

Salamander Pond

Adapted from Project WILD

Grade: 5-8

Duration: One to Three 45-60 minute sessions

Objective: Students will (1) evaluate the different kinds of land use on wetland and vernal pool habitats, and (2) discuss and evaluate lifestyle changes to minimize damaging effects on wetlands and vernal pools.

Key Terms: Land-use planning, wetlands, vernal pools, trade-offs, lifestyles.

Method: Students create a collage of human land-use activities around an image of a pond.

Materials: For each team, scissors, masking tape, paper, two sets of Land-use Patterns, one map of Salamander Pond, a large piece of paper (18x24).

Background: (Student PRE-Reading)

Since the earliest times, humans have deliberately planned the arrangement of housing in regular, rectangular patterns and the prominent locations of civic and religious buildings along main thoroughfares, and waterways. These patterns have not only given structure to American cities, but have also affected wildlife habitats and populations. Sometimes people perceive undeveloped areas of the natural environment as raw material for human use, while others believe the natural environment is to be preserved without regard for human needs. Still others yearn for a balance between economic growth and a healthy natural environment.

Growth is at the core of land use issues. Growth in natural systems has inherent limits that are imposed by the balance of energy among all parts of the system. Energy in natural systems is transferred into food, water shelter, space and continues survival. The viability of natural systems is expressed by the ability to be self regulating. This capacity of self regulation of all the life and plant forms of an ecosystem is equally important. The microbes in the soil are just as necessary to the habitat as the plants and predators. It is this natural dynamic balance, with all its inherent and essential parts, that much of human land use has tended to disturb. Growth in human activities can often go beyond the natural limits of the setting. Humans have the ability to import energy sources and other resources that allow a system to exceed its natural limits or to remove energy sources that are necessary for the system to stay in balance.

Vernal pools, for example, can be perceived by some humans as swamp land that does not have any value. Yet biologists see vernal pools and wetlands as a nursery for hundreds of forms of wildlife. Salamanders, toads, frogs, migrating birds, snakes, turtles, insects, and a remarkable variety of plant life all inhabit vernal pools. Vernal pools and wetlands are highly vulnerable to development, pollution, and a variety of forms of human interference with the natural flow of water. Hundreds of thousands of acres of valuable wetlands and their functions are lost each year in the United States- for example, to draining, dredging, filling and pollution. In Ohio 90% of all wetlands including vernal pools have been lost.

Vernal pools and wetlands provide many valuable benefits to humans which are often overlooked during land use planning processes. Wetland areas reduce flooding from strong or prolonged storm events by slowly releasing water into streams and rivers. They act as natural filters allowing contaminants to settle or be filtered out during the slow release process. Wetlands and vernal pools are ground water recharge stations. The extended time water remains in these areas allow water to slowly percolate down into underground aquifers. Wetlands and vernal pools can provide fantastic recreational opportunities right in our own communities.

(Teachers) – Students will struggle with the arrangement of overlapping and conflicting land uses in an effort to preserve a wetland habitat. When the students reach some kind of agreement about the local issues, the activity shifts to what they have done affects other “salamander ponds.” The activity ends with the idea that the planet is, in fact, a single “Salamander Pond”

Procedure:

1. Begin by having the students do the pre-reading.
2. Explain to the students that they will be using Salamander Pond as a microcosm of the environmental concerns involved in making land use planning decisions.
3. Divide the class into teams of three to five, with each group representing one of the interest groups described below. Students will stay in these groups until the end of the activity. Possible interest groups are:
 - Residents- want to live in the area.
 - Farmers- want to use the land to raise food and livestock.
 - Conservationists- want to maintain the land as wildlife habitat.
 - Business interests- want to use the land for commerce and economic growth.
 - Gas station owner- wants to make a living servicing and repairing cars.
 - Parks and recreation department personnel- want people to have a place for recreation.
 - Highway department personnel- want to maintain access in the area.
 - Factory representative- want to preserve jobs and commerce.

- School student- want to have a place to study and explore science.
- (Note: add other interest groups that may be locally important)

4. Distribute the 18 x 24 pieces of paper that will serve as the base map for each team's pond and its associated land-use activities. Have the students cut out the land- use Patterns and Map of Salamander Pond. All the land use patterns must be used. Patterns may be cut to smaller sizes and may touch, but may not overlap. The students may include additional land-use patterns; Suggest to the students that they may not want to adhere the land-use patterns to the base map until the team is in agreement.
5. When the students are ready to begin the process of making land use decisions, have them make a list of pros and cons for each land use. Guide the class discussion so that they consider the consequences of each land use. Record these lists on the chalk board. The following are only a few of the many possible examples.

Farms:

Pro

- Produce food
- Add economic value
- Provide jobs through seasonal employment

Con

- Use pesticides (herbicides, insecticides) that may damage people and the environment
- Become source of natural soil erosion.
- Sometimes drain wetlands for farm land.
- May be a source of animal manure.

Business

Pro

- Provide employment
- Provide commerce
- Create economic stability

Con

- Produce waste and sewage.
- May contaminate water (detergents, pesticides)
- Use chemical fertilizers.

Homes

Pro

- Provide shelter

- Provide a sense of community.
- Con
- Generate waste and sewage
 - Use water
 - Contribute to loss of wildlife habitat

6. Have the students work in teams for 30 to 45 minutes.

Land use patterns

Grocery	Gas Station	Dry Cleaner	Restaurant
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Farm Animal Feed Lot	House	House	House
	House	House	House

Farm Cornfield

Factory

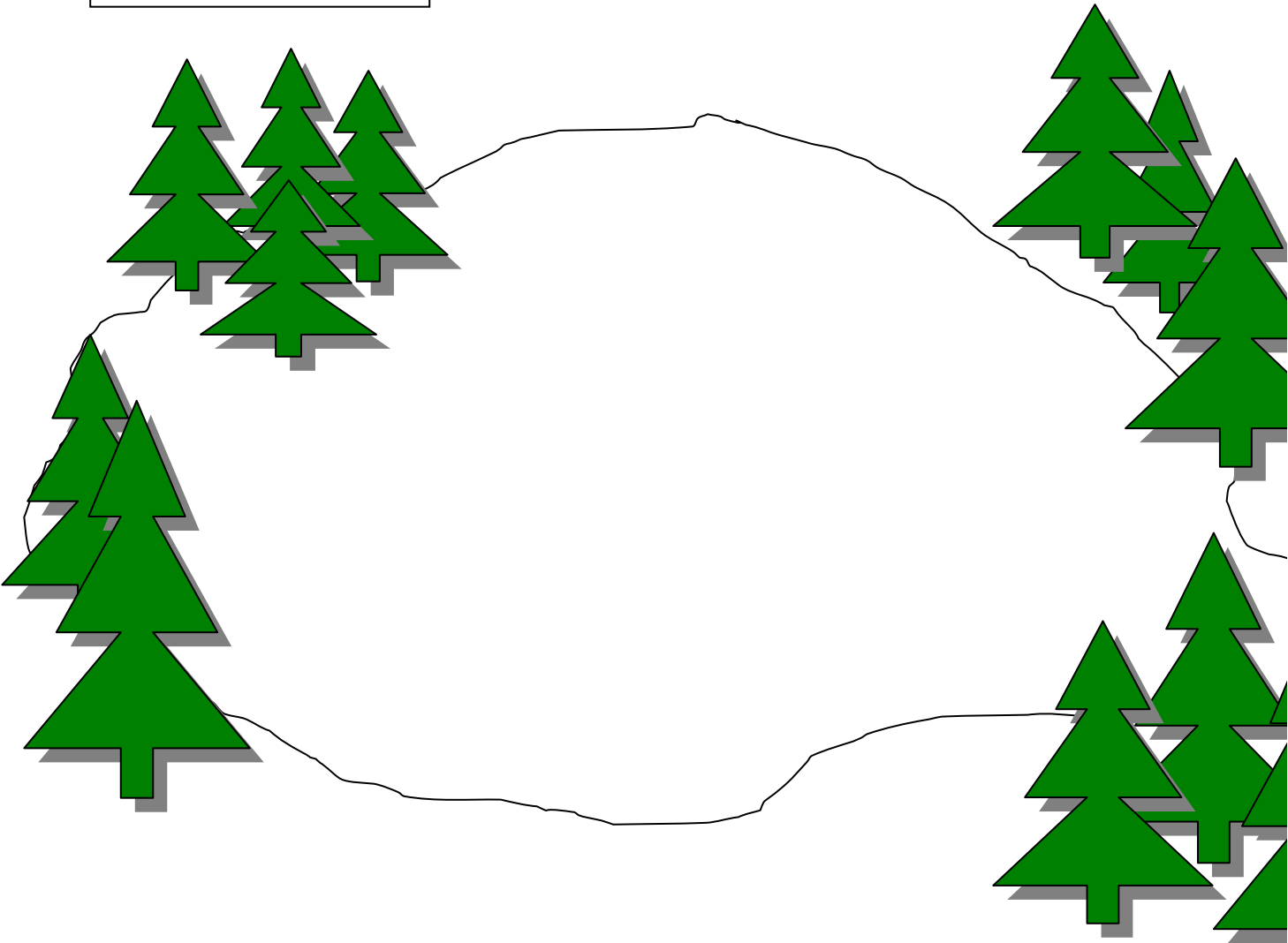
Fire House

Condominium

Park

Grocery

School



Evaluation:

Identify three actions that people can take to preserve wetlands and vernal pools.

State standards alignment

Activity Guide	Activity Title	Grade Level Band	Grade Level	Content Standard	Benchmark	Organizer	Grade Level Indicator	Details
WILD-Aquatic	Dragonfly Pond	6-8	7	Earth and Space Sciences (ES)	C	Earth Systems	2	Click here
WILD-Aquatic	Dragonfly Pond	6-8	7	Life Sciences (L)	C	Diversity and Interdependence of Life	2	Click here
WILD-Aquatic	Dragonfly Pond	6-8	7	Life Sciences (L)	C	Diversity and Interdependence of Life	3	Click here
WILD-Aquatic	Dragonfly Pond	6-8	6	Life Sciences (L)	C	Diversity and Interdependence of Life	8	Click here
WILD-Aquatic	Dragonfly Pond	6-8	7	Life Sciences (L)	D	Diversity and Interdependence of Life	4	Click here
WILD-Aquatic	Dragonfly Pond	6-8	6	Science and Technology (ST)	A	Understanding Technology	1	Click here
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WILD-Aquatic	Dragonfly Pond	6-8	6	Science and Technology (ST)	A	Understanding Technology	2	Click here
WILD-Aquatic	Dragonfly Pond	6-8	7	Science and Technology (ST)	A	Understanding Technology	2	Click here
WILD-Aquatic	Dragonfly Pond	6-8	8	Science and Technology (ST)	A	Understanding Technology	2	Click here

WILD-Aquatic	Dragonfly Pond	6-8	6	Scientific Inquiry (SI)	A	Doing Scientific Inquiry	1	Click here
WILD-Aquatic	Dragonfly Pond	6-8	7	Scientific Inquiry (SI)	A	Doing Scientific Inquiry	3	Click here
WILD-Aquatic	Dragonfly Pond	6-8	7	Scientific Inquiry (SI)	B	Doing Scientific Inquiry	5	Click here
Activity Guide	Activity Title	Grade Level Band	Grade Level	Content Standard	Benchmark	Organizer	Grade Level Indicator	Details
WILD-Aquatic	Dragonfly Pond	6-8	8	Scientific Inquiry (SI)	B	Doing Scientific Inquiry	3	Click here
WILD-Aquatic	Dragonfly Pond	6-8	6	Scientific Ways of Knowing (SWOK)	A	Ethical Practices	2	Click here
WILD-Aquatic	Dragonfly Pond	6-8	8	Scientific Ways of Knowing (SWOK)	A	Ethical Practices	1	Click here
WILD-Aquatic	Dragonfly Pond	6-8	7	Scientific Ways of Knowing (SWOK)	B	Ethical Practices	2	Click here
WILD-Aquatic	Dragonfly Pond	6-8	8	Scientific Ways of Knowing (SWOK)	B	Ethical Practices	2	Click here
WILD-Aquatic	Dragonfly Pond	6-8	6	Scientific Ways of Knowing (SWOK)	C	Science and Society	3	Click here
Activity Guide	Activity Title	Grade Level Band	Grade Level	Content Standard	Benchmark	Organizer	Grade Level Indicator	Details
WILD-Aquatic	Dragonfly Pond	6-8	6	Scientific Ways of Knowing (SWOK)	C	Science and Society	4	Click here
WILD-Aquatic	Dragonfly Pond	6-8	7	Scientific Ways of Knowing (SWOK)	C	Science and Society	3	Click here