

Lamprey River

Junior Ranger Study Guide and Activity Book



A Family-Centered Way to Learn about and
Help Protect your River

Created by the Lamprey River Advisory Committee



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Introduction

The Lamprey River is a really special place. The State of New Hampshire recognizes that the river and its five tributaries (the Lamprey rivers) are worthy of extra protection. The Lamprey rivers flow through fourteen towns. Each town has representatives that serve on the Lamprey Rivers Advisory Committee and help to guide the river into a bright future.

The lower Lamprey River, as it flows through the towns of Epping, Lee, Durham, and Newmarket, has also been recognized by the US Congress and the National Park Service as a river of national significance. This section of the river is one of only 209 rivers in all of the United States and Puerto Rico that is in the National Wild and Scenic Rivers System.

Almost all rivers have beauty and are enjoyed in some way by the people who live near them. The Lamprey is no different; however, compared to most other rivers, the Lamprey has “outstandingly remarkable” wildlife, archaeology, and anadromous fish. (Anadromous fish start as eggs in fresh water and live as adults in salt water.)

At important parks and historic sites, rangers help visitors appreciate and protect the resources of the site. The Lamprey River is not a state park or national park; it does not have paid rangers to work with the public. That’s where Junior Rangers can help. They can learn about the river and share what they know with others. When people know about their river and share their love of the river, the Lamprey will continue to be outstandingly remarkable well into the future.

The Junior Rangers program is for children and families who want to accept the challenge and fun of learning about the river and then share what they learn with others. To earn a badge, a Junior Ranger must do at least two activities listed under each of the following sections and have an adult sign off:

section	activity numbers completed	adult signature
Where Is the Lamprey River?		
The Good, Old Lamprey River: History		
Wildlife Loves the River, Naturally		
Rest and Recreation along the Lamprey River		
Current Issues		

To receive your Junior Ranger patch, please contact info@lampreyriver.org or send a note to Lamprey River Advisory Committee, c/o 88 Hedding Road, Epping, NH 03042. The committee would love to have a copy of any posters or other materials created by the Junior Rangers for the website and display boards!

Getting Started: Where Is the Lamprey River?

Five rivers flow into Great Bay: the Bellamy River, the Oyster River, the Lamprey River, the Exeter/Squamscott River, and the Winnicut River. Water that starts in these rivers goes into Great Bay and then to the Atlantic Ocean. The Lamprey River contributes the greatest amount of fresh water to Great Bay.

Activity 1: Look at Map #1 in the back. Find the Atlantic Ocean. Find Great Bay. Can you find where the rivers might flow into Great Bay? Can you find the Lamprey River? What town on the map is closest to the Lamprey River?

The water in the Lamprey River had to start somewhere else, too. Some rain or snow falls directly into the river. Some water flows into the Lamprey from smaller rivers and streams. These are called tributaries. The Lamprey has five major tributaries: Little River, North River, North Branch River, Pawtuckaway River, and Piscassic River.

Activity 2: Look at Map #2 in the back. Find the Lamprey River and then see if you can find the main tributaries on the map. Do they look like tree branches along the Lamprey?

The biggest source of water to the Lamprey River ultimately comes from an unlikely source: the ground. If you look at Map #2 in the back, you will see a few squiggly lines that mark where the rivers and lakes are; however, most of the map represents dry area. Rain and snow from the sky land in the river, but most of the rain falls onto the ground. On natural land, such as a forest, field, marsh, or swamp, the rain soaks into the ground. The groundwater travels slowly under and through the soil until it reaches a stream or pond. Through the process of traveling through natural soils, the water that reaches a stream is usually very clean.

The area of land that surrounds a stream, river, lake, or bay is called its watershed. Whenever rain falls on that area, the water will drain to the lowest point. This is similar to a shower stall. The whole shower stall floor is like a watershed and the lowest point is the drain. In a real watershed, the water collects in streams and ponds; it doesn't just go down the drain.

Activity 3: Look at Map #2 in the back. Note that the watershed of the Lamprey River is colored green. Rain or snow that falls anywhere in the green area drains to one of the tributaries or to the Lamprey River itself. How many towns are in the Lamprey River watershed? With a crayon or marker, darken the boundary to your town. Is your town entirely within the Lamprey River watershed or is it also in the watershed of another river? Do town boundaries match watershed boundaries? Do you think water stops flowing because of town boundaries?

Fun Facts:

- The Lamprey River is about 49 miles long. If the river were straightened, it would be slightly longer than the whole state of Rhode Island, which is 48 miles long.
- The Lamprey River watershed area is 214 square miles. That is about 3 times bigger than Lake Winnepesaukee.

The Good, Old Lamprey River: History



Mill at Wiswall Dam

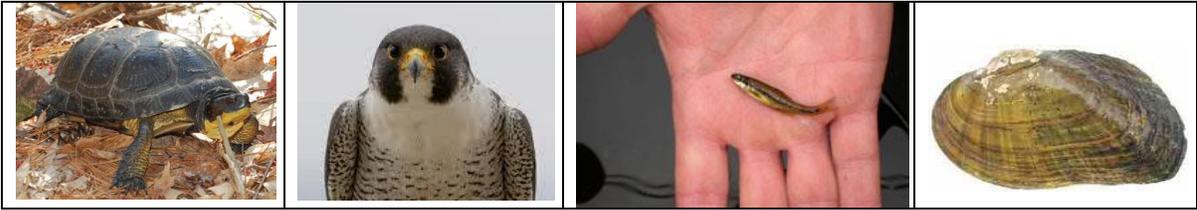
People have used the Lamprey River for a very long time. The Lamprey's history is literally a national treasure. Fortunately for you, you can see much of the history on video. Go to www.lampreyriver.org and click on the videos tab. River Story: The Lamprey River Through Time is divided into three sections that total 20 minutes. You can watch it alone, but it will be more fun if you watch it with an adult.

Activity 1: Of all the historic periods or activities shown on the video, which is the one that you would most like to experience if you could go back in time? Pretend that you are actually there. What do you hear? What do you smell? What are other people doing? Are you doing hard work, playing, or relaxing? Ask a parent or grandparent to choose a time in the past to revisit. Why did he or she choose that experience?

Activity 2: People sometimes have ideas that the past was better than today; they like to talk about "the good old days." In reality, some things from the past were really nice, but some were really difficult. Some things today are really nice, but others can give you a headache or make you angry. Find an older relative or neighbor and talk about this. What was life like before the internet, cell phones, and satellite TV? What was the environment like before the Clean Water Act and the Clean Air Act? Where did people work and how did they get there? What did people do for fun? Make a list of 5 things that are better today and 5 things that were probably better in the old days.

Activity 3: Visit Mary Blair Park in Epping, Wadleigh Falls in Lee, Wiswall Falls in Durham, or the old mills in Newmarket. Look at the informational kiosk if you find one. Based on the old pictures, try to imagine the mills running at full power and workers doing their jobs. What signs of past human activity can you see?

Wildlife Loves the River, Naturally



As you probably know already, the Lamprey River is surrounded by beautiful forests and fields. In certain places, the river slows down, gets wider, and forms wetlands. The forests, fields, wetlands, and the river itself are perfect places for many different kinds of animals. The following animals are very rare in New Hampshire, but they can be found along or in the Lamprey:

Blanding's turtles, spotted turtles, wood turtles, bald eagles, peregrine falcons, pied-billed grebes, sedge wrens, timber rattlesnakes, banded sunfish, bridle shiners, redbfin pickerels, and brook floater mussels

The Lamprey River also provides the right conditions for anadromous fish, such as river herring, that lay their eggs in fresh water but live most of their lives in salt water.

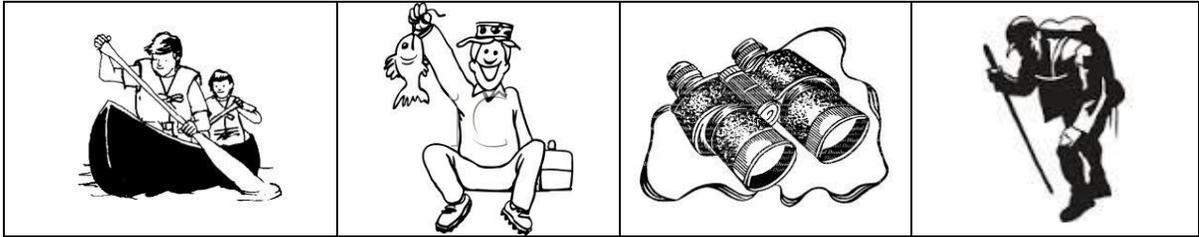
The nature in and around the Lamprey River is impressive. It is so impressive, in fact, that the US Congress officially named the Lamprey as a Wild and Scenic River. Only a few rivers in the United States hold that title.

Activity 1: Do some research on one of the rare animals listed above. Create a small poster that includes a picture or drawing of the animal. Write a paragraph or two about the animal: where it lives, how long it lives, how much space it needs, some interesting facts. What can people do to make sure the animal continues to live in or along the Lamprey?

Activity 2: Ask an adult to join you for a visit to the river. How many different kinds of trees can you find? How many different bird calls can you hear? Can you find any signs of animals, such as shells, foot prints, or tunnels? Look into the water. Can you see any fish, bugs, or mussels?

Activity 3: Do some research on "fish ladders." Why do people build fish ladders? Visit the fish ladder at Wiswall Falls in Durham or the fish ladder in downtown Newmarket. How does a fish ladder work? What time of year do fish use the fish ladder?

Rest and Recreation along the Lamprey River



The ways that people have used the river have changed over time. The native peoples relied on the river to meet their survival needs: fishing, hunting, providing raw materials such as clay and wood, and moving their families and supplies in canoes. As European settlers arrived, they dammed the river and used the water to power their mills and to transport products for trade. As work shifted from farming to industry in the mid to late 1800s, many people moved to cities. Recreation along the river became very popular as city dwellers realized that they missed nature. They came to the river to fish, hike, camp, go boating, swim, and relax. People continue those activities today, in addition to bird watching, taking photographs, creating art, and volunteering to study or protect the Lamprey. Whatever activity that you do, please remember to be safe and keep the land and river as clean as you found them.

Activity 1: Go to www.lampreyriver.org and click on the homepage box that says “Don’t miss... Maps and Guides.” Look through the map and guide and choose a place to visit. What activities are offered there? Is history a part of the site? Invite an adult and a friend to visit the site and do some exploring. What do you think of the site?

Activity 2: Recreation on the Lamprey should always be respectful of nature and done with safety in mind. If you go canoeing or kayaking, what safety rules should you follow and what equipment should you always have with you? If you like to hike and explore the land, what poisonous plants might you encounter and what do they look like? What should you do if you accidentally startle an animal and it doesn’t run away? Pick one of these questions and make a poster that explains how to be safe.

Activity 3: Think about your favorite activity that you have done along the Lamprey. Why do you like it? Did you do it only once or do you do it often? What story about the Lamprey do you think you’ll always remember and want to share with children when you grow up?

Current Issues

1. Too many nutrients: A lot of water that flows into Great Bay comes from the Lamprey River. Both Great Bay and the salt water section of the Lamprey are experiencing some problems. One of the problems is that people's activities and use of the land sometimes adds fertilizer to the water. Too much fertilizer causes too much algae to grow. Too much algae causes the water to look cloudy and it also can result in not enough oxygen for fish and other animals.

Fertilizer, also known scientifically as nitrogen or phosphorus, enters the river from many sources: septic systems, lawn fertilizer, eroded soil, sewage treatment facilities, farm animals and pets, and air pollution particles that fall to earth.

Activity 1: Does your home have a septic system or are you on the town sewer? If you are on the town sewer, ask some relatives if they have a septic system. Go to <https://www.youtube.com/watch?v=HQJXEog1VXk> or <https://www.epa.gov/septic> for some septic system basics. Ask an adult to help find where your septic system is located. How old is it? How often is it pumped out and when was it pumped out most recently? Name three steps that help to keep a septic system working well.

2. Too much water: The weather is changing. Compared to even a few years ago, New Hampshire is getting rain storms that are bigger and happen more often. The land has also changed. Forests have been cleared to build houses, roads, big box stores, and parking lots. When heavy rain falls, lots of water must go somewhere.

Activity 2: The next time it rains, go outside and watch what happens. Where do puddles form first? Where does the rain that falls on your driveway or on the street go? Is that run-off water clean looking? What has it picked up? What happens when heavy rain falls on the lawn? Go to a wooded area or a well-established garden. What happens to the rain that falls there? Which area seems to be the best place for rain to fall: pavement, lawn, or the woods? If people want to reduce run-off or the chance of a flood, which area should they try to increase? Why?

3. Too little water: The water in the Lamprey River is generally pretty clean. The Town of Durham and the University of New Hampshire take water from the Lamprey, treat it, and use it as public water. Other towns and businesses along the river have big wells to collect groundwater. Many houses near the river also take groundwater. Taking large amounts of water directly from or near the river can leave the river with not enough water for fish and other animals.

Activity 3: How can you reduce the amount of water that you use and help the fish? Start at home:

- Only let the water run when you are actually using it. For example, keep the faucet turned off while you brush your teeth and only run the water when you spit out the toothpaste and rinse your toothbrush.
- Keep a bottle of water in the refrigerator instead of letting the faucet run.
- Use the clothes washer and dish washer only when they are full. Don't do half loads.

Conclusion

If you have paid attention, completed your tasks, and had some fun, you are ready to be a Junior Ranger for the Lamprey River! Even after you receive your patch, we hope that you will want to learn more and spend time along the river enjoying its wildlife, history, and recreational opportunities. If you see a problem, we hope that you will speak up. When your friends and family ask about your patch and the Lamprey River, we hope that you will inspire them to learn more so that the Lamprey will be a special place for a very long time.

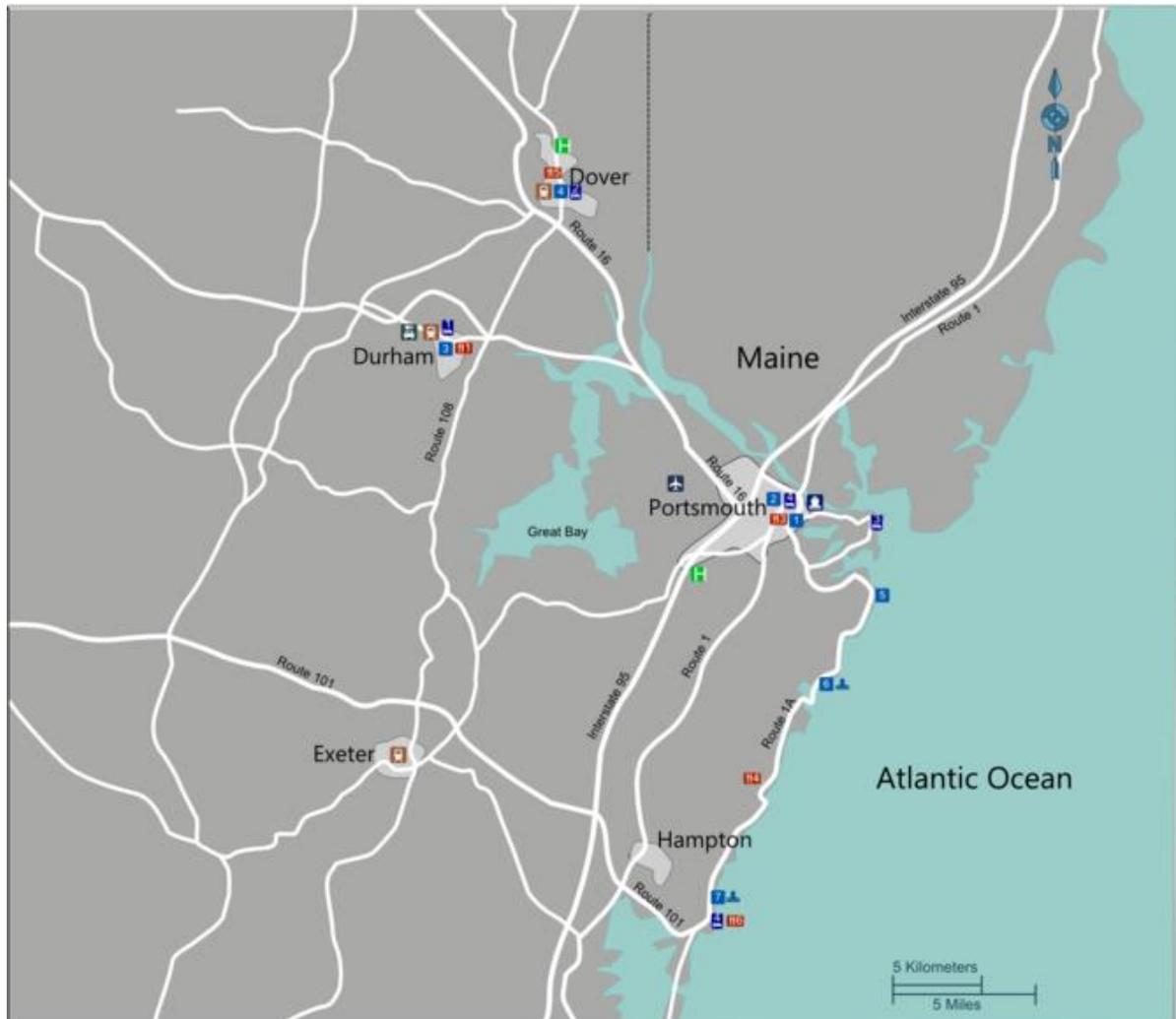
If you would like to stay in touch with the Lamprey Rivers Advisory Committee, you have several options:

- Visit www.lampreyriver.org and check out the “For Fun” tab. You will find articles about plants and animals along the river and links to some cool games or challenges. You can also view several short videos under the “Videos” tab.
- Contact the committee chair, Joe Foley, at info@lampreyriver.org and ask to be added to our mailing list. We will send you our newsletters and invitations to special events, but we will not share your name or contact information with others.
- Tell your teacher or camp counselor about the Lamprey River Advisory Committee and have that person contact us. We are happy to work with your class or after-school group to offer field trips or bring activities to your school.

Thank you for caring about the Lamprey River. Congratulations, Junior Ranger!

Map #1

from http://wikitravel.org/en/File:Map_Seacoast_NH.png



Map #2

