

## Shared Interests

**OBJECTIVES:** Students will be able to:

- describe at least three human actions that occur on waterfront property and how those actions may protect, enhance, or degrade aquatic environments
- deduce that compromise between different user groups is challenging
- describe how the Public Trust Doctrine protects their interests as anglers.

**METHOD:** Students will read a scenario and take on the roles of characters in the story. Students will develop a land use proposal, using material from previous lessons, and argue the merits of their proposal. Students will attempt to compromise on a decision.

**MATERIALS:**

- 1) Butcher paper, poster board, or a flip chart for students to display the details of their proposal
- 2) Markers
- 3) Optional: a zoning map of your community

**SETTING:** Indoors or outdoors

**DURATION:** Two 45-minute sessions

**VOCABULARY:** Ecotone, land use, land cover, zoning, sustainability

**STANDARDS:**

**Science:** F 8.8, 8.9, 8.10, 12.8; H 8.2, 12.1, 12.2.

**Environmental Education:** B 8.5, 8.10, 8.15, 8.17, 8.18, 12.5, 12.9, 12.12, 12.16, 12.19; D 8.1, 8.8, 12.1, 12.4.

**Social Studies:** A 12.11, 12.12.

**BACKGROUND:** Zoning decisions are often controversial matters, particularly in desirable locations. One way of compromising between residential or business needs and aquatic wildlife is to create a buffer. Many cities, counties, and villages in Wisconsin are adopting shoreland-wetland zoning ordinances that require new shoreline development proposals to include a vegetated buffer between homes and the water. By leaving trees, shrubs, and woody debris in place, waterfront property owners protect their shoreline from erosion, help support clean water and a healthy fishery,

and sustain the natural beauty of the landscape. But this is not a perfect solution. Most people don't want to swim around a mess of fallen logs and weedy plants. Motorboats often have difficulty propelling through submerged plants and can become tangled. Even a buffer can't completely prevent erosion and runoff from groomed lawns and construction projects in progress. The best solution, from an aquatic organism's perspective, would be to have no shoreline development at all. This conflicts with the common human desire for a waterfront home. Humans have yet to come up with a perfect solution or compromise but the Public Trust Doctrine is often called upon to settle disputes.

**OPENING:** Have students read **Shared Interests** and *Water—Good for the Constitution* in their booklets up to the *Salmo Scenario*. Ask: What is meant by the title **Shared Interests**? *Both fish and humans share an interest in the littoral zone.* Have students consider how waterfront property is used in your community. Can they describe any relationships between what they know about fish habitat and the ways that humans are using waterfront property in your community? If you have a zoning map of your town, display it for students to consider.

**MAIN ACTIVITY:** Have students read through the *Salmo Scenario*, then divide them into the following groups: sustainable growth organization, angler club, vacation home realtors, logging company, and Icthy, Inc. Give the students the rest of the class period to come up with their group's position on Icthy and their proposal for how the land should be used. You may choose to have the students consider ways in which their proposal may protect, enhance, or impair aquatic habitat. Have students use the drawing of *Salmo* as a way of presenting their ideas. Outside research is possible, but not necessary.

In the following class period, give students five minutes to present their proposal to the other groups. Have the other stakeholders in the room hold their questions until all groups have presented. Once the presentations are over, allow students to question each other, in character, about the different plans. Allow them to offer each other compromises and encourage them to come up with a plan that all

can agree on. If a compromise can't be reached by the end of class, have the students vote on a plan. Remind them that democracy is challenging!

**CLOSING:** Ask students if they know of any similar real-life land use scenarios. Who were the stakeholders in the decisions surrounding that conflict? How do those situations affect water quality and fisheries? How were they resolved? Who speaks for the environment when decisions are being made? If students cannot come up with any real-life scenarios, have them consider what effects their Salmo decision would have had on the environment.

**ASSESSMENT QUESTION:** Describe the difference between land use and land cover using examples. What is the relationship between the two concepts?

**ANSWERS:** Land cover includes the forests, asphalt, water, or other visible features found on a landscape. Land use encompasses the cultural and economic activities that take place on a landscape, such as agriculture or a subdivision. There is a strong relationship between the two terms. When land use changes, land cover often does as well, and vice versa.

**EXTENSION:**

**Field:** Have the students conduct a survey of the development along a local waterway.

Photos could be used in lieu of the field component if field trips are limited. ● See Appendix G for Shoreline Development Field Record Sheet.

**Post-field activities:** Simulate the function of shoreland buffers with a paint tray watershed model, adapted from *Water Action Volunteer materials* available on-line at [watermonitoring.uwex.edu/pdf/level1/Pubsuburbanrunoffmodel.pdf](http://watermonitoring.uwex.edu/pdf/level1/Pubsuburbanrunoffmodel.pdf).

● If you have downloaded this booklet, please see the appendix that follows for additional materials.

On the ground, shoreline development survey. See Field Trip Data sheet in Appendix G for what a scientist might look for on the shoreline.

Smaller buildings, less pavement, and more natural landscaping like the home on the left protect water quality and shoreline habitat.

## Shared Interests

People love living along the shorelines of lakes and rivers. So do fish. The water's edge is a highly diverse environment where people and aquatic species come into contact and often conflict. Fish and humans share an interest in the shoreline, but humans don't always consider fish needs when making shoreline decisions.

## On Land

Lakes in Wisconsin today have nine times the number of homes on them as they did in the 1960s. In Vilas County, over half of the new homes built are on lakes. People seek out places with views of water when selecting their vacation cabins or, increasingly, their permanent homes. And why not? It's appealing to have fishing and swimming access right out your front door.



### Ecotones

Transition areas where two habitat types meet

### Land cover

The forests, highways, water, parking lots, rocks and other visible features on a landscape

### Land use

The cultural and economic activities that take place on the landscape

## In the Ecotone

**Ecotones** (transition areas where two habitat types meet) contain greater species diversity than either habitat type alone. The aquatic ecotone of the forest contains an abundance of fish species. It is a patchwork of many micro-habitats, each offering a unique set of niches for a variety of organisms.

The near-shore habitat includes woody cover, bank cover and aquatic plants. Tangles of drooping bank plants, fallen logs, and underwater vegetation are habitat for a rich aquatic insect community. Small fish gather to feed on the insects and hide from predators. Zooplankton feed on tiny underwater plants and are consumed by small fish and young predators. Large fish gather to feed on their prey. The vegetated banks of the lake are important, too: plants hold the soil in place, preventing erosion that could clog spawning habitats. They also provide shelter for a lake's many shoreline species, like frogs and birds.

views and want to make sure they can see the water from their homes. Often people also want a sandy beach and a swimming and boating area free of aquatic plants. When waterfront property owners clear their lands of trees, shrubs, fallen logs, and aquatic vegetation, the effects are felt by the animals living nearby. Eighty percent of the plants and animals on Wisconsin's endangered and threatened species list spend all or part of their life cycle within the littoral zone. Clearly, the aquatic ecotone is under pressure from shoreline development.

## Land Use for the Future

Satellite images and air photos help scientists and land use planners monitor changes in land use and land cover over time. Historic plat maps are telling, too as they show ownership and reflect changes when land is sold and subdivided. The **land cover** of a region (the forests, highways, water, parking lots, rocks and other visible features on a landscape) often changes as **land use** (the cultural and economic activities that take place on the landscape) changes.

## Conflict in the Clearing

When humans build their waterfront homes, they change the ecosystem. People value their

For example, when an agricultural field is converted into a subdivision, the change in land use results in new land cover. But such visible

changes are helpful only on a limited scale. A satellite would not be able to see the removal of woody debris and aquatic plants from a lake, a change in land cover that makes a huge difference to a fish. What sort of monitoring method would help scientists understand local, small-scale changes?

Land use decisions at the local level are often regulated by **zoning laws**. City and county governments decide which types of activities (residential, commercial, agricultural, industrial) can take place on a parcel of land. These decisions are based on input from citizens and from environmental assessments. Some cities are moving toward zoning for **sustainability**. These communities are considering the long-term environmental and cultural effects of their land use decisions. They are working to identify ways in which they can enjoy economic growth while

preserving the environment and a sense of place. They are designing compact, walk-able communities of mixed land uses that preserve public space in important habitat areas, like along waterfronts.



Historic plat maps can give clues to how changes in land ownership affect land use, water quality, and fish habitat. Left: Bass Lake area, Washburn County, 1915. Right: Bass Lake area, Washburn Co. 1996.

**Zoning laws**  
City and county government regulations concerning which types of activities (residential, commercial, agricultural, industrial) can take place on a parcel of land

## Water—Good for the Constitution

The Northwest Ordinance of 1787 is the basis for the Public Trust Doctrine guaranteeing all citizens access to all the navigable waters of the state. It was embedded into the Wisconsin State Constitution of 1848 and states:

*“The navigable waters leading into the Mississippi and St. Lawrence, and the carrying places between the same, shall be common highways, and forever free....”*

Where can you fish in Wisconsin? Anywhere you can legally gain access to the water! All navigable water (water you can float a canoe, skiff, or kayak down during any time of the year on a recurring basis) is held in trust (protected) by the State of Wisconsin for all Wisconsin citizens, including anglers.

### Keep your Feet Wet!

As a wading angler, if you keep your feet in navigable waters, you have the right to be there, regardless if it is a stream or a lake! You may exit the water to portage around an obstruction, water too shallow to boat, or water too deep to

wade, but by the shortest route possible. Still, be considerate of riparian landowners when choosing your fishing hole and exercising your water rights.

### A Mark of Distinction

The state holds title to all lakebeds; however riparians own the streambeds to the center of the stream. The ordinary high water mark (OHWM) is the point on the bank or shore where the water leaves a distinct mark and establishes the boundary between a public lakebed and private lands. During low water, exposed lakebeds while still part of the public trust are not open to the public. The DNR’s website describes the OHWM in detail:

[dnr.wi.gov/waterways/factsheets/PublicPrivateOHWM\\_Brochure.pdf](http://dnr.wi.gov/waterways/factsheets/PublicPrivateOHWM_Brochure.pdf)

Water rights have been challenged in the courts through the years, building a body of common law that defines your rights as an angler. Watch the video, *Champions of the Public Trust*, available on the DNR’s website to learn more about this important linkage to our history: [dnr.wi.gov/org/water/wm/dsfm/shore/doctrine](http://dnr.wi.gov/org/water/wm/dsfm/shore/doctrine).

## A Salmo Scenario...Imagine If

Imagine the city of Salmo, in northern Wisconsin. Salmo is a former logging town of 10,000 with an attractive downtown district surrounded by compact neighborhoods and, further out, wooded lots with residences on them.

Salmo has been selected as a possible site for the new headquarters for Icthy, Inc., a rod and reel manufacturer. Icthy would like to relocate to Salmo because of its proximity to Truffa Lake—a known walleye hotspot.

Truffa Lake is a moderately oligotrophic lake, known for its clarity, cool temperatures, and diversity of fish. It is only 10 miles from town.

Three quarters of the lakeshore is surrounded by forest, with a narrow band of coarse sand between the trees and the water. The last quarter is a low-lying wetland that eventually rises to meet the forest.

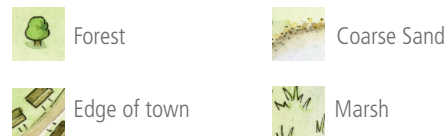
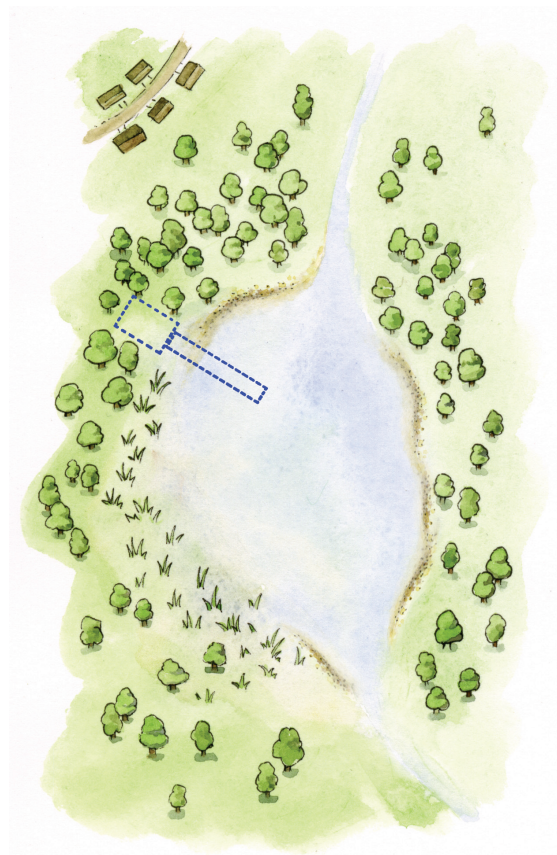
Icthy is hoping to build its headquarters along the shore of Truffa Lake so that customers can test Icthy's products right out the back door. It is important to Icthy that their building be as close to the lake as possible, and they want a large dock attached to the building's back door to make it easy for customers to test their products.

The company's president, Molly Rose Fish, imagines marketing the headquarters as a business center, a shopping place, and a fishing destination. Ms. Fish dreams that one day she will be able to attach a vacation resort to the headquarters.

Many people in the town of Salmo are excited about the possibility of Icthy moving in. Ever since a nearby paper plant closed, Salmo has been struggling to attract new people to the region. Ms. Fish has promised to bring 85 jobs to the region and hopes to provide even more in the future.

In return for Icthy's selection of Salmo, the county is considering re-zoning the lakefront as "commercial" and giving Icthy a great deal on the entire property surrounding Truffa Lake. This land is currently being leased from the county by a lumber company, which has yet to cut near the lake.

The logging lease will come up for renewal in a few months, and the county is holding a meeting to determine what should be done with the land. Four local groups have arrived at the meeting to discuss their concerns about the possible sale to Icthy. Even though these groups understand the importance of attracting Icthy to Salmo, their organization goals conflict with Icthy's business plan. The groups are:



- **Sustaining Salmo**, a sustainable growth organization. Sustaining Salmo promotes the development of downtown businesses where residents can easily walk or bus to work. The group discourages shoreline development, believing that waterfront property should be used for recreation and conservation.
- **Salmo Spinners**, an angling club. Salmo Spinners works to preserve and restore fish habitat and angling accessibility.
- **Lakeland**, a vacation home real estate group. Lakeland sells vacation homes to people seeking cabins in remote, unspoiled landscapes. Most of their sales are on waterfront property.
- **Truffa Lumber**, the logging company. Truffa Lumber seeks to responsibly and selectively log county land. The company prefers to work on land that is not visible to the public, because people often complain about logging practices.



## A Salmo Scenario...Imagine If

Each group has a reason for not wanting Icthy to gain control of the entire lakefront property. Each also has reason to believe that their own proposed uses of the land would serve the community better, while still protecting the landscape and enticing Icthy.

Think back to what you have learned about fish habitat, water pollution, and the aquatic-forest ecotone, as well as your organization's goals, to determine the reasoning behind your group's opposition to the sale. Develop a proposal for an alternate solution to getting Icthy to come to Salmo while also including your own interests. Be sure to anticipate the arguments Icthy will use against you in advocating for ownership of the entire lake. Is compromise possible?

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