



## Lower Mystic River Fish Advisory: Deep Dive

**Who is it for?** Teachers and students across the watershed (and beyond).

**What?** Not all fish are safe to eat. The fish may be healthy, but are not safe to eat. Find out more!

**Why did we make this?** Many environmental problems seem invisible, but can harm people.

**Table of contents and activities:** The Mystic River, like most urban rivers, has seen many changes over time. How people have used the river impacts the ecosystem – river and land.

The Mystic River and People. Select images of the river's past

What is pollution? When we talk about rivers, we often think of water pollution. What is pollution and what kinds of pollution are impacting our area?

What does this sign mean? Along waterways you might see signs that warn about health hazards. Reading and interpreting signage is important.

Communicating about hazards. How do people share information? Creating a short and understandable message can be challenging. Invite students to craft a message.

Sediment at the bottom of the river can be polluted. Students better understand sediment with this activity.

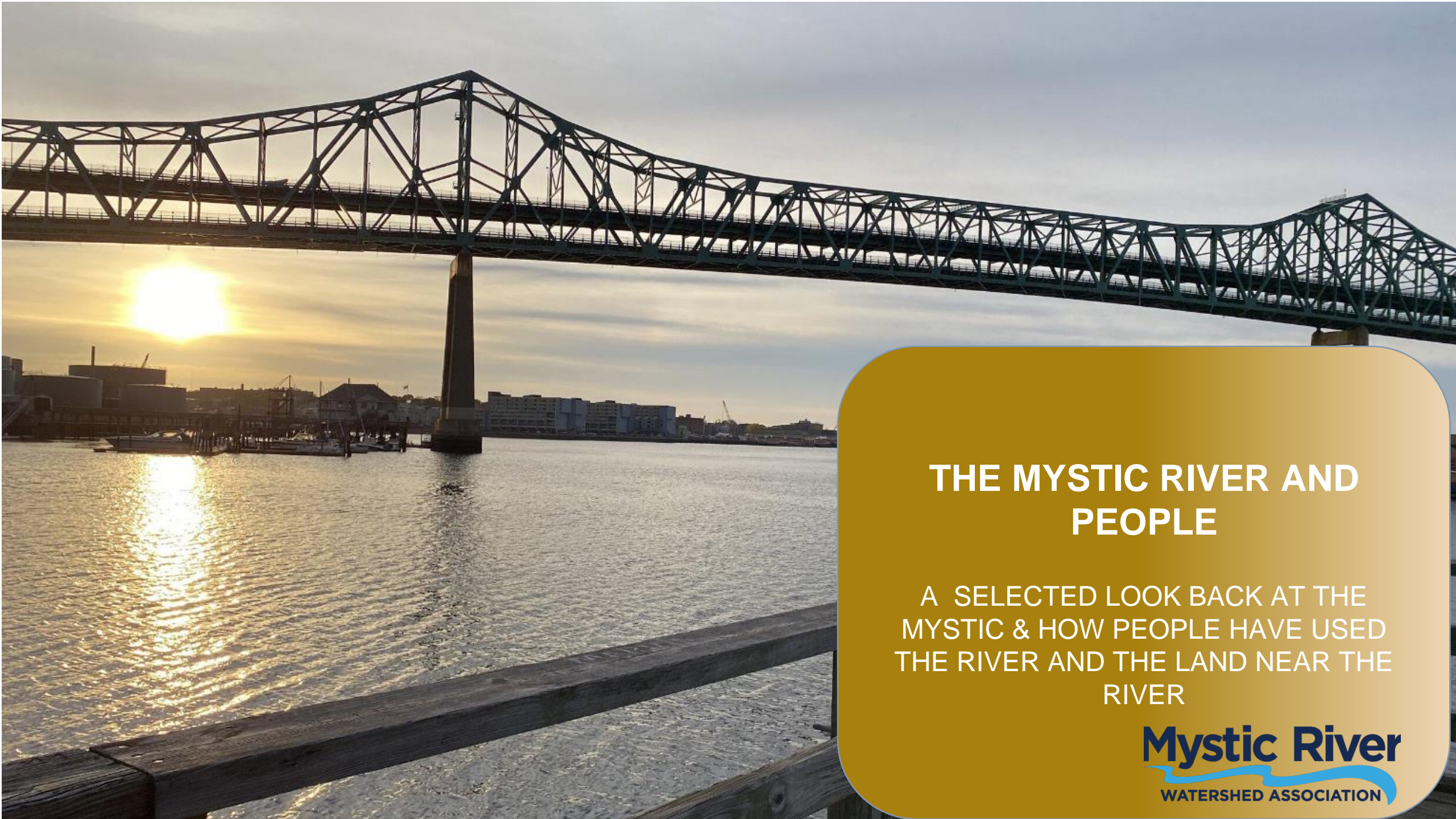
Bioaccumulation (*coming soon*) what is it and how does it impact the health of fish?

Social and Environmental Justice (*coming soon*) what are they and how are they related to the fish advisory?

Vocabulary list of terms related to the fish advisory & all maps

**PROJECT PARTNERS:** In July of 2018 the [Massachusetts Department of Public Health](#) (MDPH) released this fish advisory, in partnership with the Mystic River Watershed Association, to provide guidance on fish consumption in the Lower Mystic Area. All fish advisory information is courtesy of the Massachusetts Department of Public Health. The fish consumption study leading to the advisory was completed in partnership with MyRWA, CLF, GreenRoots, Neighborhood of Affordable Housing, Green Harbors Project at UMass Boston, and the Boston University School of Public Health and funded by the [Massachusetts Environmental Trust](#). Outreach for the fish advisory, including this resource, was funded by the EPA Healthy Communities program.

[www.MysticRiver.org/Fish-Advisory](http://www.MysticRiver.org/Fish-Advisory)



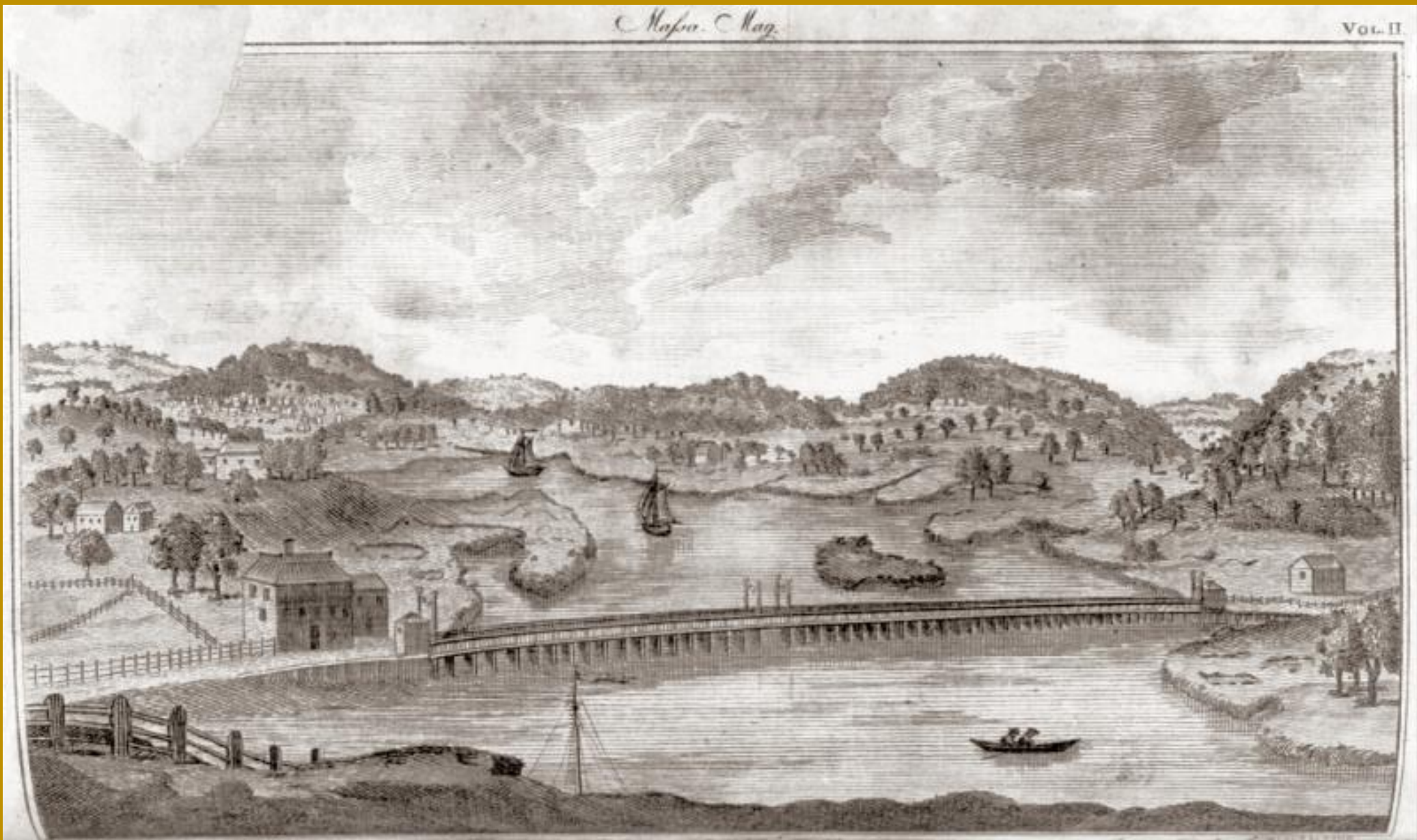
## THE MYSTIC RIVER AND PEOPLE

A SELECTED LOOK BACK AT THE  
MYSTIC & HOW PEOPLE HAVE USED  
THE RIVER AND THE LAND NEAR THE  
RIVER

**Mystic River**  
WATERSHED ASSOCIATION

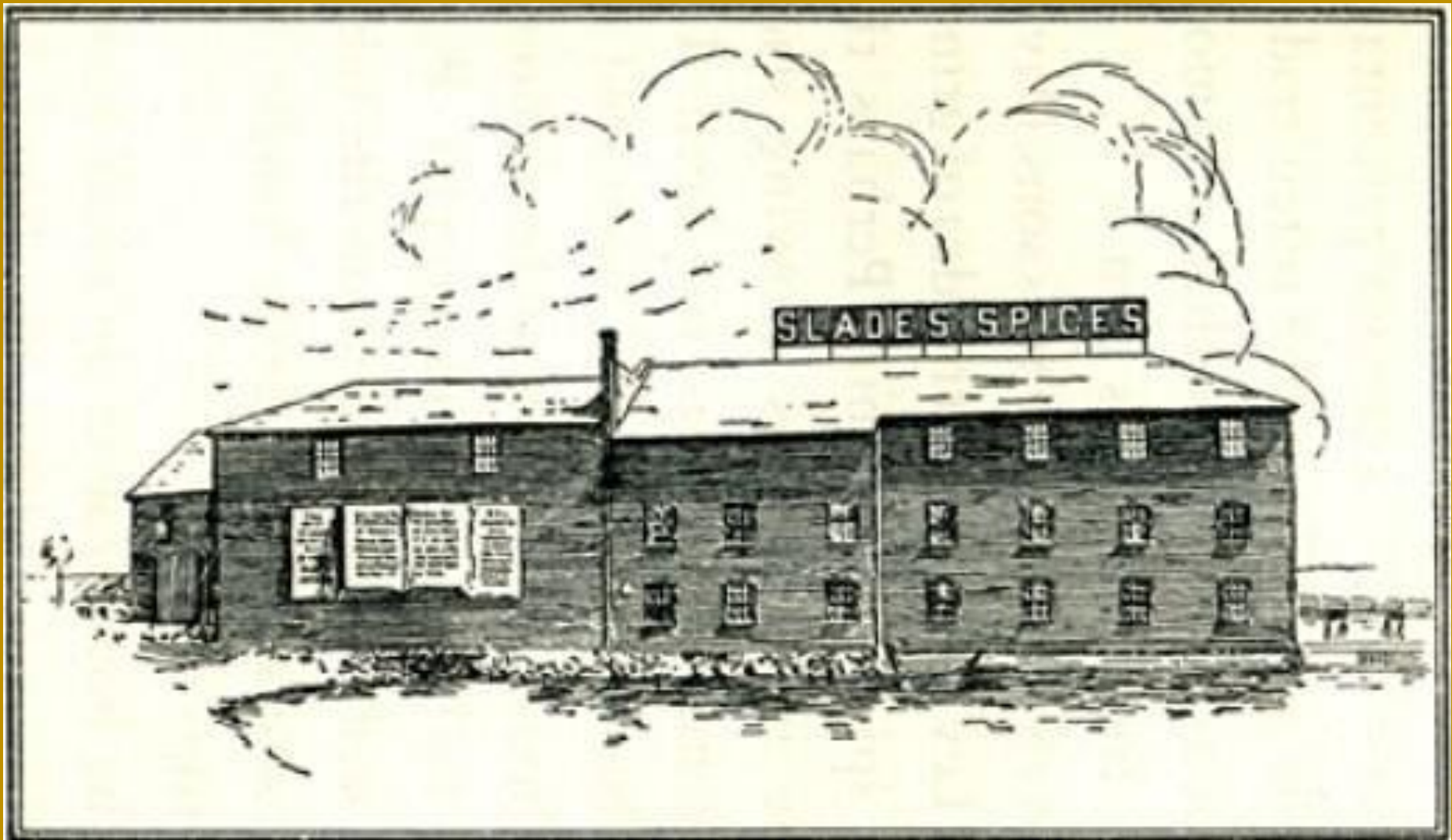
Map from  
1775





**View of the Mystic River from Bunker Hill of the Malden Bridge, parts of Medford and Charlestown Beyond the Neck, Sept. 1790.**

[http://historicsomerville.org/pictures\\_and\\_past\\_events/mystic\\_river\\_roundtable\\_with\\_richard\\_beinecke](http://historicsomerville.org/pictures_and_past_events/mystic_river_roundtable_with_richard_beinecke)

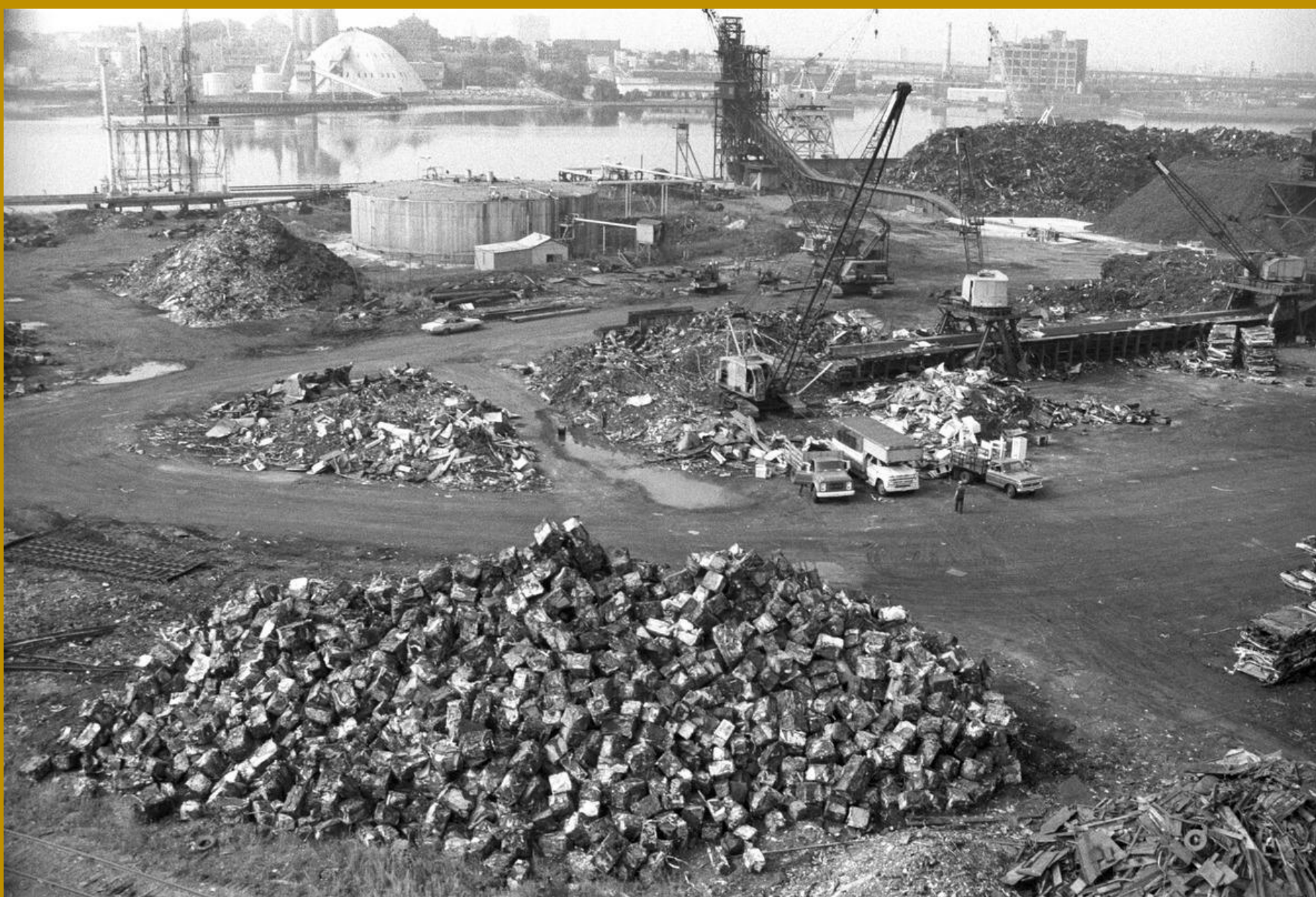


Slades Spice Mill, Revere, Massachusetts

Find out more about tide mills here <https://www.tidemillinstitute.org/slades-spice-mill/>



Elephants bathing in salt water Mystic River Everett, MA. while circus was at Sullivan Sq. grounds.  
Date: [ca. 1917–1934]



**Scrap yard, Everett 1974**

<https://www.digitalcommonwealth.org/search/commonwealth:bk128c16f>



**Tanker at Mystic River Pier, Everett, 1974**

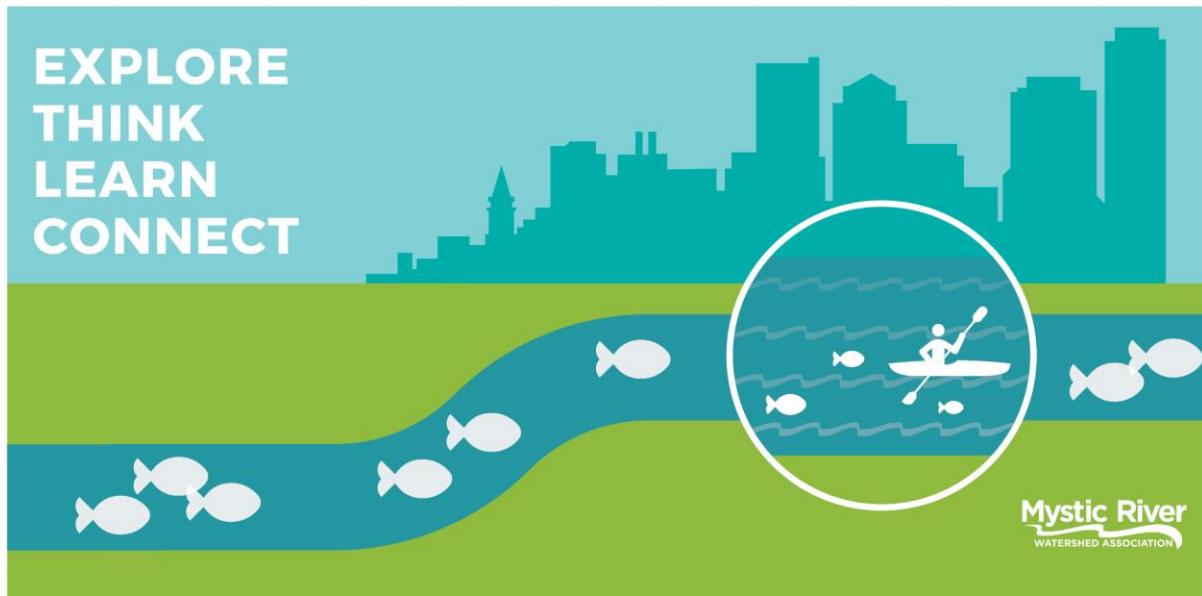
<https://www.digitalcommonwealth.org/search/commonwealth:bk128b26g>





**Natural gas plant and Mystic River Bridge, Everett 1974**

<https://www.digitalcommonwealth.org/search/commonwealth:bk128c14w>



## What is Pollution?

*Note to teachers: This activity asks student to define pollution and think about the kinds of pollution they encounter in their community.*

### **What is pollution?**

Pollution is something in the environment that causes harm. There are different kinds of pollution. **What kinds of pollution can you name?**

Air, water, light, and noise are some common types of pollution. Some kinds of pollutants are natural, like smoke and soot in the air from forest fires. Most kinds of pollution come from the actions of people. **Can you think of some examples of each type of pollution?**

Helicopters are used to take people from one place to another, but they are noisy. **What else causes noise pollution?**

Lights on at playing fields at night create light pollution. **What else have you noticed that contributes to light pollution?** People don't sleep well if there is too much light at night and plants and animals notice if there is too much light at night.

Water pollution - During a big storm water runs off the land and washes pollutants into waterways. Water pollution is a common problem for rivers, streams, brooks, lakes, ponds, marshes, and harbors. **Have you noticed storm drains in the street, parking lot or playground?**

People are noticing that some fish are polluted, meaning they have toxic chemicals in their bodies. Most polluted fish look healthy. Eating food that is polluted can affect the animal that eats the polluted food. Find out about what toxins are found in fresh water fish in Massachusetts here <https://www.mass.gov/doc/public-health-freshwater-fish-consumption-advisories-2021/download>

Find out more about water quality here. <https://mysticriver.org/water-quality>

### **Extension Activities**

What does this water quality map <https://mysticriver.org/epa-grade> tell us about water quality in the Mystic River watershed? Why is it important to know about levels of pollution in a water body?

Do you know that stormwater pollution is the biggest source of water pollution today? Find out more here. <https://mysticriver.org/pollution>

# What Does This Sign Mean?

Note to Teachers: Finding the meaning in signage can sometimes be challenging. In this activity, students read and interpret public health signage in groups or individually and answer discussion questions.

 <h1>WARNING</h1> 	
<h2>Lower Mystic River Area</h2>	
	<p>Area includes lower Mystic River and Chelsea Creek. This is a great place to fish. Eating fish from this area can make you sick. Polluted fish can still look healthy.</p>
<p>Everyone can catch and release fish. Most people should not eat any fish caught from this area.</p>	
<p><b>Shellfishing is not allowed in this area.</b> Nobody should catch or eat any shellfish from this waterbody, including oysters, clams, mussels, crabs, and lobsters.</p>	
	<p>Children under 12, pregnant women, nursing mothers, and women that may become pregnant should <b>not eat any fish or shellfish</b> caught from this area.</p>
	<p>Everyone else should eat <b>ONLY bluefish and striped bass</b> from this waterbody.</p>  

**Issued by the Massachusetts Department of Public Health**

More information about the Lower Mystic River Area is available at [www.mass.gov/lower-mystic](http://www.mass.gov/lower-mystic).

MDPH has issued other important health recommendations for eating fish. To find out more information, please call 617-624-5757 or go to [www.mass.gov/dph/fishadvisories](http://www.mass.gov/dph/fishadvisories).

Many signs posted in our environment are there to let people know important information. What is the sign above trying to tell people about catching and eating polluted fish? Signs like this are posted along the lower Mystic River to let people know what fish are safe to eat. Read the sign carefully and answer these questions.

1. Have you gone fishing or shell fishing? What are shellfish? If you have gone fishing, have you thought about if the fish are safe to eat?
2. What does catch and release mean?



3. What does this symbol mean? Have you seen other signs with this kind of red circle?



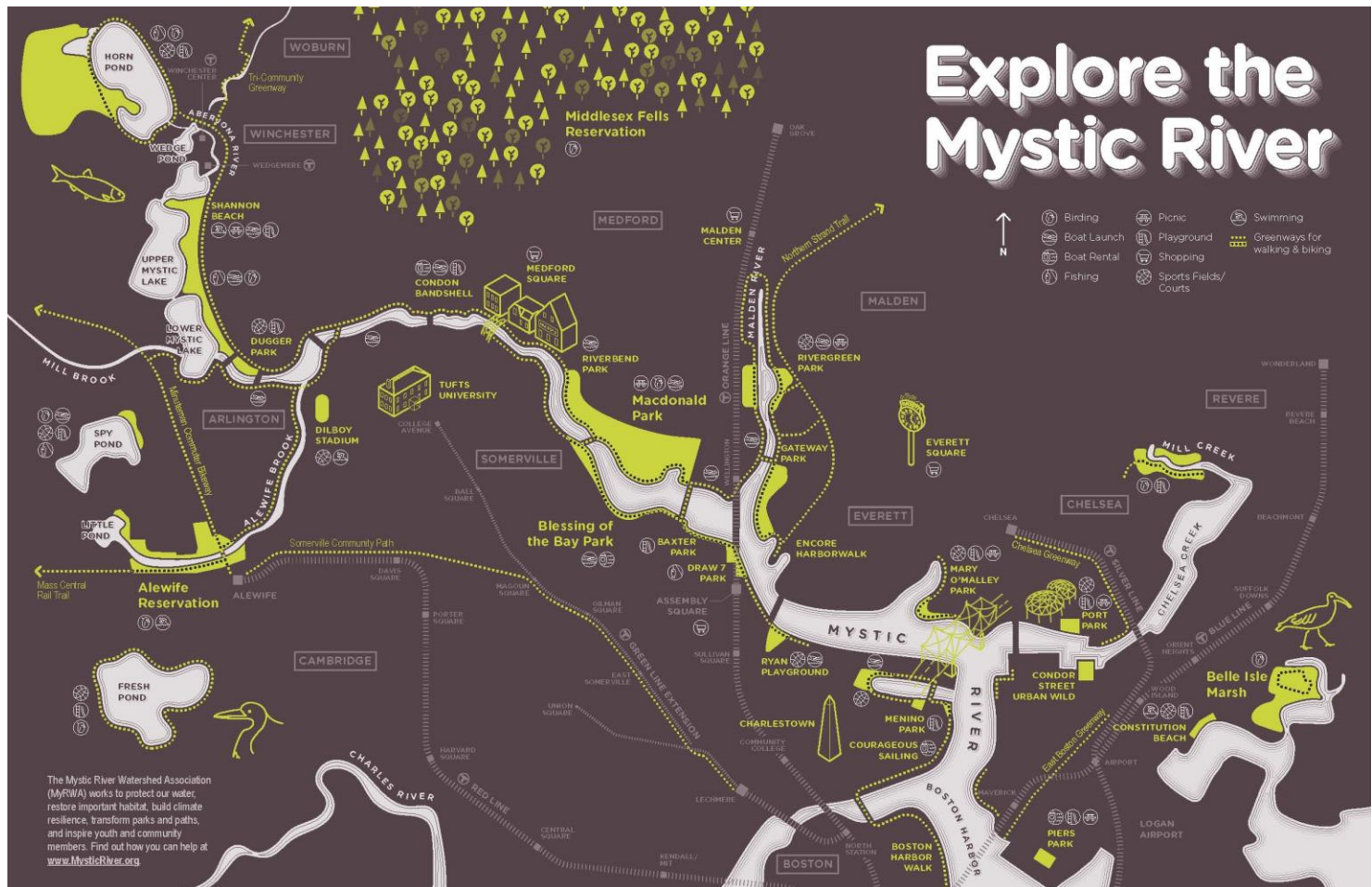
4. Do you think most people know what the term **polluted fish** means? *Why or why not?*
5. The sign says that children and mothers should not eat any fish. Why?

Extension Activity: Create your own public health sign to tell others about fishing and polluted fish.

Additional information in English and other languages: <https://mysticriver.org/fish-advisory>

# Polluted Fish and Fishing on the Mystic: Map Design and Information

Note to teachers: This activity asks students to think about an existing map of the watershed and add more information about safe fishing.



This map shows people some of the things they can do along the Mystic River. Your job is to add some detail about safe fishing.

1. Look at the map and see if you can find where you live or go to school. Are there any places along the river that you have been before?

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There are many greenways to walk and bike, especially in Macdonald Park.

Kayaks and canoes can be rented at Blessing of the Bay Park or Condon Band Shell.

Run, walk and bike. Experience the expansive—and growing—network of shared-use paths along the Mystic River and its tributaries, lakes and ponds. All of the paths are ADA-accessible and great for anyone on foot or wheels! Macdonald Park in Medford is one of the largest parks along a river in Boston. With more than 3 miles of walking/biking paths, a musical fence, an observation tower and a boat launch, it's a great place to take the family and teach kids how to bicycle.

Play all day. Stroll along the banks of the Mystic, hit one of the many playgrounds with the kids, and then head to shops and restaurants at Assembly Row. Visit the farmers market and enjoy concerts and festivals at the Condon Band Shell near Medford Square (June to October). Head over to Rivergreen Park in Everett where you'll find a picnic area, public boat launch, hockey/basketball courts, playing fields and a playground—all of these riverfront amenities are located just off the Northern Strand Community Trail. Check out some of the great new improvements to Piers Park in Chelsea or hit some of the festivals hosted at Piers Park in East Boston.

Have a picnic at Shannon Beach or Mary O'Malley Park.

Open a can of worms. Visit the public fishing piers at Draw Z Park in Somerville and Mary O'Malley Park in Chelsea. Feel like freshwater fishing? Horn Pond in Woburn is stocked every year. Mystic Lakes, Spy Pond or along the Mystic River are also go-to spots for fishing. Learn how to fish safely at [mysticriver.org/fish-advisory](http://mysticriver.org/fish-advisory).

Experience nature. The parks along the Mystic are filled with plants, animals and birds. Want to know more about what you are seeing? Use iNaturalist or eBird to help ID and learn about all the organisms living here. Hot spots for birding include Belle Isle Marsh Reservation, the Mystic Lakes, Torrey Macdonald Park, Fresh Pond Reservation, Mill Creek and Horn Pond. Want to get into the woods? Hit the trails at the Middlesex Falls Reservation or take a walk in Alewife Reservation to learn about native plants and animals found in this wetland habitat.

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THE MYSTIC RIVER WATERSHED  
[www.MysticRiver.org](http://www.MysticRiver.org)

Funded by A Greater Greater Boston, a program of the Bain Foundation and the Solomon Foundation

WOBURN WINCHESTER MEDFORD SOMERVILLE CHELSEA BOSTON

## Explore the Mystic River

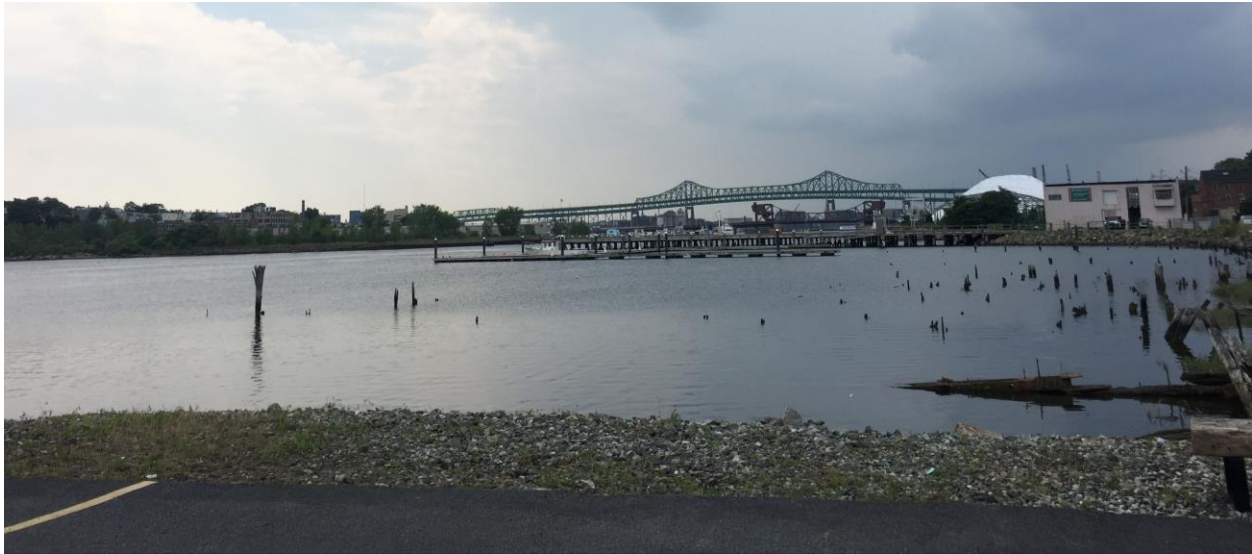
Mystic River Watershed Association

2. Take a close look at the text section called Open a Can of Worms  
What information would you add to let people know about safe fishing?
3. What could you write that tells people what catch and release means?
4. What would you tell people about polluted fish?
5. What places would you suggest people go fishing? Mark them on the map.

*As you create your fish advisory message, notice that there is not much space on the map. Choose your words to give the most information with the fewest words.*

6. Where on the map would you put safe fishing information?

Share your ideas with us! If you think you have a good way to let people know about safe ways to fish, we would love to know. Email [contact@mysticriver.org](mailto:contact@mysticriver.org) with your work!



*Lowest sections of the Mystic River, which had and still have heavy and light industry.*

## Sediment

*Note to educators: This purpose of this activity is to help students to understand the role sediment plays in a riverine ecosystem. More information about sediment here [https://cfpub.epa.gov/npstbx/files/ksmo\\_sediment.pdf](https://cfpub.epa.gov/npstbx/files/ksmo_sediment.pdf)*

### **Sediment – What is it?**

Sediment is the loose sand, clay, other soil particles that settle to the bottom of a body of water. Sediment can come from soil erosion or from the decomposition of plants and animals. Wind, water, stormwater runoff, and ice help carry these particles to rivers, lakes, and streams.

### **Find out more about sediment with this activity**

#### **Materials**

- one 1-liter clear plastic or glass bottle with a cap
- tap water
- Three or four spoonfuls of soil samples gathered in different areas. A variety of soils and/or sand is ideal.
- Paper, old envelope or light weight cardboard to create a funnel





## Procedure

Fill container 2/3 full of tap water

Create a funnel with paper, envelope, or cardboard

Add spoons of soil to the water in the bottle

Put on the cover securely

Shake up the mixture for 30 seconds or more.

Set the bottle on its side and observe. What does the liquid look like? Write down your observations and take a picture (if you can).

Leave the bottle in the same place for 10 minutes (don't pick it up)

What do you notice about the water and soil samples now?  
Write down your observations and take a picture if you can.





What you see on the bottom of the bottle is sediment. If you notice some of the soil, and sand on the bottom of the bottle- you are seeing sediment. Some of the soil particles are floating in this image. Most of the floating material is made up of plant parts.

In most watersheds, sediment can contain toxins like heavy metals, DDT, and PCBs which can be consumed by aquatic animals, making those animals polluted, and absorbed into some plants.

The term **heavy metal** refers to any metallic chemical element that has a relatively high density and is toxic or poisonous at low concentrations. Examples of heavy metals include [mercury](#) (Hg), [cadmium](#) (Cd), [arsenic](#) (As), [chromium](#) (Cr), [thallium](#) (Tl), and [lead](#) (Pb).

Heavy metals are dangerous because they tend to **bioaccumulate**. Bioaccumulation means an increase in the concentration of a chemical in a biological organism over time, compared to the chemical's concentration in the environment. Compounds accumulate in living things any time they are taken up and stored faster than they are broken down (metabolized) or excreted.

### **More Information**

Heavy Metals: <https://www.lenntech.com/processes/heavy/heavy-metals/heavy-metals.htm#ixzz6yoarosIC>

Info about sediment, causes and problems in waterways:  
[https://cfpub.epa.gov/npstbx/files/ksmo\\_sediment.pdf](https://cfpub.epa.gov/npstbx/files/ksmo_sediment.pdf)

Human health risk assessment completed on Malden River in 2019 (looking at sediment):  
<https://mysticriver.org/news/2019/4/10/malden-river-cleared-for-public-boating>



## Words and Terms to Know

### **Aquatic invertebrates**

Small animals without backbones that live in water or the sediment in rivers, lakes, harbors, and other waterbodies

### **Bioaccumulation**

Over time pesticides, heavy metals or other toxins increase in a living organism through exposure to pollution or by eating animals that are polluted with pesticides, heavy metals, or other toxins.

### **Catch and release fishing**

People catch fish only for fun and let the fish back into the river without being hurt.

### **Chemical compound**

A substance formed from two or more elements together.

### **Contamination**

Making something polluted or poisoned

### **Dissolve**

Substances become absorbed by a liquid or disappear into something else. Salt dissolving in water is an example of a substance dissolving into a liquid.

### **DDT**

The chemical compound Dichlorodiphenyltrichloroethane, which is a colorless, tasteless, and almost odorless chemical compound that harms people and wildlife.

### **Food web**

A food web shows through a diagram or drawing what-eats-what in an ecological community. Another name for food web is a food chain.

### **Heavy metals**

Substances found in sediment from natural and man-made sources that are harmful to peoples' health and the environment. Lead, mercury, and arsenic are common heavy metals.

**PCBs**

Also known as polychlorinated biphenyls they are chemical compounds used by people for many things. PCB's are harmful to people and wildlife.

<https://oceanservice.noaa.gov/facts/pcbs.html>

**Pollution**

Pollution is the contamination of water, land, or the air by substances that can harm the environment and human health

[https://oceanservice.noaa.gov/education/tutorial\\_pollution/welcome.html](https://oceanservice.noaa.gov/education/tutorial_pollution/welcome.html)

**Sediment**

Particles or tiny pieces that settle to the bottom of a liquid. Loose sand, clay and other soil that collect on the bottom of a water body.

**Toxic**

poisonous

**Waterbodies**

Oceans, rivers, ponds, streams, lakes are examples of waterbodies. A waterbody is defined by the shape of the land and the ability of land or built infrastructure to contain water.

**Watershed**

A watershed is a network of streams, rivers, and lakes, all draining into one river. Find out more about the Mystic River Watershed

<https://mysticriver.org/faqs>

# Explore the Mystic River



- Birding  
 Boat Launch  
 Boat Rental  
 Fishing  
 Picnic  
 Playground  
 Shopping  
 Sports Fields/Courts  
 Swimming  
 Greenways for walking & biking

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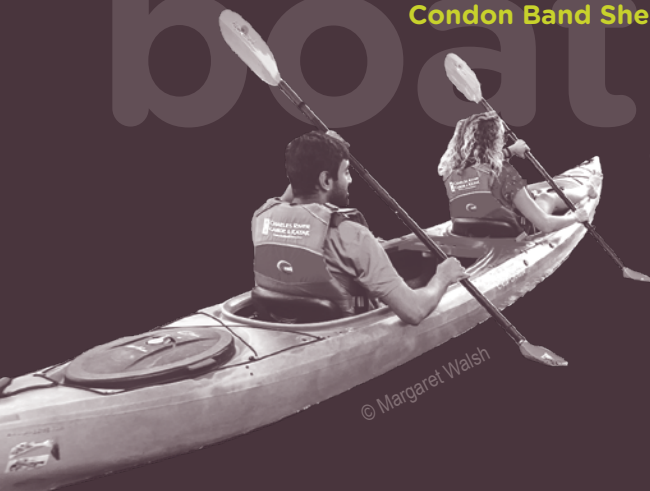
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© Chris McIntosh

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© Margaret Walsh

MyRWA wishes to honor and acknowledge the Wampanoag, the Massachusett, and any other indigenous communities native to this region and its past, present and future.

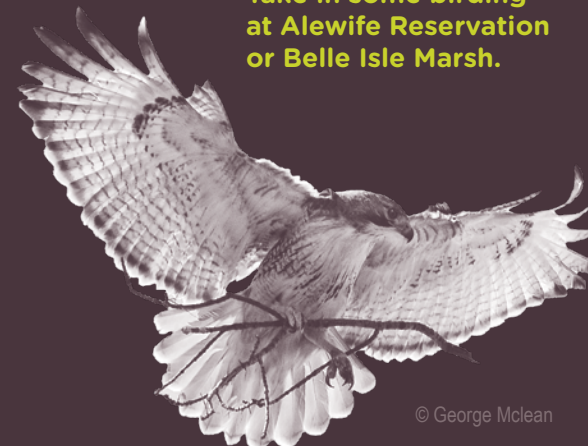
Funded by A Greener Greater Boston, a program of the Barr Foundation and the Solomon Foundation.

THE MYSTIC RIVER WATERSHED

[www.MysticRiver.org](http://www.MysticRiver.org)



Take in some birding at Alewife Reservation or Belle Isle Marsh.



© George Mclean

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## Play all day.

Stroll along the banks of the Mystic, hit one of the many playgrounds with the kids, and then head to shops and restaurants at Assembly Row. Visit the farmers market and enjoy concerts and festivals at the [Condon Band Shell](#) near Medford Square (June to October). Head over to [Rivergreen Park](#) in Everett where you'll find a picnic area, public boat launch, hockey/basketball courts, playing fields and a playground—all of these riverfront amenities are located just off the Northern Strand Community Trail. Check out some of the great new improvements to [Port Park](#) in Chelsea or hit some of the festivals hosted at [Piers Park](#) in East Boston.

Have a picnic at Shannon Beach or Mary O'Malley Park.



© Chris McIntosh

## Cool off with a swim.

A dip in the lake, pool or ocean is just a short walk, bike ride or drive away. Swim at [Shannon Beach](#) on the Upper Mystic Lake, or jump in the pool at [Dilboy](#) or [Alewife](#)—all of which have parking and are accessible by bike. Looking for a coastal beach? Check out nearby [Constitution Beach](#) in East Boston or [Revere Beach](#).

## Learn to sail, rent a boat, or use your own.

Rent a canoe, kayak or paddleboard at one of Paddle Boston's two locations on the Mystic River: [Blessing of the Bay](#) in Somerville or [Condon Band Shell](#) in Medford. [Spy Pond](#) in Arlington also has seasonal rentals. Have your own boat? There are seven public launches along the Malden and Mystic Rivers. Want to feel the wind in your hair? Learn to sail at [Courageous Sailing](#), Charlestown or [Piers Park Sailing Center](#), East Boston.

## Open a can of worms.

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