

STEWARDSHIP: AN UPWARD TREND

Adding to the usual cast of scientists in academic settings, resource managers in government, and advocates in not-for profit organizations, growing numbers of individuals — students, kayakers, amateur naturalists, planning board members, and more — are joining efforts to build understanding of the estuary, track environmental trends, and address ecological concerns.

A growing number of citizen science projects, many organized by DEC's Hudson River Estuary Program and its partners, recruit volunteers to study the natural world and record and share their findings. Well-designed citizen science projects provide personal satisfaction and valuable data as participants engage with nature and become better environmental stewards.

THE FIRST CITIZEN SCIENCE PROJECT

As the conservation movement evolved in the late 1800s, Frank Chapman — an ornithologist active in the nascent National Audubon Society — proposed a new tradition to replace the Christmas-time “side hunt.” Instead of joining teams (sides) to go afield in a competition to kill as many creatures as they could, participants would count birds.

On December 25, 1900, 27 birders conducted Christmas bird counts in 25 locations. Over 100 years later, annual participation exceeds 70,000 observers in more than 2,300 places, 17 of them in counties along the estuary. The world's longest running citizen science effort, the Christmas Count has become a source of critical data on bird population trends and a highly anticipated and enjoyable tradition for birders.



Mike Pogue

Common mergansers are frequently seen on Hudson in winter.

HOW MANY AMPHIBIANS?

Frogs, toads, and salamanders are sensitive indicators of environmental change. They are not able to move across the landscape as quickly or freely as most birds, and many have very specific habitat requirements.

The North American Amphibian Monitoring Program, begun in 1997, surveys frog and toad populations using the unique calls of each species. Adopting its methods, the Estuary Program and Cornell University have engaged volunteers since 2008 to develop an index of frog and toad distribution and abundance in the Hudson Valley; the information also goes into a national database.

In 2009, the Estuary Program and Cornell began the Amphibian Migrations and Road Crossings Project to monitor amphibians that depend on woodland pool habitat. On rainy spring nights, volunteers search for migrating salamanders, frogs, and toads on local roads. Their observations help researchers locate critical habitat and road crossings where mortality is high, and inform local plans to conserve biodiversity. Over the years, we can also learn whether the timing of spring migrations may be shifting due to climate change.

UNRAVELLING THE MYSTERIES OF EELS

The American eel is among the Hudson's most familiar fishes, but much of its life history remains a mystery. Its populations are shrinking over much of the fish's range. Strategies to address this decline require baseline information. The Hudson River Eel Project involves teams of scientists, students, and community members in collecting young eels as the fish enter tributaries each spring. They count, weigh, and release the eels; at season's



Steve Stamer/DEC

TREND: Citizen science participation in the eel migration study increased from 120 volunteers in 2008 to 516 in 2014.

end, the data are compiled and submitted to state and federal biologists to inform management decisions. Since 2008, the project has expanded from 3 sites to 12; over 500 volunteers now participate in the project annually. More than 250,000 eels have been counted since the project began.



Chris Bowser/DEC

American eels enter the Hudson and its tributaries as tiny glass eels.

PADDLING FOR SCIENCE

In partnership with the Estuary Program and the Hudson River National Estuarine Research Reserve, the Cary Institute of Ecosystem Studies has recruited volunteer teams of kayakers and canoeists to collect data on the estuary's submerged aquatic vegetation [SAV]. Their observations track year-to-year changes in extent of the plants, and has been especially valuable following Tropical Storms Irene and Lee, when the volunteers first detected dramatic loss of SAV.

Participants in the SAV study receive training in the necessary protocols and are encouraged to attend a season-ending session in which researchers discuss the year's results. Such training is a part of all these projects, as it is essential to ensure data quality. The season's end gatherings offer opportunities for scientists

TREND: Observation points checked by volunteer paddlers tracking the presence of submerged aquatic vegetation in the Hudson increased from 100 in 2003 to over 300 in 2013.



Bob Green

to communicate understandings gained from their work and for participants to share a sense of accomplishment and build camaraderie.

ASSESSING WATER QUALITY

Water Assessments by Volunteer Evaluators (WAVE) is a citizen-based water quality monitoring program developed by DEC. Volunteers collect and identify insect larvae, small crustaceans, and other invertebrates living on stream bottoms. These creatures have known sensitivities to pollution, so a stream's health can be evaluated by studying the array of species living there.



Caddisfly larva

DEC

WAVE data augment studies conducted by DEC's Stream Biomonitoring Unit. Based on the program's protocols, training requirements, and quality control measures, WAVE assessments may be confidently used in official DEC reports, alongside professional assessments. WAVE findings of possible impairment highlight sites that may merit professional investigation.

WAVE was piloted in the Hudson River watershed in 2012 with assessments at 109 sites, 86 of which had never been assessed before. Of the 109, 47 were found to have no known impacts, and 7 were possibly impaired. Under study protocols, assessments of the other sites did not produce conclusive evidence of either high or problematic water quality.

TREES FOR TRIBS

Natural borders of trees, shrubs and grasses along streams form buffers that help to reduce pollution in waterways by slowing down and filtering runoff. They lessen erosion by stabilizing shorelines and absorbing high-velocity flows, and offer a travel corridor for wildlife.

BASELINE: From 2009 to 2014, volunteers planted 32,700 trees and shrubs along tributary streams in the Hudson watershed.



Beth Roessler/DEC



Alene Onion/DEC

WAVE volunteers collect stream macroinvertebrates to assess water quality.

Since 2007, the Hudson River Trees for Tribs (as in tributaries) Program has provided landowners with free native trees and shrubs and engaged volunteers in plantings to restore stream-side buffers. From 2009 through 2014, the program planted 29,600 trees and shrubs along 12 miles of streams. Another 3,100 were planted by partnering groups in the watershed. Since DEC adopted this program as a statewide model in 2011, 13,000 trees and shrubs have been planted in seven other New York watersheds.

THE HUDSON RIVER ALMANAC

The Hudson River Almanac, a free natural history journal covering the river and its watershed from the Adirondacks to New York harbor, has compiled observations from thousands of volunteers since 1994. Contributors range from elementary school students to professional biologists. Originally published annually as a book, it began weekly distribution via e-mail in 2003. By the end of 2014, circulation had grown to 7,997 subscribers.

Rather than pursuing narrow research goals, this journal captures multiple dimensions of people's interactions with nature. While the sightings reported often contain information useful to scientists, it aims at a broader audience to promote public understanding of the river, put contemporary observations in historical perspective, and — like all the projects described here — encourage people to look more closely at the Hudson and share what they see.



Swamp white oak leaves.

W.D. Brush/USDA-NRCS PLANTS Database.