



Aquaculture Council's Own

The Aquaculture Award was created through a partnership between The White Sulphur Springs National Fish Hatchery (WSSNFH), The Sunderland Fisheries Resource Office (SFRO), United States Fish & Wildlife Services (USFWS) and Girl Scouts of Black Diamond Council (GSBDC) by Julie Boyles and Catherine Gatenby, WSSNFH, USFWS, Jan Rowan, SFHRO, USFWS, and Kim Beach-Shaffer, GSBDC.

To earn the Aquaculture Award, Brownie Girl Scouts need to complete at least 4 activities; Junior Girl Scouts need to complete 6 activities; and girls 11—17 need to complete a total of 7 activities with 2 activities from skill builder section, 1 from technology, 1 service project activity, 1 career exploration activity and 2 additional activities from any category. Keep a journal and describe what you learn as you gain knowledge while completing the requirements.



Skill Builders

1. **Fishy Business:** Find out what it takes to raise fish at home. Research different aquaria styles and sizes, types of fish, (i.e. salt versus fresh, different species of fresh or salt, fish food, etc.). Try your hand at setting up and maintaining an aquarium of your own for at least 3 months. Record in a journal of the changes you may see. Include what, how often, and how much you feed your fish. Also record the maintenance of your aquarium.



2. **Backyard Fishing:** Research and collect information on backyard fishponds. Work with an adult and design and build a fishpond for your backyard. What is the difference between an ornamental fishpond and a fishing pond? Find out what kind of fish can live outside in a pond. Learn how to keep the fishpond clean and healthy. Record in a journal any changes you may see. Include feedings (what, how often, how much) and the maintenance of your pond for three months.

3. **Fishing for Fun:** Find out how and what it takes to catch fish. Try your hand at fishing. Practice Catch and Release or harvest and cook the catch. Try fishing with at least three different types of bait. Identify your catch. Before you go fishing, find out the answers to these questions:

- What equipment (i.e. rods, lures, bait, etc.) is needed?
- Where is the best place to fish where you live? Do you need a license to fish?
- Are there human health advisories for eating the fish you catch?
- Are there any skills needed to catch fish?
- What is a Put and Take Fishery? What is a Catch and Release Fishery? (Hint: Ask your local game warden with your natural resources agency.)



4. **Swim with the Fishes:** Learn to use a mask and snorkel with adult supervision. Put your new skills to use at a stream, lake, or other natural body of water. Take inventory of the number, size and types of fish you observe. How are the fish behaving? How do they respond to your presence? What other aquatic creatures do you observe in the water? Record your findings in a journal and share them with your troop or family and friends.



Technology & Knowledge

1. **Visit a Fish Hatchery:** Find out what it takes to raise fish in a hatchery. Learn the life cycle of fish in a hatchery and find out what they eat. Where do the fish come from and where do they go? How do you keep fish healthy in a hatchery? Why are fish produced in a fish hatchery?



2. **Visit a zoo or an aquarium:** Find out what fish are raised in a zoo. Learn about the life cycle of fish in a zoo and what they eat. Where do the fish come from and where do they go? How do you keep fish healthy in a zoo? Why are fish produced in a zoo?

3. **Fish for Dinner?:** Visit your local grocery store seafood section or a local fish market. Notice the different sizes and shapes of the fish and shellfish. Compare the prices of fish. In your journal, note which fish/shellfish are more expensive and why? Ask the salesperson where the fish/shellfish came from; were they raised in a hatchery, were they caught in the wild by fisherman or were they imported from a different country. With your troop or family, purchase two types of fish/shellfish and with adult supervision prepare and cook your purchases. Compare their tastes.

Technology & Knowledge (Cont.)

4. **Imported Fish:** Find out what fish/shellfish are being imported or exported to or from our country. Choose one country and discover what types of aquaculture programs they have. Share this information with your troop. Does an imported fish cost more than a locally caught or hatchery-reared fish or shellfish?

5. **Where Does the Rain**

Go?: Find out how the rain that falls on your house gets to the ocean.

- Where does the water in your yard or street go when it rains?
- Where does the water in the storm drains go?
- Where does the water in streams go?



Look at a map and find out how the water from the stream gets to a river. Find out what other streams flow into the river. Every stream that flows into the river is part of your watershed.

What is happening on the land near the stream? Is the land forested, wooded, farmland, suburban or urban? Are there roads nearby and are they paved? What could be polluting the stream (i.e. oil from roads, manure or chemicals from farms, chemicals from factories)? Are there trees, grass, or bushes near the stream that can catch or filter out some of the pollution?

Now that you have discovered your watershed, build a three dimensional map of your watershed. Include sources of pollution and places where trees, bushes, or grass slow down or stop the pollution from running into the stream. Share your model with your troop or class at school.

6. **Explore Aquatic Habitats:** While visiting a stream or lake, measure the water quality. What are the water and air temperatures? What color is the water? Is it clear or cloudy? What does the water smell like? Measure the oxygen, pH, and ammonia levels using a kit or ask an aquatic biologist for help.

What does the aquatic habitat look like? What is a habitat? What is on the stream/lake bottom (i.e. stones, flat, rocks, sand, etc.) What is above the stream/lake? Are leaves falling into the stream/lake? What is on the banks and land next to the stream/lake? This is called a riparian zone with respect to streams. How wide is the riparian zone? You can measure the riparian zone by walking or counting the number of paces from the shore and going perpendicular to



the flow of water across the land. Are there any dams in the stream? If so, do the dams have fish passageways? What is a fish passage way?

Measure the flow of your stream. Ask an aquatic biologist to help you measure the flow rate or look up the flow rate for your stream on the internet at the U.S. Geological Survey web site. You can also measure the flow of the stream by throwing a twig in the water and measure the amount of time it takes a twig to float 1 meter or 3 feet. For example, flow rate is often measured in feet (meters) per second or feet per minute.

Do you think the stream or lake has a good habitat for animals? Is there food and plenty of places to hide? Is the water clean?

7. **Discover Aquatic Endangered Species:**

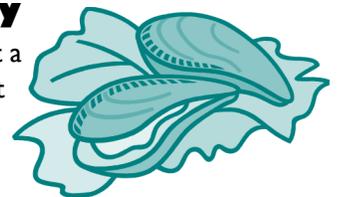
Become an expert on the biology and ecology of an endangered or threatened animal that lives in fresh water habitats. Look online at the U.S. Fish and Wildlife Service web site at www.fws.gov to learn about the species that you have chosen or ask someone at a natural resources office to help you learn about the species. Ask the following questions:

- Is the animal you chose a fish, insect, freshwater mussel, or something else?
- Why is the animal or species that you chose considered endangered?
- What is being done to help that animal?
- Is it being raised in a hatchery?
- Are the streams or rivers that it calls home being cleaned up or improved?

8. **Discover Pearly the Mussel!**

Visit a library or use the internet to find out about freshwater mussels. Answer the following questions:

- What type of animals are freshwater mussels?
- How many species of freshwater mussels are there in North America? How do freshwater mussels help water quality?
- What eats freshwater mussels?
- Why are there so many freshwater mussels that are considered endangered or threatened species in the U.S.? Are there any near you?
- What is being done to help freshwater mussels?
- What is the life cycle of freshwater mussels? Draw a picture or poster describing it.
- Go to a stream that has freshwater mussels. Look for shells along the shore of the stream or river. If the stream is shallow enough, look for live mussels. How do they look when you find them? Are they buried in the stream bottom or sitting on top? Are they moving?

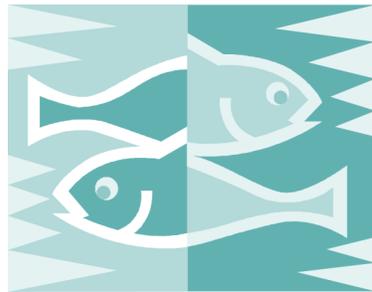




Service Projects

1. **Let's Go Fishing:** In partnership with a state, local, or federal agency, volunteer at a local fish hatchery to host a fishing event for children or people with special needs in your community. Or you could also help stock the fish from the hatchery, conduct tours for the public, help plan a special event for the public, help collect data, or help feed and care for fish. Or design new educational materials such as a new poster, or interpretive signs for the hatchery grounds and buildings.
2. **Conduct a Survey of Aquatic Life:** Contact the Izaak Walton League to get information about the SAVE OUR STREAMS program or work with an aquatic biologist to get ID keys (guide books describing how to identify animals, plants, etc.) for aquatic insects and other animals that you might find in your stream. Find out about equipment needed to conduct a stream survey. Collect and inventory the creatures in your stream. Based on what you observe, determine if the stream is polluted? Is the type of stream life you found unexpected—altered by land use, dams, etc.? What threats exist to aquatic life in your stream? With help from a state or federal natural resources office, organize or participate in a stream clean-up in your community.
3. **Help Aquatic Endangered Animals:** Contact a natural resource office to find out what you can do to help aquatic animals. For example, help plant trees along a stream bank or help put up signs informing the public about a threatened or endangered species. Make sure to have permission from the land owner.

Help spread the word about why aquatic animals are threatened or endangered. Explain what can be done to help. Make a poster and hang it in your local library or community center. Or give a presentation to your troop, school or other community group about aquatic endangered species. Or you could set up a booth with pictures, posters, and other information in the library to tell others about aquatic endangered species.
4. **Spread the Word About Pollution:** Get permission from your town to stencil storm drain covers with fish to remind people where waste water is going and what impact it has on aquatic animals. Increase community awareness and stewardship for the waterways by asking the community to help with the project. Ask a natural resource office if they have a stencil, or create your own.



Career Exploration

1. **Fish Hatchery, Aquarium or Zoo:** Find out what types of professionals are needed at a fish hatchery, zoo, or aquarium and why? Check with your local, state and federal agencies to find the answer.
2. **Education Needed:** What type of education is needed to be a professional in aquatic sciences? Interview or invite professionals from the fisheries or an aquatic biologist to speak to your troop. Ask them what the most important issues and challenges are to aquatic animals. What are their responsibilities at work? Find out what they studied in school to become a fisheries or aquatic biologist. Learn about the kinds of jobs that are available working with fish, conservation of aquatic animals or improving water quality. What is the different between local, state, and federal natural resource agencies? Other than natural resource agencies, what organizations employ people to do this type of work?
3. **Fish Farm:** Find out what it takes to raise fish to sell. Visit a fish farm where the owner sells fish/shellfish and find out where the fish are sold. What species are raised on the fish farm? Why does the fish farmer raise this species?

What would it take for you to start a fish farm? Look at how much land is needed, the tools necessary and how much it would cost. How would you dig the ponds or build the raceways. What type of fish could you raise?
4. **Pearl Culture:** Find out about pearl culture. Go to the library or search the internet for answers to the following questions:
 - What animals make pearls?
 - What causes these animals to make pearls?
 - What part of the world do most pearls come from?
 - Do the animals that make pearls live in saltwater or freshwater?
 - How are pearls cultured?Visit a jewelry shop and ask questions about the pearls you see. Are the pearls cultured or natural? Which colors are more valuable? Find out about jobs available in culturing pearls and in the pearl trade and jewelry industry.
5. **Underwater Diving:** Discover underwater diving by finding out what SCUBA diving is and how it is done. What jobs are available for scuba divers? What gear is needed to scuba dive? Take a class to learn how to scuba dive.

