

# Tag Recapture of Thames River Over-Winter Stripers

by CAPT. AL ANDERSON

Several years ago I learned the Thames River in Norwich, CT, hosted tremendous numbers of over-wintering striped bass. This raised a slew of questions, to which I could find no answers. Recognizing a unique situation, I embarked on a project of tagging these fish in the hopes of learning more about their biology. Since then I've confirmed some of what we know, as well as creating questions only others will be able to answer.

Over a period of seven years, beginning in 1997, 111 trips were made to the Thames to catch, tag and release over-wintering striped bass from November through April. During this period 6,569 stripers, mostly juveniles, were tagged for the American Littoral Society (ALS). The bulk of the fish were caught in the river channel north of the Pequot Bridge to the basin area at Chelsea Landing below downtown Norwich.

Unseasonably warm weather in the Fall of 2001 allowed increased effort to nearly double the numbers marked that season. In 2002, charter trips to the river nearly tripled, undoubtedly due to increased awareness by the angling public. When asked if I've ever recaptured one of these 6,569 fish, the answer is no! This hasn't happened yet, but many have been recaptured in the Thames and elsewhere by other anglers.

## Thames River

Three major Connecticut rivers carry freshwater into Long Island Sound. The *Captain Anderson runs a charter fishing boat out of Snug Harbor, RI. He concentrates on striped bass but also goes offshore for tuna, cod, and other prey. He took the photographs. [ahatuna@aol.com](mailto:ahatuna@aol.com)*

largest, the Connecticut, with a drainage basin of 11,200 sq. miles, is followed by the Housatonic River (1,930 sq. miles), and the Thames (1,400 sq. miles). Both the Shetucket and Yantic Rivers feed the Thames River (formerly called the Pequot), which collectively drain 510 sq. miles. Only the Thames River reportedly hosts significant numbers of over-wintering striped bass, and there is no evidence of a striper spawning population there.

## Over-Wintering

It appears that 30 or 40 thousand or more striped bass have congregated here each winter in recent times. In 1999 Bob Sampson, Jr. and I used an underwater video camera to survey an area in the basin at Chelsea Landing. In it was a school of fish 250 yds. long by 15 yds. wide by 10 yds. deep. Sampson calculated that approximately 30,000 fish made up this school, which he profiled in a story for a N.E. Edition of The FISHERMAN magazine.

Furthermore, my research uncovered a Boston newspaper article reporting that following a warm, wet Southeaster that broke up river ice, 20,000 stripers were haul-seined at Chelsea Landing over several days in February, 1729. Tremendous numbers of fish undoubtedly over-wintered here long before colonial times.

Several features may facilitate over-wintering here, including water depths approaching 48 ft., significant daily tidal flushing (2.7' rise), proximity (14 miles) to the deeper waters of Long Island Sound, flow of freshwater from the Shetucket and Yantic Rivers, and high late-season forage abundance (vertebrate and invertebrate) due to connection with several large tidal coves and creeks.



*Ned Kittredge in his just-launched skill in downtown Norwich, CT, on a cold January morning. Next stop: striped bass.*

### **Catch, Tag & Release**

Fishing occurred by means of rod and reel from several outboard powered boats trailered to various river launching ramps. Tackle was either conventional, spin or fly rod. Single hook lures such as bucktail and plastic tail jigs, small tubes and flies were used to minimize tissue damage or injury, as initial attempts ('97) using multi-hook plugs were found to be highly unsatisfactory.

The bulk of the fish were caught along river channel edges with conventional tackle trolling mini-umbrella frames sporting several single hook lures on relatively short lines, which resulted in short fight times. Fish boated were placed on a tagging board and eyes quickly covered with a wet towel to minimize any stress due to thrashing. "Lock-on" loop tags were placed in the back between the anterior and posterior dorsal fins.

Time out of water for unhooking, tagging, measuring, and releasing was kept to a minimum. Weights were not taken, but estimated from a published striped bass length to weight chart.

Seasonal surface water temperatures ranged from the low 50's F to low 30's F. Upper river areas demonstrated a constant seaward flow of fresh water over a deeper wedge of tidal salt water, in which most fish were located. Trip catch, tag and

release averaged 59 stripers; however ideal conditions allowed for as many as 150 fish to be marked in a single trip.

Juvenile fish, less than age 3 (<11" TL) were occasionally caught, but were judged to be too small for tagging. If fish size was greater than 24" TL, a landing net was used. Fish less than 23" TL were simply lifted aboard by grasping the line.

### **Recapture Rates**

Most ALS tagged stripers are recaptured within three years of tagging. Thus, near maximum possible returns have now occurred for fish marked in '97-'00. For these four years, 2,298 tags have yielded 133 returns, for a 5.8% recapture rate (Table 1), somewhat higher than the mean of 4.5% for ALS taggers.

By the end of 2003, 252 (3.8%) of the 6,621 ALS tagged bass had been reported recaptured. The potential to recapture any of these tagged fish is, of course, an ongoing situation. For example, a fish tagged in '01 may be recaptured in 2004, adding to the total number. Checking Table 1, there were slightly more recaps for fish tagged in '02, due to much larger numbers marked that year. Conversely, those T/R in 2003 have been out the least amount of time, hence less chance for recapture despite marking significant numbers. If our recapture rate of the first

three years of approx. 6% holds, we can expect many more returns for 2001, 2002, and 2003 tagged fish.

Recaptured fish in '97 averaged 16" (Total Length) at tagging, and ranged from 13" to 22". In '98, recaptured fish averaged 18" TL at tagging, and ranged from 13" to 29", and in '99 averaged 20" TL at tagging, ranging from 13" to 30". In 2,000, recaptured fish averaged 21" TL at tagging, ranging from 13" to 30". In 2001 fish averaged 17" TL at tagging, and ranged from 14" to 27". In 2002 fish averaged 17" TL at tagging, and ranged in size from 12" to 44". In 2003 fish averaged 19" TL at release and ranged in size from 12" to 38". ( Table 2.) The progressive increase in size of fish marked in '97-'99 may have been due to several factors: return of a year class for several years, modification of fishing techniques, and chance recapture reporting of larger fish.

Unfortunately, failure to provide valuable recapture information by some fishermen prevents valid reporting on length and weight increases during at-liberty times.

Would it surprise you to learn 48 of the 98 recaptures (49%) for the years '97-'99 came from the Thames River itself? Of these, 11 were at liberty for over a year, suggesting some fish return several years in a row. At the present time, 85 fish (34%) of all Thames stripers tagged through 2003 have been recaptured therein, the majority between November and April.

Of the remaining 167 fish, 141 came from 21 other New England rivers (See Appendix), along with one each from the Hudson and East River, NY. Studies published in 1987 by Fabrizio estimated that Hudson River origin bass make up 90% of the Long Island Sound fishery.

Not all recaptures report the body of water involved. If an inland municipality was named, it was assumed the recapture occurred in a river flowing through it, i.e., Derby, CT, is on the Housatonic River. For that reason, several rivers named were

assumed to be the site of recapture though not actually mentioned in recapture reports.

### **Catch & Release Mortality**

A striped bass hooking mortality study published by Diodoti and Richards (MA DMF) in 1996 concluded that angler experience, which was significantly correlated to handling time, was a major factor affecting survival of released fish. They reported that experienced anglers helped reduce fight times, substantially lowering the mortality of catch and release.

Our results reflect a minimal fight time due to small fish size and the use of short lines, single hook lures, followed by brief handling time, all complemented by seasonally low water temperatures that enhance survival rates. No doubt intense seasonal fishing pressure along the river significantly contributed to the elevated recapture rate as well.

### **Habitat Preference**

Does it surprise you to learn the bulk of the recaptures came from New England rivers? Juvenile fish prefer these habitats, as estuarine environments offer tremendous feeding opportunities. However, as fish age and mature, habitat preferences change, which undoubtedly contributes to diminishing tag recaptures. Increased swimming strength creates improved foraging ability enabling them to make use of deeper and stronger current waters of bays and sounds. This habitat change reduces the chance of recapture by shore-based fishermen, who far outnumber those in boats.

Therefore, it seems reasonable to assume this may be the primary reason why most ALS tagged fish, which are school size (juveniles), are recaptured within 3 years of their tagging. Maturation leads to increased swimming ability which changes habitat preferences. Consequently, they become less susceptible to recapture by shore based anglers.

## Time at Liberty

Time at liberty for '97 to '99 tagged fish ranged from as little as 4 days to 906 days. For fish tagged in '97, the average time at liberty was 327 days. However, the average time at liberty was only 217 days for fish tagged in '98, and 214 days for '99 fish. Several '97 tagged fish with near 3 year at-liberty periods contributed to this disparity. A total of 28 trips occurred during '97-'99, 12 during a winter-spring period and 16 during an autumn-winter period.

Although it appears a disproportion exists between the recapture percentage for '98 tagged fish as compared to '97 and '99, given the small sample number involved, 5 additional recaptures (<1%) for '98 would have increased the percentage to 6.5% for that year.

## Hudson River Stocks

Various publications have reported that, based on tagging information, Hudson River-origin fish migrate annually in an easterly direction. Assuming the bulk of Thames over-winter fish have a Hudson origin, tag-recaptures from ME, NH MA, RI, and CT continue to confirm this behavior.

Recaptures have come from 22 other New England River systems including the Merrimack River, MA, and adjacent estuarine environs, which ranks as the primary recapture zone. I'm reminded this estu-

arine environment play a tremendously important role in the maturation of these stocks.

Also, to a lesser degree, other southern New England rivers, along with coastal ponds, are presently being utilized by over-wintering populations, possibly the result of competition in the Hudson (resources in the Hudson may no longer be able to support any more fish).

## Stock Origin

Our recapture of tagged fish would help answer the question of whether Chesapeake or Delaware origin stocks utilize the Thames for over-wintering. During '97-'03, friends, clients, or myself recaptured a total of 22 tagged stripers from the Thames marked elsewhere. These fish bore either U.S. Fish & Wildlife Service (USFWS), American Littoral Society (ALS), or Hudson River Foundation (HRF) tags.

Two of the 6 USFWS stripers were marked south of the New York Bight area, one from Delaware Bay, the other from Newport News, VA. This suggests that few fish with a mid-Atlantic origin join those from the Hudson to winter-over in the Thames. In support of that premise, we have yet to recapture any other Thames stripers tagged in the Chesapeake or Delaware areas.

The other 4 juvenile stripers were tagged for the USFWS by either the New



*Juvenile striper from the Thames River (in hand), too small for a Littoral Society tag.*

York Department of Environmental Conservation (NYDEC) or the Connecticut Department of Environmental Protection (CTDEP) in either New York or Connecticut waters.

All ALS recaptured fish were initially tagged north and east of New Jersey, suggesting a Hudson-origin for these fish.

### **Schooling Fidelity**

Our HRF tagged fish recaptures occurred in '00, '01 and '03, all initially tagged one or more years prior in the lower Hudson or New York Harbor. In December of 2001, three of the 7 HRF tagged stripers were recaptured on three consecutive trips to the Thames. All recaps occurred in same area, and all were initially marked within weeks of one another off lower Manhattan. Assuming these fish came from the same massive school in the Hudson, their recapture supports the establishment of schooling fidelity at a young age. At the present time HRF tag-recaptured fish outnumber those of other tagging agencies, further evidence suggesting most Thames overwintering fish have a Hudson origin. Few juvenile Hudson-origin fish are believed to migrate south to mid-Atlantic areas, with little evidence, if any, for their overwintering in that region of the seaboard.

### **Hudson River Foundation**

The Hudson River Foundation began a Tag Recovery Program in 1984, and since that time more than 250,000 striped bass have been tagged. Tagging occurs chiefly between November and April, targeting age-1 to age-3 fish in the lower Hudson off Manhattan. Fish are caught with use of trawl nets by professional biologists, and internal anchor (belly) tags are attached prior to release. In the winter of '01, approximately 14,000 stripers were tagged. Annual recaptures from all tagging years range from about 700 to 1400, with recapture sites occurring from the Bay of Fundy to Cape Hatteras.

Juvenile fish make treks that boggle the

mind. In fact, school-size stripers may travel greater distances than adult fish. I was introduced to the marvels of steeper movements decades ago ('68) when a small steeper I tagged in the Annapolis Basin, Nova Scotia, was recaptured the following spring in the Choptank River, a tributary of Chesapeake Bay. I believe this was the first record of an internationally traveled tag-recaptured striped bass for the ALS.

### **Brokenstripedness**

Contrary to angler opinion, the origin of a fish cannot be recognized by a visibly pronounced broken stripe pattern called "brokenstripedness". Although this morphological aberration occurs in both wild and hatchery reared fish, brokenstripedness is significantly more pronounced in hatchery reared fish. Millions of hatchery reared fish released into both the Hudson and Chesapeake tributaries demonstrate a high percentage of this morphological deformity. Studies suggest it is not genetically based, but relates to a hatchery environment.

Recapture data indicate that stripers are able to find their way back to favored areas two or more years running. For example, I've tagged bass at Block Island's North Rip and recaptured them in the same area a year or two later not once, but on seven different occasions. All 12 of my personal steeper recaptures occurred in areas in which they were initially tagged weeks, months, or years prior.

After wintering in the Thames, the onset of sexual maturity may drive a striped bass to return to its birthplace in the Hudson to spawn. Both juvenile and adult bass winter-over in the Hudson; however some young fish may return to the Thames in the fall to spend another winter.

### **Stock Contingent**

At the present time, evidence suggests the bulk of these O-W fish are Hudson River stock origin, and are a probable long term contingent. How does a one year old

striper know to search out the Thames for over-wintering? My guess is those fish are programmed to do so (it's in the DNA). This probably came about eons ago due to intense competition in the Hudson resulting from high stock abundance. Could it be those fish that wintered in the Thames ages ago, which provided a sanctuary due to its deep water, close proximity to L.I. Sound, a diurnal tidal saltwater wedge, and high forage abundance were so successful they passed the "instinct" on to future generations? My guess is yes.

Thames river over-wintering striped bass are doing what countless generations have done before them. No doubt the rich forage abundance of New England rivers centuries ago, coupled with a species biomass greater than could be supported in the Hudson, led to the development of this behavior. The Thames has long suited this behavior, serving now as a window back into history. I feel privileged every winter-time I visit it.

These fish are creatures of habit. They

are programmed that way because it has contributed to success of the species. However, we can't help but wonder about their future. In the meantime, there will be days spent tagging when air and water temperatures will have me questioning my sanity. The more we learn about striper behavior, the more questions arise, confirming much remains to be learned.

## Rivers of Recapture

### NEW YORK

East River, Hudson River

### CONNECTICUT

Connecticut, Housatonic, Mystic, Niantic, Thames

### RHODE ISLAND

Barrington, Pawcatuck, Pettaquamscutt, Providence,

### MASSACHUSETTS

Annisquam, Bass, North, Seekonk, Westport, Weweantic

### NEW HAMPSHIRE

Merrimack, Piscataqua

### MAINE

Saco, Mousam, Scarborough, Kennebeck, Penobscot

### TL of Recaptured Fish at Tagging

YEAR	AVER. LGTH	RANGE IN TL
1997	16"	13" - 22"
1998	18"	13" - 29"
1999	20"	13" - 30"
2000	21"	13" - 30"
2001	17"	14" - 27"
2002	17"	12" - 44"
2003	19"	12" - 38"

### TAGGING ACTIVITY

Year	Fish T&R	Number of TRIPS	Trip Catch AVER.	Number RECAPTURED	%
1997	377	9	42	26	6.9%
1998	560	11	51	33	5.9%
1999	582	8	73	43	7.2%
2000	779	12	65	31	4.0%
2001	1,340	22	61	45	3.0%
2002	1,855	31	60	56	3.0%
<u>2003</u>	<u>1,076</u>	<u>18</u>	<u>66</u>	<u>18</u>	<u>&lt; 2.0%</u>
<b>Total:</b>	<b>6,569</b>	<b>111</b>	<b>59</b>	<b>252</b>	



*Bill Kruger with a soon-to-be-tagged striper. In the background is the Mohegan Sun Casino on the Thames.*