Striped Bass Survey Well Worth the Cost

By Tom Baum, Principal Fisheries Biologist

Marine Fisheries biologists Heather Corbett and Tom Baum deploying seine net in the Delaware River.

Maryellen Gordon, NJ Div. Fish and Wildlife

For the past 26 years, the NJDEP's Division of Fish & Wildlife has been sampling the lower Delaware River to collect information on the striped bass that are born in the river each year—the young of year or y-o-y. Sampling began in 1980 when striped bass stocks were severely depleted. Back then, the historic spawning grounds of the Delaware River produced an average of only seven y-o-y bass for every 100 hauls of the seine net. Responsible management of this valuable game fish has allowed stocks to rebound to where the seine hauls in 2003 averaged more than eight y-o-y bass each time the net was hauled. Since the project began Fish and Wildlife staff have set and retrieved seine nets 5,149 times, counted over 1 million fish from 82 different species and measured 142,807 of those fish.

More than $3 million has been spent performing this survey over the years. This is indicative of the high cost associated with sound management needed to ensure New Jersey anglers can continue to fish for federally managed marine species and that they get their fair share of the coastwide harvest quota allocated for marine sport fish. Failure to comply with federal management plans that require ongoing monitoring, like the striped bass survey, could result in federal moratoriums on fishing for managed species in New Jersey. The striped bass is only one of 22 New Jersey marine fish that have federally mandated management requirements that must be met to avoid fishing moratoriums.

The Delaware River Seine Survey was originally intended to determine the extent of striped bass spawning in the historic spawning grounds of the Delaware River and how many young fish were entering the adult population (recruitment). Today the survey's main objective is to provide an annual index of the relative abundance of striped bass y-o-y in the Delaware River. This index documents annual variation and long-term trends in bass spawning success and y-o-y survival and provides a preliminary indicator of how many y-o-y bass may later enter the adult population.

Field sampling is done with a 1/4-inch mesh seine net that measures 100-foot long by 6-foot deep and has a collection bag in the middle of the net. One end of the seine net is held close to shore by a crewmember on the beach and the net pays off the bow of a boat as it backs away from the beach. The boat drags the net with the current and then pulls the boat end of the net into the beach forming a "U" shape. The net is pulled onto the beach from both ends and the catch is funneled into the center bag portion of the seine net. All fish caught in the net are identified, counted and many are measured. Besides striped bass, measurements are taken for target species such as white perch, herring, American shad and weakfish. The striped bass y-o-y index is reported as the number of striped bass y-o-y taken per seine haul (see Graph 1). Basic water quality parameters are also recorded including water temperature, salinity and dissolved oxygen.

A particularly interesting catch occurred on August 24, 2004 when a juvenile shortnose sturgeon was netted. This was the first time the Bureau of Marine Fisheries collected a sturgeon in the Delaware River while beach seining. The sturgeon, an endangered species, was caught at the Oldman's Point station, measured just over four inches and was released unharmed.

The five most abundant species caught during these annual surveys are mainly forage fish including blueback herring, Atlantic menhaden, bay anchovy, white perch and American shad. These species make up more than 70 percent of the 1.1 million fish sampled over the survey's history and provide valuable population and diversity information for the Delaware River.

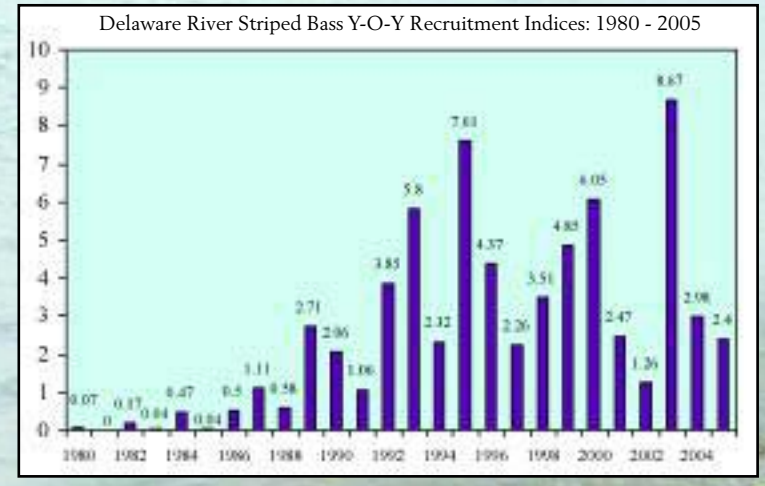
Today there are 32 sampling stations spread over 70 miles of the river from just above Artificial Island in Salem County to Newbold Island in Burlington County. The stations are all located in tidal areas but encompass estuarine, brackish and freshwater areas. Each station is sampled twice a month from mid-June through mid-November yielding 320 seine hauls per season. The sampling effort has grown

substantially from 25-76 seine hauls in the early 80's to 256 seine hauls in 1987 to the current effort of 320 seine hauls.

Typically, it takes four field days to complete one round of sampling at the 32 stations. Depending on the lunar phase, tidal ranges can be greater than seven feet. A field crew of up to four Marine Fisheries personnel will depart early in the morning from our Nacote Creek Research Station in Port Republic trailering a 20-foot boat to one of three boat ramp launch sites on the Delaware River (Pennsville, Bridgeport and Delran). Depending on weather and river conditions, a typical field day starts at 6 a.m. and ends at 5 p.m. The marine staff must endure challenges such as vessel and vehicle breakdowns, pollution, debris, rough river conditions and oil spills.

The seine haul sampling is only the beginning of the work associated with the survey. Fish that could not be identified in the field are later identified back at the lab. Also, scales taken from striped bass are analyzed to determine the ages of the fish in the sample. Numerous hours are spent maintaining equipment, entering and proofreading data, performing quality control checks and then processing data to synthesize research results. Over the survey's 26-year history, 3,378 man-days have been devoted to conducting the striped bass y-o-y surveys.

The New Jersey Delaware River Seine Survey is Marine Fisheries' longest-running fishery-independent survey. The survey design, quality control and quality assurance measures taken all contribute to ensure that the data collected are sound. Also, the survey results have been validated by other independent surveys, specifically the striped bass spawning stock survey conducted the by the Delaware Division of Fish & Wildlife. Documenting the virtual absence of striped bass y-o-y in the Delaware River during the early and mid-1980s, the survey also witnessed the rebuilding years of the 1990s. The Atlantic States Marine Fisheries Commission declared the Delaware River stock of striped bass restored in 1998 based on several studies including New Jersey's seine survey. All that work, money and effort has paid off in producing a recognized and respected survey that predicts the health of the Delaware River striped bass stock.



Large photo: Marine Fisheries personnel sorting and processing catch. Left to right: Seasonal employees Maryellen Gordon, Peter Downham, Craig Tomlin

Inset: Fish eye view of Marine Fisheries personnel hauling in seine net. Left to right: Tiffany Colman, Heather Corbett, Maryellen Gordon, Jennifer Pyle

Graph 1. Striped Bass Young of Year Per Seine Haul, 1980 – 2005

Photos: Tom Baum, NJ Div. Fish and Wildlife.