



Level 2: Glass Eels in Hudson River Tributaries

❖ Background Information:



Glass eels. Picture from the NYSDEC.

The New York State Department of Environmental Conservation (NYSDEC) monitors American eel (*Anguilla rostrata*) migrations in several Hudson River tributaries. The American eel has a catadromous life cycle, which means that it spends most of its life in freshwater but migrates to marine water to breed. The breeding takes place in the Sargasso Sea, which is located near the Bahamas and Bermuda. Once the eggs hatch, the larval eels (leptocephali) drift in the ocean for several months before being carried towards North America by the Gulf Stream current. Along the way, the larvae transform into glass eels and look for estuaries that will lead them to freshwater rivers and streams. This eel project is primarily focused on monitoring the glass eel migration. The glass eel is

the juvenile life stage of the American eel. The glass eels are characterized by their miniature, transparent appearance.

American eels are listed as endangered by the International Union for Conservation of Nature (IUCN). Because of the large geographic area over which they range and their catadromous life cycle, there are several factors that could be contributing to the decline in eel populations. Eels are popular as bait for recreational and commercial fishermen, and are also sensitive to water quality conditions and pollutants. Habitat loss may also be important. If you are interested in what is threatening eels, see the links provided in the additional resources section below for more information. It's interesting to note that the US Fish and Wildlife Service does not consider eels to be



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endangered. The eel project is a type of citizen science program that allows students, teachers, and community members to work side by side with scientists to gather information about eels and hopefully help to increase their population. The volunteers monitor eel migrations by checking eel density in the Hudson every spring. To get involved in the Eel Project, visit <http://www.dec.ny.gov/lands/49580.html> and click on volunteer opportunities.



Fyke net used for catching glass eels. Photo from <https://umaine.edu/cooperative-aquaculture/american-eels-anguilla-rostrata/>

❖ Dataset Timeframe:

- Data collection on eels began in 2008, and is collected every spring (late March-early June). This dataset contains data from 2008-2017.

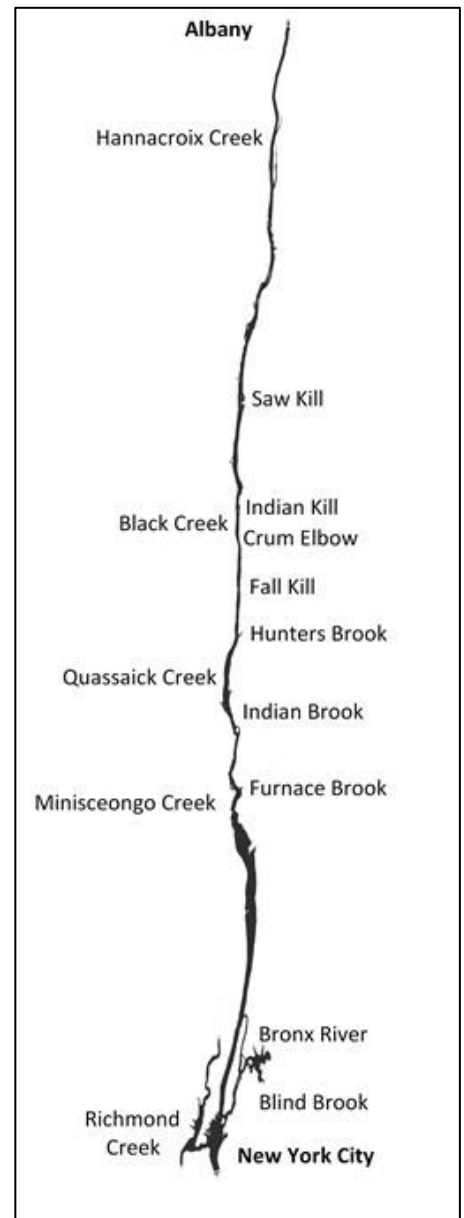
❖ Data Collection Methods:

- Volunteers monitor large fyke nets daily throughout the spring in tributaries of the Hudson River. Fyke nets are segmented nets placed in the current which prevent eels from traveling out of the net. Nets are placed as close to the mouth of the tributary as possible. The opening of the nets face the river, in order to catch eels as they travel from the Hudson River into the stream. Once a sampling site is established, the same location is used each year. There are two other methods used to collect eels; eel mops and eel ladders, but these data only come from eels collected in fyke nets.
- Once captured, eels are counted, patted down to remove excess water, and weighed in groups of approximately 20. After weighing, eels are released back into the tributary. Eels caught are recorded into two groups: "glass eels" and "elvers." Glass eels are the youngest eels in the Hudson River watershed, since they are just beginning their first year in this new habitat. Elvers are eels that have been in the Hudson River system for at least one year. The elvers are generally larger than the glass eels and more brown in appearance. This dataset only contains data on glass eels.

❖ Dataset Variables:

There are two sheets in the excel file, which present the same data sorted either by location or by year.

- **Site:** Name of tributary or stream.
- **Hudson River Mile (RM):** Miles from the New York City Battery to the sampling site. Note: River Mile values are approximate for Richmond Creek, which is south of the New York City Battery, and the Bronx River at 122nd St, which is a tributary of the East River, not the Hudson River.
- **Year:** year that the sample was collected.





- **Average glass eels per sampling day:** the average number of glass eels counted in the fyke net per day of sampling for that site and year.

❖ Information About Sites:

- Sampled streams are mostly tributaries to the Hudson River. They range from Richmond Creek on Staten Island all the way to Hannacroix Creek in New Baltimore, just a dozen miles south of Albany.

❖ Source of Datasets:

- Data are collected by students and volunteers under directions from NYSDEC Hudson River Estuary Program scientists.
- If you have specific questions about this research that you would like to ask the scientists, please email caryeducation@caryinstitute.org and we will be happy to contact the scientists on your behalf.

❖ Inquiry Idea Starters

Here are some sample questions you could ask using these data. These are just suggestions, and we hope you'll come up with many interesting questions of your own!

- How has the total average number of eels changed since sampling began in 2008?
- Is the average number of eels caught related to river mile with a given year? You might want to look at features of the Hudson River such as depth, width, and shoreline habitat when considering this.
- How has the average number of eels changed from 2008-2017 at Furnace Brook? Do you see the same pattern at Fall Kill?

❖ Additional Resources

- The NYSDEC Eel Project Website: <http://www.dec.ny.gov/lands/49580.html>
- Watch a video clip about glass eels: <https://www.youtube.com/watch?v=yRn1hu7cMaE>.
- Information about American Eels from the IUCN <http://www.iucnredlist.org/details/191108/0>
- The US Fish and Wildlife Service page on American Eels: <https://www.fws.gov/northeast/americaneel/>
- Eel project report: http://www.dec.ny.gov/docs/remediation_hudson_pdf/082415eelreport.pdf

❖ References

Bowser, C., et. al (2017). Hudson River Eel Project, 2008-2017. New York State Department of Environmental Conservation, Staatsburg, NY, 27pgs.



Photos from US Fish and Wildlife Service