

RIVER REACH CLASSROOM GUIDEBOOK

5735 Kellogg Ave. Cincinnati, OH, 45230 (513) 231 7719 www.riverlearning.org As a 501c3 Nonprofit, FORE is required to complete annual reporting . If you utilized our resources in your classroom, please complete this <u>brief survey</u> so that we can accurately capture our participation numbers.

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Environmental Protection Agency



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ABOUT THE FOUNDATION FOR OHIO RIVER EDUCATION (FORE)

- The Foundation for Ohio River Education was originally formed as the ORSANCO Educational Foundation on March 30, 2004 as a 501c3, non-profit organization. We changed our name to the Foundation for Ohio River Education (FORE) in 2009, to better reflect our organization's purpose.
- FORE was formed under the Ohio River Valley Water Sanitation Commission (ORSANCO), a pollution control agency for the Ohio River made up of representatives from eight states and the federal government.
- Although FORE is affiliated with ORSANCO, it does not receive state or federal funding and is responsible for sustaining itself through grants, corporate and foundation sponsorships, and through the support of individuals. FORE also collects and administers Ohio River Sweep funds, that are raised by ORSANCO each year, to conduct basin-wide clean-up events along the mainstem of the Ohio River and its tributaries



- The Ohio River is 981 miles long, starting in Pittsburgh, PA and ending in Cairo, IL where it flows into the Mississippi River in Cairo, IL.
- The Ohio River runs along the borders Pennsylvania, West Virginia, Ohio, Kentucky, Indiana, and Illinois.
- It is home to about 160 species of fish as well as multiple macroinvertebrate and plankton species
- Approx. 30 million people live in the Ohio River Basin

FISH

- Modified lesson plans
 - Ecosystem Dynamics, Biotic and Abiotic Factors
 - Fish Adaptations
 - Complies with NGSS LS2 standard
- Flashcards
- Activities for students
 - Build your own Fish
 - Fins Form and Function Worksheet

MOST COMMONLY CAUGHT SPECIES

NOTABLE CAUGHT SPECIES



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GIZZARD SHAD

A member of the herring family, Gizzard Shad are native to the Ohio River Basin. They are very abundant in the Ohio River, and are an important part of the resource's trophic cascade. The Gizzard Shad gets its name as it possesses a gizzard-a small, rock or sand-filled sack-as part of its GI tract that helps it break down food.

CHANNEL SHINER

Observed in large numbers, Channel Shiners are members of the minnow family and are very common within the basin, particularly in medium to large rivers, including the Ohio.



RIVER REDHORSE

A somewhat sensitive species, River Redhorse are not as frequently encountered in ORSANCO biological surveys. Their presence is indicative of good stream health, and a sign of favorable habitat conditions. Easily distinguished by its red dorsal and caudal fins, River Redhorse are important to the Ohio River ecosystem.

SILVERJAW MINNOW

Minnows are the most speciose fishes in North America, and the Silverjaw Minnow is another member of the minnow family present in the Ohio River. These are notable catches in the Ohio River as they typically prefer smaller stream habitats with riffles and constant flow, and are not typically observed in large, slower moving rivers.



EMERALD SHINER

Present in nearly every Ohio River Survey in 2022, Emerald Shiners are native to North America and are very common in large rivers and lakes. The Emerald Shiner gets its name from the silvery-emerald color along its sides.

MISSISSIPPI SILVERSIDE

Rarely encountered in the Ohio River, Mississippi Silversides are most often observed in shallow lakes and reservoirs. These hardy individuals prefer low-flow waters, and their range extends only into the lowest portions of the Ohio River.



FRESHWATER DRU

Native to North America and the sole member of the genus *Aplodinotus*, they are an important species within the Ohio River ecosystem. Their diet includes macroinvertebrates, including small mussels. Their full scientific name is *Aplodinotus grunniens*-from Greek for "single back", and Latin for "grunting"referring to a gruntint sound that mature males make.

LONGNOSE GAR

A very unique member of the Ohio River ecosystem, the Longnose Gar features an ancient appearance. It is believed that the species may have been present in North America for nearly 100 million years. Longnose Gar are piscivorous and can grow to nearly 6 feet (1.8m) and over 50 lbs (~25kg).



BLACK BUFFALO

These important members of the deep-bodied suckers are listed as species of special concern in multiple states. Having to compete with exotic species for food sources makes this native species one of note, as management practices continue to evolve to protect their habitat and ensure their success.



Electrofishing sampling took place during the index period July-October of 2022. Surveys are conducted at night beginning just after dusk to take advantage of increased foraging activity and diurnal movements of fishes that occur along the shoreline in the evening hours. *Results reflective of 2022 Pool Reports

MACROINVERTEBRATES

- Modified lesson plans
 - Macroinvertebrates as Indicator Species
 - Human Impacts and Pollution
 - Aquatic Food Chains and Food Webs
 - Complies with NGSS ESS3 standard
- Flashcards
- Activities for students
 - Macroinvertebrate Sampling Activity
 - Macroinvertebrates Hindrances Game
 - Metamorphosis Matching Game
- Collecting Live Macroinvertebrates
 - Leaf Litter Collection Method
 - <u>RiverWatchers Sampling Procedures</u>
 - Pages 58-69

Stream Quality Index

Group 1 Very Sensitive	Group 2 Sensitive	Group 3 Pollution Tolerant
U Water Penny	Crane Fly Larva	Black Fly Larva
Stonefly Nymph	Diving Beetle Larva	Aquatic Worm
Caddisfly Larva	Crayfish	Midge Larva
Dobsonfly Larva	Scud	Mosquito Larva
Mayfly Larva	Damselfly Nymph	Other Fly Larva
Riffle Beetle	Dragonfly Nymph	Leech
Gilled Snail		Pouch Snail
Shrimp	Isopod	Other Snail
	Diving Beetle	D Planaria
Number of checks in this column: x3	Number of checks in this column: x2	Number of checks in this column: x1
Total:	Total:	Total:
Excellent >22 Good 22-17 Fair 16-12 Poor 11-0 Total from all three groups: Result:		all three groups: :























PLANKTON

- Modified <u>lesson plans</u>
 - Phytoplankton and Zooplankton Distinctions
 - Plankton's Role in Aquatic Food Chains
 - Water Pollution and Harmful Algal Blooms
 - Complies with NGSS LS1 and NGSS LS2 standards
- Flashcards
- Activities for students
 - Food Chain Activity
 - Plankton Sink Off
- Collecting live plankton
 - Plankton Tow Sampling Method
 - Grow your own Phytoplanlton
 - Plankton Viewing and Identification
 - Plankton ID sheets



WATER CHEMISTRY

- Modified <u>lesson plans</u>
 - Visual Observations
 - Chemical Tests including PH, DO, Nitrates, Phosphates and E.coli
 - Water Quality Grade
 - Complies with NGSS PS1 and NGSS PS2
 Standards
- How to collect water samples
- Testing Instructions and Analysis
- <u>Resources for free Chemistry Test Kit</u>

WATERSHED MODEL

BUILD YOUR OWN WATERSHED

The land we live on is divided into watersheds. A watershed is a land area whose runoff drains into any river, stream, lake, or ocean. Small watersheds, such as the watershed for the creek behind your house, or...

US www3.epa.gov/

- Materials
 - 1 large Tupperware container
 - Modeling clay
 - \circ Sand
 - Aquarium gravel
 - Wax paper/tin foil
 - Cocoa mix iced tea mix, or other flavored drink mix
 - 1 spray bottle or bucket full of water
- Simple option
- <u>Alternate option</u>

Share your classroom experience with us on social media!



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Interested in our other programs?

Visit www.riverlearning.org or contact Nick Callahan for more information!