THAT RIVER'S ALIVE!

At last count, 221 species of fish had been recorded in the Hudson and its watershed. Of New York State's breeding birds, 87% occur here, as do 85% of the state's amphibians, 73% of its reptiles, and 92% of its mammals. The river's menagerie includes plenty of crustaceans, mollusks, insects, and other invertebrates too.

"THIS RIVER IS RICH IN FISHES"

Adriaen Van der Donck's 17th-century observation, quoted above, holds true today, though this abundance can be hard to see, hidden by shimmering waves and muddy water. Modern technology has helped to pierce this veil, adding to data from ongoing fisheries surveys. Scientists tag fish with sonic transmitters and track them through the estuary, gathering information critical to conserving our fish stocks.

After living in the estuary briefly as youngsters, the Hudson's signature species — Atlantic sturgeon, striped bass, and American shad — go to sea and range along the Atlantic coast. As adults, they return for only a few weeks or months each year to reproduce. Thus they are not just "our" fish — their management requires coast-wide perspective and cooperation.

Atlantic sturgeon

Atlantic sturgeon spawn in fresh water from May through July. Young fish may remain here up to seven years before heading to sea, where their travels take them in and out of rivers from Canada to Georgia. Males return to spawn as early as age 10. Females return closer to age 20. Sturgeon will spawn many times, as their lifespan can exceed 60 years.

Young sturgeon became scarce from the late 1980s through the mid-1990s as spawning adults were overfished for caviar and meat. New York's fishery closed in 1996; in 1998, Atlantic coastal states jointly enacted a 40-year moratorium. In 2012, the Atlantic sturgeon was given endangered species status.

Steve Stanne/DEC

On-going studies indicate that the moratorium is working. Sturgeon born when the fishery closed are returning to spawn; more young fish are showing up in surveys. The moratorium will provide protection until these offspring launch a third generation some 20 years from now.

American shad and river herring

Numbers of adult American shad started to decline in the 1990s due to overfishing. Ocean fishing for shad ended in 2005, and the 2009 Hudson River Shad Recovery Plan closed all Hudson shad fishing starting in 2010. Nonetheless, annual monitoring continues to document depressed stocks of what had long been the Hudson's most valuable commercial fish.

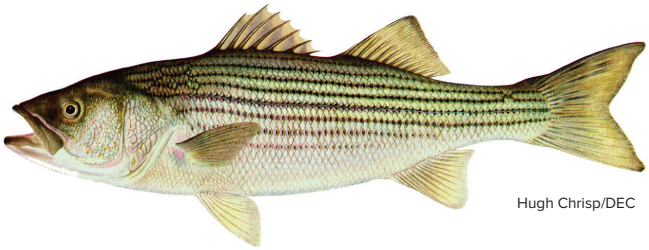
The Recovery Plan also includes studies of spawning locations, shad behavior in the estuary, and losses due to predation and ocean bycatch. Other roadblocks to recovery have appeared, notably loss of SAV beds – prime nursery habitat for young shad – after Irene and Lee hit in 2011.

Stocks of migratory river herring (alewife and blueback herring), closely related to shad, were declared depleted in a 2012 coast-wide assessment. In 2013, this resulted in harvest restrictions in New York, where herring are mainly taken for use as bait.

Striped bass

Striped bass drive the most popular fishery in the estuary. Anglers pursue stripers all the way to the Troy dam during the fish's spring spawning run.

Annual monitoring has revealed below-average production of young striped bass in recent years. Fishing mortality has increased here and along the coast. Under interstate management, tighter fishing regulations are being developed for all coastal stocks.



Hugh Chrisp/DEC

OYSTERS

On New York City streets where hot dogs and falafel are offered today, vendors once hawked local oysters. Early in the twentieth century, pollution, siltation, and overharvesting ended the estuary's oyster fishery.

Attempts are now underway to restore oyster beds in New York harbor and the lower Hudson. While these waters are still too polluted to allow oyster consumption, the reefs could have important ecological benefits. Oysters filter the water; restoration of large reefs could result in a cleaner estuary. Reef habitat could also enhance the diversity of bottom-dwelling animals.

In 2010, experimental oyster reefs were placed in the estuary. Designed to mimic natural beds, they also enabled monitoring of oyster growth and ecological functioning. The project demonstrated recruitment and growth of wild oysters on the beds, benefits from their filtering activity, and increased biodiversity compared to that found at the sites prior to reef placement.

In 2013, wild oysters were found as construction of the new Tappan Zee Bridge began. They may be genetically adapted for survival in the changeable salinities of the lower Hudson. Oysters and historic reef materials from the construction zone will be stockpiled for subsequent reestablishment.

Roberta Miller/Fisheries and Oceans Canada

TREND: After bald eagles began breeding along the Hudson again in modern times, the number of nests along the river increased from one in 1997 to 24 in 2013.

Terry Hardy

BIRDS

Highly visible, birds are ready indicators of environmental change — perhaps none more than raptors, which suffered from indiscriminate pesticide use in the mid-twentieth century. Bald eagles are now commonly seen here. Young peregrine falcons again launch into the air from traditional cliff aeries, and now from nests on river bridges too. Ospreys have begun to breed along the estuary in recent years.

Around New York harbor, herons, egrets, and ibises have become star attractions; ecotours take nature lovers out to see the rookeries. A 2013 survey found 26% fewer nests than in 2010. However, the total number of nests remained within the range observed since the early 1990s.

INVASIVES

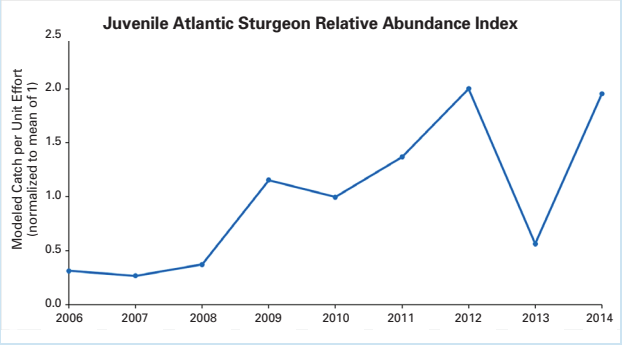
Of the invasive species starring in Hudson River ecological dramas in recent decades, none is more infamous than the zebra mussel. Its population explosion from 1991 to 1992 reduced plankton populations 50 to 90 percent, disrupting food webs. Dissolved oxygen levels dropped measurably. Native pearly mussels, unable to compete, declined in number.

However, recent research has written a second act. While still abundant, zebra mussels are not living as long now. Younger and smaller, their capacity to filter river water is lessened, and some of the changes seen earlier are being undone. Native mussel populations are rebounding. Numbers of other small invertebrates have returned almost to pre-invasion levels. The causes of zebra mussel mortality are unclear, though predation by blue crabs may be part of the story.

New York Sea Grant

While the zebra mussel may be the most dramatic invader of the Hudson ecosystem, it is not the only one. Mitten crab and Oriental weatherfish are just two of the non-native species recently found here. More are waiting in the wings. Once established, invasives are extremely difficult to eradicate. A better solution is to keep alien species out of the Hudson in the first place.

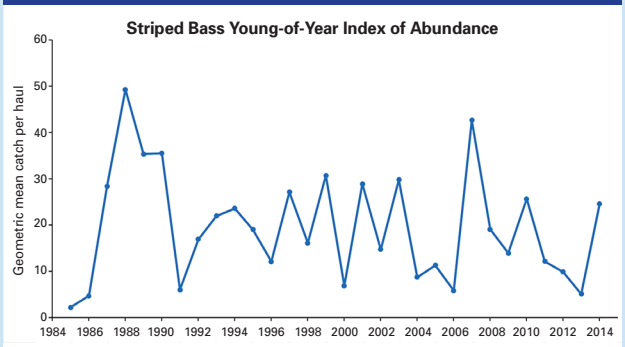
TREND: Catches of juvenile Atlantic sturgeon have been increasing in recent years.



Hudson River Fisheries Unit/DEC

Though there is variability from year to year, fisheries surveys show an upward trend in numbers of young Atlantic sturgeon in the Hudson thanks to the 1996 closure of the sturgeon fishery.

TREND: While 2014 was a good year for production of young striped bass in the Hudson, the overall trend in recent years has been downward.



Hudson River Fisheries Unit/DEC

While survey results vary from year to year, the data suggest that overfishing of adult striped bass may be reducing their spawning success.

Peregrine falcon