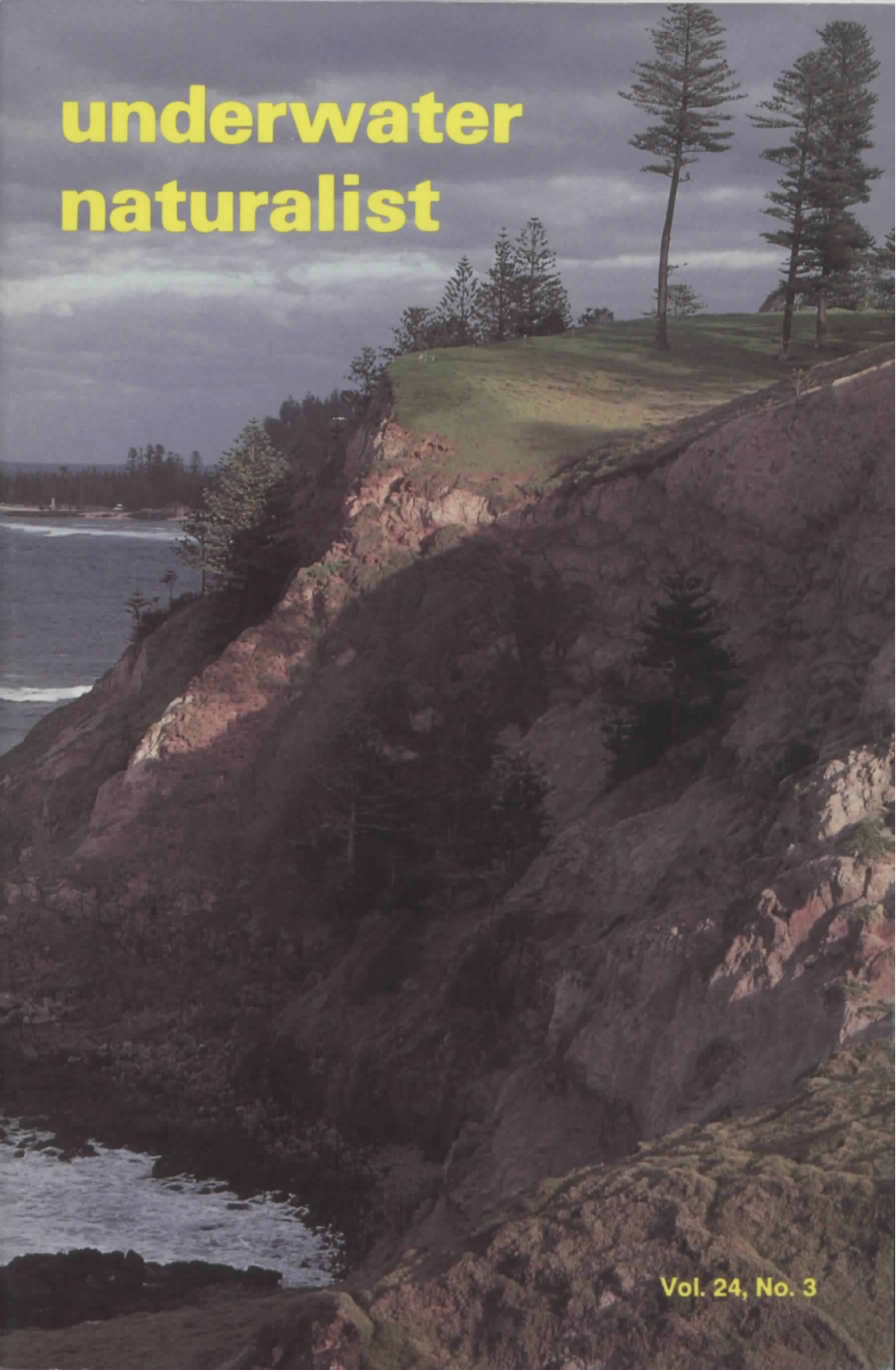
underwater naturalist



Vol. 24, No. 3

1999 American Littoral Society Symposiums

Please join ALS members and guests for an evening full of great topics, interesting speakers, and plenty of time for questions and answers. We look forward to seeing you at one or both of the following:

New York Symposium

Friday, March 26, 7:30-9:30 p.m.

"The Search for the Giant Squid"

Richard Ellis, a marine artist and writer, will lead us on a journey in search of the sea monster lurking in the deepest part of the ocean and growing sixty to one hundred feet in length. Until now, there has been little information about this creature. Through slides and talk we will learn of the investigation that has led to Mr. Ellis' latest book.

"Our Underwater World: from Mantas to Manatees"

Patricia Jordan, an underwater photographer, will bring a collection of her recent work. With her photos, she creates images representative of the fascinating marine life found in the sea as well as her personal interpretation of the experience of diving. With talk and slides, she will take us on a wonderful journey to Neptune's Kingdom.

New Jersey Symposium

Friday, April 9, 7:30-10:00 p.m.

"Marine Mammal Stranding Center"

Jeff George, Director of Education for the Marine Mammal Stranding Center, will reveal to us the inner workings of the MMSC, based in Brigantine. Each year a steady increase of sightings and strandings have been reported. We will learn what the center does for these animals and what we can do to help. With slides and talk we will hear why we have seen all types of seals, turtles, and whales wandering to the Jersey Shore.

"An Artist's View of the Hackensack Meadowlands"

John R. Quinn, a New Jersey native, artist-naturalist, and author of several books, will reveal the secrets of New Jersey's Meadowlands. No, we're not talking football, but a unique urban wilderness chock full of surprises. Slides and talk based on Mr. Quinn's latest book, *Fields of Sun and Grass*, will guide us as we explore the history and living environment of this hidden treasure. Think you've seen it all from the Turnpike? Think again.

Ticket information for both symposiums will be mailed separately to all ALS members.

ALS MEMBERS DAY - Sunday, May 2, 1999

The 15th anniversary of this annual gathering of members on Sandy Hook for morning hikes; dunes, beach, holly forest; followed by a picnic of chowder, raw clams, smoked fish, slaw, drinks (and hot dogs for kids), followed by an informal discussion of littoral topics. Members, who wish to, may bring a finger dessert to be shared by all.

Cost: $10, 2 for $18, kids under 12 free. Deadline: April 15. Meet at Sandy Hook auditorium at 10am; break by 2pm. Please send a stamped self-addressed envelope if you need directions.

Bulletin of the American Littoral Society

Volume 24, Number 3

Underwater Naturalist is the bulletin of the American Littoral Society, Sandy Hook, Highlands, NJ, 07732, and is mailed to members only as part of their dues. $15 for students, $25 for individuals, and $30 for clubs.
Note: Past volumes of Underwater Naturalist and individual articles are available on microfiche from UMI, Ann Arbor, MI 48106.

To the editor

Tagging Striped Bass

The article on netting and tagging striped bass was refreshingly good. It made me want to go out and set some twine.

It was interesting to read that your gill nets were set parallel to shore rather than across the current. Tom Baum's explanation is similar to why we do the very same thing on the Hudson in spring: The current is often too strong after spring rains and thaws.However, when we commercial-fish with gill nets (and even some of the research gill netting for herring) we also set our nets parallel to shore, or the current, and catch just as many fish. Our theory is that migrating fish do not necessarily swim upriver or downriver in a straight line. They often zig-zag, inshore-offshore. A parallel set also minimizes the stress and strain on the net and it will not collect as much floating debris. Floating or suspended material in a strong current will sometimes flatten a fixed (anchored) gill net in short order rendering it unable to catch fish.I wonder what mesh size you were using to catch bass? Stretched-mesh size in gill nets is very selective, i.e., certain size mesh will catch a certain range of fish. I would guess they used between 5 1/4 inch and 5 1/2 inch mesh, if they were looking for adult fish, and if the 26-inch hybrid was an example of those you caught. (I worry about the proliferation of hybrid "sterile" striped bass too. They seem as common as bluegills in the south.)

Best regards,
Tom Lake
NY State DEC
Wappinger Falls, NY

Tom Baum responds:
Two of the nets used had a 5-inch mesh while the net that caught the hybrid was a 6-inch mesh.

Mass Stranding of Horseshoe Crabs

I would like to express my congratulations and appreciation for the excellent Underwater Naturalist issue with the special section on horseshoe crabs. Just two additional comments:

I would like to know the location of the superb cover photograph taken by Don Riepe.

Unfortunately the only negative in the issue was the article by Bob Reid, *Mass Stranding of Horseshoe Crabs.* Mr. Reid seemed more interested in having an ego trip rather than providing information and understanding.

Sincerely
E.M. Libbin
Wellesley, MA

(The cover photo was taken at Reeds Beach, Cape May County on the New Jersey side of the Delaware Bay. Ed.)

More Stranding

I always look forward to your "bulletins." Vol. 24, No. 2 was really enjoyable. I know you folks have my type of sense of humor (warped and peculiar). Please forward my note to Robert Reid at the Howard Laboratory. I am enclosing a pout shirt for you and one for Mr. Reid.

Littorally yours,
Mudskipper P. Macdugachargy
(J. D. Sandler
Pipersville, PA)

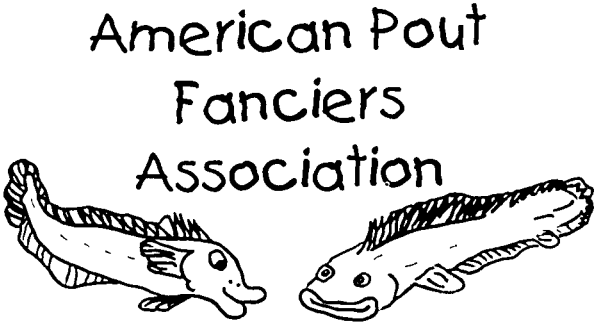


Illustration from the front of American Pout Fanciers T-Shirt.

Mr. Sandler is founder, president, and t-shirt designer for the American Pout Fanciers Association, whose motto is: "I ain't good looking but I'm some sweet person's angel child" from "Statesboro Blues."

Limulus

Enclosed please find my check for $5 for 15 "Horseshoe Crab" posters. Thanks for sending them before receiving my payment.

Thank you also for allowing me to copy the article on Limulus polyphemus for my oceanography classes. I have been teaching this course for over 25 years(27 actually). Almost 4000 students have learned more of the seas, our coast, and their planet during this time. For many of these years ALS has been a source of information. The most recent (Vol. 24, No. 2) issue of the Underwater Naturalist is one of the best teaching tools I've gotten from ALS. Thank you for the 30 flyers on ALS. I plan to put them to work and win the trip. If I don't a good cause will be served.

Continued good wishes for ALS and your service to our coasts - perhaps the most important part of the oceans which make my home the Water Planet.

Sincerely
Dale F. Wolfgram
Grand Blanc, MI

P.s. I've suggested that the *Journal of Irreproducible Results* might want to print Robert Reid's Article, *"Mass Stranding of Horseshoe Crabs,"* in their journal. They may be in touch with you. It would be good exposure for ALS.

More Limulus. . . More Stranding

Vol. 24, No.2 was primarily concerned with horseshoe crabs. The article "Living on Limulus" was written by Dave Grant, who is described as the Society's chief naturalist, a contributing editor, and a college faculty member. What Mr. Grant is not is a careful author. Examples: He writes "there's a bacteria" (p.15). He twice misspells the word "juvenile" as "juvenal" (pp. 14 & 19). He writes " movements...is" (p.19). He writes "larva" when he apparently means "larvae" (p.20). He misspells "desiccation" as "dissication" (p.21).

Then we have the article by Don Riepe, director of the Society's Northeast Chapter. Mr. Riepe is a bit misinformed about the location of the nine (read ten if the telson is included) eyes of the horseshoe crab. He should refer to Robert Barlow's article in *Scientific American*, April 1990, for correct placement of the eyes. Dr. Barlow is situated at Syracuse University and Woods Hole and has published extensively on the subject.

Sincerely,
F.M. Sturtevant, Ph.D.
Sarasota, FL

Old Friends

The current issue of the Underwater Naturalist is outstanding and particularly delightful to me. As editor you still have the right stuff!

Seeing articles by Jim Duggan, Dave Grant, Don Riepe, Bob Reid, and your Last Page was like being with friends of long standing.

Bob Reid's article had me laughing out loud as I read.

Best regards,
Ruth Waldhauer
La Honda, CA

More About Binoculars

I was surprised and delighted to receive today my first copy of Underwater Naturalist which I had not counted upon when I sent a "contribution" to the ALS.

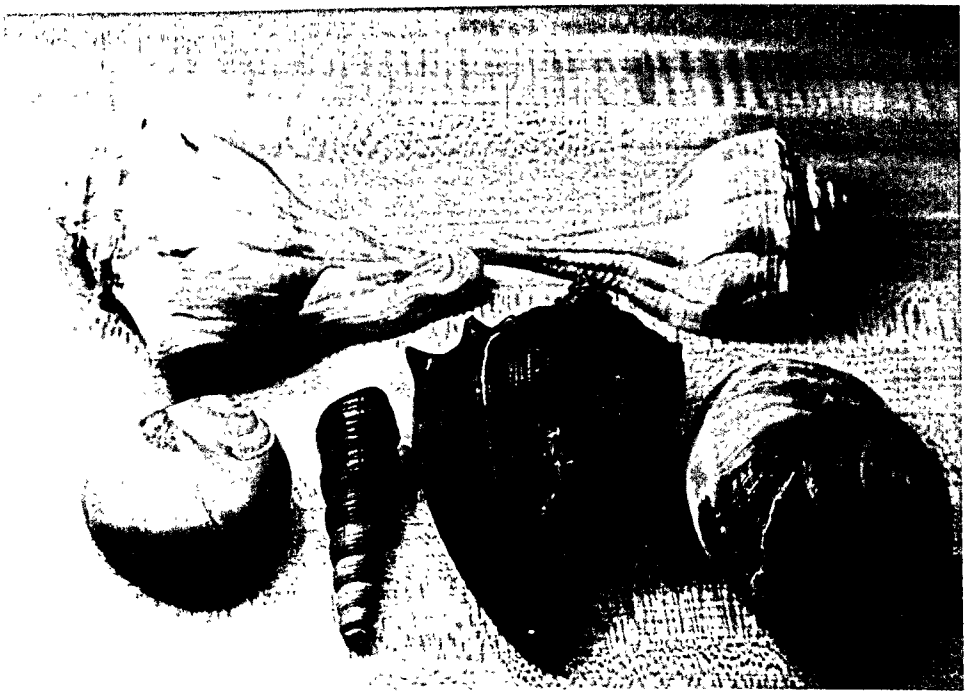
It is professionally done, and especially well presented and edited. I enjoyed it.

A small bone to pick: You recommend in your letters column, for bird watchers, extra wide angle 7x35 binoculars. However, these are heavier, much bulkier with their necessarily fat porro prisms, and more expensive to boot, than standard 7x35s. Furthermore, should you roll your eye-balls right or left to focus on something in the wider view, your pupils will rotate beyond the exit pupil of the scope (only 5mm) and draw a blank. Wide angle is good for football, where the peripheral field may be of interest, I suppose; not for bird watching. It is more natural to turn the head, binocs and all. And the added field is not that sharp or clear anyway.

My sentiments,
Bailey Guard.
Millsboro, DE

Co-evolution in the Littoral Zone

By RAYMOND SUTERA



Healed scars of probable crab attack on various snail shells.

The littoral zone is one of the earth's most prolific areas. Life abounds just below the waves. The environmental conditions in this area of the warm, cradling seas seem to be just right for a rich assemblage of form and function. And the diversity of its micro-environments partitions it into every conceivable niche and then some. It's like a tropical rain forest lapping on and off the beach.

But the littoral environment is much more than just waves, water temperature, pressure, salinity, substrate, and degree of light penetration. It also happens to be alive. This makes sense when you think about it. Just consider how many organisms you know of that are adapted to only the physical environment. You'll probably be hard-pressed to come up with any at all. Virtually every organism is adapted to both the physical environment and to the presence of other organisms. Through processes like competition, predation, and symbiosis, every organism must make its way through the jungle of relationships with other organisms. This is true today as it was in the geologic past. And we can examine this through fossils.

Usually, when we think of fossils, we think of snapshots of the distant past. Each fossil represents but a moment in the history of the organism and of the earth as a whole. Such static, unmoving snapshots only illustrate the immediate environment and some of the ecology

Mr. Sutera is a geologist-turned-science writer. He has worked as a hydrologist on soil and water quality and his work on whale origins and evolution has been printed in the Reports of the National Center for Science Education.

that typified that organism's life at one moment in time.

But sometimes we get the opportunity to put together a series of snapshots and create a little moving picture that shows change and helps us to put the organism into a framework that tells us a lot about its relationship to other organisms and the environment around it. When we do, not only do we see evolution in action, but we see that the fossil represents something that was once alive and living. Eating. Avoiding predators. Reproducing. Then, it ceases to be a mere piece of rock shaped like something we may or may not recognize, or a mere film of carbon on the surface of a rock. It's a piece of a life history.

Sometimes, we even get to see how the organism died, thus making it available to become fossilized. We can see this today when we look at the clams and snails that wash up on the beach. As observant beachcombers know, those little spherical, tapering holes that you find in clam shells and snail shells are often the result of predation by the ubiquitous moon shells — snails that use a device called a radula to bore a hole into the shell of their victims, making the soft flesh inside available to the voracious predator.

And sometimes, if we're especially observant, we notice snail shells, including those of the moon shells that wash up with a broken margin around the shell aperture. Usually, we ignore this as wave damage and toss it back on the beach for someone else to pick up, telling ourselves that it wasn't a good enough specimen to bother collecting. But next time you see one, take a second and consider that you may be able to play forensic scientist and determine the actual cause of death for the snail.

If you look closely at the shell margin, you may notice that it isn't actually wave damage that you're looking at. You may be able to see that the shell margin has been peeled back, one small piece at a time, thus revealing the perpetrator — likely a crab. Many crabs are aggressive predators that love to eat snails. Rock crabs, blue crabs, green crabs, and others have rather massive crushing claws that they use to peel back the edge of the shell. Once exposed, the snail is defenseless and is devoured quickly. When we look at snail fossils we can often see exactly the same thing. We have evidence of predation in the marine fossil record.

But that's not all we see — both in the fossil record and on the modern beach. Sometimes, actually surprisingly often, we see snail shells not with evidence of such attack resulting in death, but of failed attack. We see the scars of attack recorded in the snail's shell. Next time you pick up a snail shell, look to see if there aren't what appear to be the healed scars of a peeled-back shell margin way back among earlier growth lines. If you do, then the snail you're looking at survived that attack and then went on to repair the broken shell. Later, the snail's shell grew beyond the old shell margin and the scar from the attack was left behind among those earlier growth lines.

Looking at the fossil record we see that snail shells with healed scars are actually more common in recent times than they are deeper in the geologic past. One major reason for this may have been the crabs. To understand this, let's investigate the evolutionary ecology of the littoral zone during the Paleozoic Era and consider the snails around at that time.

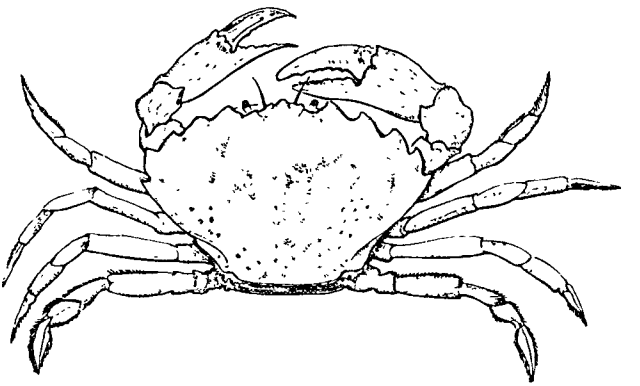
Shelled snails got their start early in the Cambrian Period, somewhere around 560 million years ago. The main thing that characterizes those snail shells and the others of the Paleozoic Era is that they were poorly equipped for dealing with crushing predators. Their shells were thin, their apertures large, there was little external ornamentation to give it strength, and their umbilicus (the area at the bottom of the shell, under the axis of

coiling) was exposed. Such shells had many weak spots and were easy to crush, especially at the shell margin, which surrounds the aperture. Having noted this, we'll move into the Mesozoic Era.

You may have heard of Geerat Vermeij at the University of California at Davis. Vermeij is a blind paleontologist who is said to be able to identify snail shells just by feel. Vermeij noted that snail shells of Mesozoic age seemed to be more robust than those of the Paleozoic. By noting the changes in the characters mentioned above, he identified these changes as anti-crushing adaptations. They had to be because the only benefits these changes could confer, in light of the extra energy necessary to build and carry around such a robust shell, must have been survival benefits. And when you consider that the main reason for having a shell in the first place is for reasons of protection from predators, any additions to such a structure must be for improved protection. But improved protection from what? Vermeij noted that during and since the Mesozoic, shell-crushing predators were on the rise. Fish, birds, marine reptiles and crustaceans saw dramatic expansions during this time. So what Vermeij did was to correlate predator and prey evolution in the marine environment. He coined a term for this: the Mesozoic Marine Revolution. His book *"Evolution and Escalation,"* describes this and is full of other instances of such co-evolutionary change.

Another term for this coordinated evolutionary change is an "arms race." Just like during the cold war, when one side upped its offensive capabilities, the other side was obligated to do the same, just to keep up. Otherwise, they'd have lost the race. If you're the predator, you're less likely to eat. If you're the prey, you're more likely to be eaten. Ever since the Mesozoic, snail shells have gotten sturdier and more resistant to crushing; they must have been the prey side of the arms race.

Having documented the evolutionary arms race, and having shown the potential players on the predator side, the question still needed to be asked, Who were the real players from the list of suspects and in what way were they involved? Vermeij did some of the early work of looking at the crabs and the results were interesting. But somebody needed to go a bit farther. Enter, myself. Upon the suggestion of my Master's thesis advisor, I undertook to look at the predator side of the equation via the role of the crabs. We chose crabs because of their rather intimate habitat association with snails along with their ubiquitousness in the littoral environment. The crabs form part of the biological environment of the littoral zone that the snails live in. If anything should show co-evolution along with the snails, we reasoned, it should be the crabs. So I looked at how the crabs' ability to crush might have changed over geologic time. Were they going to show complimentary response to the evolution of their prey?



Green crab.

I first had to study how crabs crush snail shells. Their claws, I found out, are beautifully suited to the task. Most crab claws are heavily calcified. That is, the crab adds calcium carbonate to the claw to strengthen it. Calcium carbonate is the same material that limestone is made out of. That's why when you see crab debris on the beach, the claws often outnumber the rest of the body pieces. The claws survive the surf better and are seemingly immune to sea gull scavenging. The meat inside is left to decay and never gets eaten.

A quick examination of crab claws shows us that the right and left claws are often different sizes. This is a give-away to the fact that each claw has a different function, with the larger, more massive claw devoted to crushing (usually the one on the right), while the more slender one on the left is more for dexterity and handling of small objects (like the shelled molluscan flesh that the larger claw makes accessible to it). Generally, the more massive the claw, the better it is at crushing since the muscle mass is much larger when the claw itself is physically larger. So strength and massiveness go hand in hand.

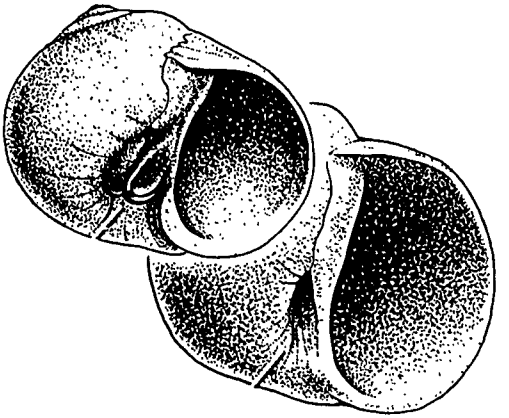
In addition to the strength and massiveness of the claw, the size and position of the dentition are also important. Crab claws, as well as those of lobsters and many other clawed crustaceans, have relatively large teeth located right near the hinge between the "fingers" of the claw. This is the best place to put something that needs to be crushed since that's the location of the greatest force produced when the "fingers" are pulled together. See for yourself the next time you cut a stack of papers with a pair of scissors — you intuitively place the paper back near the hinge rather than out near the tip. Or even better, the next time you eat a frozen candy bar, note that you get much better results biting off a piece of the frozen bar when you place it back by your molars, close to your jaw hinge (personally, I think that's the exact reason we have molars — to bite into frozen candy bars.).

Noting these comparisons, we see that the crab claw is similarly just a simple machine, like the pair of scissors and your jaw, that maximizes the applied muscular force to do work. We measure this force by noting what is called the mechanical advantage of the machine which is simply the ratio of the lengths of the two levers that comprise the machine. One of the two levers is the "finger"-length, or the length of the blade of the scissors or the length of your jaw, as measured from the hinge. The other lever is the distance from the pivot to the point of applied muscular force.

Using all of these measures of crushing ability, I examined crab claws from different geological ages as well as the present. But the results weren't what I was expecting. I could see no appreciable time-dependent difference in claw crushing ability at all, at least as far back as the Cretaceous Period. Crabs got their start in the Jurassic, some 195 million years ago, but must have had their claw morphologies reach essentially modern form by the Cretaceous (about 140 million years ago), the earliest period for which my data set was good enough to see what was happening.

So what happened? If crab claw crushing morphology was modern by the Cretaceous, then what was it that drove the evolution of snail anti-crushing defenses since the Mesozoic? I wasn't willing to give up on the crabs since I knew that they've always had that close ecological relationship to the snails. I decided to look at the diversity history of the crabs to see if it could help in my search for an answer.

With the record of crab genera taken from J.J. Sepkoski's *"A Compendium of Fossil Marine Families,"* and updated by me, I realized that although crabs hadn't evolved better crushing defenses since the Cretaceous, the families of crushing crabs had seen great diversification. Even among the rest of the crabs, and



Moon shell.

sometimes, at the expense of the diversity of families of non-crushing crabs, those families of crabs that crush shells expanded tremendously. I think this is the key. At every point in time since the end of the Cretaceous, there were more crushing crabs around than ever before, driving their snail prey to ever-better resistance to their crushing abilities.

Since crabs can gain access to even the most sturdy of snail shells (even the heavily armored whelks), it would seem that they've had no need to evolve a better crushing claw since the Cretaceous. Add to this the fact that crabs with crushing claws have other food options, such as soft-bodied animals and even plants, and the selective pressure to evolve better-crushing claws seems to disappear. So crushing crabs don't exhibit a morphological response to the evolution of their prey. Rather, they drove snail shell evolution by becoming more numerous. And in the process, they can't really be said to have participated in the way we'd have expected them to if this were a case of escalation and arms race.

But what of the snails? Is there enough here to drive their evolution? Yes, I believe so. There is an ecological principle called the Life-Dinner Principle that may come into play here. It says that in a predator-prey interaction, the cost of failure is not distributed evenly between predator and prey. If it fails in the interaction, the cost to the predator is merely a lost opportunity for dinner. Given other feeding opportunities and other, easier-to-gain prey, this would mean that there isn't much selective pressure to evolve a better prey-gaining strategy. But when we look at the prey, we see a different situation. When the prey fails, the cost to the prey is its life. Hence, it experiences a strong selective pressure to evolve an anti-predator defense. And that, I believe, is what we're looking at when we see the evolved (and presumably, evolving) defenses of the shelled snails.

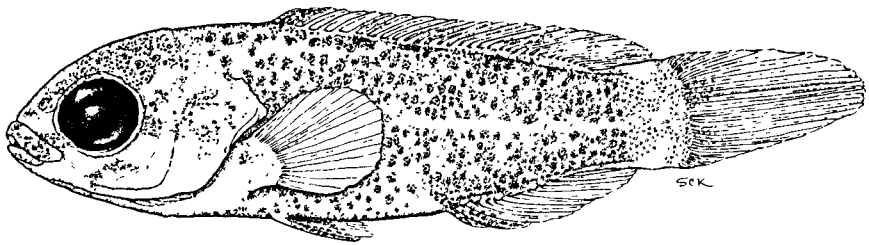
I think this sums up our co-evolutionary scenario pretty well. Whether or not the other suspects have played a role in the rise of anti-crushing defenses among the snails I can't say. I suspect though, that they contributed.

So when we see snail shells on the beach that carry evidence of thwarted attack by crabs and the scars they leave, we're reminded of the complex evolutionary history of the relationship between the snails and their crab predators, and of the depth of the relationships between organisms in the littoral zone. It's a story that's still being written. In the meantime, check out those shell scars. They're surprisingly common. □

Below we reprint with permission from the authors and the full support of Rutgers University Press, chapter 61 of the newly published volume, "The First Year in the Life of Estuarine Fishes in the Middle Atlantic Bight." In addition, there is a page that lists transient and resident fishes according to temporal patterns of estuarine use and spawning sites and a sample page of the key to identification of juvenile stages of the 71 species described in the book. Other chapters cover more general topics such as study area and methodology, and some of the questions the authors believe need to be addressed to learn about the relative importance of estuaries during the first year of these fishes' lives.

Tautog: from "The First Year In The Life Of Estuarine Fishes In The Middle Atlantic Bight"

by KENNETH W. ABLE and MICHAEL P. FAHAY



61.1 Tautoga onitis juvenile, 11.4 mm TL. Collected July 30, 1992, 1-m beam trawl, RUMFS boat basin, Great Bay, New Jersey. ANSP 175241. Illustrated by Susan Kaiser.

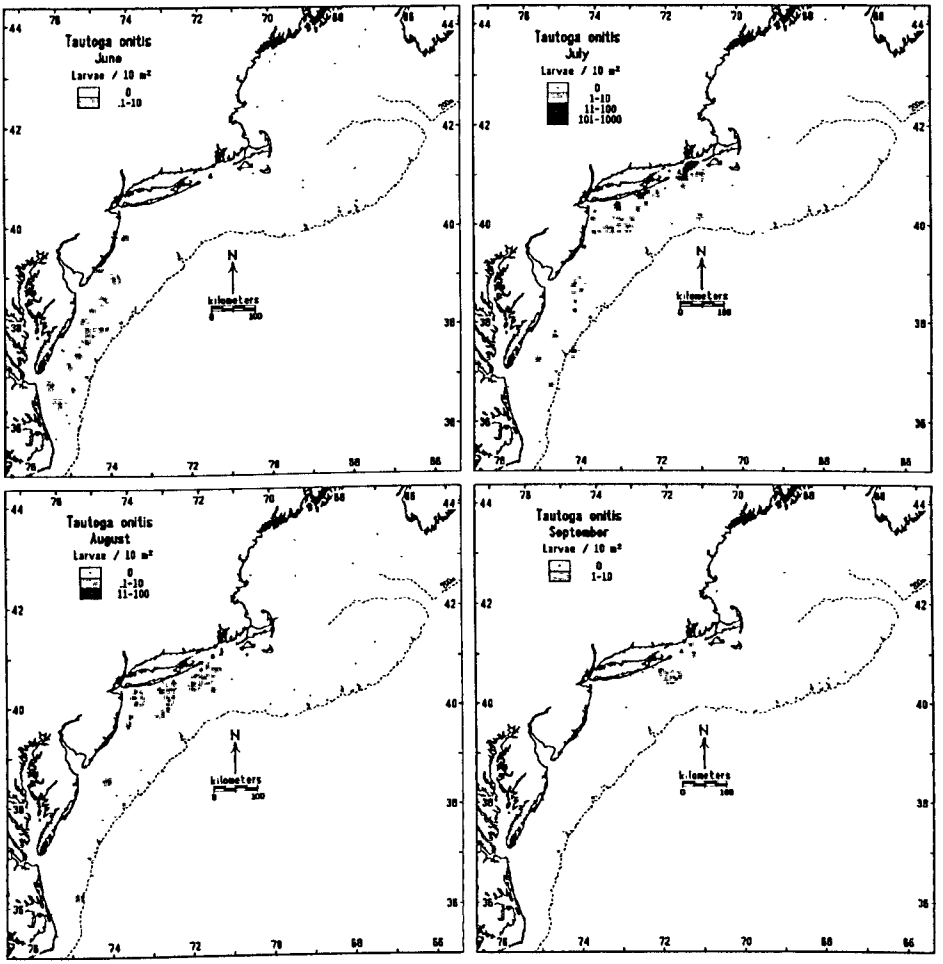
Distribution

Tautoga onitis (Fig. 61.1) occurs primarily on the inner continental shelf and the polyhaline portions of estuaries from Nova Scotia to South Carolina but is most abundant from Cape Cod to Delaware Bay (Bigelow and Schroeder 1953), where it occupies a variety of structured habitats from rocky reefs and mussel beds to eelgrass and the edges of deep channels. The populations may be highly localized (Cooper 1966), although seasonal inshore-offshore movements of large juveniles and adults are common (Olla et al. 1974). In the Middle Atlantic Bight, early life-history stages are reported from most estuaries, (Table 4.2) but they are more abundant in the northern part of the bight.

Kenneth W. Able is director of the Tuckerton, NJ, Marine Field Station of the Institute of Marine and Coastal Sciences, Rutgers University; Michael P. Fahay is a fisheries biologist with the National Marine Fisheries Service Laboratory at Sandy Hook.

Reproduction

Spawning occurs on the inner portion of the continental shelf and in estuaries in May through June. It appears to follow a northward progression through the summer, beginning as early as April in the southern part of the bight and extending



61.2 Monthly distributions of Tautoga onitis larvae during MARMAP surveys 1977-1987.

into the northern part by May. Peak spawning occurs in the central part of the bight in June and July, followed by a decline in August (Berrien and Sibunka in press). This timing is consistent with estimates derived from gonadosomatic indices off Maryland and Virginia (Eklund and Targett 1990) and the occurrence of larvae (Fig. 61.2). In the Great Bay-Mullica River estuary, planktonic eggs were collected from April through August, with peak abundances in June and July (Sogard et al. 1992). The initial occurrence and peak abundance were earlier in the river than in the bay and adjacent inlet, suggesting that spawning began earlier in the upper part of the estuary and continued later in the summer in the lower estuary. Back-calculation of spawning dates from sagittal otoliths of juveniles collected in Great Bay-Little Egg Harbor found a mean date of 4 June and a range of 17 April - 22 July (Sogard et al. 1992). This study and those in other locations in the Middle Atlantic Bight suggest that there is more spawning in estuaries and bays than on the inner continental shelf.

Description

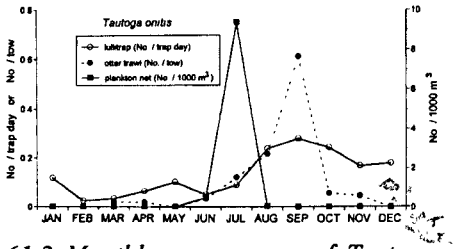
The eggs are pelagic, spherical, and 0.97 to 1.00 mm in diameter. The perivitelline space is narrow, and oil globules are lacking. Larvae hatch at

about 2.0 mm with unpigmented eyes and unformed mouth parts. Larger larvae are heavily pigmented over the anterior two-thirds of the body. The mouth is small throughout development. Most fins are well differentiated by about 10 mm, although the pelvic fins form later. In juveniles, the caudal peduncle is somewhat more lightly pigmented than the rest of the body (Fig. 61.1). The mouth is small, the maxilla barely reaching the anterior edge of the eye. There is a single, continuous dorsal fin, with no separation between the spines and rays. The anterior dorsal fin rays lack the prominent spot found in *Tautogolabrus adspersus*. Vert: 34-35; D: XVI-XVII, 10-11; A: III, 7-8; Pect: 16; Plv: I, 5.

The First Year

Embryonic and larval development occur along the estuary-ocean gradient. In sampling along the Mullica River-Great Bay-Beach Haven Ridge corridor in southern New Jersey , the eggs were most abundant in Great Bay and the inner continental shelf and less so in the lower salinity portions of the estuary (Sogard et al. 1992). In the ocean, larvae were most abundant off New Jersey, Long Island, New York, and Rhode Island during the summer (Fig. 61.2). The larvae have been collected infrequently in Great Bay (n=21; Sogard et al. 1992; Witting 1995; D. A. Witting, K. W. Able, and M. P. Fahay in prep.), and the same can be said of the nearby Beach Haven Ridge area on the inner continental shelf (15 m depth). Elsewhere in the Middle Atlantic Bight, the larvae have reported from large bays (Herman 1963; Croker 1965; Bourne and Govoni 1988) and barrier island estuaries (Allen et al. 1978; Monteleone 1992).

Daily increment formation in the sagittal otoliths has been validated, and they have a well-defined settlement mark. Thus, several aspects of the early life history can be interpreted (Sogard et al. 1992). Individuals examined from Great Bay-Little Egg Harbor estuary (n=37) spent approximately three weeks in the plankton before settlement. This is in agreement with laboratory studies in which settlement occurred 17 days after hatching (Schroedinger and Epifanio 1997). Otoliths show that the smallest settled individuals collected in the field had been settled for 11-23 days (7.6-13.2 mm SL). Date of settlement ranged from 6 May to 13 August, with a mean of 25 June. This corresponds well with peak abundance of early demersal stage individuals, which occurred in June through August (Fig. 61.3, 61.4). The infrequent occurence of early demersal-stage individuals in collections showed



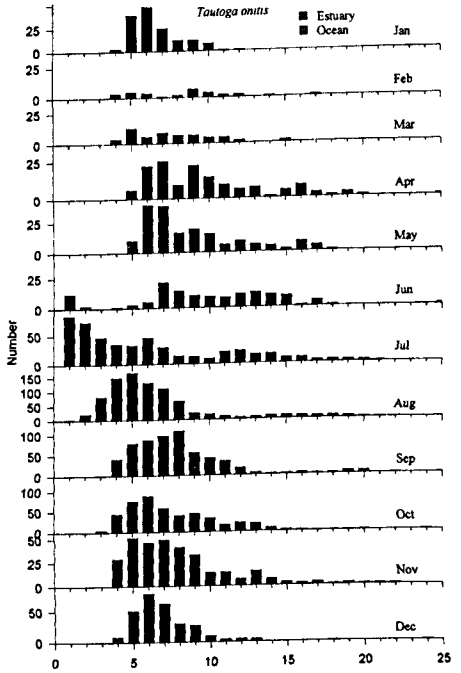
61.3 Monthly occurrences of Tautoga onitis young-of-the-year in the Great Bay-Little Egg Harbor study area based on 1-m plankton net collections 1989-1994 (n=18), otter trawl collections 1988-1989 (n=130), and killitrap collections 1991-1994 (n=1,959).

little evidence of successful settlement at Beach Haven Ridge. In Narragansett Bay the peak in young-of-the-year abundance occurred from July to August (Dorf and Powell 1997).

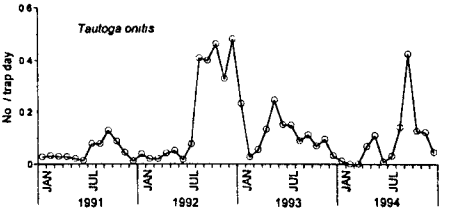
Abundance of postsettlement individuals collected in traps varied between years in the Great Bay-Little Egg Harbor estuary during 1991 to 1994 (Fig. 61.5). Most were collected in the summers of 1992 and 1994, but they were consistently abundant for a long period of time in 1992. In 1994, a single large peak accounted for the highest catches. A hurricane caused a decline in young-of-the-year in Narragansett Bay immediately after the storm and during the following year (Dorf and Powell 1997).

Independent estimates of growth for young-of-the-year individuals during the

first summer are similar. Analysis of modal length-frequency progressions and otolith ages indicate similar estimates of growth for settled tautog (0.52 mm per day and 0.47 mm per day, respectively) (Sogard et al. 1992). In caging experiments, growth rates varied from -0.47 to +0.84 mm per day but growth in vegetated habitats averaged 0.45 mm per day. Growth was usually fastest for the smallest fish, although it was strongly influenced by location and habitat (Sogard 1992; Able and Studholme 1994). Measurements of tagged fish were slightly lower with rates of less than 0.3 mm per day for free swimming fishes (Hales and Able, unpubl. data). Similar caging studies in the Hudson River,



61.4 Monthly length frequencies of Tautoga onitis young-of-the-year collected in the Great Bay-Little Egg Harbor study area. Sources: RUMFS: otter trawl (n=270); 1-m beam trawl (n=131); 1-m plankton net (n=142); experimental trap (n=934); LEO-15 Tucker trawl (n=22); LEO-15 2-m beam trawl (n=21); gear comparision (n=29); killitrap (n=2,010); seine (n=110); night-light (n=6); weir (n=45).



61.5 Annual variation in abundance of Tautoga onitis collected in Great Bay based on trapping 1991-1994 (n=1,914).

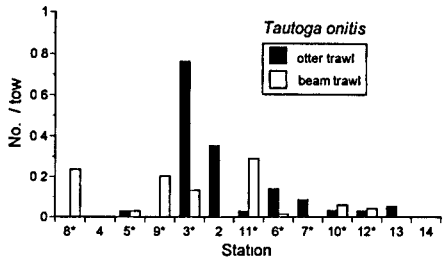
based on smaller individuals, found similar growth rates (Able and Studholme 1994). In Great Bay-Little Egg Harbor, young-of-the-year were 1-2 cm TL in June, and age 1 fish were approximately 4-12 cm (Fig. 61.4) with most individuals 4-10 cm in October (Fig. 61.4 and Sogard et al. 1992). Comparison of these sizes with lengths of individuals older than age 1 the following June indicated only minor growth during the fall, winter, and spring. Age-1 fish reached a size of 110-170 mm SL by the end of their second summer, with a modal size in September of 155 mm SL. These size estimates of juveniles in New Jersey are larger than the mean lengths of individuals older than age 1 from Rhode Island (Cooper 1967; Dorf and Powell 1997) as well as those for Virginia (Hostetter and Munroe 1993).

A variety of studies have indicated that small juveniles prefer vegetated habitats. In southern New Jersey, they have been found abundantly in both sea lettuce (*Ulva lactuca*) and eelgrass (*Zostera marina*) (Nichols and Breder 1927; Able et al. 1989; Sogard and Able 1991) as well as in areas with shell and sponge (Fig. 61.6; Szedlmayer and Able 1996). When associated with sea lettuce, the smaller juveniles (<35 mm SL) are consistently a bright green, matching the color of the vegetation, while larger juveniles, which typically occur in unvegetated and deeper habitats have a dark, mottled coloration similar to that of adults (Nichols and Breder 1927; Sogard et al. 1992). Several other studies in the

Middle Atlantic Bight have found higher abundances of juveniles in eelgrass (Briggs and O'Connor 1971; Orth and Heck 1980; Heck et al. 1989, Szedlmayer and Able 1996) and macroalgae (Dorf and Powell 1997). More recent studies of heavily impacted and man-made habitats in the lower Hudson River estuary have found small juveniles associated with old pier pilings and interpier areas but not under large intact piers. Larger juveniles are typically found with other types of structured habitats such as rocks, jetties, and shipwrecks (Olla et al. 1974, 1979).

Based on tag-recapture studies of juveniles (25-190 mm TL) in Great Bay, there is strong site fidelity after settlement and during the first summer (Hales and Able, unpubl. data). Of 1,148 individuals tagged at a single location, there were 278 recaptures (14%) with some individuals caught more than once (up to 13 times) over a nine-month period. Average distance moved was 19 m during all seasons. Of 48 individuals captured two or more times, 96% were recaptured within 5 m of a previous capture location.

Temperature has a profound affect on behavior of young-of-the-year based on laboratory observations (Hales and Able in press). As ambient seasonal temperatures declined, swimming frequency decreased sharply at 8 C, as did feeding at temperatures below 4 C. Burying occurred at low temperatures (2-7 C) and appeared to be a short-term response to sudden decreases in temperature. There was relatively little mortality at the lowest temperatures (down to 2 C). However, differences in fall and spring lengths from field collections suggested size-selective winter mortality on the smallest fish (Hales and Able in press). □



61.6 Distribution of T. Onitis young-of-the-year by habitat type based on otter trawls (n=144) and beam trawls (n=68) deployed on regular stations 2-14 in Great Bay and Little Egg Harbor. Both otter trawl and beam trawl used on stations designated by asterisk; otherwise, only the otter trawl was used. See figure 2.3 for station locations; table 2.1 for specific habitat characteristics by station.

Table 77-4:

Transient and Resident Estuarine Fishes in the Central Portion of the Middle Atlantic Bight Grouped According to Temporal Patterns of Estuarine Use and Spawning Site

Roman numerals for some species refer to different cohorts.
I indicates the products of an early spawning,
II indicates those of a later spawning

TRANSIENTS

Group I: Facultative Estuarine Users

Centropristis striata, Scophthalmus aquosus I, Prionotus evolans, Menticirrhus saxatilis ?, Tautogolabrus adspersus, Astroscopus guttatus ?, Ammodytes americanus ?, Gobiosoma ginsburgi, Etropus microstomus, Pomatomus saltatrix II, Peprilus triacanthus II, Brevoortia tyrannus II, Gobionellus boleosoma? Cynoscion regalis?

Group II: Seasonal Residents

Menidia menidia, Syngnathus fuscus, Hippocampus erectus, Strongylura marina, Sphoeroides maculatus, Gasterosteus aculeatus, Mustelus canis, Anchoa mitchilli, Bairdiella chrysoura, Pogonias cromis, Sphoeroides maculatus, Cynoscion regalis?

Group III: Anadromous

Morone saxatilis, Alosa aestivalis, Alosa mediocris, Alosa pseudoharengus, Alosa sapidissima

Group IV: Early Users

Urophycis regia I and II, Urophycis tenuis, Pollachius virens, Clupea harengus, Leiostomus xanthurus, Paralichthys dentatus

Group V: Delayed Users

Ophidion marginatum, Prionotus carolinus, Scophthalmus aquosus II, Urophycis chuss

Group VI: Distant Spawners

Mugil cephalus, Mugil curema, Caranx hippos, Pomatomus saltatrix I, Anguilla rostrata, Conger oceanicus, Brevoortia tyrannus I, Sphyraena borealis, Peprilus triacanthus I

Group VII: Expatriates

Chaetodon ocellatus, Chaetodon capistratus, Monacanthus hispidus, Sardinella aurita?, Synodus foetens?, Lutjanus griseus?, Mycteroperca microlepis?, Chilomycterus schoepfi?

RESIDENTS

Group VIII: Summer Spawners

Apeltes quadracus, Cyprinodon variegatus, Fundulus heteroclitus, Fundulus luciae, Fundulus majalis, Lucania parva, Menidia beryllina, Gambusia affinis, Gobiosoma bosc, Opsanus tau, Gobionellus boleosoma?

Group IX: Winter Spawners

Myoxocephalus aenaeus, Pseudopleuronectes americanus, Ammodytes americanus

Group X: Migrating Spawners

Microgadus tomcod, Osmerus mordax, Morone americana, Trinectes maculatus

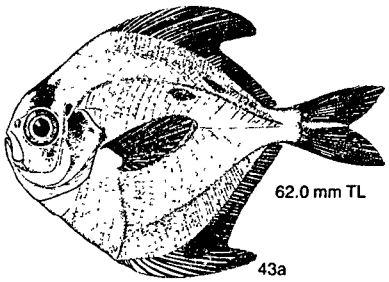
UNCLASSIFIED

Group XI:

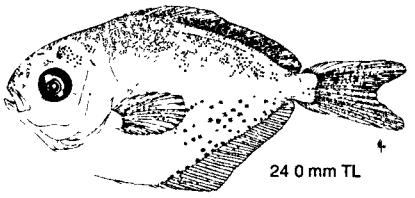
Tautogolabrus adspersus, Tautoga onitis, Micropogonias undulatus, Pholis gunnellus

Appendix A: Identification of Juvenile Stages of Estuarine Fishes

43a. Anterior portion of dorsal and anal fins strongly elevated; body deep ..... *Peprilus alepidotus*
43b. Anterior portions of dorsal and anal fins only slightly elevated; body not as deep ..... *Peprilus triacanthus*



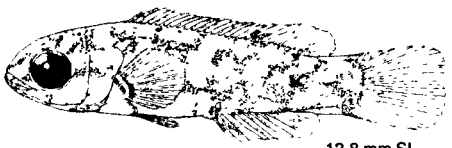
43a



43b

44a. Dorsal fin spines 16–18; mouth small, maxilla barely reaching anterior of eye 45
44b. Dorsal fin spines 10; mouth larger, maxilla reaching midpoint of eye or beyond 46

45a. A prominent melanophore on anterior part of soft (ray) portion of dorsal fin; no strong contrast between caudal peduncle and rest of body ..... *Tautogolabrus adspersus*
45b. No prominent spot on anterior soft dorsal fin; caudal peduncle may be lightly pigmented in contrast to rest of body ..... *Tautoga onitis*



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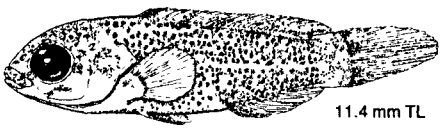
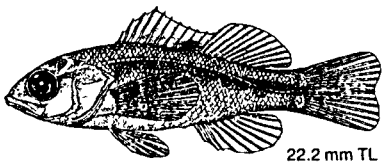


45b

46a. A prominent melanophore on posterior part of spiny dorsal fin with a vague bar extending anteriorly and posteriorly from it; a dark midlateral stripe extends length of body; dorsal fin composed of 10 spines, 11 rays ..... *Centropristis striata*
46b. No pigment on posterior part of spiny dorsal fin as described above; no midlateral stripe of pigment along body; dorsal fin composed of 10 spines, 14 rays ..... *Lutjanus griseus*
46c. No pigment on posterior part of spiny dorsal fin as described above; mottled pattern of pigment along body; dorsal fin composed of 11 (rarely 10 or 12) spines, 16–17 (rarely 18) rays ..... *Mycteroperca microlepis*



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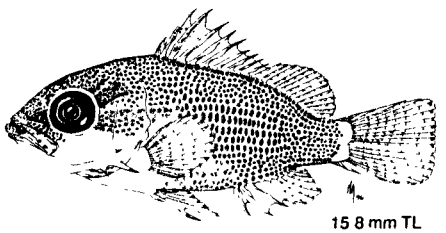
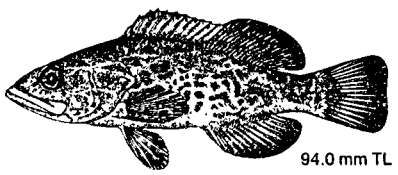


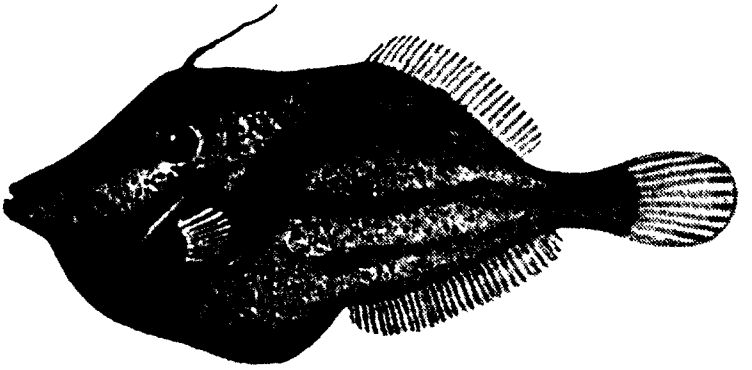
46b



46c

The Tropical Connection

by JOHN L. TURNER



Orange filefish.

Coming to the edge of a straight-as-an-arrow mosquito ditch, I scan the verdant salt marsh panorama that surrounds me. The air is filled with a bracing briny aroma of salt-filled air; it holds a hint of what smells like iodine. A willet, flashing its showy black-and-white wing pattern, calls out its piercing "pill-will-willet" song as it crosses a back channel that meanders through the island next to mine. Turning to take in the view behind me I catch the flight of several terns passing over the main channel in typical tern flight - one of buoyancy and lightness. They're actively searching with heads down for movement at the water's surface, sure evidence for the existence of the small bait fish species that comprise their diet. On the horizon, through the mid-August haze, I can discern the ornate brick tower that heralds visitors to world famous Jones Beach State Park.

The tide is rising quickly and flooding the ditch at an impressive rate. The muddy banks, habitat to a healthy community of ribbed mussels - the poor cousin to the blue mussel of "mussels marinara" fame - are now submerged. A school of darting striped killifish catches my attention; perhaps made nervous by my presence, they scamper in all directions seeking refuge amidst the Spartina cordgrass jungle that lines the channel. Suddenly, drifting in the channel's rapid current is an unfamiliar looking fish that catches my attention. It's unlike anything I've seen before: about five inches long, with a distinctive pouty look, and a long tail. It's splotchily marked with a conspicuous dark line that runs diagonally from the belly through the pectoral fin to the dorsal fin. What is most attention catching about the fish is its position in the water. Instead of swimming in a normal horizontal position, it is drifting in the rising current with its body dipped face first at a 45-degree angle. Fortunately, I'm able to match the outline, pattern, and swimming behavior to a fish in a field guide to the fishes of the Atlantic Coast - it is an orange filefish.

As I was soon to learn, this fish is part of an annual event that is both fascinating and sad — the arrival, each spring and summer, of as many as several dozen species of beautiful tropical and subtropical fish into Long Island's estuaries.

John Turner is a naturalist/writer and author of "Exploring the Other Island: A Seasonal Guide to Long Island," published by Waterline Books. Turner has been published extensively in various magazines including Birder's World, Defenders, and The Conservationist.

Here they mingle with better known marine fish so sought by anglers—striped bass, bluefish, weakfish, tautog, winter flounder, fluke, and porgy. But unlike these other fish that either move out of Long Island's coastal waters with the onset of cold weather or are adapted to surviving the seasonal drop in water temperature, the tropical species don't leave and are not tolerant of significant declines in water temperature. For the tropical fishes, the trip into Long Island waters carries no return ticket; by December they will have perished from either predation or the cold.

The list of finned visitors heralding from tropical locales is long. It includes a few species each of butterflyfish, angelfish, triggerfish, grouper, squirrelfish, doctorfish, and filefish. A few notable individual species include the blue tang, an electric purple and blue colored fish; the strange looking bluespotted cornetfish, possessing a mouth fully one third it's body length; and the striped burrfish, a species related to blowfish with a body that has the wonderful pattern of a child's discovery maze. And there are fish with colorfully descriptive names: the lookdown, the sergeant major, and the beaugregory.

The influx of tropical fish species into Long Island is almost exclusively restricted to the south shore bays — Jamaica, South Oyster, Great South, Moriches, and Shinnecock Bays. The reason for this restriction has to do with both the position of Long Island along the Atlantic Coast and the force primarily responsible for bringing these species north — the powerful Gulfstream current of the western Atlantic Ocean.

The Gulfstream, known as a western boundary current, is part of a circular group of clockwise currents known as the mid-Atlantic gyre. Ranging from 20 to 40 miles in width, the Gulfstream is a high speed current with speeds averaging between 2 to 4 knots (giving rise to the apt description: "a river within a sea"). It is also a high salinity current with concentrations averaging about 36 ppm (average seawater is slightly more than 32 ppm). It begins as a current flowing out of the Gulf of Mexico around the tip of Florida, at which time it is referred to as the Florida Current.

Many tropical and sub-tropical species spawn in waters off the southeastern United States from Cape Hatteras south. While most eggs and young presumably hatch and develop within the normal range of the species, some of the eggs and fish in the planktonic and larval stages are captured by the Gulfstream current and are swept northward. As it slides north, the Gulfstream stays fairly close to the Atlantic coastline, until it reaches Cape Hatteras. At this point the current arcs to the east and runs roughly parallel to Long Island, albeit about 200-250 miles to the south. Given this fact, it becomes clear that while the Gulf Stream is the mechanism by which tropical fish are carried northward, it doesn't tell the whole story as to how they make it into Long Island's south shore bays.

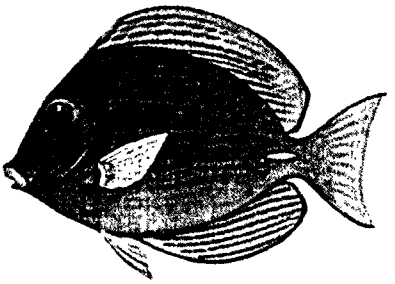
The next step in bringing tropical fish to Long Island's shore has do with the formation of what oceanographers refer to as "warm-core rings," circular clockwise currents about 100 miles across and many hundreds of feet deep. The Gulfstream often undulates, at times looking like a typical river with sinuous curves and oxbows and as with rivers that cut through land, the oxbows of the "Gulfstream river" occasionally pinch off. With normal rivers this means a new channel and a stationary oxbow that becomes a backwater swamp, but when Gulfstream "oxbows" pinch off the sections don't remain stationary. When the oxbow looks like the letter "u", the rings spin off to the south of the Gulfstream. However, when it looks like the letter "n" warm-core rings are formed. They spin to the north and west carrying the warm water entrained within them closer to the south shore of Long Island. Oceanog-

raphers estimate that the warm-core rings bring the tropical fish to within about 75-100 miles of the south shore.

By now the fish have reached the edge of the continental shelf. Up to this point in their journey, most of them were in larval form incapable of swimming, having been brought north as hostages in the Gulfstream current. But now many of the juvenile fish go through a stage called flexion in which they grow a tail, enabling them to swim, albeit rather weakly. "Once they go through flexion and form a tail they are much more capable of swimming. Not only can they swim horizontally but also in the vertical dimension and this enables them to move into different layers. Since layers of water move in different directions they may follow a favorable layer that brings them toward shore," notes Robert Cowen, a professor of Marine Sciences at Stony Brook University, who has studied the phenomenon for several years.

As the warm core rings move into shallower water they begin to break apart due to the increasingly shallow depth. At this point the larval fish become entrained within the coastal (also referred to as the longshore) current that runs east to west along Long Island's south shore. A combination of wind driven currents and tide surges are thought to be the final events which deposit the still tiny fish into these embayments.

Not all of the tropical fish coming into Long Island's waters do so as drifting juveniles. Schools of adult grey triggerfish, for example, will often visit during the summer months only to move off once water temperatures begin to drop. "We see schools of the grey triggerfish in Shinnecock Bay in late summer with each school having a dozen to fifteen fish each. I know people that tend to them and they look forward to feeding them at dock side areas throughout the Bay," notes Howard Reisman, a professor of Ichthyology at Southampton College, a



Blue tang.

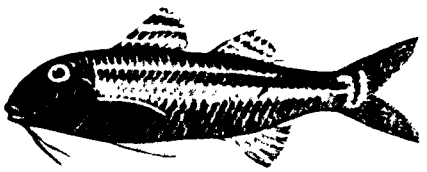
part of Long Island University. The motives of the fish feeders may not be as altruistic as they first appear, however. Triggerfish are tasty and people fish for them, catching the tamed fish quite easily.

Tropical fish seem not to reach Long Island Sound or the western reaches of Peconic Bay, at least not in any appreciable numbers. Reisman has found tropical fish in Tobaccolot Pond situated on the eastern, ocean-facing side of Gardiner's Island but not in the ponds on its sheltered western side. Gardiner's Island, the site where Captain Kidd buried treasure several hundred years ago, is located in the extreme eastern end of Peconic Bay. As might be expected, no species were located in a pond situated on the sheltered western side of the Island. Tropical fish are quite common in New Jersey's coastal embayments, too.

Late summer is the best time to observe tropical fish. Most species arrived several weeks to months before but being so small (probably one to one and one-half centimeters long) are hardly noticeable. Most tropical species find refuge in eelgrass beds, the same habitat critical to the development of many other marine species including, most notably, the bay scallop. They grow quickly, feeding on the plethora of marine invertebrates and other food items available in these important underwater communities. By the waning weeks of summer they've at least

reached thumbnail size and are clearly discernible.

I was reminded as to just how abundant tropical fish species can be in Long Island's south shore bays while visiting, on a mid-September day, the marine laboratory owned by Southampton College of Long Island University. Earlier that day, students in Professor Reisman's ichthyology class had conducted a number of sweeps through the eel grass beds of Shinnecock Bay. They had collectively caught several hundred specimens of the following tropical species: snowy and red hind groupers, spotfin butterflyfish, bluespotted cornetfish, crevalle jack, single trunkfish and red goatfish, and a number of fish that go by



Red goatfish.

the interesting name of permit. Reisman estimates that students have captured 50-55 tropical and subtropical species from Shinnecock Bay since his classes first began conducting seines in the embayment more than a decade ago.

Most, if not all, of the individuals will perish although the fish survive longer than one might first guess. A New Jersey study involving tagged butterflyfish determined that they survived into mid-December. The fish either succumb to the cold or become so moribund they become easy prey for the native predatory fish adapted to being active in Long Island's icy marine waters. "It's a one way trip for these fish," Cowmen notes succinctly.

The future is brighter for those tropical fish species caught by Southampton College students. A few are kept at the laboratory for display purposes or used in research by marine science students and faculty members at the college. Surplus fish are made available to other aquariums along the East Coast including the New York Aquarium at Coney Island. Tropical fish which spent the summer in the eelgrass beds of Long Island's south shore bays will swim at these aquaria in exhibits depicting their typical coral reef habitats - the same environments that their brethren, not swept up by the Gulf Stream, inhabit in the ocean wild.

• • •

The Marine Laboratory is operated by Southampton College of Long Island University. While the small facility is primarily for use by the faculty and students and is generally not open to the public, laboratory officials have graciously agreed to let those with a burning curiosity to see tropical fish specimens caught in Long Island waters visit the lab. Please call (516) 287-8393 between 9 a.m. - 5 p.m., Monday through Friday to schedule a visit. The best time visit the facility to view the tropical fish is between mid-September and the end of October.

If you are interested in trying to observe tropical fish on your own you can do so in one of three ways: scuba diving, snorkeling, or seining. For seining, a 20-foot long net attached to two wooden poles works best. While one person remains relatively still in knee deep water, the other gently sweeps in an arc. As the person who is moving approaches the shore, both netholders pull the net up onto the shore. Besides finding tropical fish you'll likely catch several species of shrimp, northern pipefish, killifish, silversides, and a couple of different species of crabs. Since they can be easily stressed please return the animals to the water quickly; this is especially true for silversides which often will perish if handled too long. □

The Natural Wonders of Norfolk Island

by JIM DUGGAN

View along north coast of Norfolk Island.

Lying in the South Pacific Ocean is a small, verdant island with a rich history and a unique bounty of natural treasures.

Historically Speaking...

"Shi es jewel, es pearl,
es South Sea Diamond,
But, to all o uklum (us),
es jes 'ours I'len'"

This saying is in the original spoken tongue of the residents of Norfolk Island. This mixture of Welsh, English, and Tahitian languages arose from the first settlers of Norfolk Island who arrived in 1774 with Captain James Cook. After he sailed through the fields of ice in Antarctic waters, he headed north and west toward New Zealand. Only by chance, after reaching New Caledonia, did he land at Norfolk Island. Captain Cook noted in his log that the island was uninhabited, but many of the plants were similar to those in New Zealand. He did find, however, "spruce Pines" which were unique and grew in abundance to a vast size and width. These, he stated, were "where masts for the largest ships may be had." Today, these magnificent pines are what we know as Norfolk Island pines (*Araucaria heterophylla*).

After the American War of Independence, the American colonies refused to take any more convicts from England. As a result, Britain lost not only part of her empire but also an important source of timber and a dumping ground for unwanted criminals. So with British jails overflowing and the spread of disease a major risk, an alternative site for criminals was sought. British convicts were sent to Van Dieman's Land (Tasmania) and Sydney in the colony of New South Wales in Australia. Over time, these gaols (jails) became overcrowded

Jim Duggan is the Society's official chronicler of Australian littoral wildlife; his instructions: send us notes about things we would want to see if we get down under.

Restored military barracks on Norfolk Island.

and in 1825, the convict settlement was re-established on Norfolk Island. Convicts and settlers originally settled Norfolk Island between 1797 and 1814, until cost and difficulties maintaining the post caused their relocation to Van Dieman's Land. Two additional waves of settlers arrived, including convicts, marines, and free settlers. The population of the island reached around 2,100 in 1842 and two years later, the island was annexed to Van Dieman's Land. The story of the final wave of settlers from Pitcairn Island involved relatives of families and crew of the *Bounty*.

After Captain William Bligh and his crew spent five months in Tahiti collecting breadfruit trees, they left the island, leaving their Tahitian women behind. A mutiny on the *Bounty* ensued shortly thereafter, led by Lt. Fletcher Christian. Bligh and 18 of his loyal officers were put on a small boat at sea, eventually making landfall in Timor.

Lt. Christian, his mutineers, and some Tahitian men and women eventually left Tahiti and in 1790 reached an uninhabited island called Pitcairn. Around 1855, the population began to increase so much that there was a shortage of food, water, and fertile land. At a similar time, the British were closing their penal colony on Norfolk Island. However, to maintain a strategic base in the Pacific, Queen Victoria, after being petitioned by the Pitcairn Islanders for a new home, granted them their wish and allowed the whole community to settle on Norfolk Island, which they did on June 8, 1856. Today, there are many descendants of the Bounty and Pitcairn Island, including the Christians, living on the island.

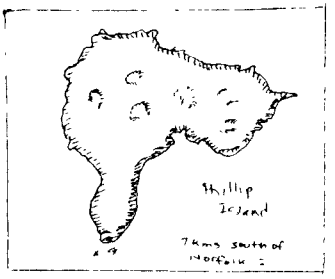
America steps in...

America also had a part to play in the development and success of Norfolk Island. After the British settled at Sydney Cove around 1859, the whaling industry started up in the South Pacific. Norfolk Island and Lord Howe Island were two islands where whalers could replenish their supplies. During convict days, whalers were banned from Norfolk Island. However, during the period of 1788-1814, over 80 whalers stopped by Norfolk Island to bring supplies to the locals, including American whaling ships.

From 1887 to 1908, there was an American consulate on Norfolk Island. The American whalers also brought along the tradition of Thanksgiving to this island community. This is still the

NORFOLK Island

By Jim Buggan



only place outside the U.S. that traditionally celebrates Thanksgiving (last Wednesday of November).

As one can see, Norfolk Island has a very rich past, with many of those peaceful and turbulent times illustrated on the island's postage stamps. The island's natural history has also had many remarkable periods.

Nature's Bounty

In the beginning...

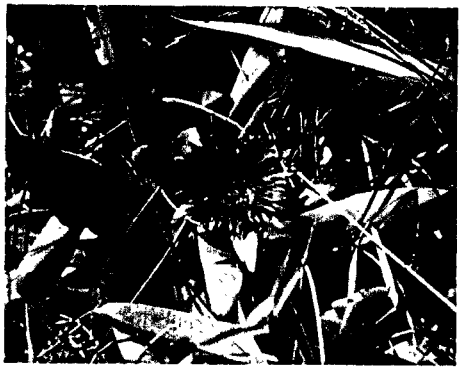
The natural wonders and richness of the island are just as interesting and significant to the islanders today as when Joseph Banks (a botanist who sailed with Captain Cook) set foot ashore several centuries ago.

Norfolk Island and the islands surrounding it are all that remains above sea level of a volcano which erupted along the Norfolk Ridge - an undersea mountain ridge from New Zealand to New Caledonia. This volcanic period occurred over three million years ago and continued intermittently over a period of 720,000 years, creating a large island of which 75% has been eroded away.

During the Ice Age, over 120,000 years ago, sea level dropped 40-90 meters below its former levels and most of the Norfolk Island group was above water. The sea level fell again to about 140 meters below present level. The island land mass would have covered over 320,000 hectares compared to today's land mass of 3,455 hectares. As the earth began to warm up about 20,000 years ago, present day sea level was attained 6,000 years ago.

They came from the sea...

The only subtropical islands in the Southwest Pacific are Norfolk, Lord Howe, and Kermadec Islands. They all share a number of marine species from both temperate and tropical seas. As Lord Howe is the furthest north, the warm currents passing around it provide an environment supporting the largest number of fish species (400) of all these islands, followed by Norfolk Island with 173 and



Carpobrotus glaucescens- pig's face.

the Kermadec Islands with 120. Norfolk Island has four endemic species of fish and 14 others which thrive in the waters around the neighboring islands. In fact, in Kingston's bays and lagoons, with an inner and outer flat, there are about 95 different species of fish that are found nowhere else along its rugged coastline. The prized fish to catch and eat is the trumpeter or sweetlip (*Lathrinus chrysostomus*).

Echinoderms, decapods, and other invertebrates are common around the coast but mollusks are few and mostly small. The other major marine animals thriving in the waters around the island are the whales, which have returned after whaling days ceased in the 1960's. Today, the common whales seen around Norfolk Island are the sperm whale (*Physeter catodon*), humpback whale (*Megatera novaeangliae*), and the southern right whale (*Eubalaena australis*). The humpback and right whales, both baleen whales, have enormous mouths but very small throats (20-30cm in diameter). The baleen is made up of keratin, a material similar to what our fingernails are composed of. The baleen plates are used to filter out organisms, like krill, in the mouth. Each plate consists of about 300 or so elastic bony plates, about 10 cm by 4 meters long, weighing up to one ton.

They roamed the land...

As an uninhabited island hundreds of miles from anywhere, it is amazing to see the variety of flora and fauna that has

Norfolk pines line trail through Norfolk National Park.

evolved and settled on the island. Many of these animals may have attached themselves to plants or flotsam, which washed up on the shores.

On the island, there is an absence of frogs, leeches, ticks, and snakes. However, there are about 70 or so land and freshwater snails, small freshwater crabs, shrimp, spiders, small lizards, and many insects. Of all the insects, the butterflies and moths are the most noted and have appeared on many stamp issues. In fact, four native butterfly and moth species have names derived from some of the island families (eg. *christiani, ralstonae,* and *jowettonum*).

Only two species of lizard are known from Lord Howe and Norfolk Islands. The greater marbled gecko (*Phyllodactylus guentheri*), appears to be extinct on Norfolk Island but is still found on Phillip and Nepean Islands. These lizards will take honey and jam from campers, even open bags of sugar. They tend to leave their tails behind as a distraction to predators; however most will grow back again. A species of skink (*Leiolopisma lichenigera*) was discovered on Phillip Island in 1978. As a result of the removal of rabbits from the island, this new species has now become very common.

The only mammals on the island were introduced by man. Polynesian rats arrived with the pre-European visitors. Mice came with the convicts and the ship rat (*Rattus rattus*) arrived in 1943 from a ship that ran aground on a reef. The island's birds and their nestlings began to decline due to polynesian rats scavenging on the ground and the ship rats in the tree tops. Some plant species also started to decline.

They took to the skies....

By far, the most evidently abundant and interesting of all wildlife on the island are the birds.

Norfolk Island has a number of diverse habitats. They range from rocky shores, cliffs, and beaches to grassy meadows, forests and some wetlands - all within 35 square kilometers. These varied environs provide suitable nesting sites for both migratory and resident species.

There are 13 species of breeding seabirds, 32 land and freshwater breeding birds, and 70 or so migrants and

non-breeding species. Of the original 14 species of native land birds, five are already extinct and the others are on the endangered species list.

The most commonly identified seabirds seen around Norfolk Island are shearwaters, petrels, gannets, and terns.

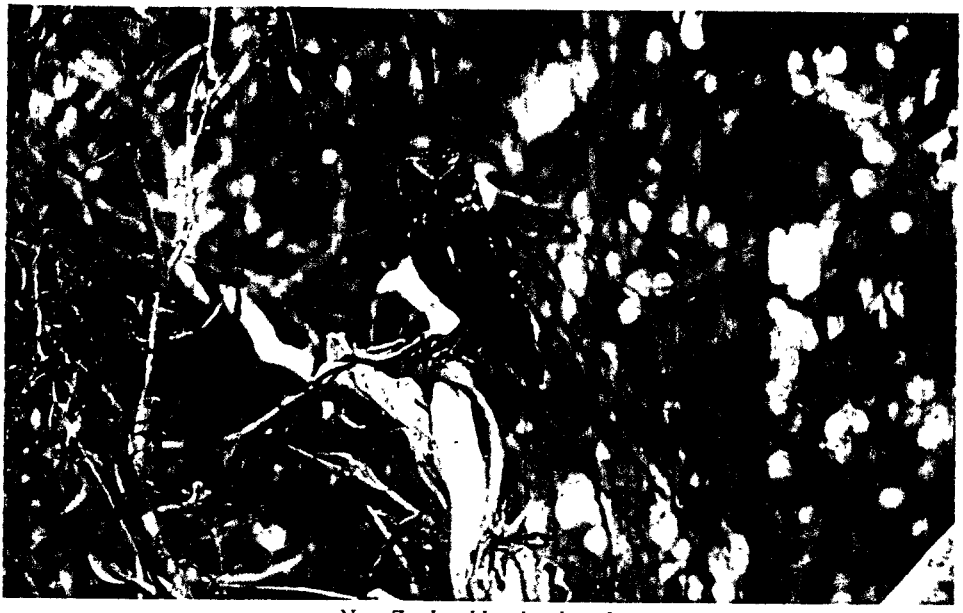
The black-winged petrel (*Pterodroma nigripennis*) is a small brown and white petrel, nesting on both Phillip Island and Norfolk Island. On Norfolk Island, cats are a serious threat to these vulnerable birds. The only other breeding area in Australia is on Lord Howe Island.

The kermadec petrel (*Pterodroma neglecta*) nests mainly on Balls Pyramid, near Lord Howe Island and on Kermadec Island.

A tragic story is one of the bird of providence (*Petrodroma solandri*). Very large numbers of these birds once nested in burrows on Mt. Pitt. In 1790, with the wreck of the Sirius, the islanders and shipwrecked sailors made nightly excursions to collect the birds' eggs, in order to avoid starvation. When fires were lit on the shore, these birds were attracted to the fires and came down in heavy showers. In a three-month period from 10 April to 10 July, some 171,000 birds were brought to a local store to be sold. Thousands of others and their eggs were probably eaten unofficially. Hence, these birds were coined "birds of providence", after saving the people from starvation. By 1800, human exploitation and damage by pigs and goats to the nesting areas resulted in complete extermination on Norfolk Island. The only remaining colonies are on Lord Howe Island, with a few returning to Phillip Island.

Both the masked booby (*Sula dactylatra personata*) and the red-tailed tropic birds (*Phaethon rubricauda roseotincta*) have been exploited for their feathers during the first settlement of Norfolk for use in pillows and mattresses. Both have large colonies on Phillip Island and some on Nepean and Lord Howe Islands. A few red-tailed tropic birds have returned to the northern cliffs of Norfolk.

The sooty tern (*Sterna fuscata serrata*) was also called the whale tern as their noisy flocks followed migrating whales around the island. There is a near record



New Zealand boobook owl.
Photo courtesy of Dr. W. Wakefield.

population of 8,000 to 10,000 breeding pairs on the island.

The common noddy tern (*Anous stolidus*) and the black noddy tern (*Anous minutus minutus*) can be found in many of the tropical seas, including around the Norfolk Group. Only the black noddy nests on Norfolk, particularly in the white oaks and Norfolk Island pines along the coast.

The emblem of Norfolk Island is the white tern (*Gygis alba royana*). The small, pure white tern only breeds on Lord Howe and Norfolk Island in Australia. They are very vulnerable to predation by cats and Australian kestrels.

There are numerous land birds on Norfolk Island, but two very interesting birds stand out.

The first of these birds of particular mention is the Norfolk Island green parrot (*Cyanoramphus novaezelandiae cookii*) or red fronted parrot.

This parrot originated in New Zealand long ago when sea level was much lower and they were able to spread out to other islands and land masses. Capt. Cook commented on these Norfolk Island parrots and their similarity to those in New Zealand. They generally lived in the forests and built nests in tree hollows.

New settlers to the island changed all this with agriculture and large tracts of cleared land for farming. These birds took advantage of the easily accessible seeds and fruit. The settlers then classified these parrots as pests and began to beat them off with sticks and exterminate them in any way they could. Cats and rats took their toll on eggs and chicks as well as adult birds.

It was then realized that these birds were on the verge of extinction. In 1983, less than 30 birds were located. As a result of this predicament, various government and private organisations set up ways to monitor and protect the remaining birds. In 1989, 13 active nests were located. In 1988, two chicks were raised in captivity. These birds were also featured on four Norfolk Island postage stamps, assisting the World Wildlife Fund in raising funds for research in order to improve the parrot's chances for survival.

The second sad story, with a promising ending is that of the Norfolk Island boobook owl (*Ninox undulata*). In August 1987, an intensive survey was done of Norfolk Island's remnant forests and revealed that there was only one Norfolk Island boobook owl in the whole world.

With the virtual extinction of this species, there was only one chance of continuing the genetic line of this species. This meant encouraging breeding with a close relative of this species, the New Zealand boobook owl. After several years of effort, in December, 1989, a nest was discovered with two baby owls in it. Now every aim to ensure their survival is being undertaken on Norfolk Island.

The Floral Perspective

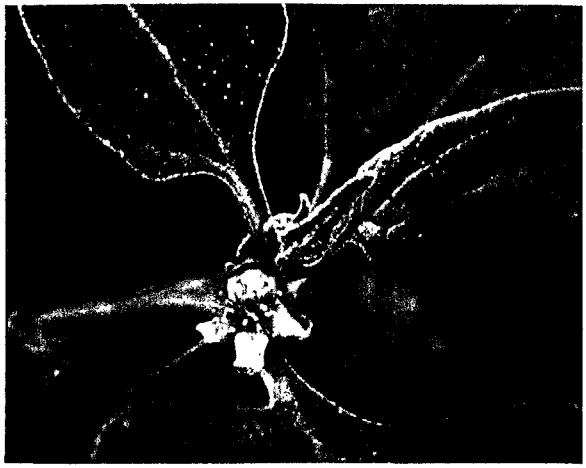
Along with the many extinctions and demise of the fauna, there were also some plants that were and still are unique and presently under threat.

For instance, of the 180 flowering plants on Lord Howe Island, 57 are endemic. On Norfolk Island, there are 178 species with 50 endemic, of which 14 are endangered or already extinct.

The Norfolk Island pines (*Araucaria heterophylla*), are very recognizable trees, with branches spreading out to form a pyramid shaped tree. These are the insignia of the island and can be found in nurseries around the world as the indoor pine of choice. They can take 80 years to mature, live up to 140 years and reach up to 210 feet with a 36-foot girth.

The white oak (*Lagunaria patersonia*) or Norfolk Island hibiscus, has beautiful deep pink flowers in spring. The heartwood of this tree makes excellent walking sticks.

Another unique palm is the Norfolk



Tetragonia tetragonioides - Captain Cook's spinach.

Island palm (*Rho palostylis baueri*). It grows preferably above 200 metres in the National Park. The palm cabbage (palm bud) was used as food during Cook's visit to the island. It was eaten raw, boiled, or pickled. Other delicacies he made use of were pig face (*Carpobrotus glaucescens*) which had edible leaves and fruit. Captain Cook's spinach (*Tetragonia implexicoma* and *T. tetragonioides*) helped prevent scurvy. Two endangered plants on the island are the Norfolk Island chaff tree (*Achyranthes arborescens*) and the Norfolk Island abutilon (*Abutilon julianae*). The Norfolk Island chaff tree is known only from two valleys in the national park. Replanting and seed collection projects are currently underway. The Norfolk Island abutilon were regarded as on the verge of extinction. However, several small colonies were discovered on Phillip Island.

Some weeds taking hold on the island have also had serious effects. As with rats, mice, cats, starlings, and other introduced species, the indigenous animals and plants are balanced very delicately with their environment. Taking care to not introduce foreign species and managing the island's natural forest lands provides encouragement and hope for a continuation of the islands unique natural history.

I highly recommend a trip over there from Sydney if at all possible. The verdant pastures are memorable, as are the cows that are natural mowing machines keeping the island's lawns and pastures well maintained and manicured. The duty free shopping, peace, and tranquillity are fantastic added bonuses to the historical and natural heritage of the island.

The Convict Isle...

The island is situated about 1600 kilometres northeast of Sydney and 1000 kilometers northwest of Auckland. The area of this volcanic island is about 3455 hectares. Its highest point is Mt. Bates at 318 meters. There are two smaller islands in close proximity, Nepean Island - about one kilometer away, is smaller of the two and is made of coral sandstone. Phillip Island is about seven kilometers away and is a volcanic mass rising to 300 meters.

The climate is very comfortable year round. The temperatures range from 12 - 17C (54-63F) in winter and 18 - 27C (64 - 81F) in summer. Most rain falls in the winter and there's always a mild sea breeze.

Norfolk Island is a territory of Australia and as of 1979 is mainly run by its elected legislative assembly. Residents of Australia need a passport to enter Norfolk Island. However, those from overseas may only require a visa. A visitor may stay up to 120 days in a year but over 30 days will require written entry permits. Cars and bicycles can be hired to travel around the island and there is a good choice of accommodation to be found at various prices. For further information, one can write to the Norfolk Island Government Tourist Bureau, PO Box 211, Norfolk Island, 2899, South Pacific. □

Grenada Fish Stories

by DONALD DORFMAN

Field Note

Gobi life stages. Top fish is an adult. Bottom is titiree.

Fish Concentrations

One day while on a six month stay in Grenada, I was looking at the clear Caribbean waters off the beach at Grand Anse, St. George's Parish. There were dark masses swirling and moving through these waters. At a point from the water's edge to approximately 500 feet from the shore, and extending for one mile, I estimated that these dark masses covered 10 surface acres of these waters. With a 20-foot by 6-foot deep seine, with 3/8 inch mesh, I swam into one of these moving masses and collected about 200 of these fish. These I identified as anchovies. Using rough calculations, and with the following assumptions: average depth of the masses of 6 feet, 100 fish per square foot (total length of each fish was 11/2 inches), and average weight of each fish of 0.3 grams, the total number of fish was 270 million, weighing in excess of 89 tons, in this 1 mile by 500 foot stretch of water. Tourism is a major source of income on this island nation. Expansions of tourist facilities are planned, including large hotels. The increase in visitors places stress on the limited freshwater availability, and on the disposal of wastes. This last stress is particularly damaging to the offshore reefs, one of the island attractions, and to nearshore waters, which may adversely affect fish populations, such as anchovies. Any reduction of fishes such as these would result in reductions of fishes higher in the food chain that feed on anchovies.

Don Dorfman is a natural science professor and a frequent UN contributor.

A Goby from Grenada

A seasonally popular food fish that occurs in the waters of Grenada, West Indies, is "titiree." This is the postlarval stage of a goby, *Sycidium palmieri*, found in the mouths of rivers around the island. The postlarval stage fish have little pigment, and are almost completely transparent, similar in appearance to glass eels. Titiree are collected in fresh to brackish water (up to four parts per thousand salinity) in partially opened burlap bags held down with rocks, the opened end of the bag facing coastal waters. Collected fishes are rinsed, mixed whole with rice, then cooked and eaten as fish cakes. This is considered a delicacy. Those fish that are not har-

vested migrate upstream. The fish, now with pigment, are called suckstones, or loesh, and have an adhesive disk on their ventral surface formed by their pelvic fins. With the use of the disk, the fish can cling to rocks and feed on algae growing on the rock surface. They dart from rock to rock as they ascend rapidly flowing streams, up to elevations of 2000 feet. These develop into adults in the upper reaches of the streams and rivers. At the onset of the rainy season the adults migrate back to coastal saline waters to spawn. Spawning probably occurs from September to December, coinciding with the duration of the rainy season. Young gobies were observed in the rivers throughout this period. Individual females may spawn several times in a season. The eggs are adhesive and stick to the rocks strewn around the coastal waters of this volcanic island.

Spawning occurs possibly as early as one year after the year the goby was spawned. The majority of the postlarval fish enter the river mouths in December, although I observed countless numbers of pigmented gobies migrating upstream in the Antoine River in October. The postlarvae are not collected in this river. The major collection effort is concentrated at the mouth of the Victoria River. Their appearance, and the collection of the postlarval gobies here, coincides with the full moon and concomitant high tides.

Fish movement between fresh and salt water (diadromy) for spawning is, more typically, a movement from saltwater to freshwater (anadromy), and includes such fishes as striped bass, white perch, shad, alewife, blueback, and salmon. Less common is the movement of fishes from freshwater to saltwater to spawn (catadromy). The fishes that have this pattern include the goby mentioned here (and other gobies), milkfish, and certain eels. □

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.

☐ We do not pay for articles or illustrations, but we do send five authors' copies when published. Thank you for your interest. We look forward to receiving your submission.

Field Note

Eel Stories

by CYRUS A. ADLER

(Editor's Note: The previous UNDERWATER NATURALIST dealt with horseshoe crabs, red knots, and eel bait. The eel part got to Cy Adler who sent in the following field notes.)

Fishing in Manhattan streets

Manhattan is a rocky little island surrounded by a tidal estuary. Both the East River and the Hudson to the west feel strong diurnal tides from the Atlantic.

On a foggy night in the 1960's (before New York was "treated" with sewage disposal plants) when the sewers still connected directly to the surrounding waters, I came across a man sitting on a wooden box next to an open manhole on Water Street. This spot is near the East River, one of many low areas built on filled land. The man sat smoking a pipe and held a cord in his right hand. Since it was two in the morning, his activity piqued my curiosity. As I watched I saw him draw up the cord from the sewer hole-it was attached to an umbrella handle. He grabbed the handle and pulled it up further; water squished out of the umbrella. Then he tipped over the umbrella and emptied a mess of wiggling eels into the crate next to him. He took a puff on his pipe and lowered his fishing gear down into the sewer hole by its handle.

Cyrus A. Adler is the author of "Walking the Hudson, Batt to Bear-from the Battery to Bear Mountain," and the leader of Shorewalkers, an urban shores walking group.

Joys of Skinning Eels

My neighbor Dr. Sam Atkins loved to fish and loved eels. He and cronies on West Fire Island, where I stayed for seven summers, used to trap eels, baiting the traps with female horseshoe crabs.

How Sam prepared the big, wiggling slimy creatures intrigued me. First he would stun the eel by touching it with a cigarette. Apparently eels are very sensitive to nicotine poisoning or euphoria-I don't know which. Once the eel was comatose, Sam would lay it on a wooden board and drive a nail through its head. The he would circumcise the skin near the eel head, and then delicately strip off the eel skin the way you would peel off a silk stocking from a thin woman's leg. Delicious meat.

Speaking of circumcision, eels should be classed as kosher since they have fins and scales. But few rabbis are ichthyologists, which is lucky for eels, and too bad for the gourmet orthodox.

Hazards of Eel Farming

A man in South Carolina went into the eel raising business figuring to make a big profit. He filled a pond with elvers, fed them well; they are hardy fish and grew nicely. He figured he had about two hundred big eels swimming around and he was looking forward to a fat profit.

One day in September he went down to his eel pond, looked into the clear water, and saw nothing. Not an eel in sight-on the nether shore of the pond he spotted a big-bellied alligator sunning himself. □

Interesting Mantis Behavior

by PETER MARTIN

Long Island's south shore barrier beaches are a wonderful area for birding, fishing, diving, and general natural history study. While engaged in these pursuits, I've occasionally found that the day's most interesting and memorable experience involved the behavior of praying mantises. The following field notes are gleaned from my journal over the past 25 years. September seems to be the prime month, as crowds and biting insects are on the wane, the mantises are large and active, and the above mentioned pursuits draw me more regularly to the shore. Notably, most of the observations involve "praying" mantises that are "preying," a behavior for which they are exquisitely adapted.

On one occasion my attention was drawn to a commotion in a Bayberry thicket. A mantis held a fluttering ruby crowned kinglet by one wing. My approach seemed to heighten the struggles of the bird and it broke free and escaped. If it was a juvenile, it had perhaps never before encountered a mantis or a human. The mantis stood its ground and then began a swaying approach along a branch. What was going on in its ganglion? What were its plans? Curiosity? Revenge for a lost meal? The appearance of a larger prey item?

On another occasion during a class trip, one of my students noticed a struggling snake on the lawn. It was a seven-inch long DeKay's snake, held by a mantis actively feeding on it. A one-inch section of skin had already been removed. A hurried majority vote was taken. Scientific detachment was overwhelmed by "kindness." The snake was released and the insect was, we hope, mollified by a piece of ham from a sandwich.

A rabbit kill provided the setting for another observation. The rabbit carcass, while fresh, had already attracted the attention of some yellow jackets and flies. I assume the mantis had happened along opportunistically, and had not provided the "bait."

An oddly perched monarch butterfly on a marsh elder branch attracted my attention on another occasion. It was being eaten by a large mantis. A safe six inches lower in the bush was a mantis a third smaller. After watching for a few minutes I captured the large mantis and offered the butterfly to the smaller mantis, which promptly grabbed it and began feeding. I kept the larger mantis at home for a week before releasing it. During that time it behaved normally and fed on other insects. Apparently the monarchs well known toxicity to vertebrates didn't seriously affect the mantis.

It is interesting to note that in all of the above described anecdotes, my attention was attracted not to the actual mantis which was only noticed secondarily, sometimes several seconds later. Such is their camouflage.

It is well known that mating can be a risky endeavor, especially for the male mantis. On several occasions I've encountered a mating pair of mantises, the male headless, reflexively copulating, the female consuming his body. On one occasion the copulating male retained his head, the female was feeding on a large caterpillar. I did not witness the circumstances that led to this arrangement but it is tempting to wonder if this male mantis was using an old strategy. Convergent behavioral evolution? Actually, some of these anecdotes suggest some interesting research possibilities and I apologize for the anthropomorphism and whimsy, but this stuff is fun. □

Peter Martin is a science teacher from New York, a keen observer of nature, and a frequent contributor to the UN.

TAGGING REPORT

compiled by PAM CARLSEN

At the time of the writing of this Tagging Report, the season should be drawing to a close, but the warm weather holds and tagging continues. Letters received from taggers in the NY/NJ area tell stories of fabulous fishing this year:

"The fall run on Fire Island has been spectacular! Sept. 9-10 mullet began to show on the beach along with sand crabs. Bass were feeding on both. This continued into October with spearing and sand eels added to the mix. By the last week of October, bunker started to show up with waves of bass and bluefish chasing them. Season's almost over, but I'll be out into December, hoping for a good herring run and big bass."

James Ragusa, New York

"Here's a couple of straggler tag cards—had a fantastic year. Fluke by the millions, bass and blues by the millions, sea bass, porgies, triggerfish...you get the picture!!"

Steve Giaccone, New York

"I am now shooting for tagging 100 bass in 1998. My first goal was to catch 100 bass. It has been so great fishing, that I am now up to 138 bass caught and 88 tagged. The weather is so nice I hope to be able to catch bass in January."

Paul Chowansky, New Jersey

From our guys, who fish Cape May and Delaware Bay:

"Warm water has kept bass there. Loads of peanut bunker and herring with birds working all over. Whales have been seen in close to shore enjoying the feast. The number of bass and blues is hard to comprehend, with no sign of slowing down."

Al D'Amato

"We have so many bass and bluefish moving along the beach it is like a dream come true."

Charlie Kennedy

From southern waters, we had some interesting returns. The amberjack tagged by Dr. Jim Wright, 50 miles SE of Virginia Beach, 8/14/97, was returned from Sugarloaf Key, Florida, on 3/24/98. The pompano tagged by Tom Walker at Stuart, Florida, on 11/6/97, was returned from Cocoa Beach, Florida, on 3/6/98. Tom wrote: "The pompano return stirred up a lot of excitement here. As far as I know this is the first pompano recaptured in our area. It had traveled north 100 miles."

Our 10,000th return brought along its own story. From Rock River Landing, Port Deposit, MD, Mary Townsend wrote: "Yesterday, June 17th, my husband and I were fishing in the lower Susquehanna River for rockfish. I am almost 85 years old and haven't fished in about a year. We were using perch for bait and at my first cast, your fish took my bait. I struggled to take him in. He was 23", 5-6 lbs." This fish was tagged the previous October at the Cheasapeake Bay Bridge Tunnel, Virginia.

Our tagger, George Dulka, Virginia Beach, also tags pelagics using USFWS tags. He wrote excitedly, "In 1994, I tagged a yellowfin tuna offshore VA Beach and this past March some guy off Liberia, Africa, recaptured it in his seine net. I tagged it at 30" fork length. He reported that it weighed about 150 lbs."

TAGGING RETURNS

Species

Lgth	Tagger	Place Tagged	Date	Recapturer	Location	Lgth	Date
Bluefish							
22	A Anderson	Block Is., RI	07/07/97	T Giovanetti	L.I. Sound		07/25/97
25	A Anderson	Montauk Pt., NY	05/25/97	J Acavell	Mamaroneck, NY		08/06/97
31	A Anderson	Montauk Pt., NY	11/02/96	A Willette	Barnegat Ridge, NJ	32	08/11/97
35	F Montz Sr.	New Haven, CT	06/28/97	L Smith	New Haven, CT	35	08/12/97
27	A Anderson	Block Is., RI	06/16/97	B Peterson	Old Saybrook, CT		08/18/97
22	A Anderson	Montauk Pt., NY	06/23/97	D Dubord	Madison, CT		08/25/97
13	H Rolufs	Offshr., Cape May, NJ	08/17/97	J Helmbrecht	Buoy #35, DE Bay, NJ		08/29/97
20	A Anderson	Montauk Pt., NY	06/23/97	H Laub	Plum Gut, NY		09/02/97
25	A Anderson	Block Is., RI	08/14/97	J Kempenaar	Newport, RI	25	09/07/97
20	A Schweithelm	Eatons Neck, NY	09/05/97	T Rodler	Huntington, NY		09/09/97
31	W Brett	Marshfield, MA	09/25/93	R Pfester	Rocky Pt., NY	37	09/25/97
15	A Schweithelm	Northport, NY	07/10/97	A Paratore	Eatons Neck, NY		09/27/97
15	S Klimek	Mud Buoy, NJ	09/15/97	E Tobie	Mud Buoy, NJ		09/28/97
20	G Horvath	Barnegat Inlet, NJ	06/27/97	J Holmes	Cape Cod Canal, MA		10/10/97
18	G Horvath	Barnegat Inlet, NJ	06/27/97	S Mateo	Little Bay Pk., NY	18	10/12/97
Fluke							
13	F Bovasso	Manasquan R., NJ	08/08/96	J Kittle	Belmar, NJ	14	07/16/97
12	M Daniewicz	Hoffman Island, NY	09/14/96	M Haines	Princess Bay, NY	13	07/17/97
14	W Filce	Mantoloking, NJ	09/10/96	Capt. Bills	Jones Beach, NY	15	07/20/97
13	C Kennedy	Lower DE Bay	07/17/96	D Miller	Cape May Pt., NJ	15	07/21/97
13	B Skirka	Flynns Knoll, NJ	07/20/96	D Castle	Newport, RI	15	07/21/97
14	F Grande	Moriches Bay, NY	06/28/97	E Booker	Moriches Bay, NY	15	07/21/97
11	J Gibbons	E. Rockaway Inlet, NY	06/14/97	P Hession	E. Rockaway Inlet, NY	12	07/22/97
12	C Kennedy	I.C.W. marker #457, NJ	06/16/97	W Boston	I.C.W. Marker #469, NJ		07/25/97
16	A D'Amato	2 mi. S Cape May, NJ	07/09/97	W Moahs	2 mi. S Cape May, NJ	16	07/26/97
12	B Shillingford	Ocean City, NJ	07/06/96	L Sofiela	Brigantine Cr., NJ	15	07/26/97
13	A Gano	Fire Is. Inlet, NY	07/13/97	R Parise	Captree, NY		07/27/97
12	B Shillingford	Ludlam Bay, NJ	07/08/97	K Gadomski	Strathmere, NJ	14	07/28/97
11	S Knapik	Point Lookout, NY	07/16/95	J Gralton	Jones Inlet, NY	18	07/29/97
13	S Giaccone	Montauk Pt., NY	06/29/97	A Paleogos	Montauk, NY	15	07/30/97
13	R Wellman	Captree, NY	08/11/96	T Kurinsky	Shinnecock Inlet, NY	14	08/01/97
11	T Ritchie	Grassy Sound, NJ	06/10/97	R Patrick	Grassy Sound, NJ	11	08/01/97
14	R Anderson Jr.	Fire Is. Inlet, NY	08/01/97	J Monaco	Captree Pier, NY		08/02/97
13	A D'Amato	Lower DE Bay	08/22/96	F Chorpita	Atlantic Highlands, NJ	15	08/02/97
12	W Filce	Manasquan R., NJ	05/31/97	S Layton	Manasquan R., NJ	14	08/06/97
12	D Hepner	Sea Girt, NJ	06/16/96	J Maccia	Beach Haven, NJ	15	08/07/97
13	J White	Fire Is. Inlet, NY	08/01/97	G Nixon	Fire Is. Inlet, NY	13	08/07/97
13	A Gano	Fire Is., NY	07/06/97	J Nolan	Robert Moses Brdg., NY	13	08/09/97
12	J Gibbons	Atlantic Beach, NY	07/05/97	T Onischuck	Atlantic Beach, NY	14	08/09/97
13	C Kennedy	I.C.W. #457, NJ	06/16/97	H Rolufs	Cape May, NJ	13	08/10/97
14	P Migliaccio	Shark R. Inlet, NJ	06/14/97	J Vernam	1 mi. E Shark R., NJ	14	08/12/97
14	A Gano	Fire Is., NY	08/03/97	R Doherty	Fire Is., NY		08/13/97
13	B Shillingford	Flat Creek, NJ	07/05/97	J Keagen	Flat Creek, NJ	13	08/13/97
13	E Zmara	Robert Moses Brdg., NY	06/05/97	R Appedisano	Robert Moses Brdg., NY		08/14/97
12	B Shillingford	Ludlam Bay, NJ	07/01/97	M Swiacki	Ludlam Bay, NJ	12	08/15/97
13	B Shillingford	Ludlam Bay, NJ	07/01/97	M Swiacki	Ludlam BAy, NJ	12	08/15/97
12	B Shillingford	Ludlam Bay, NJ	07/08/97	M Swiacki	Sea Isle City, NJ	14	08/15/97
13	A Gano	Fire Is., NY	08/03/97	S Kmiotek	Robert Moses Brdg., NY	13	08/16/97
12	M Cassara	West Islip, NY	07/13/97	A Zagaro	Great South Bay, NY		08/16/97
13	M Frawley Jr.	Shinnecock Bay, NY	07/21/97	K Foley	Shinnecock Bay, NY	13	08/17/97
13	F Haimes	State Chan. W., NY	08/10/96	M Feinberg	Moriches Bay, NY	15	08/17/97
14	R Romanow	Jones Inlet, NY	05/28/97	M Nathanson	Short Beach, NY	14	08/19/97
13	J White	Great South Bay, NY	07/20/97	L Gibson	Great South Bay, NY		08/19/97
14	C Fiorillo	Long Branch, NJ	07/14/97	C Marnieri	Monmouth Beach, NJ	15	08/20/97
12	J Genes	Sandy Hook Bay, NJ	07/23/96	M White	Leonardo, NJ	15	08/24/97
13	F Ravit	Massapequa, NY	06/21/97	H Halpern	Jones Beach, NY	13	08/24/97
12	R Anderson Jr.	Fire Island Inlet, NY	08/01/97	W Solntzeff	Captree St. Pk., NY	13	08/25/97
14	F Grande	Moriches Bay, NY	08/02/97	L Avosso	Moriches Inlet, NY	15	08/25/97
13	J Schwartz	Brooklyn, NY	06/14/97	E Canton	Gravesend Bay, NY	13	08/26/97
13	W Filce	3 mi. off Manasquan, NJ	06/14/97	P Dalik	Offshr., Manasquan, NJ	14	08/26/97
13	J Calamia	Democrat Pt., NY	06/26/97	V Riggio	Democrat Pt., NY	13	08/26/97

Species

Lgth	Tagger	Place Tagged	Date	Recapturer	Location	Lgth	Date
Fluke(cont.)							
14	A D'Amato	Cape May, NJ	08/24/97	J Doran	Cape May Pt., NJ	14	08/28/97
13	J Mayer	Ocean Grove, NJ	07/27/97	D Meester	Ocean Grove, NJ	15	08/28/97
13	J Gibbons	E. Rockaway Inlet, NY	06/14/97	Y Sofer	Far Rockaway, NY	15	08/29/97
14	S Fries	Coney Is., NY	07/09/97	P Hession	Ambrose Chan., NY	14	08/30/97
17	J Hasychak Jr.	Old Saybrook, CT	08/03/97	J Zawadski	Mouth of Conn. R., CT	17	08/31/97
13	W Filce	Mantoloking, NJ	08/03/97	R Balak	Manasquan Inlet, NJ	14	08/31/97
13	W Filce	Mantoloking, NJ	06/21/97	B Quigley	Normandy Beach, NJ		09/01/97
14	F Grande	Moriches Bay, NY	08/15/97	C McEvilly	Moriches Bay, NY	14	09/01/97
14	J Gibbons	Manasquan, NJ	08/22/97	R Balak	Manasquan Inlet, NJ	15	09/01/97
11	J Gibbons	Atlantic Beach, NY	06/10/97	R Miccio	Reynold's Chan., NY	13	09/01/97
14	A D'Amato	Lower DE Bay	07/17/96	F/V Irene B III	Offshr., Rehoboth, DE		09/03/97
13	S Knapik	Pt. Lookout, NY	08/10/97	E Salnick	Lido Beach, NY	14	09/05/97
17	T Ritchie	Grassy Sound, NJ	06/16/97	R Belli	Grassy Sound, NJ	18	09/05/97
11	J Gibbons	Long Beach, NY	06/08/97	J Williams	Long Beach, NY	14	09/05/97
14	C Kennedy	Cape May Pt., NJ	08/26/97	F Van Dalen	Cape May, NJ	14	09/06/97
14	W Filce	Mantaloking, NJ	08/17/96	F Wurum	Seaside Park, NJ	15	09/06/97
13	J Hickey Jr.	Deal, NJ	07/28/96	J Bergstresser	Sandy Hook, NJ	16	09/07/97
14	E Zinke	2 mi E. Manasquan, NJ	06/23/97	F Nowrick	Manasquan Inlet, NJ		09/08/97
14	R Wolfskeil	Lavalette, NJ	08/31/97	L McFarland Barry	Lavalette, NJ	14	09/09/97
11	L Gordon Jr.	Lynnhaven R., VA	05/24/97	K Lang	Lynnhaven Inlet, VA	14	09/10/97
12	R Anderson Jr.	Fire Is. Inlet, NY	08/31/97	A Gano	Fire Is. Inlet, NY	13	09/14/97
13	J White	Fire Is. Lt., NY	07/19/97	S Puleo	Great South Bay, NY		09/15/97
13	R Moran	Atlantic Highlands, NJ	06/01/97	G Bachert	Highlands Brdg., NJ	15	09/17/97
10	S Knapik	Pt. Lookout, NY	06/17/97	E Salnick	Lido Beach, NY	12	09/18/97
11	R Wolfskeil	Navesink R., NJ	06/22/97	M Callaghan	Ambrose Chan., NY	14	09/19/97
12	R Anderson Jr.	Fire Is. Inlet, NY	05/31/97	S Brandine	Jones Beach, NY	15	09/19/97
14	A Gano	Fire Is. Inlet, NY	07/13/97	R Edwards	Fire Is., NY	15	09/21/97
14	W Filce	Sea Girt, NJ	07/17/97	J Petrosino	Deal, NJ	14	09/22/97
11	J Hickey Jr.	Spring Lake, NJ	07/05/97	R Kirby	Deal, NJ	12	09/25/97
14	A D'Amato	Cape May, NJ	09/14/97	J Gullifer	Cape May Pt., NJ	14	09/27/97
11	S Fries	Coney Is., NY	06/21/97	I Brown	Brooklyn, NY	13	09/29/97
10	F Waltzinger III	Deal, NJ	09/15/97	J Glenn	Ocean Grove, NJ		10/08/97
15	E Zinke	Sea Girt, NJ	09/15/97	H Roughgarden	Spring Lake, NJ	15	10/11/97
15	R Romanow	Jones Inlet, NY	05/28/97	A Brooks	Long Beach, NY	16	10/12/97
Striped Bass							
14	H Sweet	Bristol, RI	07/16/96	K Casto	Warren, RI	24	06/16/97
24	R Kalenka	Hempstead, NY	10/23/94	T McCrae	Elizabeth Is., MA		07/10/97
24	D Sowerby	York, ME	09/10/93	M Horning	Cape Neddick, ME	27	07/15/97
34	T Marburger	Shinnecock Inlet, NY	06/25/95	H Baron	Shinnecock Inlet, NY	37	07/15/97
23	G Edwards	Moriches Inlet, NY	07/05/97	P Schultz	Moriches Inlet, NY	24	07/15/97
17	K Kyker	Darien, CT	10/12/96	F Fitton	Westport, CT		07/15/97
33	S Fries	Montauk, NY	07/31/96	J DeMaio	Montauk, NY		07/15/97
25	G Ciriello	Sandy Hook, NJ	09/26/96	J McLauchlen	Shinnecock Inlet, NY		07/15/97
28	J Foti	Staten Is., NY	06/29/97	P Piano	Ambrose Chan., NY	29	07/15/97
18	G Kerkhan	Sea Bright, NJ	09/27/95	D Vibbert	Barnegat Inlet, NJ	26	07/15/97
32	A Anderson	Montauk Pt., NY	10/02/96	P Eastman	Cape Cod Bay, MA		07/15/97
23	J Gibbons	Sea Bright, NJ	05/25/94	S Messeri	Ambrose Chan., NJ	29	07/15/97
35	A LoCascio	Manhasset Bay, NY	11/03/95	V Natale	Manhasset Bay, NY	35	07/15/97
41	D Kelly	Orient Pt., NY	06/17/97	B Gionfriddo	Plum Is., NY		07/15/97
43	A Anderson	Montauk Pt., NY	10/22/96	P Valentine	Martha's Vineyard, MA		07/15/97
22	G White	Piscataqua R., NH	05/31/97	J Koch	Piscataqua R., NH	22	07/15/97
26	F Coronato	Flynn's Knoll, NJ	07/22/96	B Voytasek	Flynn's Knoll, NJ	26	07/15/97
19	B Silva	Great Kills, NY	04/11/94	R Fiorelli	Norwalk, CT	27	07/16/97
27	T Shaheen	Raritan Bay, NJ	06/01/96	N LaSaca	Romer Shoal, NJ	30	07/16/97
25	J McAfee	Quick's Hole, MA	07/25/96	J Frazee	Quick's Hole, MA	30	07/16/97
18	G White	Piscataqua R., NH	08/21/96	H Smith	W.L.I. Sound	24	07/16/97
25	P Hartsgrove	Shrewsbury R., NJ	06/12/97	N LaSaca	Romer Shoal, NJ	25	07/16/97
24	P Blanchard	Salisbury, MA	07/07/97	K Kopp	Merrimack R., MA		07/16/97
21	M Berger	Debs Inlet, NY	11/23/96	J Mills	Flynn's Knoll, NJ	23	07/16/97
22	G Nigro	Sandy Hook, NJ	06/24/97	N LaSaca	Romer Shoal, NJ	23	07/16/97
23	T Marburger	Shinnecock Inlet, NY	06/30/96	M Mainland	Shinnecock Inlet, NY	26	07/16/97
25	J Foti	Staten Is., NY	07/04/97	D Torino	Verrazano Brdg., NY		07/17/97
31	J Caville	Cape May, NJ	06/23/97	M Scheidecker	Cold Spring Inlet, NJ	35	07/18/97

Species

Lgth	Tagger	Place Tagged	Date	Recapturer	Location	Lgth	Date
Striped Bass (cont.)							
31	S Fries	Montauk, NY	07/30/96	J Rade	Montauk, NY	35	07/18/97
32	F Stunkel	Stamford, CT	06/27/95	B Walker	Norwalk, CT		07/18/97
21	J Karolides	Beverly, MA	09/15/96	T Gokey	Beverly, MA	24	07/18/97
18	T Marburger	Northport, NY	05/10/97	E Fay	Newport, RI	20	07/18/97
19	R Kyker	Norwalk, CT	09/30/96	R Sprague	Milford, CT		07/18/97
21	G Nigro	Sandy Hook, NJ	08/29/96	N LaSaca	Romer Shoal, NJ	23	07/18/97
30	G Horvath	Barnegat Inlet, NJ	10/27/96	L Turner	Martha's Vineyard, MA	33	07/19/97
22	P Johnson	Cape Cod Canal, MA	07/19/97	P Johnson	Cape Cod Canal, MA	24	07/19/97
25	R Conklin	Moriches Inlet, NY	10/08/96	F Whitcomb III	Plum Is., MA	32	07/19/97
22	T Marburger	Northport, NY	01/15/94	J Pellegrino	Stratford, CT	28	07/20/97
19	R Fink	Northport, NY	04/11/95	S Rebell	Plymouth, MA	21	07/20/97
29	R Conklin	Moriches Inlet, NY	11/07/95	A Cartelami	Moriches Inlet, NY	33	07/20/97
17	A LoCascio	Manhasset Bay, NY	09/03/93	R Kotch	Block Is., RI	32	07/20/97
28	A Anderson	Montauk Pt., NY	10/22/96	R Bither	Boston Lt., MA	29	07/20/97
27	M Favale	Boston, MA	10/06/96	E Swanson	Nahant, MA	28	07/20/97
18	E Petronio Jr.	Pt. Judith, RI	07/06/97	D Tatro	Pt. Judith, RI	22	07/20/97
27	D Hoxsie	Charlestown Pond, RI	05/10/97	A Anderson	Block Is., RI	28	07/20/97
20	W Stout	Sea Bright, NJ	10/11/96	D Scott	Montauk, NY	29	07/20/97
20	E Petronio Jr.	Pt. Judith, RI	07/07/97	A Amaral	Pt. Judith, RI	20	07/20/97
29	O Van Helmond	Stony Brook, NY	06/27/95	J Bucchi	Clinton, CT	32	07/20/97
25	A Anderson	Block Is., RI	06/12/97	M Francavilla	Westport, MA		07/21/97
22	M Mercer	Barrington, RI	05/28/97	J Corbett II	Warren, RI	24	07/21/97
26	G Ciriello	Sandy Hook, NJ	06/02/95	V Lamberti	West Bank Lt., NY	29	07/21/97
28	F Casey	Boston, MA	07/25/96	P O'Brien	Boston, MA	30	07/21/97
22	M McCredie	Lambertville, NJ	07/20/97	D Reed	Scudders Falls Brdg., NJ		07/21/97
24	R Kalenka	Shinnecock Bay, NY	06/08/97	C Goldstein	Shinnecock Inlet, NY		07/21/97
22	P Grippo	3rd Wantagh Brdg., NY	07/02/96	H Roca	2nd Wantagh Brdg., NY	23	07/21/97
27	J McAfee	Quick's Hole, MA	06/24/97	W DeMello	Elizabeth Is., MA	28	07/21/97
20	W Brett	Provincetown, MA	07/21/97	R Eramian	Provincetown, MA	20	07/21/97
24	R Vogel	Sandy Hook, NJ	06/23/97	L Gonnello	Flynn's Knoll, NJ	26	07/21/97
25	S Giaccone	Montauk Pt., NY	07/19/97	M Carpenter	Montauk Pt., NY		07/22/97
23	C Carroll Jr.	Spring Lake, NJ	07/04/97	W Sadler	Coney Is., NY	24	07/22/97
34	J Foti	Montauk, NY	09/06/96	M Carpenter	Montauk Pt., NY		07/22/97
26	A LoCascio	Hart Is., NY	07/11/97	W Scharrer	Hart Is., NY	26	07/22/97
33	B Kyker	Darien, CT	08/07/94	G Snediker	Stamford, CT	36	07/22/97
19	T Lynch	Stamford, CT	10/02/95	G Snediker	Stamford, CT	23	07/22/97
32	R Kalenka	Montauk Pt., NY	07/18/97	M Carpenter	Montauk Pt., NY		07/22/97
15	W Anderson	Provincetown, MA	05/24/93	K McKenna	Groton, CT	25	07/22/97
25	A LoCascio	Hart Is., NY	07/11/97	W Scharrer	Hart Is., NY	26	07/22/97
25	G Blank	East R., NY	08/11/96	C Stamm	Roosevelt Is., NY	26	07/22/97
37	A Anderson	Block Is., RI	06/15/97	D Grandpre	Block Is., RI	37	07/23/97
20	T Shaheen	Sandy Hook, NJ	08/23/96	G Ciriello	Sandy Hook, NJ	20	07/23/97
27	K Bilodeau	Watch Hill, RI	06/27/97	D Melanson	Watch Hill, RI	28	07/23/97
34	F Casey	Boston, MA	06/25/97	J Bonacci	Boston, MA	35	07/23/97
21	W Perlman	Atlantic Beach, NY	07/13/97	D Eichlin	Atlantic Beach, NY	22	07/23/97
10	T Marburger	Northport, NY	05/14/95	M Martinez	Far Rockaway, NY		07/24/97
19	F Stunkel	Darien, CT	07/15/96	S Durkee	Housatonic R., CT	24	07/24/97
16	A Perednia	East R., NY	05/17/96	N Mujovic	Throgs Neck Brdg., NY	23	07/24/97
17	D Stratton	Niantic, CT	06/30/97	B Powers	Niantic R., CT	20	07/24/97
32	R Conklin	Moriches Inlet, NY	10/08/96	M Chancey	Cape Cod Canal, MA	35	07/24/97
24	F Heal	Staten Is., NY	10/13/96	M Rodriguez	Ft. Wadsworth, NY	28	07/25/97
29	A LoCascio	Hart Is., NY	07/11/97	J Alvarez	City Is., NY	29	07/25/97
25	P Hierholzer	Wildwood, NJ	12/05/96	R Rincones	Chatham, MA		07/25/97
24	A LoCascio	Manhasset Bay, NY	09/09/95	S Bellis	Manhasset Bay, NY	30	07/25/97
19	W Perlman	Atlantic Beach, NY	06/28/97	P Bucking	Fire Is. Inlet, NY		07/25/97
23	R Conklin	Moriches Inlet, NY	11/16/96	S Smith	Moriches Bay, NY	24	07/25/97
22	D Obropta	Cliffwood Beach, NJ	04/14/96	C Brown	Kennebec R., ME	25	07/25/97
34	R Nystrom	Bridgeport, CT	10/06/96	T Dua	Bridgeport, CT	39	07/25/97
20	A LoCascio	Manhasset Bay, NY	10/14/95	H Smith	W.L.I. Sound	22	07/25/97
19	B Hubbard	Hampton, NH	06/22/97	G Graham	Hampton, NH		07/25/97
14	E Gleason	Great Bay, NJ	06/12/97	L Berman	Little Egg, NJ	14	07/26/97
30	D Kelly	Orient Pt., NY	10/03/95	F Miller	Cold Spring Harbor, NY	32	07/26/97
17	T Marburger	Northport, NY	05/08/95	F Schrimsher	Ocean City Inlet, MD	19	07/26/97
30	W Kobel Jr.	Eatons Neck, NY	06/28/97	F Mazovec	Eatons Neck, NY		07/26/97

Species

Lgth	Tagger	Place Tagged	Date	Recapturer	Location	Lgth	Date
Striped Bass (cont.)							
26	J Calamia	W.L.I. Sound, NY	06/20/97	W Romeyko	Manhasset Bay, NY		07/26/97
16	G Kerkhan	Mantoloking, NJ	11/29/96	D Kingsley	Kennebunkport, ME	17	07/26/97
23	W Draesel	Barnegat Inlet, NJ	08/02/95	R Grillo	Long Beach Is., NJ	29	07/26/97
19	N Fiorillo Jr.	Belmar, NJ	11/16/96	P Cunningham	S. Gardiner, ME	23	07/26/97
33	T Sledzik	Cuttyhunk Is., MA	07/07/95	N Pomfret	Cuttyhunk Is., MA	37	07/26/97
14	R Kyker	Norwalk, CT	04/19/96	G Wetmore	Norwalk, CT	20	07/26/97
30	K Kyker	Norwalk, CT	06/21/96	R Kyker	Norwalk, CT	31	07/26/97
30	D Haines	Nantucket, MA	09/23/96	E Nunley	Boston, MA	30	07/27/97
34	W Kobel	Eatons Neck, NY	06/29/97	K Kern	Eatons Neck, NY	36	07/27/97
18	A Anderson	Thames R., CT	04/25/97	R Dreyfus	Provincetown, MA		07/27/97
26	G Ciriello	Sandy Hook, NJ	10/22/96	B Murray	Long Beach, NY	26	07/27/97
21	R Nystrom	Stratford, CT	09/19/93	R Salmonson	Milford, CT	29	07/27/97
21	R Kyker	Norwalk, CT	11/18/96	S Formanek	Norwalk Is., CT	22	07/27/97
27	R Vogel	Flynn's Knoll, NJ	07/09/97	A Ristori	Ambrose Chan., NY	29	07/27/97
19	T Tully	Darien, CT	11/08/95	S Boucher	Gloucester, MA	22	07/27/97
22	F Jessup	Moriches Inlet, NY	11/07/96	F Woodman	Nauset Inlet, MA		07/28/97
21	W Perlman	Atlantic Beach, NY	06/12/97	R Mayo	Atlantic Beach Brdg., NY	22	07/28/97
22	M Simmons	Barnegat Lt., NJ	07/27/97	B Taylor	Barnegat Lt., NJ	22	07/28/97
34	K Sedlak	Stratford, CT	09/21/96	T Selmon	Stratford, CT	36	07/28/97
20	A LoCascio	Manhasset Bay, NY	10/28/95	R Lazar	Kings Pt., NY	28	07/28/97
28	P Hartsgrove	Shrewsbury R., NJ	10/22/96	S Szaro	Ambrose Chan., NY	31	07/28/97
33	F Heal	Staten Is., NY	06/28/96	S Boulmetis	Ambrose Chan., NY	33	07/29/97
21	J Reiches	Hart Is., NY	08/08/96	W Scharrer	Hart Is., NY	24	07/29/97
20	P Johnson	Cape Cod Canal, MA	09/06/96	P Johnson	Sagamore, MA		07/29/97
26	R Grobarz	Sandy Hook, NJ	05/08/96	J Correia	Rockport, MA	31	07/29/97
33	R Canfield	Darien, CT	07/23/94	W Hain	Darien, CT	38	07/29/97
17	E Petronio Jr.	Pt. Judith, RI	08/21/96	G Murphy	Galilee, RI	18	07/30/97
16	A LoCascio	Manhasset Bay, NY	06/14/92	S Rose	Cape Cod Bay, MA	28	07/30/97
20	G Ruest	Quick's Hole, MA	06/18/97	R Dermody	Quick's Hole, MA	28	07/30/97
30	A Dangelo	Block Is., RI	07/01/97	S Rose	Cape Cod Bay, MA		07/30/97
29	A Dangelo	Pt. Judith, RI	11/22/96	R Pepple	Gloucester, MA	29	07/30/97
20	T Marburger	Northport, NY	01/13/96	T Hammond	Quincy Bay, MA	25	07/31/97
30	A LoCascio	Hart Is., NY	07/16/97	E Burgos Jr.	Stepping Stones Lt., NY		07/31/97
32	K Bilodeau	Pawcatuck, CT	06/27/97	C Dunbar	Watch Hill, RI		07/31/97
31	J Krauss	Monmouth Beach, NJ	07/11/97	J Gibbs	Verrazano Brdg., NY	32	07/31/97
22	A Lo Cascio	Manhasset Bay, NY	05/14/93	B Hoffman	Rockport, MA	34	07/31/97
27	L Fitzgerald	Sandy Hook, NJ	11/13/96	L Gonnello	Breezy Pt., NY	29	08/01/97
32	J Foti	Montauk, NY	09/06/96	P Chekimoglou	Montauk, NY	35	08/01/97
22	P Hartsgrove	Shrewsbury R., NJ	11/12/96	J Risco	East R., NY	23	08/01/97
19	T Shaheen	Raritan Bay, NJ	08/12/96	M Matula	Arthur Kill, NY	22	08/01/97
18	JC Wright	Ches. Bay Brdg Tun., VA	10/31/96	J Taylor	Cedar Pt. Lt., MD	18	08/01/97
17	F Ryan	Norwalk, CT	10/30/94	G Murphy	Galilee, RI	20	08/01/97
31	D Kelly	Orient Pt., NY	10/13/96	C Castioni	Nissequogue R., NY	31	08/02/97
25	R Spiro	Merrimack R., MA	07/23/97	D Handy	Merrimack R., MA		08/02/97
32	A Anderson	Block Island, RI	11/14/96	K Heinemann	Block Is., RI	33	08/02/97
20	G Kerkhan	Union Beach, NJ	04/19/97	S Palamara	Gloucester, MA		08/02/97
26	J Rand	Eatons Neck, NY	06/08/97	B Logan	The Race, L.I. Sound	28	08/02/97
31	J Karolides	Marblehead, MA	07/12/95	R Cavanaugh	Boston, MA	35	08/02/97
27	A Anderson	Block Is., RI	06/12/97	J Sidaras	Shinnecock Inlet, NY	27	08/02/97
16	E Petronio Jr.	Pt. Judith, RI	06/09/96	G Lukas	Pt. Judith, RI		08/02/97
33	B Quick	Loveladies, NJ	10/02/96	M Mirando	Montauk Pt., NY	39	08/03/97
38	T Strmiska	Fishers Island, NY	06/20/97	R Masciarelli	Watch Hill, RI	38	08/03/97
38	D Kelly	Orient Pt., NY	06/17/97	M Perivolaris	Plum Gut, NY		08/03/97
26	K Kyker	Stamford, CT	07/17/96	K Bova	Stamford, CT	30	08/03/97
29	F Stunkel	Stamford, CT	10/09/94	B Antonio	Southport, CT	35	08/03/97
16	R Belanger	Salem, MA	11/01/92	J Ordeshook	Newburyport, MA	31	08/04/97
29	S Giaccone	Throgs Neck Bridge, NY	10/29/96	R Kowalski	Clinton, CT	29	08/04/97
20	P Blanchard	Salisbury, MA	07/05/97	T Hargreaves	Merrimack R., MA	20	08/05/97
32	W Kobel Jr.	Montauk, NY	09/19/96	J Marshall	Hatchetts Reef, CT	34	08/05/97
27	T Rinaldi	Duck Pond Pt., NY	05/17/96	M Martinez	Far Rockaway, NY		08/05/97
24	A LoCascio	Hart Is., NY	07/16/97	D Beck	Hart Is., NY	27	08/06/97
26	R Leonardi	Atlantic Beach Brdg, NY	05/31/91	M Carver	Nantucket Sound, MA	36	08/06/97
27	B Vogel	Flynn's Knoll, NJ	07/08/97	P Sciortino Jr.	Tin Can Grounds, NY	27	08/07/97
26	L Gonnello	Flynn's Knoll, NJ	07/29/97	E Bannon	Flynn's Knoll, NJ		08/07/97

Species

Lgth	Tagger	Place Tagged	Date	Recapturer	Location	Lgth	Date
Striped Bass (cont.)							
33	S Fries	Montauk, NY	08/28/96	E Mulhern	Montauk Pt., NY	33	08/07/97
26	L Gonnello	Breezy Pt., NY	08/24/96	P Sciortino Jr.	Tin Can Grounds, NY	27	08/07/97
34	F Casey	Boston, MA	06/30/97	O MacDonald	Boston, MA	36	08/07/97
31	T Marburger	Northport, NY	01/23/94	J Marshall	Plum Gut, NY	40	08/07/97
26	A LoCascio	Throgs Neck Brdg., NY	09/29/96	A LoCascio	Throgs Neck Brdg., NY	26	08/07/97
26	A LoCascio	Hart Island, NY	07/06/97	F Neumann	City Is., NY	26	08/07/97
38	F Coronato	Rockaway Pt., NY	06/10/94	D Kolek	Vineyard Sound, MA	40	08/08/97
28	J McAfee Jr.	Quick's Hole, MA	07/21/95	W Barbery	Block Is., RI	28	08/08/97
19	T Marburger	Northport, NY	05/12/96	R Douglas	Bath, ME	23	08/08/97
21	T Lake	Chelsea, NY	04/22/97	J Genovese	Little Neck Bay, NY		08/08/97
29	T Nowell	Plum Is., MA	07/29/97	T Parker	Wells, ME	32	08/08/97
27	T Rinaldi	Mulford Point, NY	11/17/91	J Tucker	Clinton, CT	33	08/08/97
16	G Kerkhan	Lavalette, NJ	11/16/96	J Genovese	Little Neck Bay, NY		08/08/97
15	J Leonard	Cape Cod Canal, MA	05/18/97	C Brown	Salisbury, MA		08/08/97
35	S Fries	Montauk, NY	07/29/95	C Brown	Block Is., RI	38	08/08/97
29	R Conklin	Moriches Inlet, NY	11/20/96	G White	Piscataqua R., NH	30	08/09/97
38	R Maimone	Rye, NH	06/18/97	S Bowden	Kennebec R., ME	38	08/09/97
30	G White	Piscataqua R., NH	06/27/97	C Gee	Portsmouth, NH	34	08/09/97
28	G White III	York R., ME	06/29/97	R Lapierre	Kittery, ME		08/09/97
21	J Della Porta	Boston, MA	07/29/97	M Lundvall	Boston, MA		08/10/97
28	D Kelly	Orient Pt., NY	09/20/96	S Dinizio	Shelter Is., NY		08/10/97
26	R Grobarz	Sea Bright, NJ	05/26/95	C Bassano	Tuckernuck Is., MA	34	08/10/97
34	T Sledzik	Fishers Is., NY	08/15/96	L Orfice	Fishers Is., NY	37	08/10/97
34	A Anderson	Montauk Pt., NY	06/01/97	M White Jr.	Dover Pt., NH	34	08/10/97
26	J Karolides	Beverly, MA	07/27/94	F LeClaire	Race Pt., MA	31	08/10/97
18	A Schweithelm	Fort Salonga, NY	05/03/97	J Canoni	Truro, MA	19	08/10/97
28	A Schweithelm	Montauk, NY	10/27/95	M Galetta	Stonington, CT	33	08/10/97
20	D Kelly	Sag Harbor, NY	07/17/97	S Dinizio	Shelter Is., NY		08/10/97
17	B Shillingford	Strathmere, NJ	10/04/96	T Tyrrell Jr.	Sea Isle City, NJ		08/10/97
18	A Piszczatowski	Glen Cove, NY	09/22/96	R Diaz	Bayside, NY	20	08/10/97
28	A Anderson	Montauk Pt., NY	10/12/96	K Brown	Sandwich, MA	32	08/10/97
26	R Szellan	West Bank Lt., NY	11/14/93	R Sjostrom	Waterford, CT	34	08/10/97
33	D Dibblee	Esopus, NY	05/13/97	J Weiner	Watch Hill, RI	35	08/10/97
28	G Nigro	Sandy Hook, NJ	06/24/97	W Dunn	2 mi. SW Rockaway, NY	28	08/10/97
22	B Hubbard	Hampton, NH	07/24/97	R Sellers	Salisbury, MA	22	08/10/97
29	F Dyer	Watch Hill, RI	06/28/96	J Weiner	Watch Hill, RI	32	08/10/97
27	A Anderson	Block Is., RI	07/01/96	N LeClair	Westbrook, CT	28	08/11/97
30	J Foti	Montauk, NY	09/16/96	R Cole	Montauk, NY	35	08/11/97
19	J Beck	Cape May, NJ	09/08/96	D Rutledge	Cape May, NJ	20	08/11/97
27	F Strmiska	Fishers Is., NY	09/11/94	J Peterson	Norwalk, CT	31	08/12/97
23	K Hollins	Island Beach St. Pk., NJ	10/06/96	M Tallman	Fishers Is. Sound	25	08/12/97
24	G Ciriello	Sandy Hook, NJ	09/26/96	F Schobel	E. Rockaway Inlet, NY		08/12/97
31	R Gariepy	Newburyport, MA	07/23/96	J Ordeshook	Newburyport, MA	37	08/13/97
27	W Kobel Jr.	Eatons Neck, NY	09/30/96	W Lassen	Northport, NY	29	08/13/97
27	A Anderson	Montauk Pt., NY	10/20/95	M Negro	Montauk Pt., NY	31	08/14/97
33	W Bazel	Gloucester, MA	09/02/95	R Woods	Rye, NH	34	08/14/97
33	S Boulmetis	Ambrose Chan., NY	07/15/97	J Baumann	Gilgo Beach, NY		08/14/97
23	W Terrill	Provincetown, MA	10/01/96	J Fernandes	Brewster, MA	24	08/14/97
19	D Alves	Barrington, RI	05/21/97	T Dusablon	Warren R., RI	24	08/14/97
19	T Marburger	Northport, NY	05/13/97	M Penski	Old Field, NY	21	08/14/97
24	G Kerkhan	Sandy Hook, NJ	10/07/95	F Troy	E. Rockaway Inlet, NY	31	08/14/97
20	P Blanchard	Salisbury, MA	07/05/97	C O'Neil	Newburyport, MA		08/15/97
27	B Firth	Wood's Hole, MA	08/03/96	J Barros	Woods Hole, MA		08/15/97
25	A Schweithelm	Montauk, NY	06/06/97	J Garant	Cuttyhunk Is., MA	27	08/15/97
25	T Shaheen	Navesink River, NJ	04/30/97	M Akus	Raritan Bay, NJ		08/15/97
33	T Lynch	Stamford, CT	10/29/92	T Benedetto	Stamford, CT	37	08/15/97
20	G White	York Harbor, ME	07/27/97	R Gauron	York R., ME	20	08/15/97
22	D Alves	Barrington, RI	05/30/97	K Miner	Barrington R., RI	24	08/15/97
34	L Molnar	Shinnecock Inlet, NY	08/09/95	W Wahlfeld	Shinnecock Bay, NY	36	08/15/97
22	A Anderson	Pt. Judith, RI	07/10/96	R Sundgren	Old Lyme, CT	23	08/15/97
41	C DeCray	Great Egg Inlet, NJ	10/25/96	F Kelty	Orient Pt., NY	41	08/15/97
21	M Simmons	Barnegat Lt., NJ	11/13/96	S Goodman	Westbrook, CT		08/15/97
24	A Dangelo	Block Is., RI	08/09/96	B Cherms	Block Is., RI		08/15/97
20	A LoCascio	Davids Is., NY	07/15/96	M Falvey	New Rochelle, NY	23	08/15/97

Species

Lgth	Tagger	Place Tagged	Date	Recapturer	Location	Lgth	Date
Striped Bass (cont.)							
28	R Fink	Sandy Hook, NJ	08/27/96	E Bannon	Sandy Hook, NJ	30	08/15/97
27	A Locascio	Hart Is., NY	07/16/97	R Cook	City Is., NY	29	08/16/97
29	F Strmiska	Fishers Is., NY	05/23/96	A Lawrence	Stonington, CT	33	08/16/97
27	P Krueger	Atlantic Bch Brdg., NY	05/22/96	G Marcoux	Salisbury, MA	29	08/16/97
16	N Kittredge	Old Lyme, CT	05/20/97	M Kus	Old Lyme, CT		08/16/97
38	F Coronato	Staten Island, NY	10/23/95	P Jakits	3 mi. E Montauk Pt., NY	38	08/16/97
34	A Anderson	Montauk Pt., NY	10/23/96	J Vassar	Cape Cod Bay, MA	36	08/16/97
33	A Anderson	Montauk Pt., NY	10/26/96	R Morris	E. of CT River, CT		08/16/97
35	A LoCascio	Manhasset Bay, NY	05/03/97	J Spiegel	Eastham, MA	36	08/17/97
33	R Leja	Bridgeport, CT	09/01/96	E Wargo III	Bridgeport, CT	36	08/18/97
31	S Kellner	Mattituck, NY	06/11/95	R Hoguet	Montauk Pt., NY		08/18/97
28	R Leja	Bridgeport, CT	08/13/94	R Nickle Sr.	Bridgeport, CT	29	08/18/97
19	G White	Piscatagua R., NH	06/17/97	D Wendell	Newington, NH	19	08/18/97
19	P Grippo	Jones Inlet, NY	11/14/96	E Davis	Pooles Is., MD	21	08/18/97
27	A Anderson	Montauk Pt., NY	10/22/96	G Wissemann	The Race, L.I. Sound	32	08/18/97
29	D Kelly	Orient Pt., NY	10/17/94	J Wells	Stratford Shoal, CT	32	08/19/97
20	T Marburger	Northport, NY	05/10/97	J Cushing	2 mi. N Bath, ME	22	08/19/97
19	H Sweet	Warren, RI	06/17/97	N Mendonca	E. Providence, RI		08/19/97
19	H Sweet	Bristol, RI	08/24/96	K Paon	Bristol, RI	20	08/19/97
23	G Ciriello	Ambrose Chan., NY	11/27/95	P Wallace	Niantic, CT	29	08/19/97
29	JC Wright	Ches.Bay Brdg.Tun., VA	07/17/97	L Lewis	Ches. Bay Brdg. Tun., VA	30	08/19/97
30	S Maguire	Newbury, MA	07/06/95	B Coite	York Harbor, ME	37	08/19/97
19	R Chmiel	Stonington, CT	08/05/97	K Parker	Watch Hill, RI	20	08/20/97
33	A Anderson	Montauk Pt., NY	07/04/97	M Kaplan	Montauk, NY		08/20/97
40	K Bilodeau	Fishers Is., NY	10/17/96	E Marschner	Race Rock, L.I. Sound		08/20/97
34	G Ruest	Quick's Hole, MA	06/18/97	R Ferland	Quick's Hole, MA	36	08/20/97
17	T Marburger	Northport, NY	11/27/94	D Vosgien	East Lyme, CT	25	08/20/97
21	J McAfee	Quick's Hole, MA	08/02/96	B Haynes	Quick's Hole, MA	24	08/20/97
29	F Strmiska	Fisher's Island, CT	09/29/96	J Middleton	Fishers Is., NY		08/21/97
34	A LoCascio	Execution Lt., NY	06/06/97	B Zargo	N. Branford, CT	34	08/22/97
36	D Goldberg	Montauk Pt., NY	08/01/95	T Garrecht	Montauk Pt., NY	39	08/22/97
17	GS Gray	Charlestown, RI	05/14/96	L Farin	Charlestown, RI	20	08/22/97
18	J Karolides	Beverly, MA	07/28/97	W Krotoschin	Beverly, MA		08/22/97
28	D Brodeur	Milford, CT	06/27/95	T Carboni	Milford, CT	34	08/22/97
18	J Seton	Sandy Hook, NJ	11/23/96	J Eklund	S. Chatham, MA	18	08/22/97
30	F Coronato	Old Orchard, NY	05/24/97	E Liatsis	McBlair Shoal, MA	33	08/23/97
17	E Petronio Jr.	Pt. Judith, RI	07/02/97	W Crandall	Galilee, RI		08/23/97
34	P Grippo	Jones Inlet, NY	11/04/94	C MacDonald	Boston, MA	36	08/23/97
29	B White	West Bank Lt., NY	10/04/96	R Proimos	Fire Is. Inlet, NY	30	08/23/97
31	F Auriti	Breezy Pt., NY	07/07/97	G Oliver	Rockaway Pt., NY		08/23/97
26	J Karolides	Salem, MA	08/19/96	D Pelletier	Salem, MA	28	08/23/97
22	P Johnson Sr.	South Shore, RI	11/02/96	R Hoysradt	Eliot, ME	24	08/24/97
37	A LoCascio	Execution Lt., NY	06/29/97	J Nakelski	Manhasset Bay, NY	38	08/24/97
21	P Krueger	Atlantic Bch. Brdg., NY	06/09/93	C DeCrescenzo	E. Rockaway Inlet, NY	28	08/24/97
29	F Jessup	Moriches Inlet, NJ	06/01/95	M Mayne	Cotuit, MA	31	08/24/97
20	M Simmons	Barnegat Lt., NJ	11/06/96	W Crandall	Galilee, RI	22	08/24/97
30	F Heal	Staten Is., NY	07/01/96	P Magnuson	Romer Shoal Lt., NJ	30	08/25/97
30	R Allen	Ches.Bay Brdg.Tun., VA	09/28/96	J Bicki	Hatchett Reef, CT	31	08/25/97
25	J Fetten	Duck Pond Pt., NY	11/01/94	P Girard	Stony Brook, NY	30	08/25/97
25	T Rinaldi	Mattituck, NY	07/15/94	D Capurso	Fishers Is., NY	35	08/25/97
21	R Grobarz	Union Beach, NJ	04/21/96	C Whitlock	Nantucket, MA	24	08/25/97
36	F Strmiska	Fishers Is., NY	06/16/96	T Murgio	Fishers Is., NY		08/25/97
21	H Schauer	Martha's Vineyard, MA	06/21/97	R vonNeumann	Martha's Vineyard, MA		08/26/97
26	A LoCascio	Throgs Neck Brdg., NY	07/17/97	O Fuentes	Throgs Neck Brdg., NY	26	08/26/97
32	R Locke	Provincetown, MA	06/30/97	K Dick	Race Pt., MA		08/26/97
18	L Newsky	Little Bay, NH	09/24/96	G White	Piscataqua R., NH	20	08/26/97
31	S Fries	Montauk, NY	07/29/97	P Russotti	Montauk, NY	32	08/26/97
17	E Petronio Jr.	Pt. Judith, RI	06/30/97	F Knowlton	Galilee, RI		08/26/97
24	S Kellner	Montauk Point, NY	11/15/90	V Picone	Ellis Is., NY	30	08/26/97
27	W Perlman	Atlantic Beach, NY	06/08/96	P Cavanaugh	Norwalk, CT	29	08/26/97
	R Spiro	Newburyport, MA	08/15/96	P Smith	Newburyport, MA	25	08/26/97
20	F Tenore	Sandy Hook, NJ	06/13/96	S Titus	E. Rockaway, NY		08/27/97
27	W Stuven	Lloyd Neck, NY	05/29/96	J Ordeshook	Newburyport, MA		08/27/97
26	J Foti	Staten Island, NY	07/05/97	Unknwn Fisherman	Rosebank, NY	29	08/27/97

Species

Lgth	Tagger	Place Tagged	Date	Recapturer	Location	Lgth	Date
Striped Bass (cont.)							
38	T Ziobo	Watch Hill, RI	06/21/95	B Vass	Fishers Is., NY		08/27/97
25	G Ciriello	Offshr., Sandy Hook, NJ	09/30/96	S Titus	E. Rockaway, NY		08/27/97
20	T Rinaldi	Mattituck, NY	07/24/92	A Swatik	Plum Gut, NY	34	08/28/97
25	A Anderson	Block Is., RI	07/08/96	W Katz	The Race, L.I. Sound	28	08/28/97
29	D Kelly	Sag Harbor, NY	06/06/97	F Pisano	Montauk, NY	30	08/28/97
26	B Shillingford	Cape May, NJ	04/27/95	E Murphy	Cape Cod Canal, MA	32	08/29/97
36	J Karolides	Manchester, MA	09/18/94	R Alidice	Manchester, MA	41	08/29/97
28	B Vogel	Sandy Hook, NJ	06/11/97	C Decrescenzo	E. Rockaway Inlet, NY	28	08/29/97
18	H Schauer	Martha's Vineyard, MA	05/02/97	P Hannah	Mnchstr-by-the-Sea, MA	20	08/30/97
31	A Anderson	Block Island, RI	11/11/96	B Graney	Boston, MA	32	08/30/97
28	R Chmiel	Westerly, RI	08/14/93	J Kazersky	Fishers Is., NY	35	08/30/97
20	R Kyker	Norwalk, CT	07/21/96	T Gomez	Stratford, CT	24	08/30/97
20	P Blanchard	Salisbury, MA	07/14/97	M LaBella	Newburyport, MA		08/31/97
17	B Shillingford	Corson Sound, NJ	07/09/97	E Gregory	Great Egg Harbor R., NJ	17	08/31/97
19	R Chmiel	Stonington, CT	05/28/97	M Demmons	Manchester, MA	23	08/31/97
20	H Sweet	Warren, RI	08/17/96	P Grima Jr.	Barrington R., RI	25	08/31/97
35	F Stunkel	Stamford, CT	06/18/96	S Witthuhn	Montauk Pt., NY	37	09/01/97
32	A LoCascio	Execution Lt., NY	06/06/97	K Kenney	L.I. Sound, NY	32	09/01/97
26	J Posh	Montauk Pt., NY	10/15/96	B Lay	1 mi. NE Barnstable, MA		09/01/97
40	A Anderson	Montauk Pt., NY	07/11/97	R Lipowski	Montauk Pt., NY		09/01/97
28	A Anderson	Montauk Pt., NY	10/05/96	D Johnson	1/2 mi. E Parker Cr., MD		09/01/97
24	A LoCascio	Manhasset Bay, NY	07/05/96	A LoCascio	Throgs Neck Brdg., NY	24	09/01/97
12	A Anderson	CT River, CT	05/18/97	N Gamache	Somerset, MA		09/01/97
27	B White	South Beach, S.I., NY	05/27/96	S Noakes	Chatham Lt., MA	29	09/02/97
22	J Karolides	Beverly, MA	09/23/96	S Jazakawiz	Nahant, MA	28	09/02/97
30	A D'Amato	2 mi. S Cape May, NJ	11/06/95	H McAllister	DE Bay #34 buoy	33	09/02/97
24	M Pickering	Providence, RI	07/19/96	J White	Providence R., RI		09/02/97
25	J Foti	The Narrows, NY	07/07/94	J Wood	Montauk Pt., NY	32	09/02/97
19	M Simmons	Barnegat Lt., NJ	11/27/96	A Costello	Waterford, CT	20	09/02/97
18	E Petronio Jr.	Pt. Judith, RI	06/04/97	J White	Providence R., RI		09/02/97
30	A Anderson	Block Is., RI	11/24/96	Fisherman Eddie	Chincoteague Bay, VA	31	09/02/97
22	J Mettler	Fishers Is., NY	10/23/95	B Long	Quincy, MA	27	09/03/97
27	JC Wright	Ches.Bay Brdg.Tun., VA	11/14/96	D Traina	Gloucester Hbr., MA	28	09/03/97
22	J White	Providence R., RI	07/25/97	E Baker	Pt. Judith, RI		09/03/97
15	E Petronio Jr.	Pt. Judith, RI	07/04/96	T Rana	Pt. Judith, RI	20	09/04/97
21	M Berger	Atlantic Beach, NY	05/22/97	A Savvas	Atlantic Beach Brdg., NY	24	09/04/97
30	F Casey	Boston, MA	06/26/97	S Dangora	Boston, MA		09/04/97
20	T Marburger	Shinnecock Inlet, NY	06/13/95	J Cushing	3 mi. N Bath, ME	24	09/04/97
33	F Casey	Boston, MA	08/15/97	F Teal	Cape Cod Canal, MA	34	09/05/97
29	A LoCascio	Manhasset Bay, NY	08/01/96	J Nakelski	Manhasset Bay, NY	33	09/05/97
23	P Grippo	Jones Inlet, NY	11/21/95	J McEntee	Jones Inlet, NY	27	09/05/97
26	A LoCascio	Throgs Neck Brdg., NY	07/17/97	A Aviles	Throgs Neck Brdg., NY	27	09/05/97
20	B White	Wakefield, RI	06/17/97	J Tatro	Pt. Judith, RI	20	09/05/97
26	W Stuvens	Eatons Neck, NY	08/08/97	K Katz	Eatons Neck, NY	27	09/05/97
27	P Malamed	Moriches Inlet, NY	07/04/96	S Wnenta	Moriches Bay, NY		09/06/97
22	G White	Piscataqua R., NH	08/23/96	G White	Piscataqua R., NH	22	09/06/97
24	A LoCascio	Throgs Neck Brdg., NY	09/29/96	V Torres	Throgs Neck Brdg., NY	27	09/06/97
28	A Dangelo	Montauk, NY	07/24/95	P Butkins Jr.	Block Is., RI	32	09/06/97
29	A Anderson	Block Island, RI	06/14/97	C Hoffman	N. Truro, MA		09/06/97
27	L Gonnello	Flynns Knoll, NJ	06/25/97	F Mattioli	Romar Shoal, NJ	30	09/06/97
27	A Anderson	Montauk Pt., NY	10/24/96	M Janiak Jr.	Marblehead, MA		09/06/97
23	M Simmons	Barnegat Lt., NJ	10/11/96	J De Mio	Ambrose Channel, NY	26	09/06/97
14	T Marburger	Northport, NY	05/04/96	C Manthey	Guilford, CT	18	09/06/97
32	M Murphy	Montauk Pt., NY	09/06/96	J Breitenbucher	Montauk Pt., NY	35	09/06/97
19	J Della Porta	Swampscott, MA	08/30/97	D Terry	Boston, MA		09/06/97
16	L Fitzgerald	Sandy Hook, NJ	11/13/96	C Davenport	Ogunquit, ME	19	09/06/97
18	P Lowcher	Sandy Hook, NJ	10/30/96	V Torres	Throgs Neck Brdg., NY		09/06/97
27	A Anderson	Block Island, RI	11/19/96	C Horne	Cape Cod Bay, MA	29	09/06/97
21	R Grobarz	S. Mantoloking, NJ	11/11/96	R Gilkinson	New Bedford, MA	23	09/06/97
25	D Kelly	Orient Pt., NY	10/09/93	A Thompson	Martha's Vineyard, MA		09/07/97
30	D Goldberg	Montauk Pt., NY	07/29/97	R Fitzpatrick	Montauk, NY	34	09/07/97
32	D Spring	Ches.Bay Brdg.Tun., VA	11/11/95	C Daffinee Jr.	Nauset Beach, MA	33	09/07/97
20	R Nystrom	Stratford, CT	07/20/97	C Sepkaski	Milford, CT	22	09/08/97
31	F Casey	Boston, MA	09/24/96	J Dinga	Boston, MA		09/08/97

Species

Lgth	Tagger	Place Tagged	Date	Recapturer	Location	Lgth	Date
Striped Bass (cont.)							
21	R Lombart	Ches.Bay Brdg.Tun., VA	07/20/97	C Jones	Nanticoke R., M.D.	22	09/08/97
23	T Shaheen	Sandy Hook, NJ	06/20/97	J Snyder	Sands Pt., NY	25	09/08/97
27	A Anderson	Montauk Pt., NY	10/17/96	D Harris	Newburyport, MA	28	09/08/97
20	G D'Amato	Stratford, CT	10/11/93	N Magee	Devon, CT	34	09/09/97
33	A LoCascio	Hempstead, NY	06/23/97	J Mortak	Lloyd's Neck, NY	35	09/09/97
29	A Anderson	Montauk Pt., NY	10/04/96	F Dyer	Watch Hill, RI		09/09/97
22	W Genest	Stratford, CT	08/19/94	J Pellegrino	Stratford, CT	27	09/09/97
30	W Perlman	Atlantic Beach, NY	09/09/95	R Lynch	Rockaway Beach, NY	35	09/10/97
21	T Marburger	Northport, NY	05/18/97	M Roman	Homeport, S.I., NY		09/10/97
18	J Zaffuto	Democrat Point, NY	04/26/97	F Baiona	Hingham, MA	18	09/10/97
27	T Marburger	Shinnecock, NY	07/31/94	J DeAngelis	Sandy Hook, NJ	30	09/10/97
16	A Anderson	Charlestown, RI	11/05/96	D Pecci	3 mi. N Bath, ME	19	09/11/97
27	A Anderson	Montauk Pt., NY	06/07/97	P Dimos	Orient Pt., NY	29	09/11/97
29	M Bolton	Middletown, RI	06/17/97	J Nunes	Buzzards Bay, MA	31	09/12/97
18	B Perlman	Rockaway, NY	11/24/96	R Michel	Tiverton, RI		09/12/97
38	D Kelly	Orient Pt., NY	07/17/97	E Chilton	Orient Pt., NY	39	09/12/97
27	B White	West Bank Lt., NY	11/17/96	J Brilliant	Boston Harbor, MA	27	09/13/97
24	K Carson	U.N., East R., NY	07/27/97	W Urban	Brooklyn Brdg., NY	24	09/13/97
17	R Conklin	Moriches Inlet, NY	07/11/96	S Spaulding	Hampton Bays, NY	18	09/13/97
16	E Petronio Jr.	Pt. Judith, RI	06/25/96	A Cuglietta	Plum Is., MA	20	09/13/97
18	T Marburger	Northport, NY	04/08/97	R Pilgrim	Phippsburg, ME	19	09/13/97
34	R Szulczewski	Cape May, NJ	10/20/94	F DeMenezes	Cuttyhunk, MA	38	09/13/97
27	B Shillingford	Cape May Rips, NJ	04/27/96	N Dube	Race Pt., MA	29	09/13/97
26	S Jakubowski	Sandy Hook, NJ	06/14/96	M Miller	Sandy Hook, NJ	28	09/13/97
20	R Leja	Bridgeport, CT	07/04/97	J Brown	Stratford, CT	21	09/14/97
17	C Furman	Wells, Me	09/25/95	G White	Piscataqua R., NH	20	09/14/97
18	S Keiper	Indian R. Inlet, DE	08/25/96	A Engle	Rock Hall, MD	19	09/14/97
33	D Kelly	Orient Pt., NY	08/29/96	A Fogal	Orient Pt., NY	35	09/14/97
26	A Pittman	Narragansett Bay, RI	06/20/97	O Ward	Warwick, RI	29	09/14/97
27	P Lowcher	Sandy Hook, NJ	10/22/96	B Barneschi	Green Hill, RI		09/15/97
32	J Posh	Block Is., RI	06/23/97	N Vitullo	Block Is., RI	34	09/15/97
15	P Smith	Newburyport, MA	08/04/97	C Sladen	Salisbury, MA		09/15/97
27	R Nystrom	Bridgeport Harbor, CT	07/07/96	P Dubois	Valiant Rock, L. I. Sound	30	09/15/97
22	J Della Porta	Swampscott, MA	09/03/97	M Jazakawiz	Nahant, MA		09/15/97
19	G Horvath	Barnegat Inlet, NJ	10/27/96	E Brady Jr.	L. Chesapeake Bay, VA		09/15/97
22	G White	Piscataqua R., NH	06/27/97	M Varney	Portsmouth, NH	27	09/15/97
22	R Conklin	Moriches Inlet, NY	06/17/97	J Collins	Moriches Inlet, NY	23	09/15/97
24	D Obropta	Sandy Hook, NJ	09/27/96	M Akus	Raritan Bay, NJ		09/15/97
30	T Ziobo	Block Is., RI	06/25/97	T Andrade	Block Is., RI	31	09/15/97
27	G Kerkhan	Martha's Vineyard, MA	07/24/94	E Nichols	Montauk, NY	38	09/16/97
21	R Conklin	Moriches Inlet, NY	05/10/97	F Mastrangelo	C. Moriches, NY	23	09/16/97
34	C Kennedy	Prissywick Shoal, NJ	11/05/96	R Zatorski	Plum Gut, NY	35	09/16/97
22	M Berger	Debs Inlet, NY	11/30/96	C Peloquin	Cape Cod Canal, MA		09/17/97
15	T Lake	Danskammer Pt., NY	11/05/92	D Talerico	Island Beach St. Pk., NJ	26	09/17/97
27	J McAfee	Quick's Hole, MA	08/02/96	F Genthner	Quick's Hole, MA	34	09/17/97
31	S Penta	Boston, MA	07/27/95	C MacDonald	Boston, MA	37	09/17/97
25	P Malamed	Moriches Inlet, NY	07/09/96	P Cantalino	Moriches Bay, NY	26	09/17/97
30	A D'Amato	Cape May, NJ	04/29/97	K Maitland	Marblehead, MA	32	09/17/97
21	A Bettencourt	Barrington, RI	09/22/96	J Lampert	Fairfield, CT	24	09/17/97
28	GR Gray	Charlestown, RI	06/02/95	B Taylor	S. Kingstown, RI	32	09/17/97
18	A LoCascio	Manhasset Bay, NY	08/16/92	L Schobel	Rockaway, NY	25	09/18/97
13	A Drew Jr.	Charlestown, RI	06/06/97	W Krueger	Charlestown, RI	15	09/18/97
27	R Allen	Ches.Bay Brdg.Tun., VA	03/08/97	R Bergman	Bloody Pt. Lt., MD	28	09/19/97
29	S Fries	Montauk, NY	10/17/96	E Figueinedo	Hull, MA	34	09/20/97
29	R Nystrom	Stratford, CT	10/29/96	M Maderia	Stonington, CT	32	09/20/97
18	B Shillingford	Strathmere, NJ	10/05/95	B Milnes	Tuckahoe, NJ	21	09/20/97
21	G White III	Piscataqua R., NH	08/26/97	D Butler	New Castle, NH	22	09/20/97
30	R Conklin	Moriches Inlet, NY	10/29/95	S Smith	Moriches Bay, NJ		08/01/96
25	C Wilcox III	Moriches Inlet, NY	08/13/95	S Smith	Moriches Bay, NJ	28	08/22/96
22	M Berger	Atlantic Bch Brdg., NY	09/10/95	J Locastro	Atlantic Beach Brdg., NY	29	09/21/97
15	R Ferraro	Narragansett, RI	05/27/97	B Hamilton	E. Matunuck, RI	16	09/22/97
17	H Sweet	Warren, RI	09/06/95	H Sweet	Warren, RI	20	09/22/97
34	J Della Porta	Nahant, MA	07/02/97	D Ross	Nahant, MA	37	09/22/97
25	M DiBenedetto	Montauk Pt., NY	10/30/96	B Hamilton	E. Matunuck, RI		09/22/97

Species

Lgth	Tagger	Place Tagged	Date	Recapturer	Location	Lgth	Date
Striped Bass (cont.)							
31	D Goldberg	Montauk Pt., NY	07/29/97	E Theodorsen	Montauk Pt., NY		09/23/97
23	H Sweet	Barrington, RI	10/18/96	J Sweet	Barrington, RI	24	09/23/97
25	L Gonnello	Sandy Hook, NJ	06/15/97	E Theodorsen	Montauk Pt., NY		09/23/97
21	A D'Amato	Cape May, NJ	11/19/96	M Shepherd	Newport, RI	22	09/23/97
37	F Coronato	Old Orchard Lt., NY	05/06/94	M Nolan	Clinton, CT		09/24/97
19	P Grippo	Black Banks, NY	07/27/97	H Bowman III	Great South Bay, NY	21	09/24/97
20	J Phiefer	Avon by the Sea, NJ	05/25/97	A Dziedzic	Long Branch, NJ	26	09/24/97
27	J Posh	Montauk Pt., NY	10/15/96	A Elson	Block Is., RI	28	09/25/97
19	N Fiorillo Jr.	Deal, NJ	11/11/96	R Sellew	Cotuit, MA	20	09/25/97
18	P Sullivan	Sea Girt, NJ	07/08/96	T Kukulski	Raritan R., NJ	23	09/25/97
14	G Epple	Charlestown, RI	09/22/97	B Rathbone	Charlestown, RI		09/25/97
26	A Anderson	Block Island, RI	11/17/96	J Murphy	Nauset Beach, MA	27	09/25/97
28	D Kelly	Sag Harbor, NY	06/16/94	S Viafore	Montauk, NY		09/26/97
24	A Anderson	Montauk Pt., NY	07/02/97	B Mazzucchi	3 mi. E Montauk, NY		09/26/97
26	G Drago	Montauk Pt., NY	07/31/97	B Jakob	Montauk Pt., NY		09/26/97
18	G Dulka	Ches.Bay Brdg.Tun., VA	11/29/96	B Parkinson	Tangier Sound, MD		09/27/97
15	G Kerkhan	South Amboy, NJ	03/17/96	J' Mariano	New Brunswick, NJ	20	09/27/97
24	W Kobel Jr.	Eatons Neck, NY	07/12/97	T Trembinski	Eatons Neck, NY		09/27/97
32	T Sledzik	Fishers Is., NY	08/15/96	E Maier	The Race, L.I. Sound	35	09/27/97
17	H Sweet	Warren, RI	06/25/97	K Bedford	N E. Providence, RI		09/27/97
23	D Dibblee	Esopus, NY	05/08/97	R Thulin	Norwalk, CT	25	09/27/97
22	E Petronio Jr.	Pt. Judith, RI	06/15/96	D Lema	Pt. Judith, RI		09/27/97
25	W Sharpe	Navesink R., NJ	04/23/93	J Holst	Highlands Brdg., NJ	34	09/28/97
20	F Casey	Boston, MA	08/30/96	D McLean	Boston, MA		09/28/97
18	F Casey	Boston, MA	06/17/96	D Melchionda	Boston, MA	20	09/28/97
28	C Wilcox III	Moriches Inlet, NY	10/07/95	R Specyalski	Clinton, CT	36	09/29/97
26	D Mann	Quick's Hole, MA	06/08/97	M Francavilla	Quick's Hole, MA	28	09/29/97
27	D Holland	Barrington, RI	07/15/97	K Scott	Patience Is., RI	27	09/30/97
22	A Walker	Deal, NJ	10/01/96	G Ciriello	Coney Is. Flats, NY	23	10/01/97
18	C Carroll Jr.	Bradley Beach, NJ	08/23/97	M Iorio	Sandy Hook, NJ	18	10/01/97
23	T Marburger	Shinnecock Inlet, NY	06/16/96	P Graham	Boston, MA	26	10/02/97
19	J Pirie	Ipswich R., MA	08/20/93	S Cooper	Indian R. Inlet, DE	28	10/02/97
20	G Ottavio	Cape May, NJ	09/11/97	C Hajduk	Cape May, NJ		10/02/97
27	W Brett	Marshfield, MA	07/12/96	D Willis	Cape Cod Canal, MA	30	10/02/97
29	R Nystrom	Fairfield, CT	07/27/97	D Chavenello	Fairfield, CT	33	10/02/97
30	F Heal	Ambrose Chan., NY	06/25/97	P Moccia	Staten Is., NY		10/02/97
29	R Grobarz	Sandy Hook, NJ	09/04/96	H Bussem	Sandy Hook, NJ	29	10/03/97
16	R Conklin	Peconic R., NY	05/30/97	W Kaprielian	3 Mile Harbor, NY	18	10/03/97
18	G Ottavio	Cape May, NJ	09/13/97	J Beck	Cape May, NJ	19	10/03/97
23	T Shaheen	Sandy Hook, NJ	06/22/97	D Vervoort	Manasquan R., NJ	25	10/03/97
16	E Petronio Jr.	Pt. Judith, RI	08/27/96	S Wilson	Stevensville, MD	18	10/03/97
22	J Della Porta	Swampscott, MA	09/04/97	M Simpson	Truro, MA	24	10/03/97
21	F Stunkel	Stamford, CT	09/12/94	J Lampert	Bridgeport, CT	27	10/03/97
37	G White	Piscataqua R., NH	07/27/97	S Ryan Jr.	Newburyport, MA	42	10/04/97
22	J Feller	Montauk, NY	06/22/96	L Farr	Montauk Pt., NY		10/04/97
22	G Nigro	Sandy Hook, NJ	06/11/97	B White	South Beach, NY	24	10/04/97
21	T Marburger	Northport, NY	05/10/94	J Kijak	Orient Pt., NY	30	10/04/97
16	G Clusman Jr.	Bay Head, NJ	11/20/96	S Haywood	Barnstable, MA	17	10/04/97
16	B Hubbard	Beverly, MA	09/24/97	K] Lain	Salem, MA	17	10/04/97
18	H Sweet	Bristol, RI	07/23/95	K Bedford	Pawtucket, RI		10/05/97
23	R Leja	Bridgeport, CT	05/21/95	R Nystrom	Devon, CT	29	10/05/97
34	A LoCascio	Throgs Neck Brdg., NY	08/07/97	M White	W. L.I. Sound	35	10/05/97
43	R Maimone	Rye, NH	06/14/97	C Whitney	Kennebec R., ME	46	10/06/97
39	R Maimone	Rye, NH	06/14/97	C Sanderson	Plymouth, MA	40	10/07/97
21	R Allen	Ches.Bay Brdg.Tun., VA	03/13/97	L Western	Smith Pt. jetty, VA	23	10/07/97
32	D Kelly	Orient Pt., NY	11/17/95	R Jakubielski	Block Is. Sound, RI	35	10/07/97
35	K Bilodeau	Fishers Is., NY	08/14/97	S Jakubielski	Fishers Is., NY	38	10/07/97
31	A LoCascio	Execution Lt., NY	11/15/96	M DeLuca	City Is., NY	31	10/07/97
30	R Nystrom	Fairfield, CT	11/16/96	R Visokay	Fairfield, CT	37	10/07/97
	W Woodroffe	Rockaway, NY	11/21/96	B Tirrell	Warren R., RI	20	10/07/97
20	H Sweet	Barrington, RI	06/01/97	B Tirrell	Warren R., RI	22	10/08/97
18	JC Wright	Ches.Bay Brdg.Tun., VA	11/07/96	W Johnson	St. Michaels, MD	19	10/08/97
16	K Carson	Robbins Reef, NY	09/09/97	K McMonagle	Robbins Reef Lt., NY	18	10/08/97
34	J Posh	Stratford, CT	07/28/92	R Desrosiers	Stratford, CT	41	10/08/97

Species

Lgth	Tagger	Place Tagged	Date	Recapturer	Location	Lgth	Date
Striped Bass (cont.)							
26	R Nystrom	Fairfield, CT	08/31/97	M Esquilin	Holyoke Dam, MA		10/09/97
19	JC Wright	Ches.Bay Brdg.Tun., VA	11/14/96	B Zebrowski	Tilghman Is., MD	24	10/09/97
17	R Stroz	Shrewsbury R., NJ	12/05/96	J Medeiros	Westport, MA	12	10/09/97
26	B Mastrone	Bridgeport, CT	07/22/96	R Foster	Fairfield, CT	28	10/09/97
25	G Ottavio	Cape May, NJ	09/11/97	L Nicolo	Cape May, NJ		10/09/97
20	E Petronio Jr.	Pt. Judith, RI	07/02/97	C Ruger	Montauk, NY	21	10/10/97
21	R Chmiel	Fishers Is., NY	06/16/96	M Havens	Fort Pond Bay, NY	28	10/11/97
29	A Anderson	Block Is., RI	09/16/96	C Ruger	Montauk, NY		10/11/97
18	V Galgano	Island Beach St. Pk., NJ	11/23/96	D Tracy	Duxbury, MA	20	10/11/97
23	JC Wright	Ches.Bay Brdg.Tun., VA	10/24/96	L Rudow	S of Kent Is., MD	24	10/11/97
27	A Anderson	Block Is., RI	06/14/97	M Havens	Fort Pond Bay, NY	28	10/11/97
30	F Maddalena	W. L.I. Sound	05/30/97	S Murphy	Montauk Pt., NY		10/11/97
24	R Conklin	Moriches Inlet, NY	11/04/96	S Stiansen	Shinnecock Bay, NY	24	10/11/97
20	R Fink	Hoffman Is., NY	09/01/94	M Sherman	34th St., East R., NY	24	10/11/97
24	P Grippo	Jones Inlet, NY	11/21/95	D Coleman	Keansburg, NJ	30	10/12/97
21	R Leja	Bridgeport, CT	08/17/96	S Wibling	Fairfield, CT	23	10/12/97
27	A Anderson	Montauk, NY	05/22/96	J Fletcher	Fairfield, CT	30	10/12/97
27	A Anderson	Block Is., RI	07/16/97	J Murphy	Block Is., RI	33	10/12/97
21	R Nystrom	Fairfield, CT	08/10/97	N Caroselli	Prudence Is., RI		10/12/97
28	A Marsello	Cape Cod Canal, MA	05/25/95	G Oliveira Jr.	Provincetown, MA		10/12/97
17	A Anderson	Charlestown, RI	11/05/96	B Wazer	Pawcatuck R., CT	17	10/12/97
31	A D'Amato	Cape May, NJ	11/05/96	T Minnick	Montauk Pt., NY	31	10/12/97
34	A Anderson	Block Is., RI	07/19/97	S Fries	Montauk, NY	35	10/13/97
24	W Brett	Provincetown, MA	08/20/97	P Parker	Chatham, MA	25	10/13/97
25	R Grobarz	Monmouth Beach, NJ	06/15/97	R Amberg	Sandy Hook, NJ	30	10/13/97
23	A Anderson	Charlestown, RI	11/05/96	R Gelais	Jamestown, RI	23	10/14/97
23	S Boulmetis	Ambrose Chan., NJ	09/08/97	G Ciriello	Coney Is. Flats, NY	26	10/14/97
18	R Stroz	Shrewsbury R., NJ	09/29/96	M Monzeglio	Raritan R., NJ	23	10/14/97
17	M Mercer	Barrington River, RI	06/04/97	P Grima Jr.	Barrington, RI	20	10/14/97
28	A Marsello	Cape Cod Canal, MA	07/07/95	J Brown	Boston, MA	34	10/14/97
22	G Nigro	Sandy Hook, NJ	11/24/96	G Osborn	Plymouth, MA	23	10/14/97
16	M Aronne	Barren Is. Marina, NY	10/03/92	J McEntee	Jamaica Bay, NY	28	10/15/97
27	D Chidester	Turkey Pt. MD	04/19/94	L Phillips	Hooper Is., MD		10/15/97
34	H Schauer	Martha's Vineyard, MA	05/26/96	L Phillips	Hooper Is., MD		10/15/97
21	R Nystrom	Fairfield, CT	06/14/97	K Kaczmarick	Stony Brook, NY	23	10/15/97
16	T Marburger	Northport, NY	04/27/97	O Yanes	Stamford, CT		10/15/97
23	K Gleason	Darien, CT	07/01/97	R Arnold	Newport News, VA		10/15/97
30	F Casey	Boston, MA	09/16/96	L Phillips	Hooper Is., MD		10/15/97
23	K Dara	Sandy Hook, NJ	11/23/96	R Silva	Rockaway, NY		10/15/97
21	G Nigro	Sandy Hook, NJ	07/26/96	M Mazzitti Jr.	Hewlett, NY	27	10/15/97
24	J Karolides	Salem, MA	08/08/97	R Ruel	Sandwich, MA		10/15/97
31	A Anderson	Montauk Pt., NY	10/10/96	S Cerra	Yarmouth, MA	32	10/15/97
29	J Pienciak	Perth Amboy, NJ	06/06/97	J Elefante	Fire Island, NY	31	10/15/97
Tautog							
13	B Sloat	Rye, NY	11/04/94	L McLoughlin	New Rochelle, NY		
10	R Hennessy	Rockaway Reef, NY	04/27/97	M Schachner	Brooklyn, NY	14	07/23/97
Triggerfish							
11	T Carlsen	Hereford Inlet, NJ	07/08/97	C Wolle	Wildwood, NJ	13	07/16/97
12	T Carlsen	Hereford Inlet, NJ	07/12/97	Unknwn Fisherman	N. Wildwood, NJ	14	07/20/97
12	B Carlsen	Hereford Lt., NJ	07/08/97	Unknwn Fisherman	Wildwood, NJ		08/05/97
15	JC Wright	Ches.Bay Brdg.Tun., VA	08/16/97	R Tennis	VA Beach, VA	15	09/06/97
Weakfish							
19	G Ottavio	Cape May Pt., NJ	07/13/97	I Smith	Fortesque, NJ		07/19/97
18	B Shillingford	Ludlam Bay, NJ	07/11/97	R Sajtlava	Strathmere, NJ	18	07/28/97
12	L Gordon Jr.	Lynnhaven R., VA	05/25/97	W Smith	Long Creek, VA	14	08/24/97
22	G Horvath	Barnegat Inlet, NJ	07/29/97	J Bushell Sr.	Barnegat Bay, NJ	25	08/26/97
22	G Ottavio	Cape May Pt., NJ	06/18/97	P Evangelist	Cape May, NJ		08/29/97
20	M Strober	Verrazano Brdg., NY	07/26/97	F LoCurto	Jamaica Bay, NY		08/30/97
22	J Beck	Cape May Pt., NJ	06/15/97	R Dunham	Normandy Beach, NJ		09/14/97
18	G Horvath	Barnegat Inlet, NJ	08/13/97	M Teitelbaum	Barnegat Lt., NJ	21	09/19/97
19	G Ottavio	Cape May Pt., NJ	06/17/97	W Kopsky	Manasquan Inlet, NJ	21	10/04/97

Book Reviews

Some Kind of Paradise: A Chronicle of Man and the Land in Florida

By Mark Derr
University Press of Florida
389 p. $17.95 (paper)

This is a paperback reissue of Derr's excellent, sad study of Florida and its natural resources as they disappear down the black hole of more and bigger interstate highways (mostly Routes 75 and 95), retirement communities, sugar plantations, orange groves, drainage canals, and, importantly, Disneyworld, also known as Orlando.

South Florida long leaf pine forest - 1929.

A lot has happened since the book was first published in 1988, including the arrival of at least a million new residents bent on not paying income tax, Blockbuster Video, two professional basketball teams. two new football teams, two baseball teams, a new hockey team, a new plan to get water back into the Everglades, Hurricane Andrew, and 4000-head dairy herds, all developments confirming Derr's thesis that humankind is bent on crushing the very values that it migrates south to enjoy.

An environmental ethic is still alive in Florida; new care is being expressed about the water quality problems of Florida Bay, the wet habitats of Florida's estuaries are getting more care, and restoration of native vegetation has become a cottage industry. But flocks of retirees still arrive everyday to bask in the sun, spend their social security checks, and choke the golf courses, and Disney increases its influence over how Florida will be shaped. Maybe wild Florida was full of swamps and mosquitoes, but now it's a tame place full of condos, double wides, and fast food joints. Derr and the rest of us are trying to figure out which is better. Highly recommended.

The River Reader

Edited by John Murray
The Lyons Press
292 p.$17.95 (paper)

John Murray takes on an impossible task and almost pulls it off — summarizing all he knows and there is to know about rivers. But, then, this is not what he is up to at all in this excellent anthology. He wants to select some rivers and writers and give us just enough so we go out and canoe or float or kayak on a river, take up a river's cause, and do much better about preserving the heritage of rivers. Finally, I suspect he would be pleased if we got hold of the sources of his selections and read them in toto.

Murray's task is daunting because there are so many distinct rivers in the U.S. compared, for example, to the earth's five oceans, and because rivers have drawn such a host of good writers. Twenty-two writers are represented here; among them are Mark Twain on the Mississippi, Audubon on the Missouri, John Wesley Powell and Barry Lopez on the Colorado, and Thoreau on the Al-

lagash. Urban waters are also honored, New York City's East River is here and the nearby Arthur Kill; the writer is Lisa Couturier and she is excellent.

Some rivers are not here: the Hudson, Columbia, Suwannee, Delaware, Ohio, Russian, Peedee, Yellowstone. The list goes on — there are 4000 rivers and streams in Pennsylvania alone. Where are the rivers that feed into Chesapeake Bay? Fact is, we are blessed with big, silty rivers and small, delicate streams. Giant catfish populate the Mississippi, little brook trout inhabit some of the brooks in the mountains of West Virginia. Each body of running water has its fans who fish or swim there, walk its banks, and shake fists and swear at those who would dispoil or ignore it. This book will serve to remind us that rivers are special and deserve our care and protection.

A River Lost

The Life and Death of the Columbia

by Blaine Harden
W.W. Norton & Co.
245 p. $13.00 (paper).

Harden writes an unhappy account of the damming, dredging, and otherwise taming of the Columbia River. No matter how many times we read about the Columbia, salmon come in last, behind cheap electricity for the Pacific Northwest; barge navigation from Lewiston, Idaho, to the sea; and irrigated crops for the deserts of eastern Washington.

This book comes at the river from a novel direction. The author's father helped build the dams that turned the Columbia into a series of stillwater lakes, some loaded with nitrogen, others connected by the radioactive waters and sediments around Hanford, and most so devoid of flow that young salmon can't tell upstream from down when they start their migrations to the sea. So Harden, a journalist with the Washington Post, went back where he came from to record the river's history, with maps that show the 14 dams on the main stem and the tributaries and a voyage from the headwaters to the sea, talking to the barge captains, the farmers, and the atomic scientists who inhabit (infest?) the river banks. He gathers and records their opinions about how the river serves its public and what if anything should be done to try to restore some of the river's former glory.

It is at once a sad, hard-hitting, and sometimes macabre look at one of this nation's maybe unsolvable problems — how to repair a damaged ecosystem without seeming to desert those industries or citizens who benefit from the damage. Recently, the administration in Washington, DC, announced that it was seriously considering ways to lower some of the Columbia's dams to increase river flow and rescue salmon species or subspecies on the Snake River, way upstream from the sea. If that works, maybe other dams can be lowered or breeched and the former salmon runs partly restored. But lowering the dams is seen by some to be a threat to navigation and an increase in electricity rates. To rescue salmon, someone's ox gets gored. Harden's conclusion is: let the goring begin.

Along the American River

The 1996 Report of the Council on Environmental Quality

371 p. (paper)
U. S. Government Printing Office,
Supt. of Documents, Mail Stop: SSOP
Washington, DC 20402

The Council has chosen rivers as the topic for its 1996 report, so it's packed with data about river problems — sources of pollutants, urban rivers and their restoration, the impact of agriculture on river systems, acid mine drainage which has just about killed rivers and streams in central Pennsylvania, West Virginia, and major parts of Kentucky and Tennessee, and the problems at the rivers' ends in the estuaries.

Despite its being committee written, it's a good, readable volume, and the

tables and lists make it a valuable reference document. The CEQ does itself proud with works like this one. Sorry we don't know the price; the Supt. of Documents will tell you. This leads us to repeat our often-stated plea to publishers: please put the prices on your books.

Stripers: An Angler's Anthology

Edited by John Waldman
Ragged Mountain Press, McGraw-Hill
160 p. $21.95 (cloth).

If you walk the beaches you may have seen them, the crazies who fish only for striped bass. They fish the New England surf in the cold, during northeasters, under full moons and in pitch dark, in roaring surf, from boats in the rips off Cape May and Montauk. More recently there are saltwater flyrodders; there have always been bunker liveliners and bunker chunkers.

Their prey is sometimes shy and elusive and other times part of a swirling mass (called a blitz). Anglers want 50-pounders; short fish are called rats; stripers will fall for one kind of lure one day but not the next. A striper caught, tagged, and released one day at the mouth of the Connecticut River can turn up at the same river mouth exactly a year later.

Another can swim from its spawning grounds in the Chesapeake to a summer of eating herring or juvenile pollock off the coast of Maine. Stripers are handsome, big-shouldered fish. They can weigh 70 pounds; they can break your tackle and your heart.

One of these striper nuts is John Waldman, editor of this compact anthology, who chases all the bass described above and then apparently spends a short off-season reading about them. He works in New York City for the Hudson River Foundation, a position that includes taking a bunch of kids and adults striper fishing in New York Harbor the day after Thanksgiving. It's a tough job but someone has to do it. Waldman's choice of striper writing is excellent, including John Cole, Russell Chatham, Van Campen Heilner, Nelson Bryant, Al Reinfelder, Phil Schwind, and Frank Woolner. Good stuff this. Read on, then go fishing.

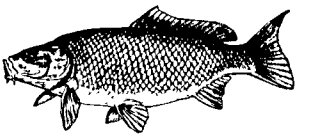
The Quotable Fisherman

Compiled and Edited by Nick Lyons
The Lyons Press, New York
184 p. $20 (cloth).

Nick Lyons owns and runs the Lyons Press in New York City and obviously fishes and reads. These are his favorite author/fishers saying memorable things. If you don't fish, the quotes won't mean a lot, but this is an ideal present for a fishing friend. Below are some examples showing anglers in the throes of "enjoying" their chosen sport:

Margo Page LITTLE RIVERS (1995): "I don't WANT to catch a fish, I felt like shouting. I can't. I am a prisoner hemmed in by walls of trees and branches. The long rod does not want to work in these conditions. I am hot and I look absurd."

Ed Zern HOW TO TELL FISH FROM FISHERMEN (1947): "The chief difference between big game fishing and weightlifting is that weightlifters never clutter up their library walls with stuffed barbells."



"A man who fishes habitually for carp has a strange look in his eyes."
—Arthur Ransome "Carp"
ROD AND LINE 1929

Arthur Ransome ON GIVING ADVICE TO BEGINNERS, ROD AND LINE (1929): "I fished a little while ago with a man, not in his first youth, who had wasted the flower of his life on business and golf and gardening and motoring and marriage, and had in this way postponed his initiation far too long."

Ed Zern (again) TO HELL WITH FISHING (1945): "Fishermen are born honest, but they get over it." □

LOOK OUT, HERE COMES LA NINA

Just when you thought it was safe to go back in the water here comes La Nina, El Nino's little sister. Coupled with the problems inherent in Y2K, the dreaded year end computer glitch/crisis/disaster, it threatens the entire coastal ecosystem and our very way of life, so we dispatched a reporter to get the facts. Here is her report:

...Naturally my first call was to Fletcher Selkirk, Harvard Ph.D. and the Littoral Society's consultant on the normal and paranormal.

UNDERWATER NATURALIST reporter (UN): Could you start off by explaining what La Nina is and what causes it?

Fletcher Selkirk, Ph.D. (FSPHD, pronounced Fizzfudd): La Nina is a huge pool of cold sea water in the equatorial Pacific Ocean, named after the smallest of Christopher Columbus's three-boat fleet. It is caused by communism.

UN: When does it happen and what are some of its impacts?

FSPHD: It always comes hard on the heels of El Nino except those times when it appears to come after and possibly be caused by a scholarly meeting of Australian intellectuals, an extremely rare event. Its impacts are variable, but usually include severe Atlantic coastal storms, more jellyfish in the surf, good growing seasons for leafy green vegetables, and an outbreak of bipartisanship in U. S. Congress. Danielle, the world famous dress designer from Paramus, NJ, says the arrival of La Nina means either higher or lower hemlines on women's skirts. She also says that a National League team will win the next World Series.

UN: Does the congruence of La Nina and Y2K mean anything?

FSPHD: What an asinine question; of course it does. Each event magnifies the other. For example surfers will encounter world class "green room" waves on the east coast, and scientists won't be able to measure them because their computers will be shut down. It means they won't be able to tell the academic community about the waves and storms because neither their phones nor their email will be operative. If you ask me, the scientific community will go bananas. (At this point Fizzfudd began to whimper, so we quietly left his cluttered office in Cambridge, and headed for downtown Boston to speak to Colonel O. Truth of the Corps of Engineers [COTCOE]). The Colonel is a brute of a man, well over 250 pounds of muscle and flab with a mind like a steel trap and a heart of tempered concrete. He was attired in battle dress — full camo, with a bandoleer stuffed with pre-approved dredging permits flung over one shoulder.

UN: Pardon the pun, Colonel, but is the Corps willing and able to help east coast residents weather La Nina?

COTCOE: That's like asking a Congressman if he likes it when someone buys him lunch. First of all, we plan to put a 10-foot-high stone riprap blockade at the low tide line of all beaches between Kittery, Maine, and Key West, Florida. Next, we plan to ask each east coast representative if he or she would like $10 million to spread around the district. And, finally, we plan to convene a workshop in St. Thomas in late February to discuss La Nina.

UN: Very interesting, Colonel. Now, what do you plan to do about Y2K?

COTCOE: What's Y2K?

D. W. Bennett

AMERICAN LITTORAL SOCIETY

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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.

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