

ALONG THE JERSEY COAST--FRESH, SOFT, ACID, HARD, ALKALINE,
& BRACKISH, by Bruce Gebhardt, Phila., PA

On May 7, NANFA members John Brill, Livingston, NJ, and Buz Allen, Phila., Pa., led fellow members Lee Harper, Media, Pa., and me, along with several non-member killie enthusiasts, on an expedition to Ocean and Monmouth Counties, NJ, north and east of the Pine Barrens. Two of the non-members--initially contemptuous of natives--will probably join; from that you may infer that the trip was successful.

May 7 was a nearly perfect spring day--about 70° and sunny. Later, a chilly wind blew in, dropping the temperature to perhaps the low 50s, though it remained sunny.

The trip was an exploratory one. John knows a lot of sites in the area, but he wanted to find new ones rather than hit his usual ones. We collected at two freshwater spots and one brackish one, after exploring a number of other, mostly brackish ones without success.

Site One--fresh, probably soft & acid

Eventually we came to a promising spot. By the time you read this, we will be able to describe it exactly, but at this writing, all that can be said is that the site is on Herbertsville Rd., southern Monmouth or Ocean County. West of the road is a long, perpendicular-to-the-road, dammed-up pond, obviously freshwater. Under the road, the water drops to begin apparently tidal mudflats of a branch of the Manasquan River. That side of the road did not seem fishable and no fish were seen, so we looked on the west side. Some boys were fishing in the pond. Their bucket contained a couple of nice Black Crappies--pronounced croppies in midwestern, crappies in eastern, and Pomoxis nigromaculatus in Latin.

A side street perpendicular to Herbertsville Rd. parallels the north side of the pond. We parked on the side street. On the opposite side of the street from the pond is a suburban-type housing tract. We explored the banks of the pond. Lee, using a handnet, scored immediately with a beautiful, blue-streaked and -spotted male Banded Sunfish (Enneacanthus obesus). A few other exploratory thrusts produced nothing startling, so we decided to leave and return later for a more thorough exploration.

Site Two--fresh, but brackish-influenced, hard & alkaline

We went north until, crossing a wide stream, we saw signs announcing we were in the Manasquan management area.

We turned into a dirt road paralleling the stream, later identified as the Manasquan River. The river seemed potentially difficult to work--deep, dirty, and probably tidal. The banks were black, muddy, and plantless. On the other side of the road, as at the first site, there was a completely different aquatic environment--a freshwater swamp pond, appearing to be a typical Pine Barrens habitat. Not so; John's pH tests--and a conservation officer's later confirmation--revealed that the water was alkaline. There was a goodly amount of duckweed afloat on the pond to lend credence to this; most aquarists have difficulty growing it in acid water. The pH question might be appealable on the basis of sphagnum lining the banks of the pond and a strain of admittedly straggly bladderwort (Utricularia) in the water. Both species are associated with acid environments. The proximity of the pond to brackish water probably accounts for the chemical and botanical anomalies.

The most common fish netted in the pond, despite the chemistry, was the Bluespotted Sunfish (Enneacanthus gloriosus). I was able to net two magnificent pairs, The total length of each specimen was about 2". The males were among the most beautiful I've seen, with showy blue spots on a dark background, red eyes, and lots of red-orange in the anal fin. The spots spill over from the body onto the fins.

I am unused to finding this species in alkaline water, though the Atlas avers that it ventures up into the Susquehanna in Pennsylvania. In that extension of its range, it leaves behind the other two Enneacanthus species, chaetodon (Blackbanded) and obesus; this was only the second site at which I have found Bluespots without either or both of the the other species. My experience with the species is mostly Pine Barrens-type environment up and down the Atlantic Seaboard.

Waiting in a bucket, the four I caught lost some of their magnificence. Their fins tore. This always occurs with this species. It is hard to believe that they do it to each other, since they're normally mild-mannered. Perhaps their fins are just unusually susceptible to chemical or physical damage.

We found only two other species at the site: either Bluegills (Lepomis macrochirus) or Pumpkinseeds (L. gibbosus)-- they were babies and we were uncertain which; maybe both-- and eels. The latter were maybe 6" long. They are fascinating aquarium species--one is tempted to say "pets"--but they inevitably find their way out of the tank.

Officer of the Law

We took some Bluespotteds, then departed for new environs--after a brief diversion.

My collecting permit in New Jersey requires me to give advance notice of collection. While I did not know where I

would be collecting, I gave three counties in which I would probably be. Now along came a conservation officer in his maroon Chrysler. Although he could not have known where I'd be, he knew my name from my message, and he checked credentials. It's my opinion that he'd never met fish-collectors before; the opening colloquies were rather tense. Eventually we smoothed out relations. This was the first time I have ever been stopped while collecting.

Back to Site One

We returned to the first site for some intensive collecting. We drove into the side street again and I immediately launched myself into the pond. The shoreline was congested with branches and rimmed with floating algae, pine needles, and other flotsam. I collect with a one-man, 4'x4' seine on poles. I thrust it under the junk and between branches, perpendicularly into the bank, then opening it as I raised it, in order to encompass as much flotsam as possible. Rewarding me was one of America's most common--and most spectacular--collecting sights. The net held about a 6" Pumpkinseed (Lepomis gibbosus) in glorious color--sides blue and green with orange spots, bright red "ear," and incredibly yellow fins. All hands with cameras went to work as it lay in the net. (I'd left mine home, not wanting to slow down other collectors with my photographing!) But Buz told me, "When you go somewhere with Brill, you've always got to be ready for some camera work.") Had I been "armed," I would have burned a lot of film myself.

Shortly after, I retired from active seining. My six-year-old, \$6 sneakers had fallen apart completely, and were flopping loosely around my ankles. I knew it was time to retire when, at the first site, I felt something wriggling in my shoe other than my toes. A Leopard Frog had slipped between the canvas and the flapping rubber sole! Several repair attempts after that failed, so I gave up. I handed my seine over to a lady who accompanied one of the killie fans and gave her lessons (with the seine). She came up with a nice pair of young obesus. Meanwhile, the others unfurled their long seines and came up with more obesus, Pumpkinseeds, and eventually a crappie. Lee was naturally after a breeding-size female obesus to go with the beautiful male he'd opened with. He eventually got it, in dramatic fashion; he had to wait until the very last netful before he had to leave.

We were getting ready to seek another site when a local resident hastened our departure. He said the pond had been closed to swimmers years ago on account of septic-tank run-off from the adjoining housing development! And here I was with my bramble-scratched, tick-bitten legs. What are the early warning signs of hepatitis? Of some comfort; our informant acknowledged that locals happily eat the fish they catch there.

On to Site Three: Brackish

We spent a lot of time looking for new brackish sites. We failed to find an approach from the seashore resorts on the barrier island fringing much of the New Jersey coast. It was getting late, so John took us to his and Buzz's Old Reliable. The site is in the Toms River area, on Fischer Blvd. about 3 or 4 miles north of NJ Rte. 37. There an obviously brackish creek fringed by tall reeds crosses the road.

We began on the east side. John, Buz, and the others took their 12' seines into the creek where it narrowed to enter a culvert carrying it under the road. The bottom is fairly firm in the center, though mucky at the edges and in the deep part near the culvert. Each sweep brought up hundreds of fish. Many were killies and the rest were silversides (Menidia sp./spp.). I've talked with midwesterners who have kept their own species of silversides; why doesn't somebody write about them? These little atherinids are notorious for fragility. It's hard to keep them alive even for a few minutes in a collecting bucket; possibly they are hurt in capture. Because of their reputation for fragility, their unprepossessing appearance, and the collecting party's interest in killies, only John wanted to keep any. That was for a bizarre photographic project you wouldn't believe if I described it. Most silversides caught at this site were under 2½", but in a later trip, two that were over 5" were netted--the largest I've ever seen.

We caught four species of killies at the site. Buz said there were two others sometimes found there, but not at this time of year. Those two are Fundulus luciae and F. majalis. Buz has bred all of the site's six killies except majalis.

Perhaps the most common killie in rather salty brackish water from New England to the Gulf is the Common Killie (Cyprinodon variegatus)--a "pupfish," as the genus name indicates. This hyperactive little fish (1") is quite attractive. Some males have reddish or red-orange bellies and fins. At some sites, probably those further south or on the Gulf Coast, I believe, the tint is truer red or red-orange. The fins of mature males have dark margins. The back is a mixture of dark hues. The male's most striking distinction, however, is an iridescent chevron draped across the nape; one arm of the V on each side, pointing back and down. The chevron can be as sky-blue metallic as you've ever seen on a fish, but sometimes it seems turquoise, aqua, or silver, probably depending largely on the angle of the light. Females lack the chevron and the reddish trim. They have a light yellow to yellow background color with dark blotches--somewhat reminiscent of the Leopard Frog mentioned above, actually. The dorsal often carries a black spot.

It should be noted that there is much variability in color even at any one site, let alone between sites hundreds of miles apart.

There has been much discussion in American Currents about the differences between Fundulus heteroclitus and F. diaphanus. John Eccleston raised this in November in the course of general commentary on the inadequacy of many published sources as guides to identification. One of the reasons I went on this trip was to refresh my memory as to the distinctions. Having done so, I agree with Bill Kenney's observation: you can read all the keys you want to and not understand the distinction, but when you have seen the two species in the field, things become clear--or at least clearer. Some specimens, particularly young ones-- confuse at least the inexperienced eye.

The main distinction between adults is shape. F. heteroclitus are stockier, with blunter, more rounded snouts. Adult males of the two species are easy to distinguish. F. diaphanus males have a lot of closely-spaced, bluish-silver vertical stripes. Ground color can be anywhere from yellowish drab to bluish gray. In Pennsylvania and Southeastern Massachusetts, I've caught blue-gray males with bright greenish blue fins; stripes were sometimes bright greenish blue also. At this site, most males had partially clear, yellowish-tinged fins, with white-blue metallic patches on some of the anals. On a subsequent trip I caught one male with bright yellow fins. Heteroclitus males, when mature, routinely have bright yellow fins, and bodies spangled with gold. They often have blue stripes too, but these tend to be subtle. The males taken here were very similar to their conspecifics which Eric Sweet and I caught in Winthrop, Mass. a couple of years ago. At an all-freshwater site near Philadelphia, by contrast, where the fish never taste salt, males have well-spangled bodies, but clear fins.

Females are less certainly distinguished, at least by me. The shape distinction prevails, of course, so that's most valuable. My slides show that F. hetero. females have less distinct vertical black bars, very thin and relatively close together, on the rear part of the body only. My photographed diaphanus female has slightly more obvious vertical bars, on the front part of the sides also, slightly further apart.

I had never seen, or never noticed, the Rainwater Killie (Lucania parva) before, but this is a very impressive little fish. Parva means small, and $1\frac{1}{4}$ " was about tops. Note that genus name--the same as the more familiar L. goodei, the Florida Blue-fin. Indeed, there is great similarity. They have about the same shape. Rainwater Killie males, however, lack the brilliant blue in dorsal and anal, though in the right light there is a blue-white sheen. Also, their bodies lack the black horizontal stripe of goodei; body color is nondescript yellowish or paler. Sometimes there are vaguely rectangular, not-solid dark blotches along the sides, in both sexes, particularly in a dark setting. The chief decoration

of parva which outshines the goodei is a greater amount of red in the anal fin. Overall, this species is admittedly not as colorful as its better known congener, but it is still an attractive, appealing fish--a potential source of consolation for those of us without access to the Blue-fin.

Females lack the red and the blue sheen. When caught, they resemble female Gambusia. Males have a black spot on the dorsal which females lack.

Besides the two missing killies, John and Buz have found flounders, gobies, and sticklebacks at the site. On a second visit, I caught a 1½" Alewife (Alosa pseudoharengus) or Blueback Herring (A. aestivalis).

After some time on the east, seaward side of the road (this site is just a mile or two west of the ocean), the collecting party crossed to the west side. There is a large pond there which is fed by freshwater streams. Consequently, there is a mixture of freshwater and brackish species. John and Buz predicted spectacular Pumpkinseeds. We didn't see any on the first collecting trip; however, when John Eccleston and I visited a week later, we caught one--not as yellow of fin and body as the ones at Site One, but endowed with particularly deep shades of green and blue on the sides. We shot slide after slide! John Brill also reported finding Enneacanthus obesus here, but I haven't seen any in my two visits.

Tidal fluctuations vary species mix from one hour to another. In our first visit, we caught literally hundreds of F. heteroclitus; in the second, John Eccleston and I caught one male and one female, period. There is a regular gradation of species as one moves from west to east. Buz reports that L. parva and C. variegatus appear in larger proportion east of our east-side collecting site.
