

Fish Communities in the Hudson

Students will use tables of fish collection data to draw conclusions about where fish live in the Hudson estuary.

Objectives: Students will use data presented in tables to:

- interpret organized observations and measurements;
- recognize simple patterns, sequences, and relationships;
- understand environmental factors that influence where fish live and determine the makeup of fish communities.

Grade level: Elementary (Grades 3-5)

Subject Area: Math, Science, English Language Arts

Standards:

Mathematics, Science, & Technology Standards 1, 4
English Language Arts Standard 1

Skills:

- Interpret data presented in table format.
- Observe, identify, and communicate patterns.
- Present inferences or generalizations indicated by data

Duration:

Preparation time: 5 minutes

Activity time: 30 minutes

Materials: Each student should have:

- Worksheet: Fish Communities in The Hudson
- Hudson River Miles map (helpful but not required)
- Pencil

Note: A simpler food chain lesson - "What Do Animals Need to Stay Alive? HABITAT!" - is available for kindergarten to third grade students at <http://www.dec.ny.gov/education/77601.html>.

Background:

The Hudson is home to a great variety and abundance of fishes. Each kind has its habitat and lifestyle preferences. For example, the Hudson is an estuary in which salty ocean water and fresh water mix. Some of the river's fish are found only in salt water, others only in fresh; a few can live in either. Some fish swim in schools; others tend to keep to themselves. Given these preferences, fishes occur in communities—fishes of freshwater shallows, for instance.

During DEC's annual Day in the Life of the Hudson River event, students collect fish at sites all along the tidal Hudson and New York Harbor. Of the 200+ kinds of fish found in the Hudson and its tributaries, students caught 33 species from 2003 to 2006; the worksheet's tables show data for a handful of these. To simplify, data from sites less than one mile apart were combined, and many sites were left out. Most of the fish recorded during Day in the Life events are caught in beach seines—curtains of netting with a pole at either end.

Locations along the Hudson are often measured in Hudson River Miles. Hudson River Miles start at the southern tip of Manhattan. This spot, called The Battery, is River Mile 0. The estuary part of the Hudson ends at the Federal Dam in Troy at River Mile 153.

Activity:

1. Review the concept of estuary with the students.
2. Introduce the Hudson River Miles system.
3. Go over the worksheet with the class or hand out as an in-class or homework assignment.

Assessment:

- Have students share answers to questions from worksheets, or collect and grade sheets.
- Investigate one species of fish further, using the resources listed below.

Vocabulary:

average: equal or close to an arithmetic mean

community: a group of living things that interact and are located in one place

fresh water: water that is not salty

Hudson River Miles: distance north from the Battery at Manhattan's southern tip

leading edge: line marking a beginning or end

salt front: the leading edge of seawater entering an estuary

salt water: seawater or other water that contains salt

school (of fish): a group of fish swimming together

seine net: a fishing net that hangs vertically between floats and weights

species: a class of living things of the same kind and same name

upriver: towards a stream's source

Resources:

Find illustrations and information about the fish described in this activity at the Department of Environmental Conservation website www.dec.ny.gov/animals/269.html or the Estuary Program's gallery of Hudson River organisms <http://www.dec.ny.gov/education/88154.html>. The Atlantic silverside and other fish of salt water are described in the Chesapeake Bay Program's Bay Field Guide www.chesapeakebay.net/bfg_fish.aspx?menuitem=14340. Information about and data from the Day in the Life of the Hudson River is available at www.ideo.columbia.edu/edu/k12/snapshotday/

Fish Communities in the Hudson: ANSWER KEY

Fish Communities in the Hudson

Many kinds of fish live in the Hudson. However, not all of these fish live everywhere in the river. People live in different sorts of **communities**, and so do fish. Some like **salt water**; others like **fresh**. Some prefer to live among plants; others prefer open water.

During the Day in the Life of the Hudson River event each fall, students catch fish at many places along the river. Then they compare results to see where different kinds of fish live. The location of each place is given in **Hudson River Miles**. River Mile 0 is in New York City. Going north towards Albany, the mile numbers get higher. Yonkers is at Hudson River Mile 18. Beacon is at Hudson River Mile 61.



Seine nets can be used to catch fish in shallow water.

These fish were caught and released at Green Island, Hudson River Mile 152.



The white perch is often caught in seine nets.



This table shows 2006 fish catches. Use it to answer questions 1-3 below.

Hudson River Fish Caught on October 12, 2006

Hudson River Mile	14	18	25	28	41	61	85	97	102	115	124	Totals
spottail shiner			1			1	6	23	2	11		44
Atlantic silverside	1	5	87	21	1							115
white perch	1	3	13		3	5	1	3		8	3	40
striped bass		1	15		17	6	1	3	8	1	1	53
pumpkinseed						1	29		1	2		33
smallmouth bass						2	1					3
tessellated darter							1	1	2	10		14

Salt front located at HRM 53 

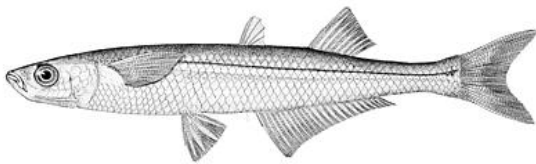
1. Which fish was caught in greatest numbers on October 12, 2006?

Atlantic silverside (115)

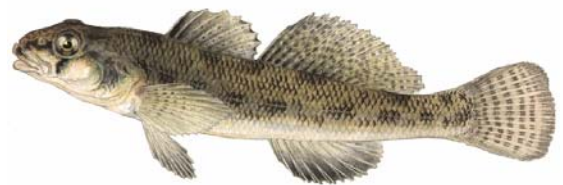
2. Which two fish were caught in the most places on October 12?

white perch (9 places), striped bass (9 places)

3. The Hudson River **estuary** is influenced by salt water pushing in from the Atlantic Ocean. The salt's influence is strongest near New York City. Moving **upriver**, the water becomes fresh. The **leading edge** of salty seawater entering the river is called the **salt front**. On this day, the salt front was at Hudson River Mile 53. In the table, look at where each of these fish was found. **Does it prefer fresh water or salt water?**



(a) Atlantic silverside **Salt**

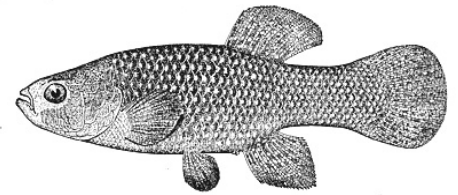


(b) tessellated darter **Fresh**



(c) pumpkinseed **Fresh**

4. In 2006, students caught mummichogs only at Inwood Hill Park in Manhattan. Not far away, in Yonkers and Alpine, students did not find mummichogs. Look at the pictures of each place.



How is Inwood Hill Park different?

Plants grow in the water at Inwood Hill Park, but not at Yonkers or Alpine.

What do mummichogs like about Inwood?

Mummichogs prefer areas where water plants grow.



Inwood Hill Park is near Hudson River Mile 14.



Yonkers is on the east side of the Hudson at Hudson River Mile 18.



Alpine is on the west side of the Hudson at Hudson River Mile 18.

Species	Average catch per site
spottail shiner	6
Atlantic silverside	52
white perch	5
striped bass	4
pumpkinseed	3
smallmouth bass	1
tessellated darter	3

5. This table shows the **average** catch per site over four years of Days in the Life of the Hudson Estuary. Use the table to answer the questions below.

(a) Which fish is most likely to live in **schools** (groups of fish)?

Atlantic silverside

(b) Which is least likely to live in schools?

smallmouth bass

(c) Which is more likely to travel in schools—the spottail shiner or the tessellated darter?

spottail shiner