



The Salmon Times

November

Number 2

Students Visit a "Real Live" Salmon Hatchery!



On the left, hatchery staff take sperm or "milt" from a male fish. At right, eggs are taken from a female salmon.

Now that you have had a chance to visit a local hatchery, you know all about how eggs, "stripped" from a salmon hen, are fertilized with milt from the male fish. Tucked safely away in the cold water of the hatchery incubator trays, young salmon alevin will emerge from the pea-sized eggs in March. Did you think artificial spawning was going to be so simple? Were you brave enough to touch the eggs?



The eggs are fertilized by mixing them with milt. Placed in incubation trays, the eggs will hatch in 3 to 4 months.

Restoring Atlantic salmon to New England's rivers is a big job. This winter eleven federal and state hatcheries across New England will be kept busy incubating more than 20,000,000 salmon eggs. About half of that number will end up as fry in our rivers and streams next spring. 200 of the young fish will have been raised in your classroom!



The Nashua National Fish Hatchery in 1900.

Many fish hatcheries have long and interesting pasts. For example, the federal fish hatchery in Nashua, New Hampshire first opened almost 100 years ago! Like many U.S. Fish and Wildlife Service hatcheries in New England, the Nashua hatchery produced trout before switching over to Atlantic salmon. These fish were stocked in lakes and streams so people could fish for them. Imagine that, as a child, one of your grandparents may have caught a fish that was produced at the hatchery you just visited! Today, the Service focuses on producing fish species that have declined in the wild. Such fish include the salmon, Striped bass, and Lake trout.

A Downstream Journey:

FROM THE MOUNTAINS TO THE SEA

From "Waterways: Links to the Sea", Maine Coastal Program, John Luoma



As you learned in the last issue of *The Salmon Times*, a watershed is an area of land that drains to a common body of water. In many of New England's watersheds, the common body of water is a river. These rivers, many as old as the land they flow upon, have a tremendous influence on the people and wildlife, both plants and animals, that call the watershed home.

The landscape you see today was strongly influenced by glaciers. As recently as 12,000 to 10,000 years ago, New

England was covered with ice, in some places up to one mile thick. As the glacier gradually advanced south, it carved the landscape. Eventually the climate warmed and the great ice sheet began to melt. As the glacier retreated north, highly altered mountains and valleys were revealed. Melt water filled depressions in the land to form lakes and rivers.

As time passed, rivers continued the carving process began by the glaciers, making valleys deeper and deeper. As this erosion occurred, fast moving river currents swept tiny particles of rock and sand downstream, depositing them at various points along the way. This accumulation of sediments laid the foundation for the soils that gradually developed over thousands of years. In time, plants took hold and animals gradually moved into the watershed.



Perhaps the best way to experience a watershed is to paddle down its river, from the mountains to the sea. To start the journey, you put your canoe in the water at the beginning of the river, called its headwaters. Some rivers are formed at the outlet of a lake, others where two or more smaller streams flow together. Here the river is narrow, the water generally cold and fast moving. Perhaps young salmon and trout, tucked safely behind rocks on the river bottom, see the shadow of your boat as you pass overhead. Because of the rapids in the upper reaches of the river, you face some pretty challenging paddling ahead!

As you move further downstream, the river gets wider as more and more tributaries flow into it. The land changes, mountains gradually giving way to gentle





From "The Estuary Book," Maine Coastal Program

hills and fields. Where there is forest, you notice that the types of trees are much different from those you encountered up in the mountains. Farms, taking advantage of the fertile soils created by the river, begin to appear in great number.

All along your journey you have noticed low lying areas of land all or partially covered with water. These wetlands are among the most productive places for plants and animals to live. Once regarded as having little value, people have begun to recognize the importance of protecting wetlands as wildlife habitat. Wetlands are important for other reasons, something we will discuss later in this newsletter.



As the current slows, paddling becomes much more work! Because you are not moving as fast now, you can spend more time observing the wild things around you. Rounding a bend in the river, salt air fills your senses. Approaching the river's mouth and the end of your journey, you pass through a rather magical place called an estuary.

An estuary is a place where the fresh water of a river mixes with the salt water of the sea. Nutrients carried downstream by a river and brought in on the incoming tide mix, forming a rich "nutrient soup." This soup supports an amazing variety of plant and animal life. Two thirds of all the seafood we eat, including lobsters, crabs, and many fish, begin life in an estuary.

Salt marshes, a specific type of wetland, are created by estuaries. As soil and plant materials settle to the bottom of an estuary, a mud flat gradually develops along the margins. In time, the roots of certain grasses will take hold, creating a marsh.

Your downstream exploration has shown you the tremendous variety of habitats found in a watershed. Whether an aquatic or terrestrial habitat, each provides essential food, shelter, and protection for countless wildlife species. Getting out of your canoe and scrambling up onto the shore, you begin to realize the importance of a healthy watershed.



From "The Estuary Book," Maine Coastal Program

Wonderful Wetlands...

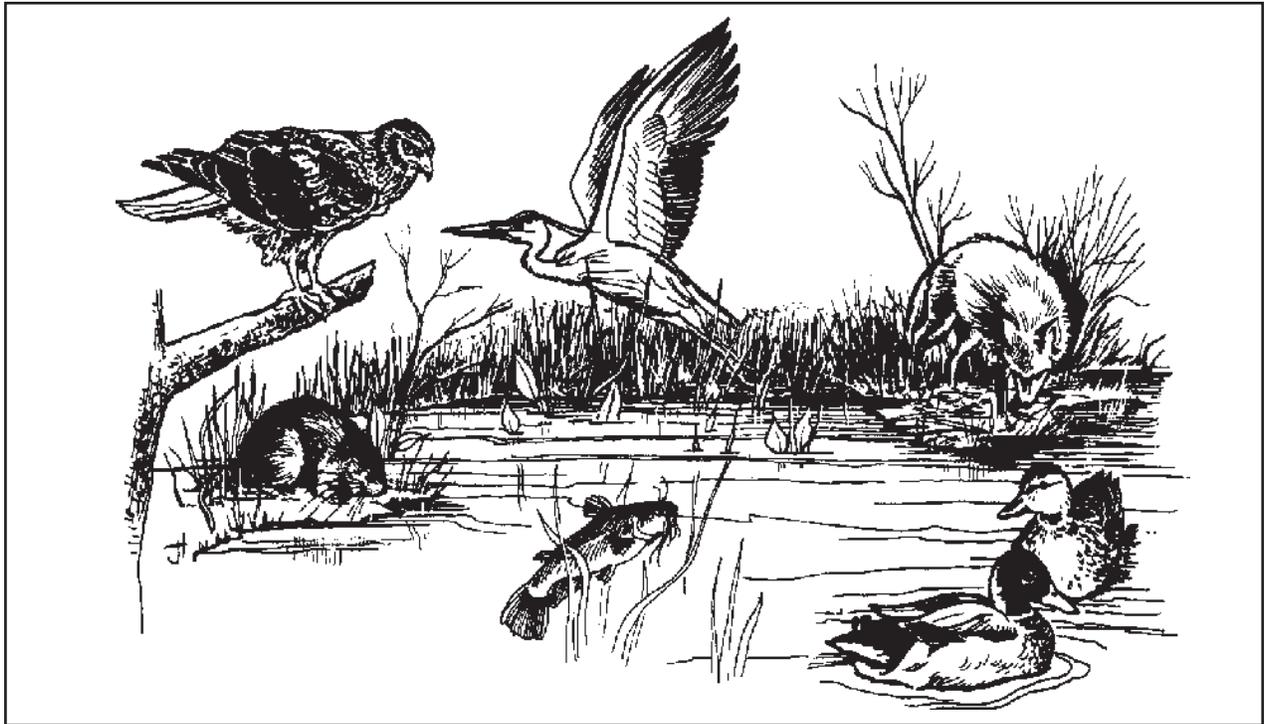


illustration copyright - June Henshaw

...Get the Picture?

Many people don't have a very high opinion of swamps. They tend to be very wet places that provide a great place for insects to live. In fact, aswamp is just one of the many types of wetlands. Wetlands are a very large and important part of a watershed.

A wetland is any area of land that is wet for at least some portion of the growing season. Wetlands are frequently found in low lying areas near rivers, streams, ponds, lakes, and the ocean. Inland marshes, coastal salt marshes, bogs, and wooded swamps are examples of wetlands.

For hundreds of years people considered wetlands to be wastelands. They were filled in to build cities and drained to create farmland. Only recently have we begun to protect wetlands because of the important roles they play in nature and our own lives:

Flood Protection: Much like a sponge, wetlands have the ability to absorb great quantities of water and therefore are helpful in reducing the damage caused by floods.

Clean Water: Much of the water that moves through a watershed flows through wetlands. Wetlands have a great ability to remove sediments and pollutants from water.

Erosion Control: Coastal wetlands absorb the force of strong wave action and help reduce erosion of our shorelines.

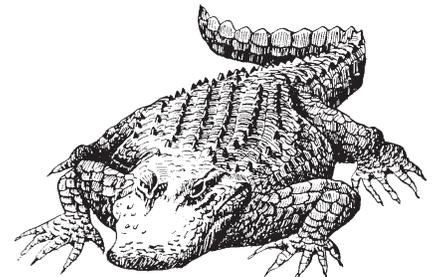
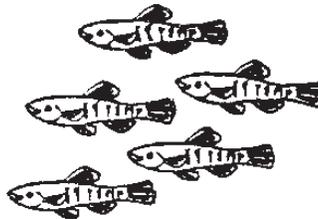
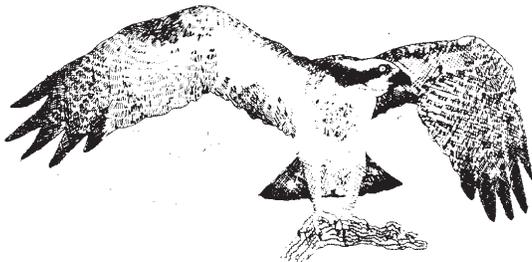
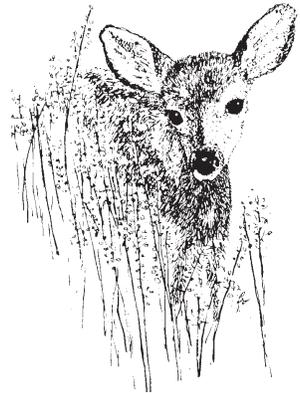
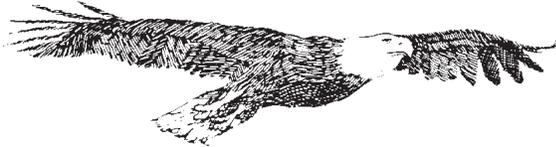
Fish and Wildlife Habitat: Wetlands are rich in plant and animal life. Many ocean creatures spend the early part of their lives in coastal wetlands. Wetlands are important to migratory birds as places to feed and raise their young.

Endangered Species: One third of all threatened or endangered species would disappear if there were no more wetlands.

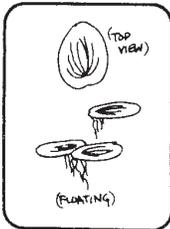
Recreation: Wetlands provide people with beautiful and interesting places to boat, fish, bird watch, and study nature.

Life in a Wetland

Wetlands provide important habitat for an amazing variety of wildlife. How many of the plants and animals on this page do you recognize?



Duckweed (*Lemna minor*)



- Where it grows...**
- floats on the surface of fresh water (not rooted to bottom)
- How to plant it...**
- just place it on water's surface
 - often carried in by ducks, etc.
- Wildlife value:**
- food for waterfowl, coots, rails, and beaver

Cinnamon Fern (*Osmunda cinnamomea*)



- Where it grows...**
- nontidal fresh water areas that are always or sometimes wet or have saturated soils
- How to plant it...**
- 3 ft. on center (fronds are big)
 - can tolerate full shade
- Wildlife value:**
- food for upland game birds, deer

Wild Rice (*Zizania aquatica*)



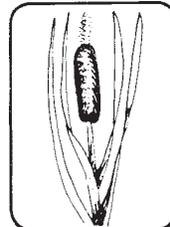
- Where it grows...**
- tidal fresh water, middle of IZ
 - nontidal fresh water up to 3 ft. deep and areas regularly wetted
- How to plant it...**
- an annual plant -- dies back each year, new plants grow from the seeds dropped -- plant as needed to fill space desired
- Wildlife value:**
- food: waterfowl, rail, muskrat;
 - nesting: marsh wren

Swamp Rose (*Rosa palustris*)



- Where it grows...**
- tidal fresh water, in drier areas above MHW
 - nontidal fresh water areas that are regularly wetted
- How to plant it...**
- shrub; plant 6-8 ft. on center
- Wildlife value:**
- food for upland game birds, food and cover for songbirds

Cattail (*Typha latifolia* or *angustifolia*)



- Where it grows...**
- angustifolia* in tidal brackish water, upper part of IZ
 - both species in tidal fresh water, upper part IZ; nontidal fresh water up to 1 ft. deep, and areas sometimes wet; tolerates dry
- How to plant it...**
- 2 feet on center, spreads rapidly
- Wildlife value:**
- food: waterfowl, muskrat, beaver;
 - nesting: waterfowl, marsh wren, red-winged blackbird, young fish

Saltmeadow Hay (*Spartina patens*)



- Where it grows...**
- in tidal salt and brackish water, above MHW
 - characteristic of the high marsh
- How to plant it...**
- 1 foot on center
 - full sun, no shade
- Wildlife value:**
- food for geese, black duck, sparrows, rails

Some of the illustrations adapted from "WOW!: The Wonders of Wetlands" - used by permission

Music can be a powerful way of sending a message. If you have watched MTV recently, you know how popular rap music is all over the country. How about a rap song with a wetland protection message? Too much of a stretch? Why not give Oscar Otter's rap song a try? Perhaps you can perform it for other kids at your school. Even better, why not write your own?!

The Wetland wRAP!

Yo! I'm Oscar. I'm an otter and I'm really hip.
I've come to rap with you -- I've got a serious tip:
Ya' know, lately this place seems to be in a mess!
That's one big problem that we should address.
We've gotta keep the air clean, keep our water clear--
Do ya' wanna know how? Well, gimme your ear!

Wetlands are an answer to some of this trouble,
So listen to me, and on the double!
These are lands that are wet -- with water, ya' know--
Those mucky mushy places where awesome plants grow!
These are homes to fish, birds, mammals (like me!)
And the really neat thing is they keep the water free
Of the glop and slop that washes off our land--
Are you listening, friend? Do you understand?

It's the wetland wRAP!
There's lots to do!
We can wrap up this mess,
yes! me and you!

Yeah, wetlands are cool, they're something to enjoy,
But people don't know, and they're working to destroy
These lands that we need, from coast to coast!
So I've got a solution (though I don't like to boast)--
We've gotta work together! This is your world and mine.
There are things we can do to keep it workin' fine.
So get off your chair and stand up and shout!
Yo! This is what livin' is all about!



We've gotta clean up our act, keep trash in its place!
And those critters I mentioned need lots of space,
So don't wreck their homes -- build yours on drier ground!
Keep those plants in wetlands, cause this is what we've
found:

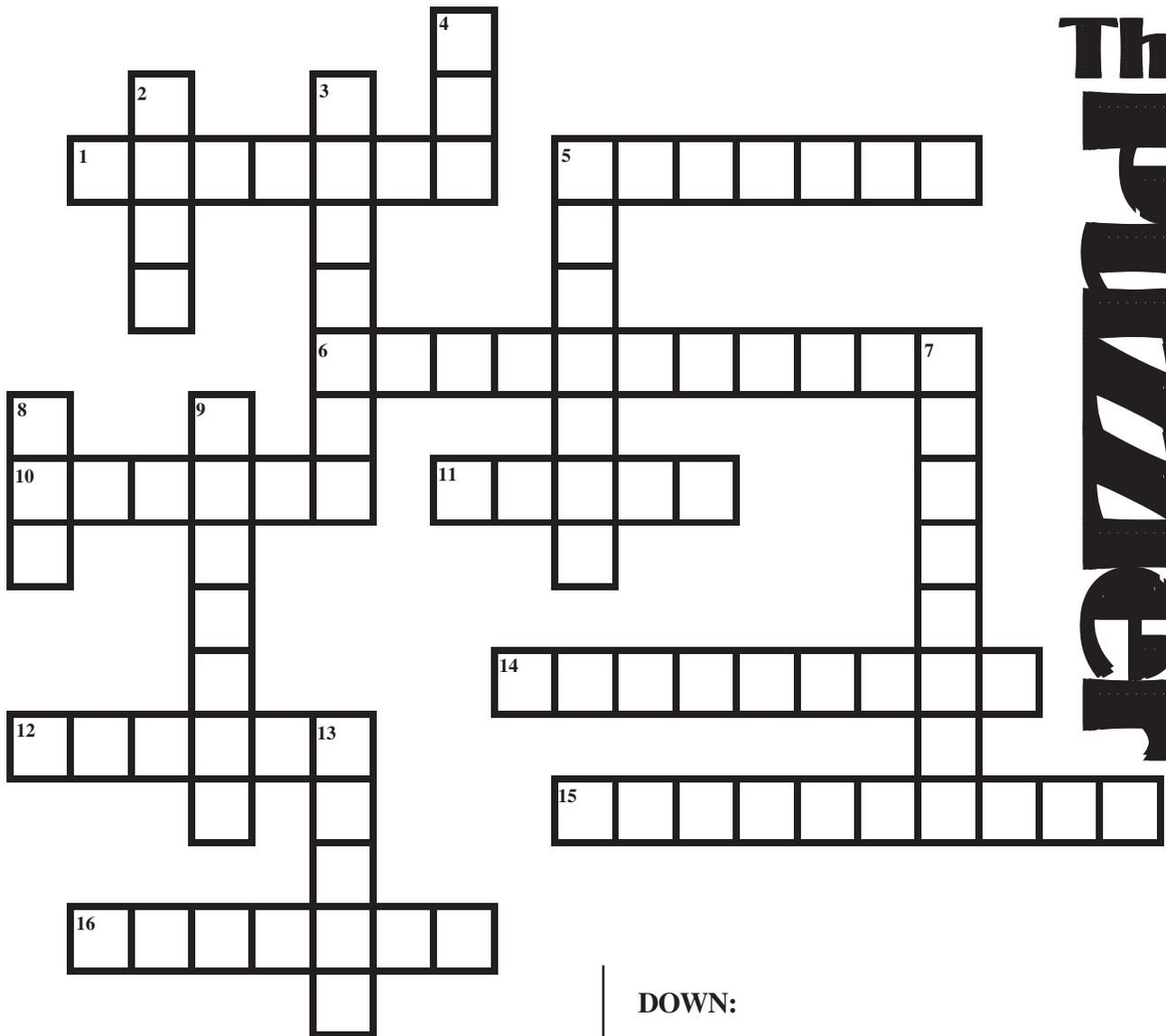
They trap silt, debris, chemicals and stuff
Without wetlands, drinking water would really be rough!
So get out and about and keep wetlands protected
If you do, you'll be one who's really respected!

It's the wetland wRAP!
There's lots to do!
We can wrap up this mess,
yes! me and you!

The solution to pollution is in your hands,
What we all need to do is understand
That what's ours today, will be our children's tomorrow;
We need to take good care of what we borrow!
So tell all your friends, tell the neighborhood, too!
Keepin' it clean is up to me and you!
Ya' know, YOU have the power to turn it around,
So start today, right in your own town!

wRAP up this mess! YO! wRAP up this mess! Yeah!
wRAP up this mess! (clap) wRAP

The Puzzle



ACROSS:

1. A _____ provides important habitat for many plants and animals.
5. Rain washing away a stream bank is an example of _____.
6. Smaller streams flowing into large streams are called _____.
10. A river may be formed at an _____ from a lake.
11. A salt _____ often develops along an estuary.
12. A very small river.
14. Plants, animals, and people live together in a _____.
15. The beginning of a river.
16. Fish live in an _____ habitat.

DOWN:

2. Glacial _____ water filled depressions on the landscape, helping to form lakes and rivers.
3. A place where a plant or animal lives.
4. _____ flats are a type of wetland.
5. Two thirds of the fish and shellfish people eat are born in an _____.
7. Mud flats are formed from _____ deposited in an estuary.
8. A type of wetland.
9. A thick sheet of ice that carved the landscape 12,000 to 20,000 years ago.
13. The point at which a river flows into another body of water.

