

underwater naturalist



Vol. 22, No. 4

AMERICAN LITTORAL SOCIETY FIELD TRIP SCHEDULE

This listing of trips was selected from the 1995 Field Trip Schedule and is designed to tempt you into the littoral out-of-doors where you can explore with fellow Littoral Society members under the leadership of experienced naturalists. Call the office at (908) 291-0055 for trip availability, and then send in your deposit to assure your spot. For a complete listing, consult your Field Trip Schedule. Call or write the office if you would like to have one sent.

April 28 - 30

WETLAND RESTORATION, WESTERN PENNSYLVANIA

A weekend of seining, muskrat watching, birding, mink surveys and plant identification. Picnics on the mountain, hiking, wading, campfires, and informal talks with wetland scientists. All this on a freshwater wetlands site restored by former ALS president Tom Dick, the USF&WS, and hundreds of volunteers.

COST: \$155 covers two nights motel lodging, guides, cookouts.

April 30

MEMBERS' DAY, SANDY HOOK, NEW JERSEY

The Society's 10th annual gathering of members on Sandy Hook for morning hikes - dunes, beaches, holly forest - followed by a picnic of chowder, raw clams, smoked fish, slaw, something to drink, and hot dogs for the kids. No formal notice will be mailed to members, so circle the date and send in your payment as soon as you can.

COST: \$10; 2 for \$18; kids under 12 free. Enclose SASE and we will send directions and last minute details.

May 19 - 21

CAPE COD WHALE WATCH, PROVINCETOWN, MA

Cape Cod in mid-May is the best East Coast spot to see humpbacks and right whales. Come join us on our 15th annual trip to Provincetown for two whale watching excursions and natural history tours around the outer Cape.

COST: \$90 covers boat trips, guides, lectures, a big Saturday night dinner, and slide show. Lodging not included.

May 27 - 29

MURDERKILL CAMP & CANOE, DELAWARE

Despite its name, the Murderkill is a most enjoyable stream to canoe, especially during the Spring migrations. One day spent on the freshwater upper part of the river and another canoeing the lower estuarine section that flows into the Delaware Bay. Novice canoeists welcome.

COST: \$180 covers campground fees, food, and guides. Must bring your own camping gear and canoe or team up with a member who has canoe space.

June 1 - 4

MAINE COAST WEEKEND

A good time to sneak off to Maine before the summer crush to spend a weekend hiking for wildflowers, birds and plants. We will stay Craignair Inn and take excursions to Mosquito Head, Owl's Head, Camden Hills, and a one-day boat trip to Monhegan Island. Lighthouses, rocky shores, eider ducks, and seals. Lots of walking.

COST: \$285 covers rooms at the Inn (double occupancy, bathrooms down the hall), all meals including a lobster dinner, and boat fare to Monhegan.

June 9 - 11

MONTAUK WEEKEND, NEW YORK

An extended weekend at the luxurious Montauk manor on the tip of Long Island. Hiking, birding, wildflowers, butterflies, tidepools, beaches, rocky cliffs, a visit to Montauk Light, and optional whale watching trip.

COST: \$225 covers lodging at Montauk Manor, five meals including a lobster dinner, field trips, evening programs, pick up at the LIRR train station.

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To the editor

Skimmers' Wing Motion

...In your observations of skimmers (vis. UN, Vol.22, No. 3) did you ever note the change in wing stroke during the actual skimming activity? I have watched them often in Key West during their passage by that area. Normal wing stroke when away from the water surface is full-stroke but when they go into "skim" mode the inner wing section, nearest the body has a restrained stroke, most of the stroking being done by the outer sections, thus keeping the tips out of the water.

They present a charming sight when clustered on the beach during bad weather, like little old scullcapped men all facing upwind. They swarm on the beach, but skim alone.

Thank you for a charming article.

John T. Weeks
Hanover, NH

Osprey Chase

...I've got an osprey story to pass along. Back in August I was fishing in Ocean City, NJ when I noticed a school of dolphin chasing bluefish. Following the dolphin were eight osprey, diving on the same bluefish school. It was an incredible sight!

Mike Kenville
Mt. Laurel, NJ

Still More About Searobins

...Glad to see your magazine give space to the good old searobin, an intriguing fish. Authors Grant and McBride are to be congratulated.

I can second McBride's comment that searobins sometimes prey on finfish. While surfcasting with a small spoon for stripers last fall, I was surprised to catch several searobins on the surface. They were almost as aggressive as bluefish; obviously they are comfortable rising off the bottom to hunt.

Let's have more articles on some of the ocean's "lesser known" marine life like the searobin.

Dick Snader
Mt Holly, NJ

Whose Canoe?

...Great cover photo on the last UNDERWATER NATURALIST. Makes me want to paddle down the Suwannee River again. I did the river from Fargo to Dowling about 15 years ago. A pretty paddle. The canoe looks like a wood and canvas Old Town. Is it?

Meg Donnelly
Homerville, CA

(The photographer says it is an Old Town, vintage 1950. She writes: "The lower Suwannee is fine for canvas canoes because there are few rocks, but one need be careful; the limestone ledges in the river bed are very sharp.")

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Life's A Beach

by D. W. BENNETT

Along more than 90 percent of the world's shorelines, sea level is rising. In the northeast U.S., sea level is up a foot this century, and the rise is accelerating. Sand grains are moving, and the beaches are drowning. Geologists now believe this has been the trend for about 3000 years.

To go back even further, their data show that the beaches and barrier islands along the U.S. northeast coast formed about 8000 years ago when sea level was some 450 feet lower than it is today. As the sea moved in over the land, it carried shoreward the sands of the continental shelf; these sands form what we now know of as the shoreline.

Native Americans were sensible (or lucky) enough to treat the shoreline with great respect, visiting it for its natural resources of fish and shellfish, then retreating during the stormy winter months. There are no indications that they attempted to build permanent structures there. That came with European settlement, around the turn of the century, but the big building boom started after World War II with the advent of prosperity, two-car families, and better highways from urban centers to the shore.

Meanwhile, the beaches continued to move, laterally with littoral drift and landward with sea level rise. These moves were gradual and cumulative, punctuated irregularly by hurricanes (usually in the summer and fall) and severe winter nor'easters. Northeast beaches are usually relatively stable from April to September and given to fits of drastic movement during the stormier seasons.

Coastal storms have always been front-page stories in newspapers. Now, they become the lead stories on national television. The setting is standard: a *Bennett is the Executive Director of the American Littoral Society and an avid beach-watcher.*

reporter nattily clad in a yellow rain jacket talks to a camera while waves crash, palm trees sway, and automobiles drown. A wet old codger is found; he has been through a number of these storms, staying put at home to do battle with looters; he will perform the usual post-storm clean up. Suddenly, a noise from the sky. A helicopter lands, the governor bounds out, runs to the camera, and pledges emergency aid to help the distressed community. (The television station will then run file footage or, if lucky, live stuff, of a rowboat being poled down Main Street, or a wet dog and a young boy sitting on the roof of a battered house.)

While sea level rise drowns the shoreline and the beaches move to adapt to wave stress, residents of the lower 48 are busy abandoning the country's interior to move closer to the sea. It is estimated that 70 percent of the population will live within 50 miles of a coast by the year 2000. In the interests of protecting their new real estate investments near the beach, oceanfronters are more and more distressed by the ocean's steady landward assault. These landowners want the ocean to behave, to lie quietly in its basin and lap on the beach only if it can increase the landowner's equity.

But beaches and barrier islands react to the ocean. They lie there serenely during calm times, and then give way when storms push the sea far up onshore. Natural beaches depend on the ocean to shape them to be resilient. When pinned down artificially, beaches and barrier islands lose their ability to adjust. In human terms, they misbehave. Beaches steepen, and dune fields narrow. Wave energy increases, and with no place else to go, the ocean heads for the living room. Houses fall down, pianos float down the street, roads and sewers are ripped up — things get ugly.

There seem to be only two solutions to this problem, either figure out a way to calm the ocean and halt sea level rise, or move out of harm's way. Even the staunchest of the can-do coastal engineers admit that the former is pretty much impossible — the ocean doesn't calm down (it just rests between storms), and sea level rise appears inexorable (physicists estimate that 60 percent of sea level rise can be attributed to ocean warming; water expands as it warms). Moving back from the ocean is anathema. A person wealthy enough to afford an oceanfront (sometimes second) home probably didn't accumulate that capital by running away from challenge. And, besides, someone else (the US Army Corps of Engineers, the Federal Emergency Management Agency, the Federal Flood Insurance Program, or an elected official adept at the art of salt pork production) has been more than willing to pay the inherently high cost of oceanfront living.

The future of the shore looks dim. Without a fundamental change in current practices, the scenario is quite clear. Coastal population pressure and sea level rise will continue. To protect real estate investment, attempts will be made to "stabilize" the water's edge with rocks or line it with artificial beaches. As this occurs, coastal habitat will suffer. Barrier islands, frozen in place, will lose their biologic functions. The beach's gradual slopes will disappear. True dune fields will be replaced by regimented piles of monocultured sand. Offshore sand mining will destroy productive habitat. Wildlife that has evolved over thousands of years to inhabit barrier beaches and islands will diminish.

As the authors of the following article point out, most of the facts about the shoreline are known. The question arises: Can the shore be proper habitat for both wildlife and tamelife (humanity)? Present practices and mindsets say no.



TRUTHS OF THE SHORELINE

by ORRIN H. PILKEY, JR. and KATHARINE DIXON

A study of shorelines, those natural and unfettered and those developed and buttressed, reveals certain generalizations about how they behave. These truths are equally evident to scientists who have studied the shoreline and old-timers who have lived there all their lives. As aids to safe and aesthetically pleasing shoreline development, the following serve as fundamental basics for planning on any coastal barrier.

Beaches and Buildings

1. Beach erosion is not a problem until the beach's path of retreat is blocked.

It is important to distinguish between erosion and an erosion problem. Beach erosion, therefore, is a common, expected event, not a natural disaster. Most shorelines are eroding, which really means that they are moving back. There is not an erosion *problem* until the beach runs into a building or other structure. When a beach erodes, it is not disappearing, it is simply changing its position.

A beach erosion problem occurs when a building, wall, or other "permanent" structure blocks a shoreline's retreat. For instance, when a seawall is built on a retreating beach, it is only a matter of time before the beach, because it cannot move beyond the wall, disappears.

2. You can have buildings or you can have beaches; you can't have them both.

Mile after mile of New Jersey shoreline is walled and beachless. The good news is that many buildings have been saved from falling into the sea; the bad news is that a price has been exacted — the beach.

In order to survive, beaches must be allowed to erode. To keep the beach, you have to sacrifice the buildings.

Pilkey is James R. Duke Professor of Geology at Duke University and the author of a series of books covering state beach issues. Dixon is a Research Associate at Duke University.

Shoreline Stabilization

3. There is no need for hard stabilization until someone builds too close to the shoreline.

Whether the beach is growing, shrinking, or moving landward does not concern the visiting swimmer, surfer, hiker, or fisherman. It is when people build a "permanent" structure in this zone of change that a problem develops. No buildings, no need for stabilization. This point is critical in determining if there really is a justification for shoreline armoring and, if so, who should pay for it.

4. Armoring destroys the beach, it's ugly, and it reduces beach walkability.

Structures, such as groins and offshore breakwaters, interrupt the movement of sand along the beach. Sand collects where it is trapped by an "erosion control" device. Another beach depends on this supply of sand, so it erodes when the supply is interrupted. What is left are pockets of sandy beach trapped by structures interspersed with areas of no beach, only walls of rock, wood, or old tires.

Seawalls are usually the "rocks of last resort" after other hard devices have failed. Seawalls can accelerate beach erosion. Waves soon pound the seawall, and then rebound seaward, pulling what remains of the beach with them. Examples in northern New Jersey and Galveston, Texas, illustrate this. In Sea Bright, NJ, a 12-foot high seawall stands where there was once a beach to which a train brought vacationers from New York City. As erosion threatened beachfront cottages, a protective seawall was built at the expense of the beach. In Galveston, TX, a massive seawall was built in the early part of the century after a hurricane nearly destroyed the city. Beachfront hotel owners have tried small replenishment projects between groins fronting the seawall to build private recreational beaches.

5. A very small number of people create the need for shoreline armoring.

Armoring is a choice that mainly benefits beachfront property owners. In a typical beachfront community, a few hundred property owners line the beaches used by millions. Despite claims to the contrary, it is apparent that shoreline stabilization, including beach replenishment, is carried out only when the front row of buildings is endangered. If the shoreline were allowed to migrate naturally past houses and hot dog stands, the erosion problem would disappear, and the community would have a beach.

Property owners, while small in number, exert a disproportionate political influence in most legislatures and are able to simultaneously generate public sympathy for the plight of the buildings that they chose to perch precariously on the edge of the sea.

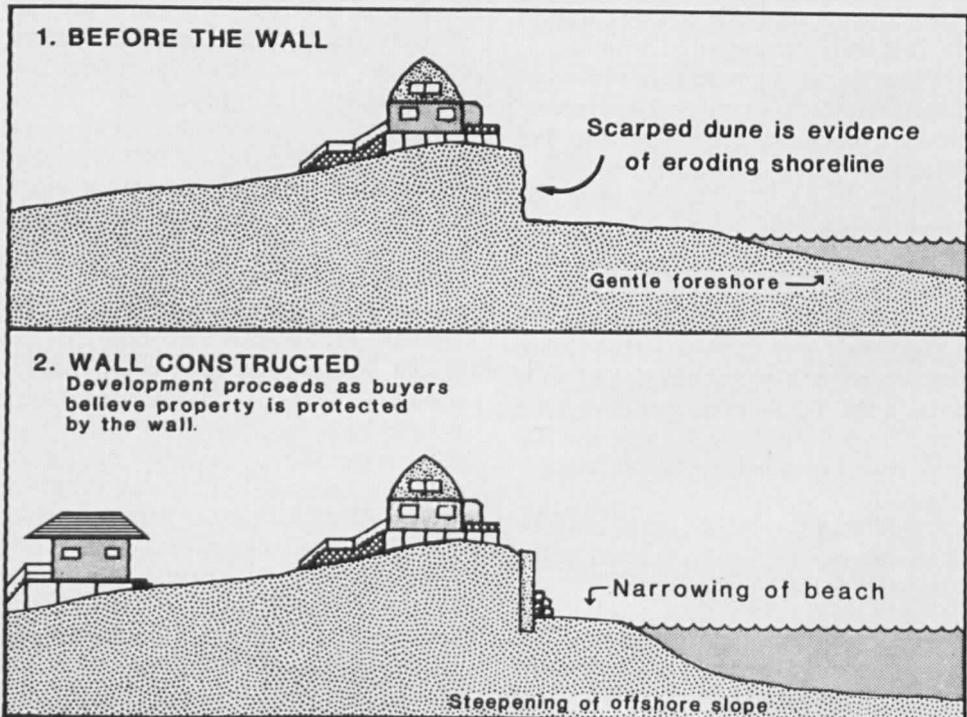
6. It costs more to save the property than it's worth.

When viewed over decades, the costs of most efforts to stabilize a shoreline

with hard structures or beach replenishment will exceed the value of the property to be saved. When the cost of the eventual degradation of the public beach is thrown in, the cost of holding the shoreline in place with armor is orders of magnitude greater than the value of the property to be saved. Such is likely the case in Sea Bright where the cost of the seawall and its maintenance may exceed the value of the houses protected. Now, a large expensive beach replenishment project is in the works, further skewing the ratio of the cost of protection to the value of property protected.

7. Once you start, you can't stop.

Hard stabilization is irreversible as confirmed by shoreline history throughout the world. Removal of groins, jetties, seawalls, and the like almost never occurs. Coastal engineering structures are often altered or replaced but not taken away. Once, while examining the coast of Northern Portugal, we discovered a stone groin in the process of being dismantled and the rocks being carried away in a dump truck. After exten-



sively photographing this most unusual event we followed the dump trucks around a bend in a shoreline only to discover that rocks were being used to construct a much longer groin. Once buildings are protected it is a near political impossibility to remove the protection. Even in states with strong regulations prohibiting all kinds of hard structures, the existing ones are always "grandfathered in" and allowed to remain.

8. Shoreline armoring begets shoreline armoring.

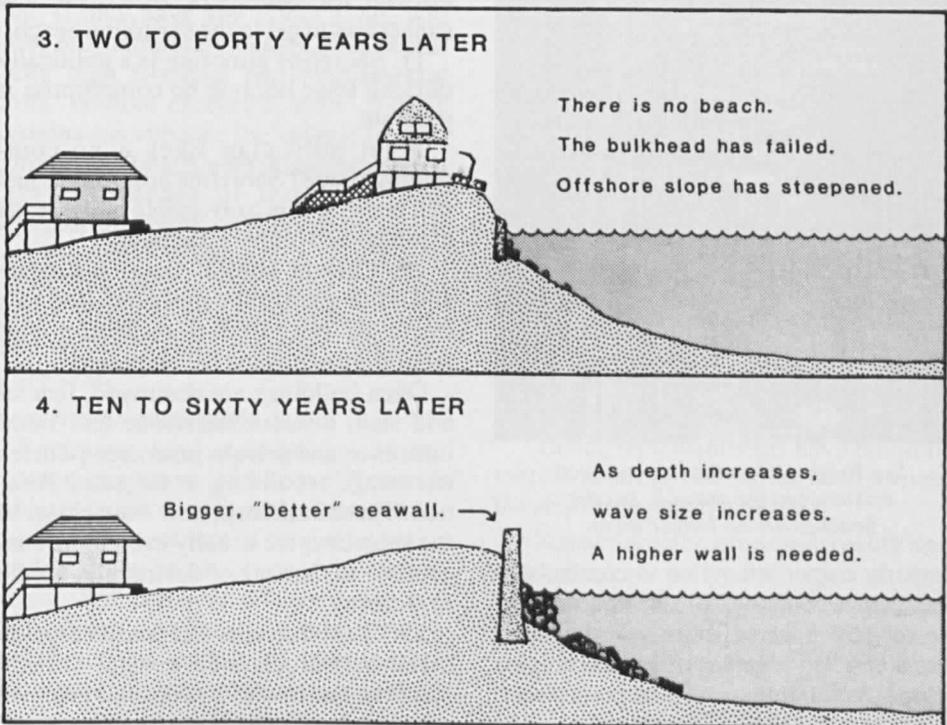
All structures eventually cause sand supply deficits on adjacent beaches, resulting in a need for armoring. Seawalls get longer, single groins become groin fields, and offshore breakwaters are extended. Some thought is being given by the Louisiana legislature to continuing the segmented offshore rock breakwaters already begun off Holly Beach for more than 100 miles to the Texas line. This would be the ultimate in lengthening of shoreline armoring in

all of North America, but the real impetus behind the move may be more the ownership of rock quarries (by family members of state congressmen) than shoreline stabilization needs. At Cape Hatteras, North Carolina, plans are underway to add a fourth groin to the groinfield fronting the Cape Hatteras Lighthouse, despite the state's prohibition against the use of hard stabilization structures.

9. Shoreline armor grows bigger.

Shore protection structures may slow the rate of erosion but do not stop it. Once a shoreline structure has been installed, larger and more expensive structures must subsequently be installed, only to suffer the same fate as their predecessors.

Shoreline engineering structures are inevitably damaged or destroyed after which the structure is replaced by a grander one. Often the reason the structures are damaged is that the structure causes narrowing of the beach and loss of the wave buffering effect of the beach. This loss of protective beach can be seen clearly along the long-seawalled por-



tions of the Jersey Shore. Here, waves from minor storms smash directly against the walls producing spectacular displays of wave spray. With the beach diminished or gone altogether, walls must be increased in size if they are to continue to protect buildings adequately. Seawalls can only grow larger, never smaller.

Political Realities

It seems axiomatic that, as the scale of erosion increases through time, the size of the responsible agency also escalates. Thus, at the initiation of erosion, the local

sion problem is now being dealt with at the national level by the U.S. Army Corps of Engineers, the Federal Emergency Management Agency, and the National Oceanic and Atmospheric Administration. Although there is value in approaching the problem on a regional basis, empowering a larger agency to attack an immense problem is no guarantee of success. As structures and bureaucracy grow, the shoreline erosion problem is becoming more complex and more difficult to resolve.

10. Shoreline armoring is a politically difficult issue because it pits long term environmental impact against a seemingly "quick fix" solution.

Surely it is a rare politician who can withstand the complaints of beachfront homeowners and developers seeking seawalls and instead think ahead three to four decades to the beach destruction the walls will cause. Most politicians are satisfied to let the next generation of politicians worry about the diminishing beaches lined by ugly seawalls, making it difficult for swimmers, fishermen, and sunbathers to get to the shrinking beach.

11. Shoreline armoring is a politically difficult issue because no compromise is possible.

What politician likes a no-compromise issue? Shoreline armoring is just that because it is irreversible and it leads to longer and higher structures.

12. Current coastal flood insurance and other emergency measures lead to a cycle of repeated destruction and rebuilding of coastal development.

Once buildings are destroyed, federal and state disaster assistance and flood insurance and private insurance policies encourage rebuilding in the same location. These buildings, now even closer to the shoreline, are usually even more susceptible to damage or destruction by the next storm.

13. Coastal storms and coastal erosion breed self-proclaimed coastal erosion control experts whose proposals promise solutions that tend to be expensive, short



Sea Bright, NJ, owes its continued existence to the seawall, but the beaches are no longer there.

property owner attempted to combat the loss with wooden bulkheads and rubble. As erosion became more severe, there was a banding together of several neighbors, a community, and then perhaps an entire barrier island. The shoreline ero-



Beach house on an eroding beach, Surfside, Texas.

term, and dependent on someone else's money.

Some are well-intentioned, others are the snake oil salesmen of the sea, most are self-proclaimed experts, but all of the peddlers of schemes for "solving" erosion problems with special offshore breakwaters, artificial seaweed, dune glue, or beach dewatering, sell systems that, if they have any effect at all, will offer only temporary benefit with potentially high financial and environmental costs. Without exception, none of these systems can enhance the volume of sand coming to a beach without depriving adjacent stretches of shoreline. The schemes that work only do so by upsetting the dynamic balance in which each exists. It's akin to bandaging a wound before cleaning it; what might seem to help will only end up making the problem worse.

Beach Replenishment

Replacing hard stabilization as the erosion response of choice is *beach replenishment*. Beach replenishment involves the placement of new sand on an eroded shore in an attempt to restore beach. The practice, *always* expensive and *always* temporary, has met with mixed success and is of questionable merit as a long-term coastal management strategy, but is far better for the beach

than seawalls and other engineering structures.

14. Beach replenishment, the newest and hottest approach to "shore protection," carries its own set of truths:

- Beach replenishment connotes long-term commitments and can lead to a false sense of permanence or security.
- Beach replenishment projects cost more than initial estimates and don't last as long as planned.
- There is no such thing as a cheap replenishment, even when someone else (i.e., the federal government) picks up the major cost share.
- The public is often denied access to the beaches it pays for; true access must include parking, walkways, and other services (changing, eating, restrooms). True public access should be the linchpin of federal participation in beach replenishment efforts.
- Beach replenishments have environmental impacts, both at the sand source, the shoreface, and the beach.
- Sooner or later, economic reality and sand sources will catch up with any beach replenishment project and maintaining the beach will become too expensive and sand reserves scarce. Beach replenishment is a viable option for only as long as money and sand are available.

• Replenishment can lead to increased development. After replenishment in Carolina Beach, North Carolina, development increased dramatically. This only served to put more people and property at risk during the next storm and increased the necessity for beach replenishment making relocation (see below) more difficult.

SUGGESTIONS FOR USING AND PROTECTING COASTAL BARRIERS

1. Accept storms as a way of life on the coast. Do not accept excuses that blame the rapid erosion of a replenished beach or other engineering failure on an "unexpected storm."

2. Design for living with the flexible coastal environment. Encourage dune building, but resist attempts to fight nature with a "line of defense."

3. Consider all man-made structures, including houses near the shoreline, as temporary.

4. Accept only as a last resort any engineering solution for beach restoration or preservation.

5. Accept that beach replenishment will always cost more and last less time than predicted.

6. Base decisions affecting shore development on the welfare of the public as well as the minority of shorefront property owners.

7. When the lighthouse, beach house, motel, or hot dog stand falls as its time comes, don't rebuild it in its original location. Move inland.

Relocation, moving buildings back with retreating shores, is the tried and true way of keeping both buildings and beaches. In the early days of coastal dwelling, relocation was the only option. Until about the turn of the century the choice was "move it or lose it!" The town of South Seaside, New Jersey, originally built all of its houses on wooden runners, so that they could be moved back with the beach. In 1888, the Brighton Beach Hotel of Coney Island, New York, was drawn landward by a team of six steam locomotives. In 1989, the National Academy of Science advised the National Park Service that the best way to save the Cape Hatteras Lighthouse was to move it landward. Today, coastal communities and beachfront property owners often scoff at the notion of relocation. But, the day may come when taxpayers refuse to continue paying the millions of dollars needed to maintain artificial beaches, and the ocean will reclaim its shores.

8. Use beach replenishment only as a way to buy some time while relocation plans are being designed and implemented. Do not build in recently replenished areas believing that they are now safe.



The Reefs of Bermuda

PART II – THE FISHES

by DAVID K. BULLOCH

FISHES

For sheer beauty, the stars of the coral reef are its fishes whose abundance and diversity provide a kaleidoscope of colors and motion in and around the coral heads. Unlike the drab brown, olive, and gray colorations of their temperate water cousins, tropical fish are swimming advertisements for their respective species, each dressed in colors and shapes easily remembered and delightful to behold.

Learning to identify fish is much like identifying birds. Once you have noted its size, shape, and color you look for tell-tale identifiers; vertical markings (bars), horizontal markings (stripes), streaks, bands, blotches, spots, or ocellated spots (spots with an outer ring of another color around it).

The fish can be all of one color, its upper body different from its lower body, or its colorations may be variegated to a point where they are not easy to describe.

Its shape can be slender longitudinally or laterally. It can be flattened, short and stocky, or laterally triangular. Its fins can be exceptionally long or large, heavily spined or threadlike. Its body can be heavily scaled, smooth, or downright prickly.

Many species of fish have favorite haunts — halfbeaks, needlefishes and flying fishes stay close to the surface; rays, lizardfishes, gobies, blennies, scorpionfishes and flounders hug the bottom and often burrow. Gobies are especially fond of sand burrows while blennies prefer holes in the coral. Squirrelfishes and damselfishes hole up in coral crevices and seldom stray far from their

Bulloch is a past president of the Society and frequent contributor to this bulletin. Bulloch's latest book, THE WHALE WATCHER'S HANDBOOK, was published by Lyons & Burford in 1993.

allotted territory. A number of other species school, often in mixed groups; such as tangs and surgeonfishes.

Because many families of tropical fishes have distinctive shapes, it is often easier to group a fish into its appropriate family than it is to immediately identify it to species. Since species belonging to the same family usually have similar life styles, it is easier to learn something about the life styles of a few prominent families than to try to learn the specifics about many individual species.



Blue-Queen Angelfish hybrid.

ANGELFISHES

The most striking fish of the reef because of its size, bright colors, and winsome shape are the angelfishes. In Bermuda, the Blue Angel and the Rock Beauty are the most common; the Queen and French Angel less so. Blue and Queen Angelfish look much alike as adults (and occasionally crossbreed in Bermuda) and are practically indistinguishable from one another as juveniles. Both are blue and yellow; the Blue Angel dorsal and anal fin tips are yellow and its pectoral fins entirely yellow. The Queen Angel has a distinctive "crown" on its forehead and a bright yellow tail.

Except for the Rock Beauty, angelfishes tend to roam over large sections of the reef. The Rock Beauty sticks close to a part of the reef and will defend the area from other members of its own species as well as members of other species. All feed on sponges, crustaceans, worms, and coral polyps. The juveniles of the Blue and Queen Angelfish act as "cleaner" fishes (that is, fish who will pick the scales and parasites off larger fishes); the Rock Beauty juvenile is not. Adults are often seen in pairs, suggesting monogamy.



Spotfin butterflyfish.

BUTTERFLY FISHES

Smaller but vividly colored in bright yellow and white, butterfly fishes instantly draw attention to themselves. Bermuda has five common species. The Spotfin, Foureye, and Reef Butterfly Fish look enough alike that you need to learn their spot arrangements to tell them apart. You will rarely see the Longsnout Butterfly on shallow reefs so that for the snorkler the choices fall among four species.

Closely associated with the reef they feed on crustaceans, the tentacles of tubeworms and other invertebrates. They are not territorial and have a large home range. They are often seen in pairs. At night they undergo changes in color pattern.

DAMSELFISHES

Small, deep-bodied, colorful and aggressive, this family is among the most ubiquitous and territorial of the reef's inhabitants. The Sergeant-Major is the best known because it seems to be everywhere. Its yellow body is lined with five or more vertical black bars. One often sees a variant in which the yellow is nearly replaced by gray on the Midnight-Major, which may be a separate species. Of the many others, the juvenile Jewelfish is the most eye-catching; its dark blue-black body is covered with bright iridescent blue spots.

The family also includes the Beau Gregory, the Bicolor and Threespot Damselfish, and the Blue Chromis. These fish are benthic spawners, laying their eggs in a "nest" which the male will aggressively defend. A few are algae eaters but most snap up passing planktonic creatures. If you watch a territorial damselfish, you will in time note a certain angst in its behavior. Torn between defending its home ground and straying farther away from an enveloping sphere in which it feels safe in order to select better morsels, it grows more skittish the farther out it ventures.



Sergeant major.

WRASSES

With many species, which vary considerably in size and form, their most conspicuous characteristic in common is their use of their pectoral fins in a "wing-beat" form of swimming. They have distinct canine teeth and, some, look positively buck-toothed.



Bluehead wrasse.

The small cigar-shaped Bluehead Wrasse (only the terminal male has a blue head, the smaller females are bright yellow) dances continuously over their chosen coral head or will follow a grubbing fish, like a Goatfish, to feed on what it may turn up but overlook. If a triggerfish opens up a sea urchin, the opportunistic wrasses like Slippery Dick, the Yellowhead and Bluehead will quickly mob the booty and the triggerfish will have all it can do to salvage part of the meal.

Among the wrasses are also some foot-long fish, the prettiest of which is the Puddingwife. Rows of near glowing blue spots stand out in sharp relief against a yellowish-olive base color. The Hogfish, more an explorer of the sandy regions, and the Spanish Hogfish (blue on its upper side and yellow below) are also common.

The wrasses and the parrotfishes exhibit what is known as protogynous hermaphroditism; wherein each species has two types of males. One type is born male



Spanish hogfish.

and will stay male throughout its lifetime; the other starts life as a female then turns into a male as it matures. There usually is also one dominant male per group which has its own distinct coloration and is larger than any other of the same species.

PARROTFISHES

The major difference that distinguishes the parrotfishes from the wrasses are their teeth. Fused together into a beak, a parrotfish has a formidable nipping instrument that, combined with a pharyngeal mill, allows it to feed on hard surfaces, grind them up and excrete the leavings as a fine sediment. They are a major erosional factor on the reef and provide the finer sediments that eventually settle into all the nooks and cranies between loose debris, there to set up and consolidate into stone.

Parrotfish can be large, growing to well over three feet. They have large prominent scales on a deep-bodied frame and a blunt head that, in some species, is decorated with streaks, bars, and blotches of various hues. There are 14 species in Bermuda but because of the many color differences due to age and sex, learning the species takes more effort than one would first anticipate.

Like the wrasses, the parrotfishes make much use of their pectoral fins for swimming and can also move very quickly by additional motive power from



Queen parrotfish.

their tail. Like the wrasses, they are also protogynous hermaphrodites. Unlike the wrasses, they do not have nests but cast their milt and eggs adrift during spawning.

They have two spawning systems; intermediate males and females, by the hundreds, will congregate and mill around each other near the bottom and, as a group, rush for the surface, simultaneously casting off milt and eggs. This usually takes place at dusk. Dominant males never participate in mass spawning, but court an individual female. Both follow the same course of action, ejecting gametes during their rush to the surface.

Parrotfish are both algae and coral eaters. They often browse in groups of mixed species and with fish of other families. Signs of their presence are everywhere as scars on the corals attest. They feed only during the day. At night,



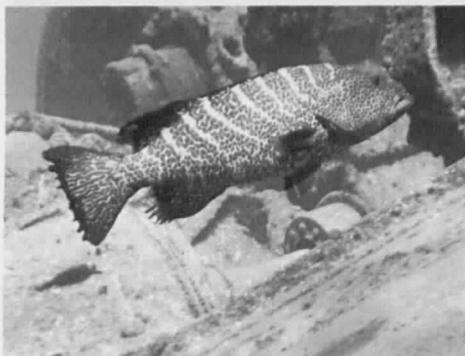
Princess parrotfish.

they hole up under a ledge or in a cavity. Some spin a mucus web around their bodies which is said to ward off sudden attacks of predators such as morays.

SURGEONFISHES

The surgeonfish and tangs are built horizontally high and laterally narrow with eyes set high on the head and prominent lips set low. Where body and tail join, on each side lies a sharp spine which is normally folded into a groove but which can be erected when the need arises.

Three species often commingle together; the Blue Tang, the Doctor Fish and the Ocean Surgeon. Wandering over the reef, the Blue Tang graze exclusively on algae whilst the other two snatch up unwary invertebrates. They often school with parrotfish.



Tiger Grouper

GROUPERS

The groupers are moderate to very large sea basses that are top level predators. They have large scales, big mouths, and big appetites. In size they range from the small, Barred and Spotted Harlequin Bass to the Tiger Grouper which can reach a length of five feet. The Nassau Grouper can be regularly seen on shallow reefs while the Coney, Graysby, and Hinds prefer the deeper reefs.

HERRINGS AND SARDINES

The baitfish of the reefs, the most plentiful of which are the Dwarf Herring, locally known as Blue Fry, swim in dense schools and are the prey of many larger

fish. A look-alike, belonging to the silversides family, is the Reef Silversides or Rush Fry. Both Blue Fry and Rush Fry are plankton eaters.

SQUIRRELFISHES

Large dark eyes, an erect spiny dorsal fin, a red to gold body color, and a penchant for staying holed up during the day best describes the squirrelfishes. Of the two commonest species, the Longjaw Squirrelfish can be distinguished from the Common Squirrelfish by the white triangular markings on the tips of its dorsal spines. Squirrelfish tend to be very territorial during the day and will drive away much larger fish who contemplate refuge in their digs. They leave to feed at night.

TRUMPETFISHES

There is only one species in the Atlantic although it can assume a wide variety of colors. Its elongated body and snout and its habit of hovering, head down, nearly vertically, unmistakably mark it. It often aligns itself next to soft corals, there to await a passing fish which it will grab with surprising quickness.



French grunt.

GRUNTS

Chunky fish with forked tails, erect dorsal spines, and often finely striped in yellow, bronze, blue, or black. The Cottonwick, Caesar, White, French, and Blue-Striped Grunts often swim in mixed schools. When taken from the water, the fish produces a noise by rubbing two throat-teeth plates together, hence its common name.

PORGIES

The commonest porgy on Bermuda reefs is the Bermuda Bream, a dark silvery fish, slightly barred and with a conspicuous black spot on its upper side at the junction of its body and tail fin.

LIZARDFISHES AND GOATFISHES

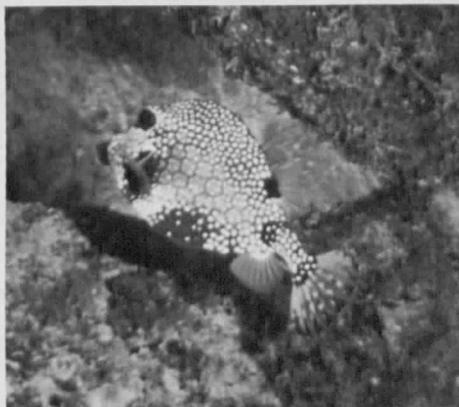
The Sand Diver or Lizardfish takes on the color of the bottom and is usually seen sitting with head erect by using its pectoral fins as props on sandy or smooth surfaces waiting for a passing meal.

Goatfishes swim mainly over sandy or rubble bottom stirring up benthic critters with their two long chin barbels. The commonest is sand-white with wide brown bars along its sides.

TRUNKFISHES

Triangular in cross-section and quadrangular in profile, their body is completely encased in bone. Since they cannot flex their body, they swim by sculling with dorsal and anal fins and "butterflying" with their pectorals. If the situation warrants more speed the tail fin adds an additional burst.

The Smooth Trunkfish is the most common. Its basic body color is black but it is so thoroughly rosetted with white spots as to appear checkered. Under stress these fish can exude a powerful toxin that understandably discourages would-be assassins. They feed by blowing on the sand and snarfing up anything they disturb.



Smooth trunkfish.

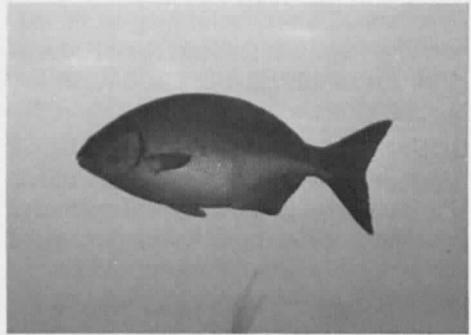
PUFFERS AND PORCUPINEFISH

The little Band-Tail Puffer, with its row in dark spots, is frequently seen in and about the patch reefs. When in trouble, it can swallow water and distend its body into the shape of a balloon.

The more spectacular members of a closely related family, the porcupinefishes, not only swell up but they simultaneously erect a series of hard spines that cover their entire body. The Porcupine Fish which can grow to three feet in length, also has a formidable set of teeth which it puts to good use feeding on mollusks, sea urchins, and hermit crabs.

MANY OTHERS

Of the sixty-four families of fishes that swim in Bermudian waters, at least 22 depend on the reef for food and shelter. At least five other families live close enough by to be considered reef fishes. Half the remainder visit the reefs regularly or on occasion but do not count on the reef or its nearby environs for survival. It isn't easy to dismiss a Barracuda who takes up residence over a patch reef month after month, yet the Barracuda can do just as well living in open, oceanic water. The Bermuda Chub is common on the oceanic side of the cup reefs of the south shore as are jacks and other large fish but other than snatching up a careless reef inhabitant now and then they seem to have little attachment to the reefs except



Bermuda chub.

perhaps for the security the high vertical walls present in time of need.

The reefs are also home to morays, soapfishes, bigeyes, sweepers (although I've never seen one in many years of looking), blennies and gobies. Visitors include not only the barracuda, jacks, and chubs but rays, skates and sharks. However, the latter are rare.

AND MANY MORE

What has been described is what you are likely to see within a few days snorkeling on shallow reefs. Given more time and more searching you can uncover a host of other fishes and invertebrates that are less obvious, cryptic, or rare. Nearby mud flats, grass flats, rubble areas and sandy stretches have their own cast of characters whose life styles differ from the fauna of the reef flats.

Blue chromis.



Volunteer Water Monitoring Works— THE LAKE/BAYWATCH PROGRAM IN ST. ANDREW BAY, FLORIDA

by JOHN M. FOSTER

Our numbers were few and our bodies were chilled on that dank, windy Sunday morning in February 1990, as we embarked upon a new adventure in environmental activism. We were not carrying petitions or legal briefs, but were armed with Beta bottles and Secchi disks. We left from several points, all heading into the choppy waters of St. Andrew Bay, each committed to a year of monitoring our bay's water. We were alone that day because we were the only volunteer group on the Atlantic or Gulf coasts who had undertaken a sampling program of such ambitious scope and one which would be conducted primarily from boats. The innovative efforts in citizen volunteer water monitoring, which had evolved in several locations from Chesapeake Bay to Perdido Bay, had been limited to pier sampling, but they inspired us to take an active role in shaping our bay's future.

The program, known as Lake/Baywatch (LBW) was initiated in late 1989 by members of the St. Andrew Bay Resource Management Association (RMA), a non-profit environmental organization formed in 1986. Its purpose was to monitor activities on St. Andrew Bay, a bay increasingly threatened by strained sewage treatment systems and stormwater runoff, yet still remarkably clean. Lake/Baywatch was initiated with some specific objectives. Over our five-year history, our specific goals have become more focused as we determined what we could effectively and economically accomplish. Our wider goals, however, remain the same. We seek to acquire, through monthly or more frequent sam-

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pling, a reliable, long-term data base to document normal and abnormal water quality trends and fluctuations; provide sufficient data to develop and progressively upgrade a rational, county-wide aquatic resources management plan; positively influence public education and local attitudes concerning the importance of Bay County's water resources; and establish an archive of regional hydroecological information to serve the needs of educators and concerned citizens.

Following the sampling and analysis methodologies established in monitoring programs operated by regulatory agencies and their contractors, the originators of LBW established a program which was scientifically defensible, financially feasible, and one which could be operated totally by non-scientist volunteers with some professional guidance. To ensure the validity of LBW data, early communications were made with the Environmental Protection Agency and the Florida Department of Environmental Regulation to certify that our sampling methods and data handling would be in compliance with accepted standards. In addition to the support of our experienced scientific staff, the members of RMA, and the regulatory agencies, LBW was boosted in terms of technical support by its association with the Florida Lake-watch program of the Institute of Food and Agricultural Sciences (IFAS) at the University of Florida. The field director of that program has been in contact with us from the beginning.

Original funding came from several local businesses. Start up funds of \$6,250, half of which came from Wal-Mart Corporation, allowed for the purchase of the basic field and laboratory



Beta bottle filled with bottom water.

equipment necessary to complete our task. Subsequent funding has been in the form of a grant from the Environmental Protection Agency and the in-kind contributions of materials from local businesses. We were especially fortunate to have the Bay County Utilities Department allow us the use of their laboratory facilities and the oversight of their technicians. By late 1989, everything seemed to be in place for an effective and useful project, except one thing...people. A major effort was mounted by the leaders to recruit sector captains and crew members. Since LBW is a program operated from boats, we had to approach interested and dependable people who owned or had access to a boat and didn't mind working one Sunday morning per month. A pool of crew members was also solicited from the scientific, educational, and technical communities in Bay County. We were gratified to receive a huge response from persons in all walks of life, from teenagers to retirees. We put them to work and the program grew.

We live around the St. Andrew Bay system, a 90-square-mile estuary on the Florida panhandle coast of the Gulf of Mexico. It is formed into four large basins. Geologically evolved from a deep coastal river channel, extant when sea level was much lower, it is now linear on a northwest/southeast axis. It was conceived as an estuary about 5000 years ago with a post-Pleistocene rise in sea level. The four basins, known as East Bay, West Bay, North Bay, and St. Andrew Bay proper were designated as sectors. In addition, Deer Point Lake, a 5000 acre reservoir created by the truncation of the northern arm of North Bay with a dam, was suggested by Florida Lakewatch as a sector. At the west end of Bay County, Lake Powell, the largest coastal lake on the Gulf coast, was also selected. Having an intermittent connection with the Gulf through a temporary pass, Lake Powell is an excellent site for a variety of hydrological studies. The lake was selected as an Outstanding Florida Water by the state of Florida after strong support from the RMA, and its well-being is essential.

Although not connected to the St. Andrew Bay system, Lake Powell, and all other LBW stations, are located totally in Bay County. From the five open water and three bayous sectors, 61 sampling stations were established. The open water stations required surface and bottom water samples while the bayou stations, at least initially, were limited to surface samples. Within three months, several Van Dorn type samplers were purchased and the sampling of all open water stations for surface and bottom data began. At this time, most bayou stations are sampled for surface and bottom water.

As originally planned, we sample all stations on the second Sunday of each month between the hours of 10:00 am and 02:00 pm. Ideally, that time frame is best for water visibility. Of course, as anyone familiar with volunteer efforts

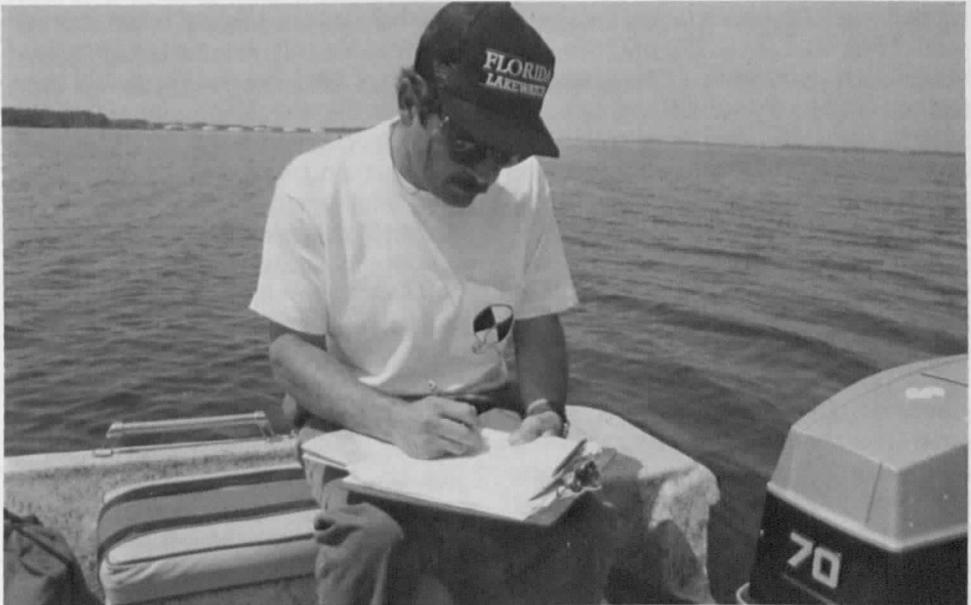
knows, nothing works as planned all the time. We have had many rain-outs, blow-outs, a hurricane, a tropical storm, and zillions of thunderstorms. We have had broken down boats, sick crewmen, previous commitments, and almost every other type of distraction one might consider. With the careful application of back-up crews and the willingness of some crews to cover for others, over the past four years we have been able to sample 90% of our stations within a week of the scheduled date, mostly within a day or so.

Once on the water, the sector captain or bayou leader locates the stations by loran, multiple bearings, line of sight, or by its proximity to aids to navigation or some geographic feature. Anchor is set and time is allowed for any disturbed bottom sediment to settle. If the water is exceptionally calm, some crews do not set anchor. The time, tidal state, and weather conditions are noted first. Next, the field crews record the surface and bottom water temperature, the Secchi disk visibility and the water depth. One liter bottles are filled for laboratory analysis of salinity, turbidity, and pH and

iced immediately. Oxygen is determined on the station with a modified Winkler titration kit produced by LaMotte Company. Data sheets are placed in plastic bags in the ice chests with the samples and delivered to county utilities laboratory on Sunday afternoon or Monday morning. The lab crew, indispensable and highly regarded, starts the next day by analyzing the water in nearly 200 samples. This process takes three people all day. By the end of the day, the sample bottles are re-labeled and packed for pick-up by the sector captain in preparation for the next month's work. Later in the week, data are recorded from the original field and laboratory sheets to a computer data base at the Panama City Laboratory of the National Marine Fisheries Service. From that data base, yearly reports are prepared. The data are available to anyone who requests them.

As a part of our cooperation with Florida Lakewatch, we collect a separate set of samples which are sent to Gainesville. Every other month, all open water stations collect water samples for total phosphorus, nitrogen and chlorophyll *a*. The chlorophyll is extracted by our

The author recording data from North Bay.



laboratory personnel and the filter papers are sent to Gainesville with the separate Lakewatch data sheets. The other samples are frozen and picked up periodically by the field director of Florida Lakewatch when she visits our area.

All persons who collect samples for Florida Lakewatch must be certified by the field director or her representative. About twice a year, we have a "training party" where new or potential members are checked out on the proper way to collect samples without contaminating them. This session is conducted at the home of a member with a dock so the training can be realistic. All training occurs upon the occasion of a large cook-out or barbecue. We have found it important to bring together all the participants in LBW occasionally for socializing and trading stories. Because the bay is so expansive, persons from different sectors may not see each other often and because of the volunteer nature of LBW and its labor-intensive operations, morale must be maintained. Results and analysis from sampling are provided to the crews along with an opportunity to make suggestions or register complaints. As a result of the meetings, and other communications, we have learned much from each other.

The Florida Lakewatch program has been most supportive of our program and has extended its scope by allowing LBW to participate. Our four open water bay stations comprise the only saltwater stations in the total program of nearly two hundred lakes across Florida. At IFAS, they process, plot, graph, and analyze data and send it to us periodically. It is gratefully acknowledged and included in our evaluations and reports.

The practical advantages to LBW are numerous. Obviously, in a time when government programs are being reduced, an effort such as ours can partially replace important data which may be overlooked by overburdened regulatory agencies. We have roughly estimated that the data produced by LBW during its first four

years saved the State of Florida, had they chosen to collect such data, over \$30,000. Included in that estimation are about 3000 volunteer hours, fuel costs, equipment purchases and maintenance, and personal expenses absorbed by crew members. Volunteerism, which is so important in our culture, shows its best side in LBW because not only do participants often endure uncomfortable and difficult conditions, they often spend their own money in the process. Other benefits derived from LBW include the use of our data by local educators as a teaching aid about our bay system. We often provide an opportunity for students to do science projects about water quality and oceanography. Additionally, we have had government agencies and individual researchers request our data. Finally, and perhaps most importantly, we have produced a solid baseline of bay data. Whatever happens in the future, we know what the bay's condition has been for almost five years past.

We have managed to stay fresh by rotating leadership every two years. At the present, we are half way through our fifth year of operation. Our third team of directors are in place and new faces appear constantly among the crews. Few members of the original team are still involved actively, but the list of persons who have been involved is nearly three hundred. We are quite proud of that outpouring of community spirit. As long as we maintain funding and good leadership, the program should continue. The quality of data produced by LBW places it near the top of any list of citizen's volunteer water quality monitoring projects anywhere and for that, hundreds of persons share credit.

* * *

For information about Lake/Baywatch, contact John Foster, Marine Education Associates, 1706 Maryland Avenue, Lynn Haven, Florida 32444 or the Director, Lake/Baywatch, St. Andrew Bay Resource Management Association, P.O. Box 15028, Panama City, Florida 32406.



TAGGING REPORT

compiled by PAM CARLSEN

Littoral Society tagging data provide scientists with information for their studies. While working with the same, certain observations "jump out" as the data are processed. Striped bass seem to show up in the same places year after year. If you have a good spot and tag a bass, return to it about the same time the following year. You may recapture your own fish. Capt. Al Anderson, Narragansett, RI, wrote, "My records indicate this was my fifth ALS personal tag/recaptured striper. There is little doubt in my mind many of these fish are creatures of habit, returning to those spots that perhaps previously were a good feeding area." Fran Flaherty called to elaborate on a 30" bass caught 6/27/94 in almost the identical spot in Boston Harbor where his son Christopher tagged and released the fish at 28" on 6/12/93. Fran uses the "Tagging Returns" section of the U.N. as a reference guide for fishing in the spring. He highlights the dates and the places where fish are tagged and recovered in the Boston area. He finds this to be helpful after a long winter. Bill Dalton's 25" striper tagged at the Highlands Bridge, Shrewsbury River, NJ on 9/6/89 was recaptured by Frank Adams, 5/16/94 at the same bridge, 34." He wrote, "fish in very good condition." Art Drew, East Greenwich, RI, wrote about another bass recaptured near where it was tagged in Narragansett Bay, "I was thrilled to receive the tag return and your note. Imagine him or her swimming around for 6 years." Art tagged this 20" striper on 5/30/88. On 6/11/94, outdoor writer, David Pickering, recaptured this fish at 36", 22 pounds.

Fluke, on the other hand, do not generally return to the same area year after year. In the fall, the fish move offshore into the deeper water of the canyons. In the spring, when they return

inshore, they move further up the coast from where they were tagged. Many fish seem to make a moderate "jump," such as Bill Shillingford's 12" fish tagged 7/7/93, at Corson's Inlet, NJ, recaptured 7/2/94, at 16", off Long Branch, NJ. An unusual return was Scott Carlsen's, 9" fluke tagged 6/17/93, in Atlantic Highlands, NJ, recaptured 7/14/94 at Narragansett, RI, at 14." A fluke tagged by Stuart Fries 7/17/92, in Gravesend Bay, NY at 12" was recaptured 2 years later on 8/1/94 at 21" in the Mystic River, Mystic, CT. So, if you want to recapture your own fluke larger and fatter, head north.

Tag data also show that fish are survivors. Ed Wargo tagged a 27" striped bass on 6/24/93. It was recaptured and retagged on 8/5/93 by James Demarais, Jr. On 6/9/94, it was caught again by Bill Roesch, retagged and released. Finally, on 6/26/94, Ed Wargo, once again, caught the fish now measuring 28." It was released once more into Bridgeport Harbor, where all of this took place, one year to the date. Marvin Berger, noted on a tag card that he released a "survivor" at Atlantic Beach on Long Island, NY. This fish was "missing one eye—fully healed—also had a fresh deep wound on the top of head...one lobe of caudal fin was missing from an old injury too." Two north Jersey stripers of Rob Grobarz, had also overcome injuries. A 29" fish "had a hole through it, in the top of the head, like it was shot with a spear gun" and a 25" "fish's tail had 2 bites out of it's fins." A fish's life is not easy.

Tagging onboard party boats is unusual, except for the "Freddy-C" from Leonardo, NJ, where Capt. Jerry Ciriello does a lot of striper tagging on his evening trips. Tagger Walter Gundersen, Jr. wrote, "These bass were all tagged the same night. I was fishing aboard the 'Freddy-C'. Capt. Jerry Ciriello was run-

ning the boat and he graciously allowed me to tag any fish caught. It ended up being a very good night. I only had 9 tags with me and I easily could have tagged 25 to 30 fish. I only caught 2, as I was too busy running around tagging fish, but it was fun and a lot of people on the boat were very supportive of the tagging of the fish."

Amazing Reports: Dennis Kelly, Sag Harbor, NY reported his 2,900th striper

tagged on 9/21/94, 42", at Orient Pt., NY. Capt. Al Anderson released his 4,500th gamefish, an ALS striper on 9/28/94, 30", at Block Island, RI. Congratulations and thanks.

The Those Who Fish Together, Stay Together Award goes to: Jesse and Mary Lou Wright, Venice, FL. Jesse tagged a 14" sheepshead on 6/24/94. Mary Lou recaptured the fish on 6/25/94. It was released.

TAGGING RETURNS

Species	Lgth	Tagger	Place Tagged	Date	Recapturer	Location	Lgth	Date
Black Grouper								
	12	J Wright	Venice, FL	04/28/94	E O'Rear	Venice, FL	12	04/29/94
Bluefish								
	27	T Lynch	Stamford, CT	10/29/92	J Savastano	Rye, NY	28	06/18/93
	20	M Barrett	Great Kills, NY	05/15/94	M Roman	Perth Amboy, NJ		05/18/94
	25	M Barrett	Great Kills, NY	05/23/94	R Jeandron	Raritan Bay, NY		06/04/94
Fluke								
	15	R Haug	Moriches Inlet, NY	07/06/92	A Plastino	Moriches Bay, NY	16	09/15/92
	14	V Viola	Moriches Inlet, NY	07/19/92	A Plastino	Moriches Bay, NY	15	09/15/92
	11	R Anderson Jr.	Snake Hill Chan., NY	07/11/93	D Shumski	Bay Shore, NY	12	08/15/93
	13	M Mucha	Greenwich Cove, CT	08/26/91	R Wroblewski Jr.	Pt. Judith, RI	14	05/04/94
	10	N Leone Jr.	Sandy Hook Bay, NJ	06/19/93	N.M.F.S.	E. Hampton, NY		05/09/94
	11	V Galgano	Sea Girt, NJ	07/03/93	S Johnston III	Hampton Bays, NY	12	05/10/94
	12	A D'Amato	Delaware Bay, NJ	08/06/92	R Gray Jr.	Indian R. Bay, DE	15	05/11/94
	13	L Gordon Jr.	Lynnhaven Inlet, VA	05/14/94	M Scullion	Lynnhaven Inlet, VA	13	05/21/94
	13	F Waltzinger III	Deal, NJ	09/20/93	C Rutherford	Moriches Bay, NY	15	05/22/94
	12	B Shillingford	Corson's Inlet, NJ	07/05/93	A Fanizza	Captree, NY	14	05/22/94
	14	R Anderson Jr.	Fire Is. Inlet, NY	05/22/94	C Bohl	Great South Bay, NY	15	05/22/94
	13	JC Wright	Lynnhaven Inlet, VA	05/19/94	F Krohenbill	Lynnhaven R., VA	14	05/24/94
	14	L Gordon Jr.	Lynnhaven Inlet, VA	05/15/94	R McClain	Lynnhaven Inlet, VA	14	05/24/94
	12	R Anderson Jr.	Fire Is. Inlet, NY	05/22/94	S Markowich	Robert Moses Brdg., NY		05/24/94
	15	A D'Amato	Delaware Bay, NJ	06/30/93	B Fry	Indian R. Bay, DE	17	05/25/94
	14	R Anderson Jr.	Fire Is. Inlet, NY	05/22/94	R Annino	Robert Moses Brdg., NY	15	05/29/94
	13	C Witek	West Islip, NY	05/15/94	S Giglio	Great South Bay, NY	14	05/30/94
	13	M Greatsinger	Captree, NY	05/21/94	M Barbera	Captree St. Pk., NY	13	05/30/94
	14	N Fiorillo Jr.	Long Branch, NJ	08/28/93	R Everett	Shark R., NJ	15	06/02/94
	12	T Marburger	Shinnecock Canal, NY	05/31/94	P Munaco	Shinnecock Canal, NY		06/03/94
	12	K Leopold	Great South Bay, NY	05/21/94	W Davis	Fire Is., NY	12	06/03/94
	13	S Fries	Rockway Inlet, NY	09/12/93	H Staub	Lynnhaven Bay, NY	14	06/06/94
	13	B Julian	Jones Inlet, NY	05/20/94	J Sabourin	Jones Inlet, NY	14	06/07/94
	13	M Daniewicz	Sandy Hook Chan., NJ	10/06/93	M Breslin	Deb's Inlet, NY	14	06/08/94
	12	W Filce	Sandy Hook, NJ	05/28/94	C Overhand	Sandy Hook, NJ	13	06/08/94
	14	D Dixon	Chincoteague, VA	05/23/94	P Boone	Chincoteague, VA	14	06/10/94
	13	A D'Amato	Cape May, NJ	08/05/93	J Nilsen	Shrewsbury R., NJ	15	06/10/94
	11	R Joyce	Pt. Judith, RI	08/07/93	E Moehring	Provincetown, MA	13	06/11/94
	15	B Goodman	Jones Inlet, NY	06/14/94	A Meyers	Pt. Lookout, NY		06/14/94
	13	J Irwin	Delaware Bay, NJ	07/25/93	K Bradshaw	Sandy Hook Bay, NJ	14	06/16/94
	13	JC Wright	Lynn Haven Inlet, VA	05/19/94	S Fiore	Broad Bay, VA Beach	14	06/17/94
	13	S Carlsen	Atlantic Highlands, NJ	06/25/93	G Arata	Atlantic Highlands, NJ	16	06/17/94
	13	R Anderson Jr.	Fire Is. Inlet, NY	05/22/94	C Hooppaw	Captree, NY	13	06/18/94
	13	R Anderson Jr.	Fire Is. Inlet, NY	06/05/94	S Breitfeller	Fire Is. Inlet, NY	13	06/18/94
	10	B Hastings	Great South Bay, NY	05/30/94	J Wyka	Captree, NY	13	06/18/94
	11	W Filce	Sandy Hook, NJ	08/14/93	D Carkhuff	Deal, NJ	14	06/19/94
	12	W Filce	Manasquan, NJ	09/14/93	R Gafgen	Manasquan, NJ	16	06/20/94
	13	E Feret	Freeport, NY	05/28/94	A Ravit	3rd Wantagh Brdg., NY	13	06/22/94

Species

Lgth	Tagger	Place Tagged	Date	Recapturer	Location	Lgth	Date
Fluke (continued)							
14	W Filce	Manasquan, NJ	09/14/93	F/V Kids N Me	Off Hyannis, MA	15	06/22/94
13	S Wisnewski	Provincetown, MA	06/19/94	R Rourke	Provincetown, MA	13	06/22/94
13	T Marburger	Shinnecock Canal, NY	05/31/94	M Delie	Shinnecock Canal, NY	13	06/23/94
12	R Anderson Jr.	Captree, NY	05/15/94	R Schneider	Lindenhurst, NY		06/23/94
13	R Anderson Jr.	Fire Is. Inlet, NY	05/22/94	J Reilly	Ocean Beach, NY	14	06/23/94
13	W Filce	Pt. Pleasant, NJ	06/16/94	J Malone	Manasquan R., NJ	14	06/23/94
13	A D'Amato	Delaware Bay, NJ	06/03/94	P Harris	Delaware Bay, NJ		06/23/94
12	S Knapik	Pt. Lookout, NY	06/15/94	J Reizner	Pt. Lookout, NY	14	06/24/94

Sheepshead

08	D Sherman	Offshr., Savannah, GA	12/08/93	B Parker	Offshr., Savannah, GA	10	04/02/94
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Striped Bass

23	S Uszakiewicz	Lordship, CT	07/20/88	W Spilbor	Poughkeepsie, NY		08/09/92
33	K Bilodeau	Norwich, CT	05/16/93	R Chmiel	Montville, CT		08/15/93
25	J Mester	Staten Island, NY	11/15/90	P Barbis	Rye, NY	26	09/15/93
22	J Karolides	Danvers, MA	09/10/93	J Manley	Chesapeake Bay, MD		01/15/94
14	D Kelly	Sag Harbor, NY	07/07/92	J Niosi	Alpine, NJ	18	04/02/94
17	T Marburger	Northport, NY	02/12/94	T Marburger	Northport, NY	17	04/02/94
14	T Marburger	Northport, NY	12/26/93	T Marburger	Northport, NY	15	04/04/94
15	R Conklin	Stamford, CT	07/14/93	G Blank	Alpine, NJ	16	04/04/94
11	T Marburger	Northport, NY	03/19/94	T Marburger	Northport, NY	11	04/05/94
17	T Marburger	Northport, NY	03/29/94	T Marburger	Northport, NY	17	04/05/94
16	T Marburger	Northport, NY	01/15/94	T Marburger	Northport, NY	16	04/05/94
17	T Marburger	Northport, NY	04/02/94	T Marburger	Northport, NY	17	04/05/94
23	M Christiansen	Longport, NJ	10/23/93	R Massey	Mays Landing, NJ	24	04/05/94
18	T Marburger	Northport, NY	03/06/94	T Marburger	Northport, NY	18	04/05/94
20	D Kelly	Orient Pt., NY	10/15/93	J Lantiegne	Norwich, CT	22	04/08/94
13	T Marburger	Northport, NY	03/29/94	M Butta	Northport, NY	16	04/09/94
15	T Marburger	Northport, NY	03/19/94	M Butta	Northport, NY	16	04/09/94
14	T Marburger	Northport, NY	03/19/94	T Marburger	Northport, NY	14	04/10/94
16	T Marburger	Northport, NY	04/02/94	T Marburger	Northport, NY	16	04/10/94
18	T Marburger	Northport, NY	04/04/94	T Marburger	Northport, NY	18	04/10/94
18	T Marburger	Northport, NY	04/05/94	T Marburger	Northport, NY	18	04/12/94
18	J Patterson	Gaston, NC	04/24/93	G Hughes	Gaston, NC	19	04/13/94
13	G Blank	Alpine, NJ	04/10/94	O Christianson	Bayonne, NJ		04/13/94
27	D Kelly	Orient Pt., NY	10/29/92	J Andrea	Offshr., Brigantine, NJ		04/15/94
21	S Kellner	Mattituck, NY	06/21/91	B Biedenger	Sandy Hook, NJ	26	04/18/94
15	K Morgan	Piermont, NY	04/04/93	L Americo	Bayonne, NJ	15	04/19/94
20	T Rinaldi	Duck Pond Pt., NY	09/05/93	R Farry	Piermont, NY	22	04/19/94
17	J Karolides	Danvers, MA	06/10/92	N Houle	Norwich, CT	23	04/20/94
21	J Mettler	Fishers Is., NY	09/22/93	F Fratangelo	Port Monmouth, NJ	23	04/21/94
19	J Niemczyk	Baiting Hollow, NY	11/03/93	E McDonnell	Uncasville, CT	21	04/24/94
31	G Ministeri	Wellfleet, MA	08/06/93	C McCarty	Cape May Pt., NJ	32	04/24/94
21	D Partusch	Shrewsbury R., NJ	10/31/92	P Eidman	Rumson, NJ	23	04/24/94
12	G Blank	Alpine, NJ	04/05/94	S McCormick	Bear Mt. Brg., NY		04/24/94
30	G Ottavio	Cape May, NJ	11/06/93	F Graf	South Amboy, NJ	32	04/24/94
25	M Habel	Keasbey, NJ	04/14/93	T Baum	Nvsnk/Swimg R., NJ	26	04/25/94
16	R Piscopo	Englewood Cliffs, NJ	04/17/94	R DiNunzio	Carteret, NJ	17	04/25/94
33	J Demarais	Bridgeport, CT	10/01/92	D Atkinson	Croton, NY	35	04/26/94
24	P Brassard	Pt. Judith, RI	09/19/93	J Mulkerin	Port Monmouth, NJ	25	04/27/94
21	M Romano	Kill Van Kull, NY	07/01/92	R Baroch	Piermont, NY	27	04/28/94
22	S Kellner	Mattituck, NY	07/28/91	J Newton	Hampton, VA		04/29/94
18	J Mettler	Fishers Island, NY	11/02/91	G Blank	Alpine, NJ	20	04/30/94
22	F Jessup	Shinnecock Inlet, NY	11/11/93	F/V Goforit	Ship Bottom, NJ		04/30/94
16	A Marsello	Swansea, MA	08/13/93	F/V Goforit	Ship Bottom, NJ		04/30/94
27	D Kelly	Orient Pt., NY	10/14/93	F/V Goforit	Ship Bottom, NJ		04/30/94
19	T Rinaldi	Mulford Point, NY	11/20/91	E Ortiz	Jamaica Bay, NY	26	05/01/94
19	J Sullivan Jr.	Newburyport, MA	08/10/93	E Sikorski	Island Beach St. Pk., NJ	22	05/01/94
26	A Anderson	Charlestown, RI	09/16/93	B Tan	Bayside, NY	26	05/01/94
29	B Sharpe	Sandy Hook Bay, NJ	04/23/94	R Hendrickson	Navesink R., NJ		05/02/94
34	P Grippo	Tobay Beach, NY	10/29/92	J Rundall	Kingston, NY	38	05/03/94
27	M Berger	Debs Inlet, NY	06/08/93	A Murasko	Cape May, NJ	30	05/03/94
17	R Kyker	Stamford, CT	11/04/93	J Rivera	Jamaica Bay, NY	19	05/04/94
18	P Chowansky	Normandy Beach, NJ	12/14/91	C Monteiro	N. Tarrytown, NY	30	05/04/94

Species

Lgth	Tagger	Place Tagged	Date	Recapturer	Location	Lgth	Date
Striped Bass (continued)							
28	B Shillingford	Barnegat Inlet, NJ	06/08/93	S Pendino Jr.	Barnegat Inlet, NJ	33	05/04/94
18	T Marburger	Northport, NY	04/29/94	J Killian	Northport, NY		05/04/94
19	T Surgent Jr.	Shrewsbury R., NJ	06/16/93	S Hawkins	Shrewsbury R., NJ	22	05/05/94
19	W Woodworth	Connecticut R., CT	05/05/91	F Metz	Sweetwater, NJ	28	05/06/94
20	M Romano	Kill Van Kull, NJ	07/16/92	M Trombeto	Bayonne, NJ	26	05/07/94
22	C Nelson	Darien, CT	08/22/93	R Alberti	Eastchester Bay, NY		05/07/94
18	J Karolides	Danvers, MA	08/11/93	F Shegogue	Solomon Is., MD		05/07/94
31	P Grippo	Jones Inlet, NY	10/26/92	A Becker	Catskill, NY	36	05/07/94
26	K Sprankle	Outer Banks, NC	02/04/92	J Morgan	S of Chespeke Bch, MD	28	05/08/94
40	J Mester	Staten Island, NY	11/16/93	C Johnson	Cape May Harbor, NJ	40	05/08/94
31	W Sharpe	Sandy Hook Bay, NJ	04/27/94	M McNally	Highlands Brdg., NJ	32	05/09/94
24	W Matuszak	Gilgo Beach, NY	08/17/90	C Shirey	Wilmington, DE	35	05/09/94

From Al D'Amato, Cape May, NJ: "Here is a real fish story for you. While fishing for stripers today, my pole snagged a fishing pole on the bottom. After I got the pole in the boat, I noticed the line was still out. The reel had jammed, so I hand lined the line in and found a 37" striper on the end. I tagged him and he seemed in good shape being only lip hooked. What luck!"

25	K Sprankle	Outer Banks, NC	01/27/91	J Stech	Mth of Potomac R., VA	32	05/09/94
24	T Marburger	Shinnecock Inlet, NY	09/14/93	D Obropta	Sandy Hook, NJ	24	05/10/94
38	F Heal	Staten Is., NY	11/14/93	D Waters	Bloody Pt. Lt., MD		05/10/94
36	R Fink	Rockaway, NY	05/23/93	R Guzman Jr.	Great Kills Harbor, NY	39	05/10/94
22	F Casey	Boston, MA	10/09/92	D Pickering	Matunuck, RI	23	05/10/94
26	M Russo	Stony Brook, NY	09/27/92	P Valkavich Sr.	Stony Brook, NY		05/12/94
24	S Kellner	Riverhead, NY	11/12/93	W Gemmell III	Kingston, NY	24	05/12/94
23	W Perlman	Rockaways, NY	11/13/93	J Mattera	Hampton Bays, NY		05/12/94
26	T Rinaldi	Mulford Pt., NY	10/14/93	A Moore	Beacon, NY		05/12/94
11	R Piscopo	Englewood, NJ	12/01/93	J Pettit	Chelsea, NY	14	05/13/94
23	N DelPrato	Boston, MA	08/19/92	J Rusk	Great Kills, NY	27	05/14/94
22	T Rinaldi	Duck Pond Pt., NY	08/09/93	R Springer	Duck Pond Pt., NY	24	05/14/94
27	GS Gray	Charlestown, RI	06/12/93	E Soth	Calvert Cty., MD	29	05/14/94
15	E Janiga	Rye, NY	11/11/93	T Smith	Bayside, NY	16	05/14/94
17	A LoCascio	Manhasset Bay, NY	11/14/93	C Tompkins	Milford, CT	17	05/15/94
35	G Keenan	Shinnecock Inlet, NY	05/30/93	B Koja	Shinnecock Bay, NY	36	05/15/94
19	M Russo	Westhampton, NY	09/22/92	R Murray	Democrat Pt., NY	26	05/15/94
18	J Whaley	NE Pt. Judith, RI	05/03/94	F Magrans, USCG	Pt. Judith, RI	18	05/15/94
24	S Wisniewski	Truro, MA	10/07/92	M Gmyrek	Cape Cod Canal, MA	27	05/15/94
25	G Ministeri	Wellfleet, MA	08/22/93	E Castro	Howard Beach, NY		05/16/94
28	D Hawkins	Riverhead, NY	06/19/92	D Caruso	Orient Pt., NY	34	05/16/94
23	S Kellner	Orient Point, NY	10/30/90	M White	Barnegat Lt., NJ	31	05/16/94
25	B Dalton	Highlands Brdg., NJ	09/06/89	F Adams	Sea Bright Brdg., NJ	34	05/16/94
20	K Henrich	Cape Cod Canal, MA	08/22/93	R Casabianca	Shinnecock Inlet, NY		05/16/94
18	G Blank	Piermont, NY	03/26/94	A Tuthill	Kingston, NY		05/17/94
18	T Tully	Eatons Neck, NY	12/11/91	K Moss	Sunken Mdw St. Pk., NY	19	05/18/94
24	H Sweet	Warren R., RI	07/04/93	T Cummings	Warren R., RI	25	05/18/94
28	A D'Amato Jr.	Cape May, NJ	04/27/94	T Heeber	Fire Is. Inlet, NY		05/18/94
37	G O'Driscoll	Penns Grove, NJ	04/28/94	J Kaminsky	Mattituck Inlet, NY		05/18/94
25	D Kelly	Orient Pt., NY	10/29/93	L Sullivan	Cape Cod Canal, MA	29	05/18/94
25	G Nigro	Sandy Hook, NJ	11/14/93	K Dibblee	Highlands Brdg., NJ	26	05/20/94
25	A Anderson	Block Is., RI	10/17/93	M Perrone	Jones Inlet, NY	32	05/20/94
31	A Dangelo	Block Is., RI	06/03/93	F Dombroski	Kingston, NY	44	05/20/94
18	F Urban	Shrewsbury R., NJ	06/06/91	R Petschauer	Highlands Brdg., NJ	24	05/20/94
21	G Dulka	Shes. By Brdg. Tn., VA	11/19/93	E Pittman	Smith Pt., VA	21	05/20/94
23	F Jessup	Shinnecock Inlet, NY	11/11/93	G White	Cape Cod Canal, MA	29	05/20/94
24	D Kelly	Montauk Pt., NY	11/22/93	B Smith	Sandy Hook, NJ		05/20/94
18	F Stunkel	Norwalk, CT	05/13/94	A Ceresa	Norwalk Is., CT		05/21/94
16	A Fette	S. Kingstown, RI	10/25/92	M Pickering	Matunuck, RI	26	05/21/94
19	D Kay	Taunton River, MA	07/28/90	F Masseria	Raritan Bay, NY	28	05/21/94
17	A Silver	Ellis Is., NY	11/26/93	D Eardley	Newburgh, NY		05/21/94
26	C Ponte	Quick's Hole, MA	07/17/93	G Ewell	Indian R. Inlet, DE		05/21/94
25	G Blank	Alpine, NJ	04/05/94	J Petersen	Crnwll & West Pt., NY	28	05/22/94

Species

Lgth	Tagger	Place Tagged	Date	Recapturer	Location	Lgth	Date
Striped Bass (continued)							
26	T Lyons	New Rochelle, NY	08/01/93	P Barbis	Mamaroneck, NY	26	05/22/94
19	G Ministeri	Cape Cod Bay, MA	07/09/93	R Coppola	Cape Cod Canal, MA	32	05/23/94
23	B Shillingford	Corsons Inlet, NJ	10/08/93	J Simmons	Somers Pt., NJ		05/24/94
23	W Sharpe	Navesink River, NJ	05/05/93	F Malley	Highlands Brdg., NJ	28	05/24/94
22	G Kerkhan	Sandy Hook, NJ	11/27/91	T DiAlfonso	Highlands Brdg., NJ	29	05/24/94
22	A Marsello	Swansea, MA	08/17/93	R Medeiros	Swansea, MA		05/24/94
18	J Karolides	Danvers, MA	07/26/93	P Hofmann	Island Beach St. Pk., NJ	18	05/25/94
21	R Wellman	Riverhead, NY	11/10/93	D Dubois Sr.	Bristol, RI		05/25/94
29	B Glynn	Great Kills, NY	11/12/93	B Hathaway	Esopus, NY	29	05/26/94
20	M Christiansen	Ocean City, NJ	09/16/92	M Christiansen	Longport, NJ	24	05/26/94
30	R Canfield	Westport, CT	07/19/92	B Hathaway	Esopus, NY	32	05/26/94
17	D Sowerby	York, ME	08/28/92	J Plummer	Newburyport, MA	27	05/27/94
16	P Orenzo	Piermont, NY	04/19/94	K Woltens	Co-op City, Bronx, NY		05/27/94
22	B Shillingford	Cape May, NJ	05/12/94	T Carter	Cape May Rips, NJ	23	05/28/94
21	S Kellner	Mattituck, NY	08/15/93	T Rinaldi	Duck Pond Pt., NY	23	05/28/94
34	B Billerman	Newburyport, MA	06/30/92	C Mulcahey	Newburyport, MA	40	05/29/94
23	D Renk	Sandy Hook, NJ	11/09/93	L Richards	Atlantic Beach, NY	23	05/29/94
27	L Richards	Atlantic Beach, NY	07/04/93	A Ciampa	Atlantic Bch Brdg., NY	34	05/29/94
22	R Nystrom	Westport, CT	06/12/93	C McElwee	Westport, CT	25	05/30/94
33	M Berger	Debs Inlet, NY	06/17/93	M Berger	Atlantic Bch Brdg., NY		05/30/94
28	R Szulczewski	Cape May, NJ	11/17/93	J Pace	Highlands Brdg., NJ		05/30/94
12	M Aiken	Milford, CT	10/10/93	V Brosseau	Derby, CT		05/30/94
21	B Perlman	Rockaway, NY	11/21/93	W Perlman	Atlantic Bch. Brdg., NY	21	05/30/94
18	A Marsello	Bristol, RI	06/08/93	R Medeiros	Swansea, MA	21	05/30/94
26	T Rinaldi	Mattituck, NY	07/19/93	B Hoover	Newburyport, MA	28	05/31/94
25	J Hardy III	Nantucket, MA	10/28/92	D Rich	Salisbury, MA	26	05/31/94
22	R Grobarz	Sandy Hook, NJ	10/11/93	E Rivera	Jamaica Bay, NY		05/31/94
18	A Marsello	Swansea, MA	08/20/93	A Marsello	Swansea, MA	21	05/31/94
36	J Mester	Staten Island, NY	11/16/93	R Gillespie	New Rochelle, NY	36	06/01/94
12	P Kershbaumer	Stockton, NJ	06/20/93	G Horvath	Duck Is. Pwr Plant, NJ	11	06/01/94
17	H Fisher	Delaware R., NJ	03/14/93	J Biddlecomb	Potomac R., VA	21	06/01/94
27	V Galgano	Island Beach, NJ	11/29/91	A Holley	Block Is., RI	35	06/02/94
31	H Bowman III	Fire Island Inlet, NY	10/12/92	R Bartlett	Fire Is. Inlet, NY	32	06/02/94
35	W Perlman	Atlantic Beach, NY	06/03/93	W Perlman	Atlantic Beach, NY		06/02/94
22	W Kobel Jr.	Northport, NY	03/30/92	P Barbis	Larchmont, NY	27	06/02/94
18	R Vogel	Rumson, NJ	10/21/91	M Gola	Highlands Brdg., NJ	28	06/02/94
22	W Langworthy	W.L.I. Sound, NY	06/12/92	S Hennegan	Saugerties, NY	26	06/03/94
24	R Nystrom	Stratford, CT	09/28/92	J Terrault	Troy, NY	29	06/03/94
20	D Bogdanowich	Wantagh, NY	06/26/93	C Andreski	Wantagh, NY	25	06/03/94
16	M Aiken	Milford, CT	05/23/93	M Aiken	Milford, CT	21	06/03/94
21	J Mester	Staten Island, NY	07/14/90	M Sherman M.D.	West Bank Lt., NY	24	06/04/94
20	D Kay	Taunton River, MA	06/07/90	D Furtado	Berkley, MA	26	06/04/94
31	D Kelly	Orient Point, NY	09/09/90	H Laufgraben	Hempstead Harbor, NY	33	06/04/94

From George Cardel, Queens Village, NY: "My recommendation to other taggers is to split slightly the feed end of the needle and flair slightly. This helps considerably when introducing the tag to the needle."

23	A Dangelo	Watch Hill, RI	10/09/92	G Clusman	Sandy Hook, NJ	25	06/04/94
27	T Strmiska	Fishers Is., NY	10/17/93	J Augustyniak	Watch Hill, RI	27	06/04/94
24	G Kerkhan	Provincetown, MA	10/09/91	M Lambert	Bourne, MA	30	06/04/94
18	K Martin	Newport, RI	08/10/92	J Conrad	Fire Is. Inlet, NY	22	06/04/94
31	D Mann	Sow & Pigs, MA	09/18/93	B Assif	Block Is., RI		06/04/94
25	G Ciriello	Sandy Hook, NJ	04/20/94	B Tuma	Montauk, NY		06/05/94
27	J Doyle	Trenton, NJ	05/23/93	M Robinson	Trenton, NJ	30	06/05/94
20	W Sharpe	Navesink R., NJ	05/15/93	T Angelos	Falmouth, MA	20	06/05/94
28	D Mann	Quick's Hole, MA	07/24/93	J Aylward	Quick's Hole, MA		06/05/94
32	C Ponte	Quick's Hole, MA	06/04/94	R Cingolani	Quick's Hole, MA	32	06/05/94
21	D Kelly	Sag Harbor, NY	05/23/92	J Rago	Chatham, MA	28	06/05/94
21	T Rinaldi	Baiting Hollow, NY	11/10/93	S DeSenti	New Haven, CT	21	06/05/94
22	F Adams	Highlands Brdg., NJ	05/18/94	F Dougherty Jr.	Highlands Brdg., NJ	25	06/06/94
24	M Berger	Atlantic Bch Brdg., NY	05/10/94	D Lilly	Shrewbury R., NJ	25	06/07/94
25	A Anderson	Block Is., RI	10/08/93	A Anderson	Block Is., RI	27	06/07/94

Species

Lgth	Tagger	Place Tagged	Date	Recapturer	Location	Lgth	Date
Striped Bass (continued)							
33	G Buono	Great Kills, NY	05/11/94	R Lombardi	Great Kills, NY	33	06/07/94
20	T Lyons	New Rochelle, NY	08/07/93	S Drake	Cape Cod Canal, MA	30	06/07/94
17	T Lynch	Stamford, CT	10/02/91	L Seivecal	Stamford, Ct	21	06/07/94
23	R Leja	Bridgeport, CT	07/29/89	E Wargo	Bridgeport, CT	32	06/08/94
16	A Marsello	Swansea, MA	08/21/93	K Bouchard	Fall River, MA		06/08/94
28	R Canfield	Westport, CT	07/05/93	M Persanis	New Rochelle, NY	28	06/08/94
23	C Lienau	Montauk Pt., NY	11/11/93	V Tuzzolo	Breezy Pt., NY		06/09/94
28	J Demarais Jr.	Bridgeport, CT	08/05/93	B Roesch	Bridgeport, CT	28	06/09/94
33	S Witthuhn	Cold Spring Harbor, NY	06/28/93	R Zaccai	Oyster Bay, NY	33	06/09/94
19	B Wilkins	Newburyport, MA	09/21/93	M Arnold	Mystic R., CT	21	06/09/94
26	J Karolides	Danvers, MA	07/14/93	M Doane	Danvers, MA	29	06/10/94

From John Andia, Red Bank, NJ, commenting on his tagging of a 41", 33 lb. striper at the Highlands Bridge: "My largest fish tagged to date. What a feeling of letting a big one go free."

22	W Terrill	Provincetown, MA	10/14/93	C Crue	Merrimack R., MA		06/10/94
19	R Pearson Jr.	Breezy Pt., NY	12/01/93	J Shaw	Charlestown, RI	20	06/10/94
30	P Geiselman	Fire Is. Inlet, NY	05/28/94	M Mannecci	Jones Beach, NY		06/10/94
29	E Baracchini	Cape Cod Canal, MA	06/06/91	G White	Cape Cod Canal, MA	36	06/10/94
33	GS Gray	Charlestown, RI	10/17/92	D Lowry	Newburyport, MA	34	06/10/94
18	K Black	Plum Island, MA	06/13/90	R McDevitt	Plum Is., MA	28	06/11/94
20	A Drew	Narragansett Bay, RI	05/30/88	D Pickering	Narragansett, RI	36	06/11/94
22	G Ciriello	Sandy Hook, NJ	11/18/93	L LaPierre	Seabrook, NH	24	06/11/94
33	J Mester	Staten Island, NY	11/16/93	E Madison	Norton Pt., NY		06/11/94
30	G Epple	Charlestown, RI	10/14/93	C Andrews	N. Truro, MA		06/11/94
21	T Rinaldi	Horton Pt., NY	10/16/93	J Patinella	Huntington, NY	22	06/11/94
20	T Marburger	Northport, NY	01/04/94	D Lyon	S. Norwalk, CT		06/12/94
15	R Kyker	Norwalk Pwr. Plt., CT	04/28/94	J McOrmond Jr.	New Haven, CT		06/12/94
22	D Kelly	Orient Pt., NY	11/08/93	M Carey	Gloucester, MA	22	06/13/94
21	K Gleason	Stamford, CT	11/24/91	P Friel	Martha's Vineyard, MA	26	06/14/94
29	P Krueger	Atlantic Bch. Brdg., NY	06/23/93	R Kessinger	Atlantic Bch Brdg., NY	34	06/14/94
23	B Quick	Loveladies, NJ	06/29/91	W Montrey	Surf City, NJ	27	06/14/94
29	T Sobka	Shrewsbury R., NJ	06/12/92	T Sobka	Shrewsbury R., NJ	34	06/15/94
31	F Stunkel	Stamford, CT	07/21/93	F Stunkel	Stamford, CT	31	06/15/94
32	W Kobel Jr.	Moriches Inlet, NY	05/20/92	R Crowley	Massapequa, NY	36	06/15/94
35	F Stunkel	Darien, CT	07/18/93	K Gleason	Darien, CT	36	06/15/94
23	A Anderson	Block Is., RI	06/07/94	H Eklund	Block Is., RI		06/15/94
32	E Wargo	Westport, CT	10/07/92	R Astacio	L.I. Sound	35	06/15/94
26	J Della Porta	Winthrop, MA	08/12/92	R Brousseau	Boston, MA	28	06/15/94
24	A Fette	S. Kingstown, RI	05/10/94	F Cohen	Caumsett St. Pk., NY		06/15/94
16	S Penta	Boston, MA	08/12/92	E Wargo	Bridgeport, CT		06/16/94
35	E Wargo	Bridgeport, CT	07/22/93	E Wargo	Bridgeport, CT		06/16/94
31	W Perlman	Atlantic Bch Brdg., NY	05/21/94	G Montemagno	Atlantic Bch Brdg., NY	33	06/16/94
25	B Chace	Navesink R., NJ	06/03/94	J Onorato	Highlands Brdg., NJ	26	06/16/94
16	A LoCascio	Manhasset Bay, NY	11/17/93	R Metcalf	So. Dartmouth, MA	18	06/16/94
26	J McAfee Jr.	Quick's Hole, MA	06/24/93	V Bertozzi	Pt. Lookout, MD		06/16/94
25	F Urban	Flynns Knoll, NJ	06/17/92	R Crawford	Island Bch St. Pk., NJ		06/16/94
36	E Wargo	Bridgeport, CT	06/07/94	E Wargo	Bridgeport, CT	36	06/17/94
22	E Lelie	Delaware R., NJ	05/29/94	R Burd	Trenton, NJ	24	06/17/94
34	G Keenan	Shinnecock Inlet, NY	06/24/93	D Carpenter	Shinnecock Inlet, NY		06/17/94
24	A Dangelo	Charlestown, RI	09/26/92	P Desirey	Warren R., RI		06/17/94
28	F Strmiska	Fishers Is., NY	09/12/93	M Anderson	Fishers Is., NY	28	06/18/94
18	J Kane	Delaware R., NJ	06/01/93	S Kollar	Washington's Cross, NJ	23	06/18/94
28	J McAfee Jr.	Quick's Hole, MA	06/11/94	J McAfee	Quick's Hole, MA	28	06/18/94
35	C Ponte	Quick's Hole, MA	07/11/93	L Anastasia	Pasque Is., MA		06/18/94
22	A LoCascio	Manhasset Bay, NY	10/18/91	F Cifarelli	Manhasset Bay, NY	24	06/18/94
27	G Karr	Island Beach, NJ	11/08/92	F Valentine	Ford Motor Pwr Dam, NY	31	06/18/94
20	S Kellner	Riverhead, NY	11/08/93	C Gianakakis	Plum Is., MA	26	06/18/94
25	K Black	Merrimack River, MA	07/05/91	J Candage	Newburyport, MA	28	06/18/94
31	F Stunkel	Stamford, CT	06/15/94	F Stunkel	Stamford, CT	31	06/18/94
18	A Poreda	Throgs Neck Brdg., NY	11/01/92	J Lantiegne	Westerly, RI	23	06/19/94
24	B Edwards	Stratford, CT	06/02/94	C Michaud	Milford, CT	26	06/19/94
24	T Long	Pineville, NJ	05/18/94	M Kenville	Trenton, NJ		06/19/94

Species

Lgth	Tagger	Place Tagged	Date	Recapturer	Location	Lgth	Date
Striped Bass (continued)							
23	G Gerenza	Atlantic Highlands, NJ	07/02/92	D Ambrico	Breezy Pt., NY		06/20/94
35	A LoCascio	Manhasset Bay, NY	10/19/93	C Mehring	Manhasset Bay, NY		06/20/94
21	J Karolides	Danvers, MA	09/08/93	J Barber	Danvers, MA	23	06/20/94
26	J Jordan	Pt. Judith, RI	05/22/94	A Dangelo	Pt. Judith, RI	30	06/21/94
25	G Buono	Staten Island, NY	05/23/94	R Allen	Cape Cod Canal, MA	28	06/21/94
22	T Marburger	Northport, NY	04/27/91	T Ziobo	Watch Hill, RI	30	06/21/94
31	F Stunkel	Darien, CT	06/16/92	R Ciliberto	Darien, CT	36	06/21/94
31	T Pendyk	Bayonne Brdg., NJ	05/17/94	T Pendyk	Bayonne Brdg., NJ	32	06/22/94
24	T Rinaldi	Mulford Pt., NY	10/08/93	G Tamasy	Island Beach St. Pk., NJ	25	06/22/94

From Tom Lynch, Darien, CT: "Out last night, drifting eels in the Race by Fishers Island, NY, and I came home with a 43", 32 lb. beauty. We will be eating striper tonight."

23	B Cotiaux	Great Gull Is., NY	08/04/92	R Conklin	Moriches Inlet, NY	26	06/22/94
19	S Kellner	Orient Pt., NY	11/14/92	M Melito	Fire Is. Inlet, NY	24	06/23/94
23	R Greger	Sandy Hook, NJ	11/21/92	M Kelley	Narragansett Bay, RI		06/23/94
34	R Grobarz	Sea Bright, NJ	09/29/93	B Bertsch	Monmouth Beach, NJ	35	06/23/94
27	Denizens of the Sea	Montauk, NY	05/22/93	C Rance	Lloyd Neck, NY		06/23/94
33	J Morgano	Westhampton, NY	07/25/93	M McEvoy	Greenwich, CT	33	06/24/94
18	G Buono	Great Kills, NY	05/07/94	B Busch	Biddleford, ME	18	06/24/94
30	M Behl	Enfield Dam, CT	06/14/94	J Sampson	Old Lyme, CT	34	06/24/94
15	W Anderson	Provincetown, MA	05/28/93	D Cooke	Ipswich, MA	20	06/24/94
16	J Karolides	Danvers, MA	05/22/94	C Roy	Danvers R., MA		06/24/94
28	A LoCascio	Manhasset Bay, NY	06/11/93	J Scalone	Barker's Pt., NY	30	06/24/94

Tautog

17	D Spring	Ches. By Brdg. Tn., VA	04/17/94	D Wynn	Ches. By Brdg. Tn., VA	21	05/02/94
10	JC Wright	Latimore Shoals, VA	05/14/94	JC Wright	Latimore Shoals, VA	10	05/30/94

Winter Flounder

12	W Anderson	Provincetown, MA	05/26/93	F/V Maureen S.	Offshr., Nantucket, MA	13	04/30/94
10	M Stankiewicz	Copiague, NY	10/19/93	P Lee	Jones Beach, NY	12	05/21/94

GENERAL STORE

Here is a sampling of books and items for sale. More selections available in our BEACHLOVERS Catalog. Call or write for a copy.

BOOK SHELF

Fishwatching, by John Quinn. A guide to the diver's underwater world. How to gear up, where to look, when to go. Many drawings and a color photo section. \$18.



AMERICAN LITTORAL SOCIETY BOOKS

Published by Lyons & Burford

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

Marine Parks & Aquaria, by Anthony Pacheco & Susan Smith. A guide to marine aquaria and national seashores. Divided by regions. Reduction in price since admission prices of parks outdated. \$5.

The Whale Watcher's Handbook, by David K. Bulloch. A field guide to the whales, dolphins and porpoises of North America. \$12.



Life in the Chesapeake Bay, by Alice & Robert Lippson. A guide to the marine animal life plus some of the common seaweeds and aquatic plants of the Chesapeake Bay. \$14.

Fisheries of Raritan Bay, by Clyde MacKenzie. The formation and characteristics of the Bay chronicled, plus fishing methods and lives of the people who caught its fish over the past 300 or more years. \$15.

OTHER ITEMS

Crab T-shirt: It's back and all new. Crab on the front - explanation of "littoral" on the back. 100% cotton, beige w/navy blue printing. M, L, XL, \$15.

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

Fish Tagger's Stuff: Jacket patch, \$4; Hat, blue/white baseball cap with tagged striped bass and ALS Tagging Program logo, \$7; Window decal, \$2.

SHIPPING CHARGES:	\$ 30.01 to \$ 50.00—\$ 5.50
\$ 5.01 to \$ 15.00—\$ 3.50	\$ 50.01 to \$ 75.00—\$ 7.75
\$ 15.01 to \$ 30.00—\$ 4.25	\$ 75.01 to \$100.00—\$ 8.50

Send check or VISA/MASTERCARD details to:

AMERICAN LITTORAL SOCIETY, SANDY HOOK, HIGHLANDS, NJ 07732

Marlin Fishing in Hawaii – A Deck Hand's Memory

by TIM BURKE

The day dawns cool and humid at the same time, more times than not, under the huge old shade trees that cover both sides of the broad valleys like Manoa that flow back away from the sea above Honolulu. When you first awaken, you are aware of the wind seeking through the heavy branches, and of a light rain pattering on the tin roof of the house that is left open to these elements by its position high up one of the ridges inhabited by enormous boars at their crests.

If you are a fisherman, as I was that year, maybe you lie awake a few minutes in the dark, waiting to hear the dull purr of the little sports car engine whining its way along the fronts of two volcanoes, through the rain forest, and the horn at the foot of the driveway announcing your skipper has come again to pick you up and bring you to Kewalo Basin, where your boat is moored, to prepare for another day fishing for mahi mahi, wahoo, ahi, ono, and the great Pacific Blue Marlin.

In the little Alfa convertible the skipper fixed up himself, you settle into the passenger seat for the two-mile ride to the harbor. He points to a clear plastic object nestled into the console, about the size of a small cucumber, and says not to touch it — it's too hot — so you look at the new lure. It does look tempting, if you can project being a marlin, with bright flakes of mother-of-pearl shell glimmering inside the extruded plexiglas tube that is solid except for several holes that run through its length, formed by inserting drinking straws while the plastic is still molten. Around the rear end dozens of pieces of colored rubber bands have been

Burke teaches writing at Brookdale Community College in Lincroft, NJ. He fishes from the shore now.

attached to simulate a skirt where the first hook will be hidden, eight inches ahead of the trailer hook that is just visible outside the skirt, each of them filed to a sharp point every morning, at both their tips and their barbs.

On the pier, the old fish truck is making its rounds in the five o'clock darkness, stopping at one boat after another to see if they have fish from yesterday's catch that they want to sell at the fish auction downtown near the pineapple cannery. All the big Waikiki hotels send men down there to bid on giant tunas, mahis, yellowfins and marlin, which they buy whole and cut up for fillets to serve raw with a mustard and shoyu sauce mixture for a delicacy the locals call sashimi. Around the holidays, the meat from the giant tuna sells in the markets for \$12-\$15 a pound; multiply that times the weight of one 600-700 pound fish, and it's not hard to figure why the skippers will spend hours following these monsters around until the tide changes and they begin to feed.

If yesterday's catch went back to the hotel with the lucky tourists who chartered your boat, or has been tagged and frozen for shipping to California for mounting, or cut up on the pier in the late afternoon and distributed in ten-pound portions to all the other skippers and their crews for barbeques accompanied by Primo Beer, you ignore the fish truck, lace up your deck shoes, and turn your attention to getting the boat in shape for today's charter. It may be a couple of families from the mainland, or a birthday party of local people, or half a dozen members of some college football team in town for a game against University of Hawaii, or six men who have never met one another, or even a one-armed man



Looking to the condos and hotels at the base of Diamondhead

with a white beard and a small boy, who will not get the opportunity to fight the biggest marlin you've ever seen alive.

No matter who emerges from the taxis at the end of the slip in the morning chill, rods need to be positioned in their holders in the transom, akule needs to be sought by offering old Japanese bottom-fishermen part of the next ahi you catch, engines must be checked, cushions put out, leaders changed, line discarded, hooks sharpened, reels oiled, lures selected.

Once everyone is on board, you find out who wants to fish — some people come along for the ride — and you lay out that many playing cards, face down on the counter in the cabin. During the briefing, when introductions are made and procedures explained (crew only on the flying bridge; location of the heads; where to get seasick — not in the heads; etc.) anyone who intends to handle a rod if there is some action draws a card — ace through six or eight, or however many want to fish that day. The card you draw determines the order of fighting any fish that gets hooked up.

Getting a fish hooked and having strikes are two very different things when you are fishing for marlin, because a marlin doesn't bite at its prey the way most fish do. Rather it moves into a school of smaller fish and at lightning speed begins slashing with its bill, a long protuberance of hard cartilage that feels as if someone has wrapped sandpaper around it. The bill on a 300-pound marlin is about 20 inches long and capable of putting out your eye while you are trying to get a gaff into it, leaning over the transom at the end of a battle that may have lasted five or six hours. After the marlin stuns a few of its prey, it circles around in a wide arc and easily devours them as they are sinking to the bottom.

A smart skipper will use this knowledge to great advantage, stopping the boat dead in the water (a risky procedure off Oahu, where currents are funneled into tremendous swells between the islands that can swamp any boat drifting without power). Immediately after a marlin strike — identifiable because usually several lures will be struck almost simultaneously through separated

by as much as 40 yards from one another — the skipper releases the drag on one of the larger reels and manually peels off yards of line. This allows the stricken lure to sink, just the way a real akule would, and entices the marlin to take one of the hooks hidden in its skirt.

These strikes are audible from anywhere on a 60-foot boat, if you know the sound of the inch-wide rubber band breaking in a loud “snap” as the line is released from where it has been fixed at the reel by the rubber band and begins to play out from the tip of the rod. Generally, only the deck hand and the skipper will hear the strike; the tourists are usually in the cabin playing cards, or getting drunk, or sick, or sleeping, or any combination of these. Suddenly, sometimes after hours of peacefully scanning the waters for palm fronds or telephone poles floating in the sea — anything a fish could be under — pandemonium breaks out: the reel is zinging, skipper and crew are practically floating down the ladders to the first deck, shouting as they descend “Who’s up? Who’s up? Who’s number one? Get in the chair! Get in the chair!” and the tourists emerge, still not sure what all the commotion is about, until someone sees the rod bent way over, feeding out line, pointing in the direction of the fish straight out off the stern of the boat.

During the briefing, only the man who picks the ace is happy, until we explain to them all that it is often not the guy who has the first strike that gets to fight the fish. A marlin may well knock down three lures before he hooks himself on the fourth. Four rubber bands break; the fisherman who picked the number four card is the one who gets in the fighting chair and is handed the rod after the crew muscles it out of the rod holder in the transom.

Then it begins. This is what they paid for, though when it happens they seem quite unsure they wanted it all along: there’s much more power taking line than they ever dreamed; the stiff rod is much

more curved than they thought possible; the reel is singing much louder than seems reasonable; someone is fussing with a back brace, trying to clip it onto the reel; someone else gets a bucket, fills it with cold seawater, and dumps it over the reel and into the startled fisherman’s lap to keep the reel from fusing its moving parts, breaking the line and losing the fish.

Most times, for the first 30 seconds or so, the marlin or the ahi — it has to be one of those, nothing else takes line this fast with this much drag set on the reel — will just flee straight out the back and stay in the water, so you still don’t know what you’ve got, or even if you’ve actually got it hooked. If it is an ahi (Hawaiian for the giant tuna, also known as bluefin) you’ve probably got a hook in it. Ahi feed almost exclusively during the 10 or 15 minutes when the tide is changing, but if you’ve managed to position your lures in among them at that time they’ll take almost anything in their frenzy to feed, even bare hooks. You might have followed the little flocks of white birds that soar over a school of them, trying to anticipate the angle between where they are, where they seem to be going next, and where you are, because they’re too fast to actually follow in a boat. That’s why the Hawaiians call them ahi: in the old days, before rods and reels, Hawaiian fishermen would fish lines attached to a wooden spool affixed to the deck of their boat, wrapping the line like thread around the spool. Fastest fish in the sea, ahi took line so fast they burned the spool and set the lines on fire. In Hawaiian, “ahi” means fire.

The whole trick to catching ahi, once you get them to take your lures, is to stop that first long run they make when they realize they are on your line. Stopping them and getting them turned around is a delicate matter of tightening down on the drag to make it harder for them to take line but not so much that they break it. If you can manage to do that before they run off the entire 700 yards of line, you have a



A mahi-mahi catch. Oil painting by the author.

good chance of landing them, because once they are facing the boat they go deep and it becomes a matter of working the rod a foot or two at a time to bring them up close enough to get a gaff in them. Of course, that process may take hours and wear out all the fishermen on the boat, who often disregard your advice about using their backs to pull with and who soon experience excruciating bicep cramps that force them to relinquish the rod to someone else. While that is happening there's a chance the line will go slack and the hook will fall right out of the fish's mouth.

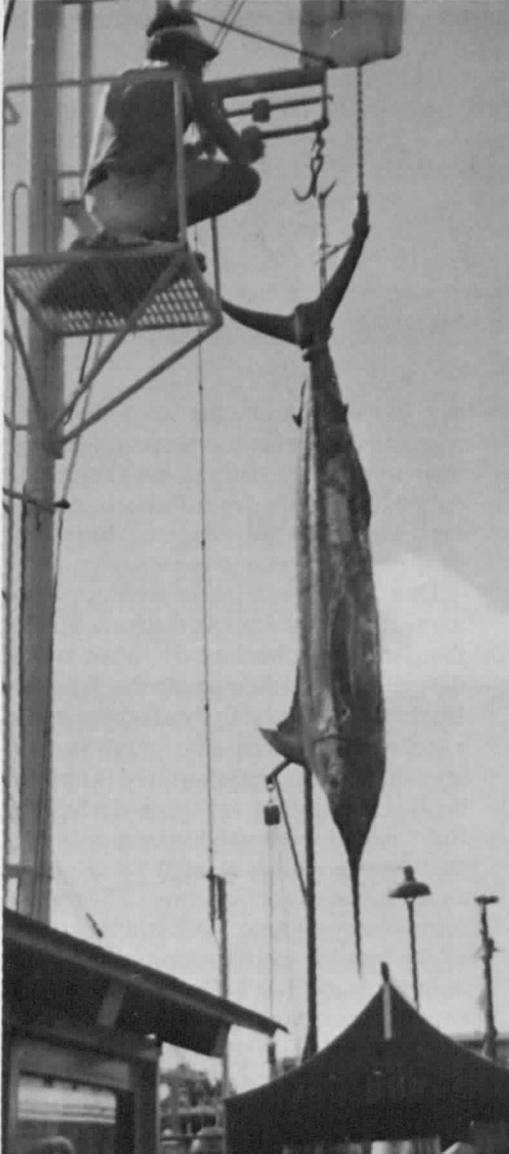
If what you have is a marlin, however, you will know soon enough, because it will jump, magnificently, enormously, its full length straight out of the water so it seems to be standing on the tips of its tailfins, throwing its huge head left and right, trying to throw off the line that has it. Then it will turn tail and run, the reel signaling every surge of power even as it gets farther and farther from the boat. The fisherman is often in shock from what he

has just seen, from the imprudence of trying to master such a monster, from the thought of being pulled out of the chair, pulled through the sea still attached to the reel, strangled by the back brace, or drowned. Welcome to paradise.

One reason marlin is such a prized game fish is that you can fight one all day that isn't even hooked up. Most often, they are just billwrapped: the lure has tangled in itself during the slashing initial encounter, and the line stays wound around the bill as long as there is tension on it. One leap at any time during the fight and a billwrapped marlin will gain slack with a violent twist of his head and shrug off that line and lure. Then all is immediately silent, the rod becomes weightless for the first time, and there's nothing to do but look at one another, smile in amazement and reel in whatever is left of the line. And try again.

If you are lucky enough to actually hook up a marlin, the chances of landing it are still remote, because it can beat you a dozen ways. Unlike the ahi, a marlin

doesn't just pull and pull until one of you wins. Marlin will run right at the boat, and go under it, and around it, and try to cut the line with a fin or with its tail, or throw the hook. If it is a fish that has been feeding at the surface for some hours, or sunning itself, and has adjusted to the pressure of the water at that level, it can fight you all day until it is too dark to fight safely, or you run out of fuel, or food, or strength. The decision to cut the line and



Weighing in.

go home is one not easily made, but it is made from time to time. You can fight a healthy marlin for five hours, get it right up behind the boat, watch it begin to lose color as the blue iridescence fades out of its skin, think you can tighten down the drag to keep it from running again, then watch as it turns and peels off all your hard-won line, stripping the reel bare and disappearing forever into the sea.

Even a 150-pound fish can do this to you, if it's healthy. The chances of landing a really big fish — seven, eight, twelve hundred pounds — are slim to none. The largest marlin ever caught on rod and reel — 1805 pounds — drowned in its own greed, as it had a 150 pound tuna in its mouth when it was brought alongside the boat, dead in the water. The fisherman and his daughter who landed that leviathan, which now hangs in the International Market Place in Waikiki, had to back down on its sinking hulk to get line onto the reel, as it was too heavy to raise manually. Though a lot of fame accrued to him worldwide when the photo was sent over the wire services, the world record belongs to somebody else, because to get a record no one but the fisherman of record can touch the rod from the time the strike occurs until the time the fish is landed.

The most unusual day that transpired during the 10 months I fished off Honolulu began when I saw that one-armed fellow I mentioned earlier. He was tall and gangly, and had fished all over the world, he told us. As the day progressed I believed he had.

This guy chartered the boat alone; his little boy (we assumed it was his boy — neither of them said much all day, until the very end, when it was too late) sat quietly on one of the couches on the rear deck that covered the huge refrigeration compartments, out of the sun and in sight of the two fighting chairs. The gentleman let us know immediately that he wanted to fish for marlin and nothing else, which suited

us just fine. That meant no feather lures dancing close in our wake — lures the small yellowfin tunas thought of as part of a school of baitfish in a feeding frenzy. Nothing but the big, hot, luminous plexiglas tubular lures like the one I'd examined that morning in the Alfa Romeo — six of them: two in the wake; two off the corners about 30 yards back; and two skipping over the surface swells about 40-50 yards behind the boat, held aloft by the outriggers spread akimbo off both stern corners.

We decided to head straight for the tanker anchors off Kaina Point out southwest past Pearl Harbor, hoping to pick up a run along some Japanese longlines on the way, a trip of about an hour to an hour and a half. If we couldn't find a longline — a mile-long piece of fishing line suspended at the surface by glass balls from which Japanese fishermen dropped shorter lines at various depths with hooks and bait that they came around to check every couple of days — maybe we'd come across a trashline, garbage gathered by the currents and frequented by all sorts of marine life. Also passing anywhere across the mouth of Pearl Harbor was a good idea if you wanted to catch marlin, because we had often had strikes there as big fish gathered to feed off other fish that feed off the trash discarded by military ships entering and leaving Pearl.

So we set a course for Ewa Beach, which would bring us in close to the mouth of Pearl, and skipper and crew went aloft to scan with binoculars for high circling frigate birds, the best sign of a marlin while our customer stood on second deck portside, looking.

Forty minutes at sea and we heard a shout from below. We looked down, and there was the gentleman without a left arm pointing with his right toward shore. We looked, and saw a great marlin knifing out of the water about five yards behind a mahi mahi, who was doing the same trying to lose it. They were about 500 yards away when we first saw them,

and too far to estimate size, but we knew this was a fish worth pursuing, and brought the boat about to intercept predator and prey and try to distract the marlin with one of our shiny lures.

They disappeared from view for a minute or two. It was impossible to tell whether that meant the marlin had sensed our lures and was maneuvering around behind them, as it would do, to attack from the rear, or whether it and its prey had gone deeper and taken off on a different course, or even whether it had caught up to the mahi, stunned it, and was preparing to eat.

Then we saw it in the water, circling wide behind our farthest lures, making an arc with a 50-yard diameter. Then it was moving in, and we came down off the bridge and the one-armed man met us on the first deck astern, ready to fight his fish, though I can't imagine how. Generally it takes one hand on the reel and another up above on the rod; he must have had a plan for that.

But it didn't matter. The marlin vanished for a few seconds while we all held our breaths, then suddenly one outrigger was knocked down — snap — then the other — snap — then the portside corner rod went off — snap — and began giving line. We had the fish billwrapped or hooked up, no one knew. But it had begun to run. Immediately then it jumped — straight out of the water, 15 yards behind the boat. We fell back, as if it might jump right over and spear one of us just for the hell of it. It was huge — 13 feet long, maybe, 900 pounds, about. It seemed capable of any trick when it stood on the water for what seemed like a few seconds, glaring out of those big black eyes at us, furious and momentarily humiliated. It landed broadside across the length of its body on the surface of the water and then, as if it had sized up its enemies and decided we were not worthy of this conquest, began to do what it had to do to put an end to this inconvenience.

The first thing it did, and the only thing it had to do, as it turned out, as soon as it

hit the water, was take line so hard and fast that the rod bent in the transom straight over at its butt, below the reel, at a 90-degree angle, so its tip pointed straight out toward where our prey was headed. Fishing rods this size are as thick around at the butt end as a toilet paper tube, and a thick steel pin runs the length of the butt up into the fiberglass, several feet long altogether, which the power of this marlin had bent like a bobbypin. All but the part of the rod that was down in the transom was now, suddenly, inexplicably, lying horizontal across the broad surface of the transom, and line was flying off the reel.

We couldn't do anything. We were helpless to remove the rod from its holder. The fish was pulling way too hard for that. We stood there in shock and watched the great fish strip the line bare, the last few yards vanishing through the eyelets.

The one-armed man was furious. He wanted his money back. He paid to have the chance to fight a marlin, and never got that chance, through no fault of his own. In fact, he had even found the fish himself. Our equipment was defective, he insisted. He demanded a refund.

He had a point. He had several points. We got on the short-wave radio and called the office. Said that The Captain — that's what everyone called the boat's owner — had better meet us at the pier. We were coming in.

The Captain wasn't in business to give refunds. Everybody at the harbor knew that as sure as they knew not to eat the Portugese-style breakfast special at the shanty down the end of the pier.

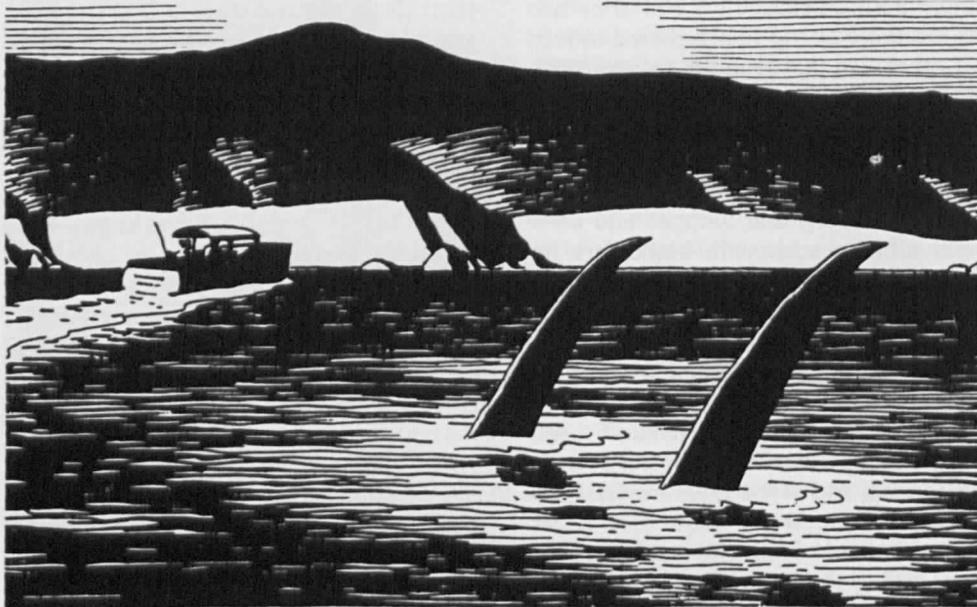
The one-armed man stepped ashore. The Captain stepped out of his red Cadillac and met him beside the boat. The Captain listened, relaxed, a little impatient, as always. The one-armed man stopped talking. The Captain told him, "The fish was bigger than the equipment."

The Captain walked away from the man. He stepped down onto his boat. The skipper stood with him a minute, talking low. They walked over to the transom. They handled the rod. The one-armed man stepped aboard.

"Your equipment was defective."

"The fish was bigger than the equipment."

There was no money refunded that day.





Notes from Australia

Exploring A Mangrove in Cairns

by JAMES DUGGAN

The protected fringes of the northern Queensland coast provide a suitable environment for mangrove forests. Substrate composition was a prime ingredient in the development of the mangrove system around the city of Cairns, Australia.

Here some 16 square miles of mangroves grow on a sand-ridge plain consisting of alluvial silt and clay. These sediments are the deposits of a flood plain created by the Musgrave River prior to the Pleistocene Age when volcanic activity diverted the river farther south. In recent times, the Barron River has deposited mud around Cairns, providing an ideal environment for mangrove growth. A mangrove area near Cairns International Airport was opened in 1988 complete with a boardwalk trail, jointly funded by the Cairns City Council, the Cairns Port Authority, and the Commonwealth.

The Jack Barnes Bicentennial Mangrove Boardwalk takes either a northern or southern route. Each is studded with plaques identifying mangrove species and discussing the intricacies of the mangrove ecosystem. The northern route to Middle Creek is about a half mile loop which includes some viewing platforms and a canopy tower. The southern route to Swamp Creek is under a half mile and ends at a tower which provides good views of Cairns City. The sights, smells, sounds, and sensations of a mangrove must be experienced to be appreciated. A prerequisite for any mangrove walk is insect repellent since mosquitoes in this area do carry Ross River Virus and at times, Dengue Fever.

At the beginning of the southern walk

Duggan, a member of both the Australian and American Littoral Societies, lives in Queensland and is a regular reporter on "down-under".

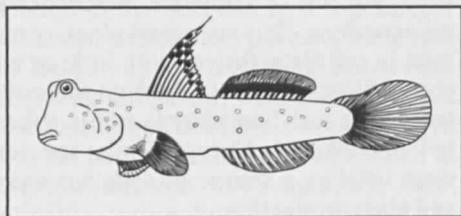
there is a salt flat devoid of mangrove flora, but full of samphire, *Sarcocornia quinqueflora*. This succulent plant, common in salt flats, thrives with little or no competition because of the high salt content of the soil. Samphire is edible either raw or cooked. In Europe similar species were used as a source of soda for soap and glass production.

At the entrance to the mangrove forest, the first two dominant species are eucalypt, *Avicennia eucalyptifolia*, and yellow, *Cerriops tagal*. Both host several species of gastropod on their trunks, as far as six feet up. *Cassidula angulifera* is the least common. *Littorina scabra*, a periwinkle, is the next most common, and *Cerithidea anticipata*, a mud whelk that can withstand long periods of time out of the water, is the most common. All three of these herbivores are detritus feeders and are common to the northern mangrove swamp. The periwinkle is found on the lower trunks of the wood as well as below the trees where it browses on seaweed and microscopic algae. *Cassidula* species tend to browse on decaying vegetation, but these particular individuals were well up the mangrove trunks; their shells covered with a tint of green algae.

Farther along the boardwalk, the canopy becomes more dense and less light penetrates through to the forest floor. Here, a larger gastropod, *Telescopium telescopium*, a mud whelk, crawls along the surface of the muddy sediments searching for food during low tide. Its shell is cone shaped with a single white line on each whorl.

Small fish jump between pools of water as the tide ebbs. Closer observation reveals them to be mud skippers. *Periopthalmus koelreuteri*, the most common of the five species found in the swamp, is a drab, brown-grey fish, about six inches

long. Its pectoral fins are muscular and have developed into limb-like appendages for creeping along the mud. It uses its tail to skip and leap across the mangrove swamp, and is most readily seen on an outgoing tide.



At this point along the walk, the dominant mangrove species has changed again. The trees commonly seen here have prominent stilt roots and are primarily of the *Rhizophora* species, the most common being the spider mangrove. Popping sounds made by crabs and mollusks can be heard as they go in and out of their burrows and shells in the mud. Leaves fall from the mangroves, decay, and are fed upon by many marine organisms, including crabs which live around the mangroves' trunks.

At the end of this boardwalk route, a tall mangrove species with a large canopy above, the orange mangrove, can be seen along the edge of the forest and swamp.



If you want to catch lots of striped bass in the surf, then forget images of stripers chasing mullet through blue breakers, or nimble terns dive-bombing sand eels driven to the surface by boiling bass. Instead, find just the opposite: a mud-brown, foamy surf void of baitfish, and filled with lounging herring gulls or laughing gulls (the kind you might associate with the local landfill), some floating debris and seaweed, and most importantly, dead and dying surf clams.

Sautner is an ardent fisherman and staff member of Clean Ocean Action.

This variety has many knobby protuberances or knee roots thrusting upwards through the mud. The orange mangrove has a high tannin content and was once used in Southeast Asia for tanning animal hides and by the Australians for tanning cotton fishing nets. Viviparity (seeds germinate still attached to the parent tree and develop into seedlings without any dormant period) in this species is well developed and Aboriginals ate the hypocotyl (portion of the seedling between the stem and the root) after the tannin was removed.

The northern route boardwalk has similar flora and fauna, with a well exposed mud flat along one leg. Here, many fiddler crabs scurry around with their bright orange claws in full view, keeping their burrows cleared and protected from other crabs as the tide ebbs. The viewing platform on this route provides a good view of Middle Creek, where schools of mullet swim along the banks awaiting the flood tide to bring them in among the mangroves to feed.

Should a mangrove swamp be accessible in your area or during a vacation, be sure to schedule a walk or paddle through it. Fascinating.

Clammy Bass

by STEPHEN C. SAUTNER

The surf clam, (*Spisula solidissima*) is found from New England to North Carolina, mostly in waters less than 100 feet-deep. Coastal storms dislodge clams from nearshore beds and cast them shoreward where wave action either breaks up their shells, filling the surf zone with the clam's soft-body, or deposits the whole clam on the beach at the high-water mark.

Finding such an area is easy. Just visit any mid-Atlantic or northeast ocean beach after a coastal storm, particularly a snotty nor'easter. The more washed-up clams the better, and if the surf has a faint

aroma of fermenting clam juice, and the muffled sound of clicking and clacking clam shells can be heard with each receding wave, you're in. Rest assured the bass, which are known to key in on abundant prey, are probably there — gorging.



I first learned about clam fishing while surfcasting in New Jersey. A wicked storm two days earlier had left the surf churned up and brown, and three hours of plugging had produced not even a bump for me. I was about to quit, when an angler arrived carrying just a surf rod — no plug bag, bucket, or tackle box. He picked up one of the thousands of clams lying on the beach*, pried it open with his hands, and threaded the soft-body on a single hook tied directly to his line, with no weight. A few turns of elastic string secured the clam. He then lobbed the bait out no more than ten yards where it splatted down and slowly sank out of sight.

A minute or two passed when he suddenly heaved back on the rod and was into a fish. Moments later, a five-pound striped bass was flopping on the sand, its stomach bulging like an overfilled innertube.

By the time he released that fish, I had taken his cue, and already threaded one of the treble hooks off the plug I was using, and tied it to the end of my shock leader. Finding a clam was no problem

either — they were literally ankle-deep along most of the beach. The first cast sent the bait one way, my rig the other, and I quickly learned the importance of string to keep the clam from tearing off. Thankfully, the fisherman took pity on me and gave me a few yards of his.

I wrapped the string around the clam a few times, finished with an overhand knot, and sent the bait seaward with a gentle lob. The wave action pushed and pulled the settling clam, and I had to keep a slack line to keep it tumbling naturally in the wash.

I didn't have to wait too long before I felt a no-nonsense pick-up and take, reminiscent of a sea robin grabbing a fluke belly. A quick lift of the rod and a seven-pound striper thrashed on the surface, then peeled off line from my spinning reel. When I released that fish, I looked back at the shoals of surf clams rolling in the wash, and realized the great action I had been missing.

Since then, whenever I come across beached surf clams, I make it a point to put the plugs and hardware away, and switch to clams. This is also about the time when I turn a fishless day into a productive one.

*Before you go filling up five-gallon pails with beached surf clams, check local regulations. In some areas, it's illegal to take surf clams from the beach, even for bait; many nearshore clambeds are closed because of pollution problems.

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The Shore in Winter

by DAVID K. BULLOCH

Walking the tideline of my favorite stretch of seashore in winter, when town cleanup crews are more concerned about removing snow and sand drifted on to roads than beach litter, gives me an opportunity to contemplate the growing accumulation of flotsam brought in by the tide and speculate on how it came to wash up there.

The leavings along the New Jersey and Long Island shoreline have little of the multi-lingual and multi-national flavor of, say, the beaches of Padre Island, Texas even though they lie adjacent to shipping lanes plied by the merchant freighters of a score of nations. Nevertheless, these objects from the sea are every bit as instructive.

Natural offerings abound; shells of clams and whelks, clumps of seaweed, and windows of marsh reeds. Here and there the trunk of a tree or an old, creosoted bulwark, broken away from some rotting pier, has run aground.

But the obvious and all-pervading elements of this wrack-line's restless accumulation are the plastics; some recognizable, some ripped or crushed beyond ken, but everywhere abundant. They lie along the strand in a profusion of sizes, shapes, and colors awaiting the next tide.

Where does it all come from? You can, by the nature of some of it, make an educated guess even though much is so non-descript that its point-of-entry into the sea will forever remain obscure.

The scattered beer bottles and cans, some no more than a hundred feet from a well-marked litter barrel, are the wanton discards of thoughtless and irresponsible beach-goers; perhaps a fisherman, a local on lunch break, or an end-of-the-season sunbather.

An intact, tied, garbage bag can't have travelled too far either; likely as not, the

wastes of a boater too lazy to cart it ashore and put it in one of the bins available at every marina. Boatmen, private and commercial, contribute a multitude of other objects to the scenery; remains of rope, motor oil containers, odd hunks of styrofoam, and other items of a clearly maritime nature.

An empty, small, and flimsy plastic shopping bag, pinned down only by washed over sand offers a bit more intellectual challenge. Shoppers dispose of them in their household garbage yet these bags most likely make it to the water's edge borne by the air. Near New York waters, it probably blew off a garbage barge during transfer or from a solid waste site close to the sea, such as Fresh Kills in Staten Island.

The ubiquitous "beach whistle," a colorful sobriquet for the plastic tampon insert, is a sure sign that raw sewage pollution has touched these shores. Most of the metropolitan and suburban sewage systems have combined sewer overflows, that is, street runoff and household sewage go to the treatment plant through the same pipe. When it rains the system overloads and raw, untreated sewage goes directly into the nearest waterway. A quarter-inch rainfall is enough to flood most systems beyond their capacity. A number of Long Island towns close their beaches for 48 hours after every rain-storm because bacteria counts predictably rise too high for safe swimming.

You will also find an infinity of little plastic sipping straws in the wrack, innocuous to behold, but a sure sign of street runoff that brings with it nearly all the major ingredients that make up what is called non-point source pollution. The same rains that brought raw sewage to the shore also bring silt, fertilizer, and pesticides from suburbia, bacteria from animal droppings, and motor oil. A

quarter of all the oil that makes its way into U.S. waters every year from all sources is waste crankcase oil either dumped in streets by do-it-yourself oil changers or from oil leaching out of the ground where it had been previously dumped.

As you look up from this man-made wrack out into the cold, choppy waters,

you remember the effect this waste had on humans in past summers but wonder about its year around consequences on the seashore life that is part and parcel of this scene. No "indicators" wash in to tell us about its silent destruction; no bones survive to remind us of our continual folly.



The Future of Our Coast is Down the Drain

by MEGAN McQUARRIE

Many people are still under the impression that industrial and municipal discharges are the leading cause of water pollution. Due in large part to citizen action and stricter environmental laws, most such discharges are now controlled. Today, the largest threat to water quality is non-point source (NPS) or "pointless" pollution. This is especially true of coastal waters near high-density development.

Pointless pollution comes from various, indirect, unrelated sources and includes storm-water run-off from streets and parking lots (carrying hydrocarbons, heavy metals and litter), pesticides, fertilizers, and pet waste, as well as overloaded septic systems and boating dischargers. Collectively, these sources severely impact water quality and pose a threat to public health.

Nationwide, NPS:

- contaminates drinking water and waterways
- closes beaches and shellfish beds
- causes algae blooms which can lead to fishkills
- adversely effects the lifecycles of aquatic organisms
- can lead to public health risks and to fish consumption advisories.

McQuarrie is the NPS Coordinator for Clean Ocean Action and the Littoral Society.

But, pointless pollution is difficult to control through regulation. There are laws in place, but they are largely unenforced. For example, pooper scooper laws and fines for improperly disposing



A storm drain stenciling session.

of oil and other household hazardous wastes are difficult to enforce. Therefore, what must be dealt with are the cumulative impacts of individual actions.

An individual may not believe he or she can have a large impact on water quality. Not true: One gallon of motor oil dumped down a storm drain can create an 8-acre slick and contaminate a million gallons of drinking water. People need to be made aware of how they contribute to water pollution and how they can be a part of the solution.

There are simple things that can be done on an individual or community level.

Millions of people throughout the world participate in beach cleanups. Volunteers collect trash and keep a tally of what they pick up. This information is part of an international database at the Center for Marine Conservation that allows us to track the types and sources of debris washing up on our shores.

Across the country, students are working to educate their communities about NPS by stenciling storm drains with messages such as "Drains to Bay" or designs such as fish and crabs. These stencils adorn drains from San Francisco, CA, to Providence, RI, and point out that what is in our streets can impact marine habitats.

Recent federal law creates programs and incentives to reduce NPS. Under the 1990 Coastal Zone Reauthorization Amendments (CZARA), all states with a federally funded coastal zone management plan must develop Non-Point Source Pollution Management Plans by July 1995.

The National Oceanic and Atmospheric Administration and the Environmental Protection Agency have published guidelines for creating these plans. Five main categories: Agriculture, Boating and Marinas, Forestry, Hydromodification (dams), and Urban Measures must be considered. A state

may file for an exemption from any category if it can prove NPS resulting from such category does not cause a significant impact on water quality.

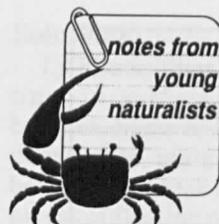
Some states have submitted their plans for preliminary approval and others are still in the development stage. To find where your state stands and how you can participate, call your state's Environmental Protection Department and ask about the 6217 stormwater management plan.

While people are the leading cause of the pointless pollution problem, they are also the solution. Individuals and communities can work to insure that our coastal waters are fishable and swimmable by using recyclable goods and providing public comment on the state's stormwater management plan. The goal is to prevent this type of pollution from entering waterways, rather than to clean it up at the end of a pipe.

* * *

For more information on how to keep your coastal waters clean, write to Our Habitat is Down the Drain, P.O. Box 505, Highlands, NJ 07732, an NPS education campaign sponsored by the American Littoral Society and Clean Ocean Action, or send \$8.95 to NRDC, 40 W 20th Street, New York, N.Y. 10011, for its publication "Upstream Solutions to Downstream Pollution."





Analysis of Beach and Marsh Litter from Long Island's North Shore

by NEIL GUARNIERE, MELISSA NEGRIN,
BRIAN KEEN and KEVIN STEELE

When we walk in Long Island's salt marshes and on beaches we often encounter a sickening brew of trash and litter which is composed primarily of plastics. Plastics in our coastal waters and on our shore lines are responsible for an escalating aesthetic and environmental problem. The physical and chemical stability of these plastic products enables them to spend long periods of time fouling our beaches and waterways. The beaches and waters surrounding Long Island are responsible for infusing billions of dollars into our local economy each year. If the pollution problems facing the southern bay system and the Long Island Sound are not solved these revenues may be lost. Pollution problems also adversely affect the quality of life.

Teams of students at Smithtown High School collected, weighed and classified litter from local beaches and salt marshes to better understand the nature and cause of this escalating problem.

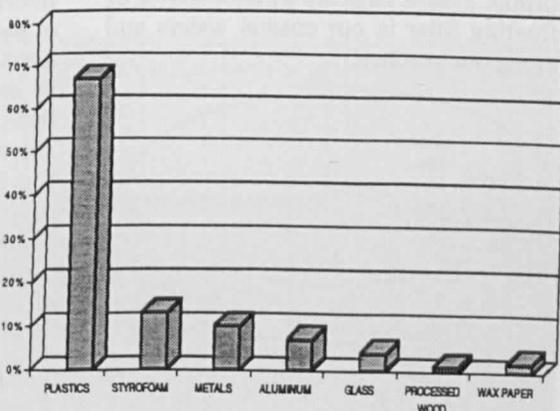
Data Collection

Much of Long Island's coastal litter is left in the strand line with each receding tide. Small segments of these strand lines were raked at random from local beaches and marshes. These samples were then returned to the lab for analysis. Natural debris was separated from man-made litter and trash. Each litter item was categorized as

to its chemical composition and function. Each litter/trash item was then weighed. The total sample contained three hundred and thirty nine items.

The majority of the litter had been in the water for a long time. We also sampled the water of a local harbor with a plankton net. We found over 30 small pieces of plastic in the collection bottle after a 10 minute sample. We believe these tiny bits of plastics (microfloatables) are produced from the weathering of larger items such as plastic bottles.

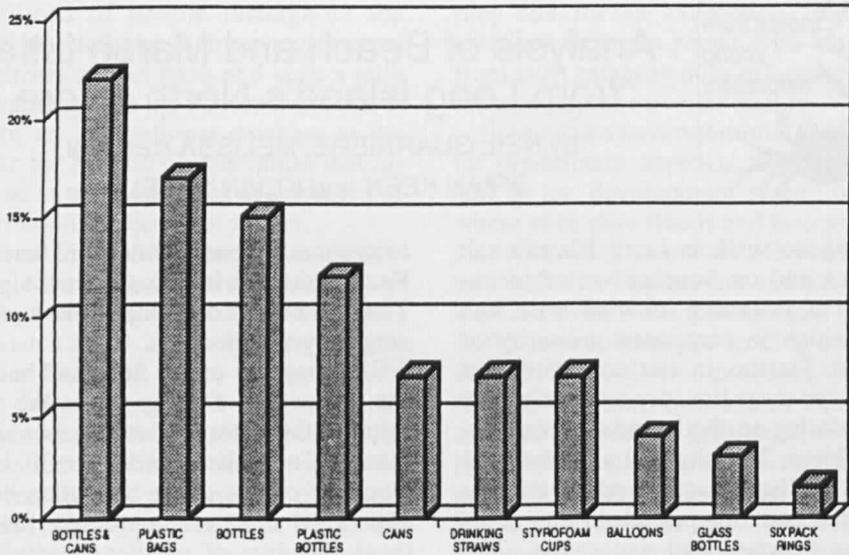
The data were analyzed by mass and by number of items. The results were very similar; therefore only the percentages based on number of items are shown in the following graphs.



PERCENTAGE OF ALL ITEMS

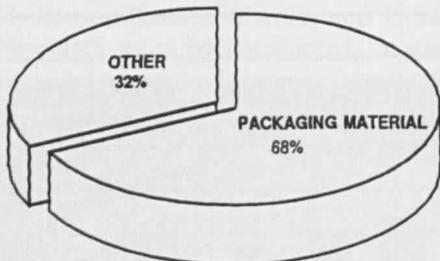
The category labeled "plastics" includes any plastic or styrofoam item. Almost 70% of the beach litter material was plastic and was dominated by plastic bottles and bags. Styrofoam, a form of plastic, was graphed independently so that the amount of styrofoam alone could be seen. We found 13% of all litter items were composed of styrofoam.

Guarniere, Negrin, Keen, and Steele, students at Smithtown High School on Long Island, assembled this report as part of a class project.



PERCENTAGE OF ALL ITEMS

The litter was categorized by the function that each item served before it was discarded by the user. Bottles and cans made up 22% of all items. Most bottles were plastic, and held a wide array of liquids such as bleach, soap, baby oil and drinks. Plastic bags are a major source of floating litter in our coastal waters and along our beaches.



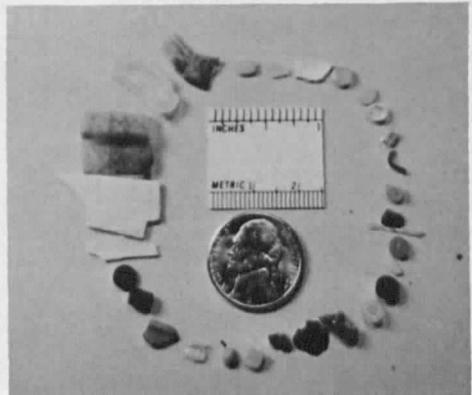
Sixty-eight percent of the beach litter was packaging material for consumer items.

We sampled the water in Stony Brook Harbor (L.I. Sound) in January of 1992. A fine mesh plankton net was suspended from the pier on an incoming tide. The net was sampling for about 10 minutes. The contents of the collection bottle are shown in this photo. This would seem to indicate that large concentrations of small plastic floatables are in the waters

of the L.I. Sound. It appears that the weathering of larger floatables is responsible.

Discussion

We believe the major pathway of this debris into our coastal waters is from littering. Individuals illegally disposing of packaging materials in or near coastal areas or while boating plays a major role in our coastal litter problem. Many of these packages, especially plastic bags and wrappers, are low density and therefore are moved easily by wind and water runoff. Many roads drain directly into coastal waters. These road surfaces act as pathways for suspended and dissolved contaminants and plastic litter.



Solutions

1) Plastic litter has lengthy residence time in surface waters and on our beaches. Some of these items may spend decades in marshes and on beaches before they break down into very small pieces of floating plastic.

Plastics designed to degrade with exposure to the ultra violet (UV) in sunlight would certainly reduce the visibility of this problem. The entanglement of marine animals by plastic, as well as the ingestion of plastics by these animals would decrease if this trash were UV sensitive. However, the decomposed plastic material would still pollute the water and could present other problems.

2) Roads and parking lots drained directly into coastal waters with no intermediate recharge basins are contributing to this problem. All municipalities with roads draining into coastal waters should be redesigned to eliminate this input immediately. No road or parking lot should drain directly into these resources.

3) Expand bottle/can recycling laws to include as many types of bottles and cans as practical.

4) "Sin taxes" could be levied against packaging modes which are particularly offensive.

5) Formation of "No Litter Coastal Zones" where littering enforcement and fines are high.

6) Municipalities should ensure that sufficient garbage receptacles are present at all facilities in coastal areas. These receptacles should be monitored closely to ensure the trash is promptly removed to prevent overflow and wind dispersal. Retail concerns in coastal areas should be mandated to have garbage receptacles available for public use.

7) Manufacturers and retailers of consumer products designed for coastal activities should stress photo- and biodegradability in their packaging. Bait and tackle stores and tackle manufacturers have been slow to decrease their use of plastics.

8) Long Island retailers should avoid plastic bags unless the product being packaged absolutely requires a plastic enclosure.



Book Reviews

MONSTERS OF THE SEA

by RICHARD ELLIS

Knopf, NY. 388 p. \$30.00 (hardcover).

Richard Ellis's fine new book confirms what we all know. If new and mighty creatures are to be found on this planet, they live in the sea. It is true that rain forest biologists seem to find new species all the time, but they are in daylight, in air, above ground, in a word, safe. Ellis's monsters, real and mythic, live at sea, usually down deep. He catalogues them with accuracy and humor, debunking many old tales, but never really denying that something may be down there that we don't know about. After all, the "extinct" coelacanth was discovered in 1938 and the megamouth shark in 1976. We are due for another monster by the end of the century.

Ellis is known for writing about and illustrating sharks and whales. In "Monsters of the Sea" he covers those and includes squid, octopus, mermaids, sea serpents, blobs, and globs. Lots of illustrations — fanciful drawings and photos, newspaper clippings, asides, movie posters, and trivia. This is terrific reading, fun for all.

And don't believe for a moment that the sea is through scaring us. Someone once described swimming on the surface of the Atlantic about 500 miles west of Gibraltar. It was kind of fun until he realized he was some 4000 feet from the bottom. He could see light shafts reaching below him. What was down there? He got back on the boat.

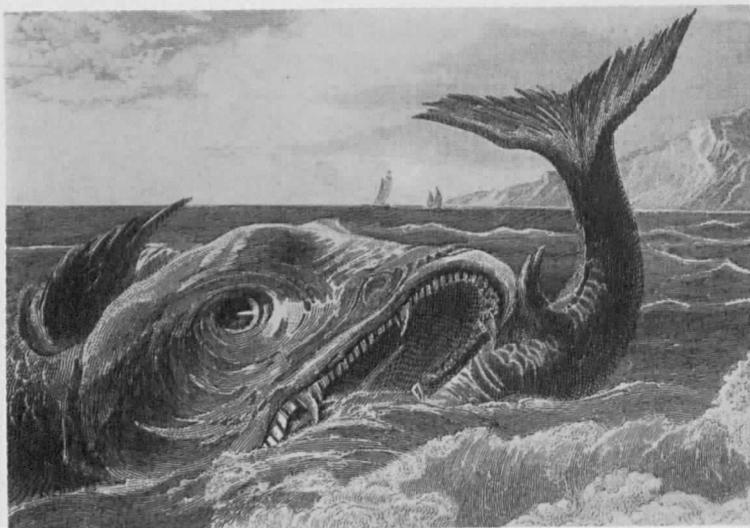
FISHES OF THE SEA

by JOHN and GILLIAN LYTHGOE

MIT Press, Cambridge, MA, 1992,
256 p. \$35.00.

This book is a collection of underwater photos showing fishes in their natural surroundings. It is unique among similar undertakings in that the fauna treated occurs in areas other than coral reefs. 900 species from the North Atlantic (north of Chesapeake Bay) and Mediterranean are covered. There are about 200 photos with emphasis on the eastern Atlantic. Simple line drawings describe most of the remainder. The text is almost entirely concerned with identification, but many of the characters described require that the specimen be in hand. Very little life history or ecological information is provided and except for photo credits, there are no citations for sources of information.

MPF



SHARKS: QUESTIONS AND ANSWERS

by Maria Levine

1994. 32 p. (paper).

(Order direct from Maria Levine,
70 Heather Lane, Princeton, NJ 08540
\$15.00 postpaid.)

This is a well illustrated, big format book that should answer most of the questions your basic eight-year-old nuts-about-sharks kid asks — size, behavior, feeding habits, locomotion, distribution, and conservation.



Levine is a long-time ALS member, a member of its advisory council, a veteran diver who spent five years in South Africa working with sharks, and now director of the Shark Research Institute. She knows and respects her subject.

The illustrations are just right, three or four to a page, with concise text. A good buy.

BUSH RAT GOVERNOR

by JAY HAMMOND

Epicenter Press, Anchorage and Seattle.
330 p. \$27.95 (hardcover).

There he is on the book jacket with at least three layers on, a pile of wood in the background, and a smile on a gray-bearded face. No necktie. It's Jay Ham-

mond, ex-Governor of Alaska, bush pilot, trapper, fisherman, family man, and resident of Clark Lake, just a little out of town from Anchorage, but in the wilds.

Hammond went to Alaska after flight duty in World War II in the Pacific, aboard his newly bought, barely flyable 1929 Loening amphibian bi-plane with a 400-horsepowered Jacobs engine mounted on top. Once there, Hammond took on Alaska with a vengeance. He fished commercially, shot wolves, guided, flew, crashed, and flew some more.

Later he entered the realm of public service first in the legislature, and then as a two-term governor in the seventies when Alaska changed — it became a state and it discovered oil. The fact that Hammond was governor then probably saved Alaska; he was able to protect most of the state from the scourges of oil development, which was coming, like it or not.

This is a compelling story of a man and his state. Lots of natural history, told firsthand. And plenty to help explain Alaska's love/hate relationship with itself and with those in the lower 48 who care about Alaska but are seen by the locals as muddlers in its affairs.

SEASHORE ANIMALS OF THE SOUTHEAST COAST

by EDWARD E. RUPPERT
and RICHARD S. FOX

University of South Carolina Press,
Columbia, SC, 1988, 429 p. \$24.95 (paper).

Field guides to seashore life along the Atlantic coast generally skip the invertebrate fauna from Cape Hatteras to Cape Canaveral covering either north or south of those promontories. This guide concentrates on this span of coastline and should also serve as well for the north Gulf coast which is faunistically similar.

The book opens with a brief, illustrated key to typical phyla and significant classes. This is followed by a section describing about three hundred

common species of the shore. Seventeen invert phyla are covered, eight of which are mainly worms of one sort or another.

The latter half of the book covers three more topics: major groups of marine animals (a biological description of invert systematics — major phyla and classes); water, currents, waves and tides, and marine ecology.

The tenor of the text is tutorial. It is not an exhaustive compilation of species descriptions but more a broad view of the common ones with enough biology thrown in to remind the reader about basic systematics and ecology. DKB

AMERICAN NATURE WRITING 1994

selected by JOHN A. MURRAY

Sierra Club Books, San Francisco.
218 p. \$12.00 (paper).

This is the first of what Sierra Club Books promises will be a series of "the best nature writing of the previous twelve months." It is an auspicious start. It looks as if outdoor writing is alive and well and in a generation of new hands.

Some of the usual suspects are here: Russell Chatham (fishing), Barry Lopez (the far West), and Edward Abbey (counting bighorn sheep), and a piece of Annie Dillard's terrific book "The Living," about what Puget Sound was like in the early days.

One of the nicest from the collection is Jan DeBlieu's "Into the Dragon's Mouth," her thought on living with the Outer Banks of North Carolina, including sitting out Hurricane Charlie in 1986 with two men, a Chesapeake Bay retriever, and a Carolina wren.

SKINNY DIPPING

by JANET LEMBKE

Lyons & Burford, NY. 177 p. \$21.95 (hardcover).

These are mostly essays about water and people, specifically how water influences Lembke's thought processes. Her approach to life seems dictated by wetness, by water's flow. She swims in it, walks along it, and dumps Uncle

Charlie's ashes in it. All this and more are covered with style and simplicity.

The author is a translator of Greek and Latin, but this leaves her enough time to spend near water, freshwater in Virginia and brackish along the North Carolina coast, especially on the Neuse River.

There is a saying from California: "Out here whiskey's for drinking and water's for fighting." In Lembke's world, water is also for dipping into, as are her writings.

HERON HILL CHRONICLE

by GEORGE REIGER

Lyons & Burford, NY. 179 p. \$19.95 (hardcover).

George Reiger saw the light in 1970, when he and his wife decided to buy some land in Virginia and leave the madding crowd. This is his tale.



Reiger, who writes the conservation column for "Field & Stream" magazine, is a huge person with a booming voice. When we talk on the phone, it sounds as if he's on a loud speaker. Our conversations usually end when he says he's got to get back to a piece he's writing and it's already a week late. He writes on subjects ranging from gun laws to bureaucrats, the price of white cedar, quail shooting, going offshore for tuna, protecting wetlands (from developers & bureaucrats), his family, the weather and geese. He's written loads of books, including "Wanderer on My Native Shore."

This chronicle of Heron Hill covers its

discovery, purchase, renovation, its neighbors, but mostly its landscape and how he brought back its habitat. A subtitle is "Self sufficiency and stewardship on a salt marsh farm." It is clear that Heron Hill is in good hands and that its lands and waters get better as Reiger cares for them.

The chapters are headed with marvelous line art by Gordon Allen. This is a handsome, valuable book.

THE GREAT DEEP: The Sea and Its Thresholds

by JAMES HAMILTON-PATERSON

Random House, NY, 1992
300 p. \$23.00 (hardcover).

In *The Great Deep*, although the author starts aboard a scientific vessel in the Pacific, exploration extends beyond geographic regions to the evolving ocean boundaries of our imagination.

He draws together a wide range of ocean-related subjects by engaging insights and excellent writing. We learn how myths about the ocean depth have been dispelled through the course of scientific research. And, how remnants of these myths have played curiously upon our psyche. Dozens of land fragments have been charted in the North

Atlantic that do not exist. These whimsical islands, it seems, remained plotted on maps only "to blot up excess vacancy until something more solid turned up" to allay the Western horror vacui, or fear of the sea's void."

The limits of scientific understanding are also questioned through natural history accounts, such as the debate as to whether coral is animal, vegetable, or mineral. "All limnalities belong entirely to the mind" states the author, who clearly prefers psychological groupings to scientific classifications. Wrecks are either tombs, time capsules, or gold mines. Small islands can be perceived as objects, fantasy satisfiers, regressive in nature, and without fixed boundaries. This subjective sorting allows for fascinating analysis. These small island characteristics, for example, combine to represent the "perfect territorial expression of ego."

The author's breadth of knowledge is astounding. References come from sources as disparate as poet John Donne and geographer Yi-fu Tuan. *The Great Deep* will be enjoyed by anyone whose thoughts about the ocean go beyond the near shoreline.

GAR

TONY PACHECO, vice-president of the Littoral Society, edited and laid out this issue of the *UNDERWATER NATURALIST*, a volunteer job he has done with skill and grace for many years. He brought experience to the job as a longtime fisheries biologist at the Sandy Hook Marine Lab, and before that, while he pursued his education by collecting, tagging and recording the behavior of menhaden, primarily in the Carolinas.

He knew and appreciated all fishes – what they did, where they went, what they looked like, and how they tasted. He conveyed his love of marine life to thousands of students from age eight to eighty, in the classroom and in the field. He often got wet and dirty pulling nets (which he sometimes designed and hung). He fixed engines in both autos and boats, he could cook, he collected model cars, scuba dived and tied knots that held. He was unfailingly courteous to authors, some of them polished, others caught in a language thicket. Recently he took up choral music, starting in the back row but working his way to the front.

He died February 21. The day before, he worked on this magazine, and the day before that he was putting glass panes in his greenhouse, getting ready for spring.

Faking a "Taking"

It was all set. U.S. Representative Charles Canady from Lakeland, FL would chair a congressional hearing Feb. 11, 1995, to launch a "Contract With America" attack on federal environmental land use regulations. The Contract's proposal would make the federal government compensate people if its acts somehow reduce the value of their lands — the "takings" issue.

Canady's prize witness was to be Grace Heck of Farmingdale, N.J. In prepared testimony she said she and her husband were "mom and pop" landowners "who have had their private property rights stolen by arrogant, abusive and overzealous bureaucrats." Heck's case was dug up by a private property rights group called FLOC (Fairness to Landowners Committee), of Cambridge, MD. "I am asking our government to buy and pay us for our land if they want to prevent us from using it," her statement says.

Grace Heck and FLOC left important parts of the story out. Back in 1992, when the developer was trying to get building permits, the following came to light:

- The Hecks have a development company, Heck W. Associates, Inc. which has completed three sections or about 30 of the planned 75 single-family homes on 42 acres of land in Farmingdale. The fourth 45-unit section was to be built on the remaining 24 acres, half classified as wetlands.
- The wetlands classification came from New Jersey, not the federal government.
- Clearing and filling the wetlands would cause flooding problems for houses around the property, houses built and sold by the developer.
- Some residents say the developer's representatives used the wetland site as a selling point. A survey map of the fourth section was marked "wooded area (not to be built on.)"
- The developer did not finish promised streets, leaving residents without a completed roadway.
- The developer is tens of thousands of dollars in tax arrears.
- According to the NJ Department of Community Affairs, the developer's builder's registration was revoked in 1991 after he failed to honor home warranties. According to an article in the TAMPA TRIBUNE (Rep. Canady's district), the registration has not been restored.
- The developer's application is opposed by the mayor and council and the planning board and by local residents. "Further development at the proposed site would only increase flooding problems," Farmingdale's mayor said.

This doesn't sound like "taking" by bumbling bureaucrats. It sounds like sensible decision-making at the local level to prevent costly (probably federally subsidized) relief after the next flood.

It should be noted that FLOC and the developer were dropped from the witness list at Rep. Canady's hearing when the facts behind this "taking" were brought to light.

We're still waiting for a private property owner to come forth with a federal deficit reducing, voluntary contribution after a federal action (a highway or a newly built beach) adds value to the owner's property. "Man bites dog," the headline will read.

D. W. Bennett

Continued from inside front cover

June 28

SHARK/TUNA FISHING & TAGGING

Our 13th annual offshore trip on small, fast boats to search for, find, hook, fight, tag, and release sharks. If tuna are around, we'll try for them and bluefish, too, if they show up. Or sit back, relax and look for seabirds and marine turtles.

COST: \$75 covers boat, bait, tackle, tags, and guides.

August 6

**CRAB FEAST,
MARYLAND'S EASTERN SHORE**

ALS's annual crab eating frenzy. Join us for all the big, steamed crabs you can eat, plus burgers, dogs, salads, beer & soda.

COST: \$20 per person, kids under 10 free.

Sneak Preview...Field Trips 1996

February 22 - 28, 1996

SHARKS IN BIMINI

Escape for five full days to the Bahamas where we will come in close personal contact with some of the most magnificent creatures in the sea - the Requiem sharks. Swim safely with these sharks in their own environment and go on field trips to catch, tag and release large tiger and lemon sharks. World renowned shark biologists Drs. Samuel Gruber and Erich Ritter will debunk the myths about sharks through a series of illustrated lectures and videos. Participants must be able to snorkel.

COST: \$895 covers lodging at the Bimini Biological Field Station, lectures, field and

snorkel trips, meals, and airfare (Ft. Lauderdale - Bimini, roundtrip), taxes and transfers.

April 24 - 30, 1996

BELIZE ECOLOGY WEEK

Join trained guides to explore the second largest barrier coral reef in the world, the rainforest, and Mayan ruins. Explore eight days of intriguing diversity, including five days on Caye Caulker where you'll experience spectacular snorkeling, ecology lectures, and tours by a marine biologist.

COST: \$1200 covers guides, ground and marine transportation, most meals, lodging (double occupancy) and lectures.

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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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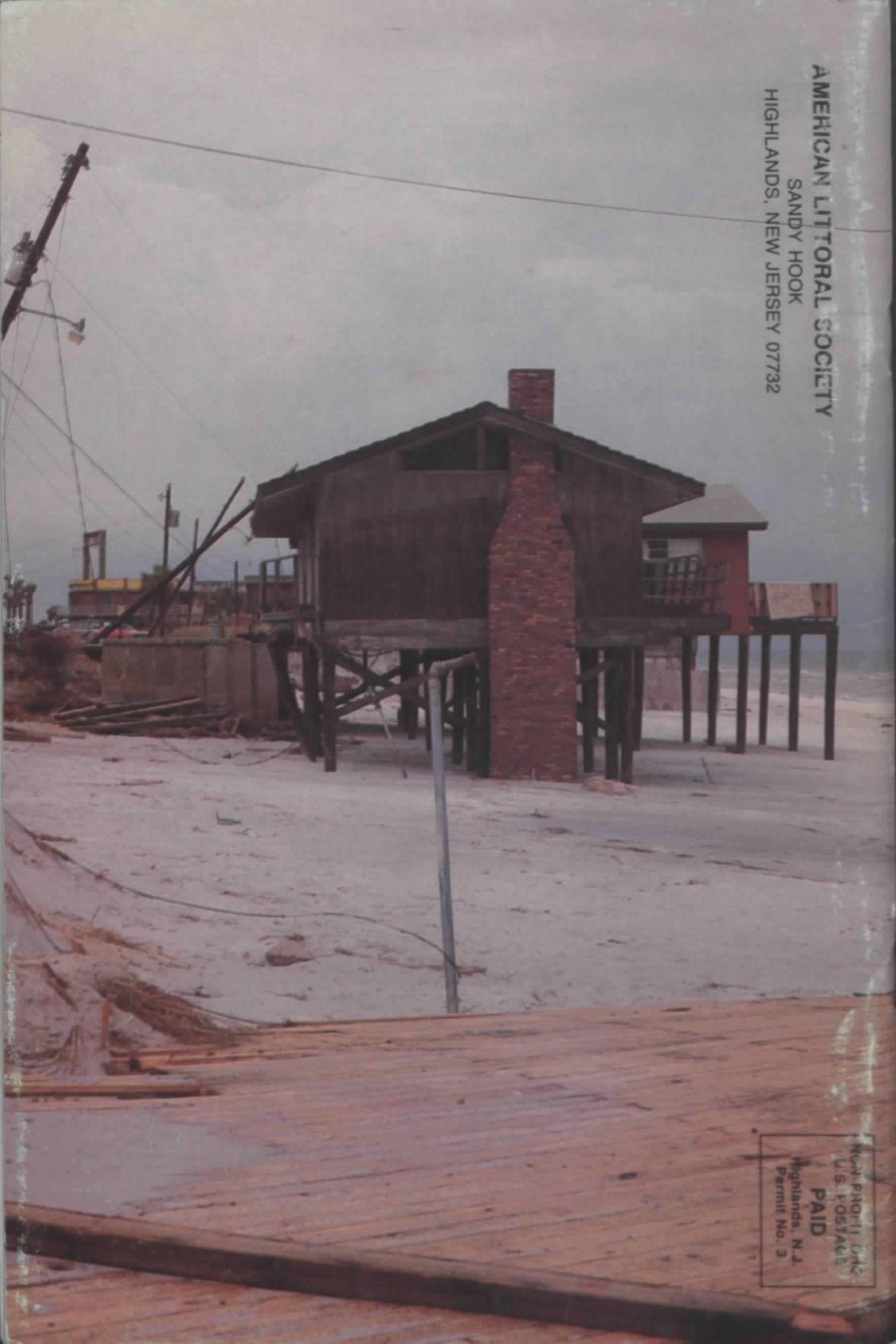
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