

Marsh Critters Discovery

Grades PreK - 2

Teacher's Information, Pre-trip and Post-trip Activities



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A marsh is a wonderful and exciting place. Not only are there tons of mud to slosh through, but the marsh is home to many interesting plants and animals. However, most marsh organisms are small, inconspicuous or secretive, and take time, patience and careful exploration to discover. Marshes and other wetlands have often been thought of as smelly, disease-harboring wastelands. Marshes have been drained, filled and built upon to make them more “useful.” Over half of the marshes and other wetlands in the United States have been destroyed. Luckily there are still thousands of acres of wetlands remaining to be explored.

This booklet contains information to help you and your students prepare for your trip to the Wetlands Institute. The accompanying activities are designed for before and after sessions and are intended to enhance the learning experience of your visit. However, feel free to use the activities in a manner best suited to the needs of your students.

PRE-VISIT ACTIVITIES

- 1. How Many Legs?** Is a counting activity using marsh animals that your students might see on their trip to the Wetlands Institute.
2. What kinds of animals live in the marsh? **Marsh Critters** will introduce your students to some of the creatures that can be found in the salt marsh.
- 3. A-Maze-ing Terrapins** is a maze that will introduce your students to the life history and ecology of the diamondback terrapin.
4. For younger students you will find two **Coloring Critters** for them to color on their own. After they have colored the animals talk about how the animals might live in the marsh.

POST-VISIT ACTIVITIES

1. After your visit to the marsh have your students draw their favorite marsh critter. Create a marsh scene bulletin board in the classroom and place the animals the students have created in the suitable location in your marsh discussing why that critter lives there.
2. Make a salt marsh T-shirt using fish from a local seafood market. **Fish Printing** is an ancient Japanese art used by fisherman to advertise the kinds of fish they had for sale. You can create colorful fish designs on a shirt using a fish, fabric paints and the Fish Printing instructions in this booklet. The students love this activity and all they need is a plain T-shirt (White is best) and some great imagination.
- 3. Critter Crossword** is a simple crossword puzzle with some of the animals your class might see during their trip to the marsh.
4. Animals have adaptations that enable them to survive in their environment. Adaptations of marsh animals include webbed feet, hard shells and pinching claws. In **Create A Critter** your students will combine the adaptations found in a variety of marsh animals to create a marsh creature of their own.

What is a Wetland?

The name says it all: wetlands are wet! They are areas that have water at or above the surface for all or part of the year. Because they are always wet, wetlands soils lack oxygen. Plants that grow in wetlands must be able to cope with the stresses of flooding and the oxygen poor soils. Wetland plants are called **hydrophytes**, which means water-plants. Relatively few kinds of plants can live in wetlands.

There are many different kinds of wetlands. You can tell them apart by the kinds of plants found each. Most wetlands fall into one of the three broad categories.

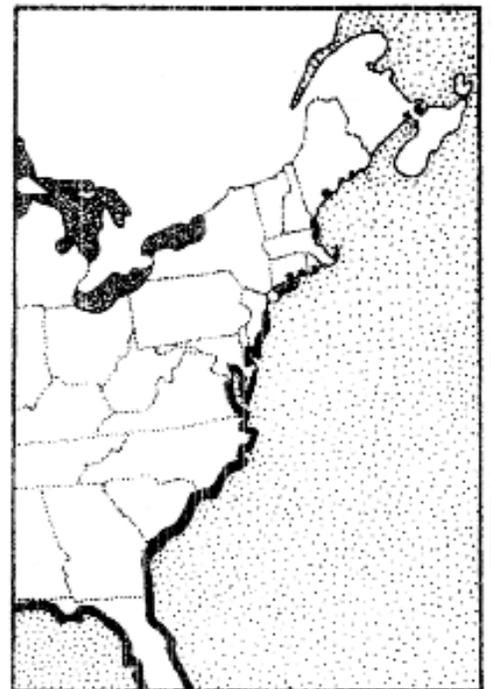


A **bog** is a wetland with small shrubs and stunted trees, often growing on a thick mat of moss. Bog water is very acidic and poor in nutrients that plants need to grow. Some bog plants, like sundews and pitcher plants trap and “eat” insects to get the nutrients they need. Most bogs are found in areas that were once covered with ice during the last ice age.

A **swamp** is a wetland with trees. In the shade of the tall trees grow smaller trees, shrubs, vines, and other non-woody plants. Swamps are found in both the north and south. They occur in low-lying areas and along slow moving rivers. Mangrove swamps which are found in the United States only in southern Florida are found along estuaries and sheltered seashores.

Marshes are wetlands with grasses, sedges, rushes, and other non-woody plants. Trees and shrubs are not found in a marsh. Like swamps, marshes are found in many locations. They occur along the shallow edges of lakes and ponds, along slow-moving rivers in both fresh and salty water.

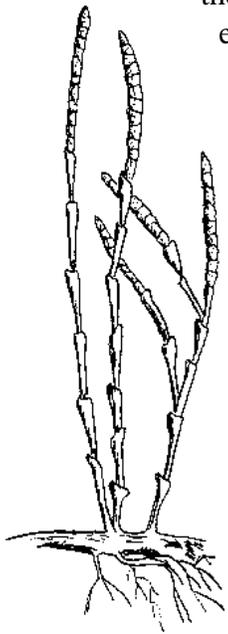
The Wetlands Institute is surrounded by salt marsh. A salt marsh is a marsh that grows in salt water from the ocean. Salt marshes are found along the Atlantic coast from Canada to central Florida. They are also found along the Pacific coast. North of New Jersey and along the Pacific coast, salt marshes are relatively small and are found in sheltered bays and coves. From New Jersey south, salt marshes form a nearly continuous band. Along this section of the Atlantic coast are a series of narrow, sandy islands called **barrier islands**. On the ocean side of these islands turbulent, sometimes violent surf creates constantly shifting and changing beaches. When people vacation at the Atlantic shore they go to resort communities that have been built upon barrier islands. In direct contrast to the beach front, the waters behind the islands are calm. In these calm, shallow waters marshes developed and grew.



The Salt Marsh - High and Low

The salt marsh forms a transitional zone between sea and land. Large areas of the marsh are flooded with sea water on each high tide. This part of the marsh is called the low marsh. Most of the low marsh is covered by just one kind of plant, smooth cordgrass. Cordgrass grows both tall, 4 to 6 feet, or short, between 1 and 2 feet tall. The low marsh is intersected by many winding creeks. Along the edges of these creeks cordgrass grows tall. But just a few feet from the creek edge the tall grass is replaced by the short form. Most of the low marsh is covered with short cordgrass. In the creeks, many kinds of seaweed grow. Rockweed, a brown algae with air filled bladders on its "leaves" and green sea lettuce are two kinds.

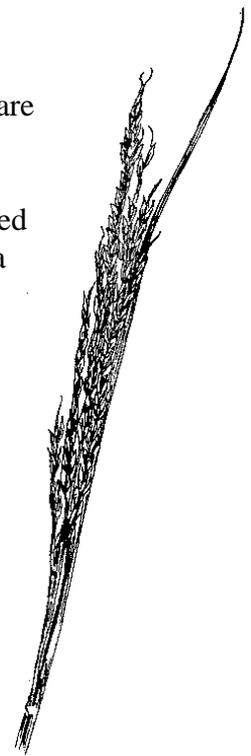
The low marsh is also dotted with many ponds or **pannes**, both large and small. Some are deep (up to 4 feet) but most are less than a foot deep. Pannes almost always have water in them, even when marsh creeks may be empty at low tide. They are filled with sea water twice each month by especially high tides called spring tides. In the summer the water in very shallow pannes may evaporate. The water evaporates but the salt is left behind. **Salicornia**, or pickleweed, is the only plant in the marsh able to grow in the extra-salty soil of these pannes.



Next to the low marsh is an area that is slightly higher in elevation. Though only a few inches higher it is only flooded by spring tides twice each month. However the soil is still saturated with salt water. This is the high marsh. Two other grasses grow here. Saltmeadow hay is a short, fine, wiry looking grass that may grow up to two feet high. Its leaves are weak and are often blown by the wind into swirled shapes called **cowlicks**. Salt meadow hay may be found in pure stands or with other short grass called salt grass. Salt grass has coarser leaves that grow from the stem at a pronounced angle. Sea lavender is often found in the high marsh as well. It has a few spoon shaped leaves that grow close to the ground. In the summer a thin, branching, wiry, green stalk grows up from the leaves. In the late summer and early fall it blooms with many tiny purple flowers.

On slightly higher ground, just above the high marsh grows a small bush called marsh elder. Marsh elder roots are usually only submerged by sea water during floods. The bush has thick, toothed leaves and in the fall its small green flowers bloom.

On upland areas next to the salt marsh grow plants that can tolerate the occasional flooding by sea water during floods and the salt spray that is carried off the marsh by the wind. Groundsel and bayberry, two small trees are common near the salt marsh. Bayberry has small leaves tapered at each end. In the fall it is covered with small, blue-gray, waxy berries. The berries are a favorite food of many migrating birds and were used at one time to make candles. Groundsel has leaves that are tapered at one end and fat at the other. In the fall groundsel's fluffy, cream-colored flowers bloom. The evergreen tree red cedar is also common at the marsh edge. Other plants that can be found here include wildflowers like yarrow, Queen-Anne's-lace, seaside goldenrod, and poison ivy.



Animals in the Marsh

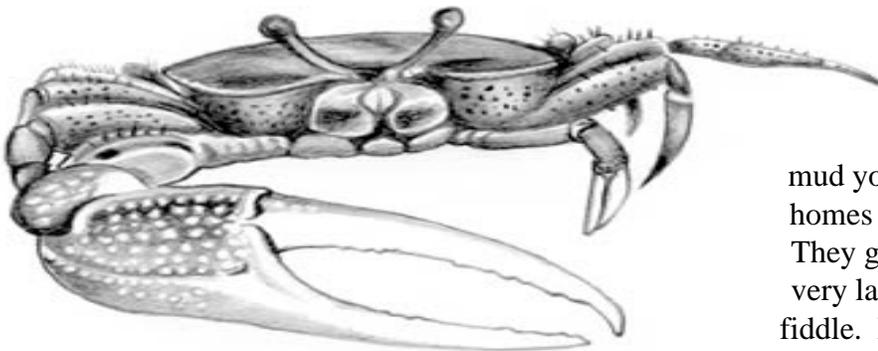
Many animals can be found in the marsh. While some of the animals live in the marsh all the time, others may be just visiting the marsh in search of food. Many marsh animals are very small, live in the mud, or are only found underwater. The most obvious animals are birds. A few kinds of birds nest right in the marsh. Osprey used to make their large stick and grass nests in dead trees on the barrier islands. Today, osprey nest mostly on special platforms placed in the marsh for them. Laughing gulls, terns, and willets all make nests of grass on the marsh surface. When you get close to their nests, these birds usually let you know by scolding you, swooping at your head, and sometimes even going to the bathroom on you. Other marsh nesting birds like clapper rails and seaside sparrows are very secretive and usually stay hidden or creep away when danger is near. Red-winged black birds and boat-tailed grackles nest in the trees along the edge of the marsh.

Hérons, egrets, and glossy ibises come to the marsh to feed on fish, shrimp, and crabs. They nest in groups, called colonies, in trees on **spoil islands** in the marsh or on the nearby barrier islands. Usually they are seen fishing alone or in small groups. But on early summer mornings groups of hundreds of these birds may feed together in a marsh panne. They often eat all of the fish in the panne.

In the spring and fall many birds stop in the marsh during migration to feed and rest. Many kinds of **shorebirds** rest on the marsh at high tide and hunt for worms and other small animals in the exposed mud of marsh creeks at low tide. In late summer and fall, huge flocks of ravenous tree swallows descend on bayberry trees to feed on the multitude of berries. They often eat all of the berries around the Wetlands Institute in just a few days. Ducks and geese also stop in the marsh during migration. Brant, Buffleheads, and red-breasted mergansers stay for the whole winter.

A few mammals also live or feed in the salt marsh. However, they are active mostly at night. Only tracks on marsh mud reveal the presence of raccoons and voles. Like these mammals, most marsh animals are hard to see; however, they are there. Look beneath the **cowlicks** of saltmeadow hay and you may find tiny saltmarsh snails. They feed on algae and bits of dead plant and animals, called **detritus**, on the mud and grass

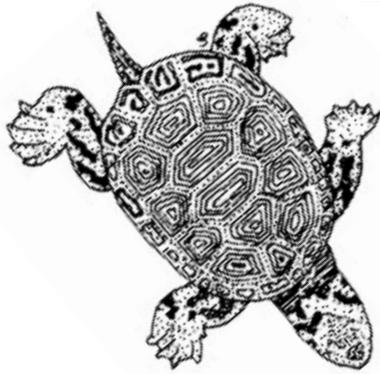
stems. Periwinkle snails also feed on algae and detritus and are found on the stems of tall cordgrass.



If you look at the surface of the marsh mud you may see small holes. These are the homes of another detritus eater, the fiddler crab. They get their name because the male has one very large claw that it holds under its head like a fiddle. Females have two small claws. They are shy creatures and run into their holes when they feel

the vibrations of foot steps. Purple marsh crabs may also be found in the mud with fiddler crabs. They are only found near the edges of marsh creeks where they dig larger holes than fiddlers. Mud crabs, spider crabs, lady crabs, and blue crabs live beneath the water's surface and cannot come up on land. Lady crabs and blue crabs are predators of fish and other small creatures. Spider and mud crabs are scavengers and also eat barnacles and mussels. The horseshoe crab also lives in marsh creeks. They are not really crabs though because they are more closely related to spiders and scorpions. In the winter only mud, spider, and rock crabs are found in the marsh. The others move out to sea, bury in the mud until spring, or stay in their burrows.

Marsh creeks are also home to many kinds of fish. The most abundant are several types of minnows. Mummichogs and sheepshead minnows are everywhere. They are especially abundant in small creeks and pannes. Silverside minnows travel in large schools and are the favorite food of small “snapper” blue fish and other fish, as well as fish eating birds. Resting on the bottom, waiting for an unwary fish to swim nearby, is the summer flounder. It actually lays on its side, not its stomach. One eye migrates from one side of its head to the other as it grows. As an adult, it has both eyes on the right side of its body. Clinging by their tails to submerged marsh grass stems and seaweed are sea horses. They slurp up small shrimp with their tube like mouth. Sharks may also come into the marsh. The smooth dogfish is a small shark that lives in the marsh in the summer. It feeds on crabs and other marsh animals.



Only one kind of reptile lives in the salt marsh. The diamondback terrapin is a turtle. Terrapins spend most of their time in the water feeding on fiddler crabs, shrimp, snails, and dead fish. In the late spring and early summer females come out of the marsh to lay their eggs in nearby upland areas. The females lays eight to ten eggs in a shallow hole. She then covers the nest and returns to the marsh, leaving her babies to fend for themselves. The eggs hatch in about 60 days and the young turtles make their way to the marsh. Some nests are dug up an the eggs are eaten by raccoons. Baby turtles may be eaten by raccoons, fish, and birds. However, some will grow to be adults and have young of their own.

People and the Marsh

Are wetlands important to people too? Besides being great places to explore and beautiful to look at, wetlands are important for other reasons. Freshwater wetlands help to clean water and can control floods by absorbing tons of water from storms. Salt marshes are particularly important to the people that live along the coastline. Most commercial fish and shellfish species depend on the marsh for food, a place to spawn, or as a nursery in which to develop relatively safe from large predators. Even fish that do not come into the marsh depend on them indirectly.

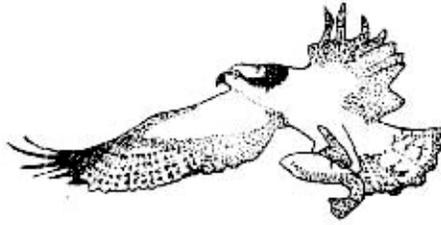
Each winter the leave of the marsh plants die. The roots and stems which grow underground live through the winter to send up new leaves in the spring. The dead leaves break off and bacteria and fungi begin to break them down. The dead leaves and attached **decomposer** organisms are called detritus. It is an important source of food energy to the marsh **food web**. Most of the detritus is slowly broken down into **nutrients** right in the marsh.

The marsh also serves as an important recreational open space. People come to the marsh to fish, sail, water ski, watch birds and other wildlife, or to take a relaxing walk. The marsh is indeed a wonderful, exciting place!

A FIELD GUIDE TO SOME MARSH PLANTS AND ANIMALS



Cordgrass
Spartina alterniflora



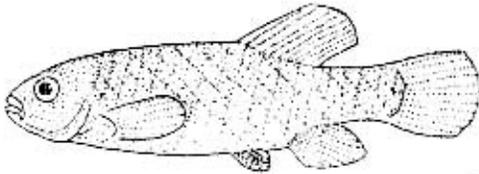
Osprey
Pandion haliaetus



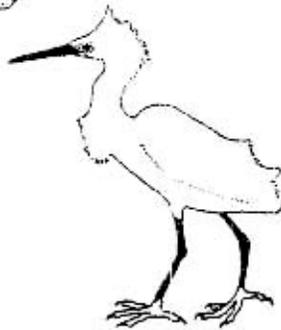
Horseshoe Crab
Limulus polyphemus



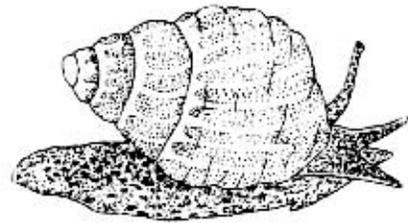
Sea Lettuce
Ulva lactuca



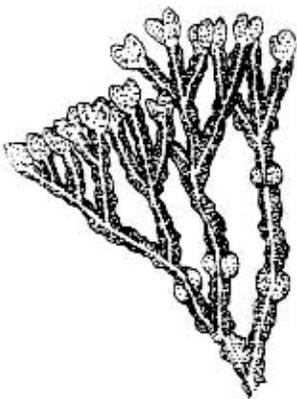
Mummichog
Fundulus heteroclitus



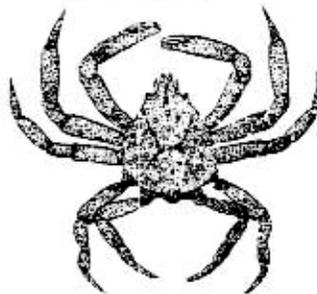
Snowy Egret
Egretta thula



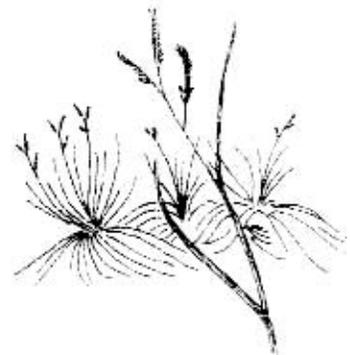
Mud Snail
Nassarius obsoleta



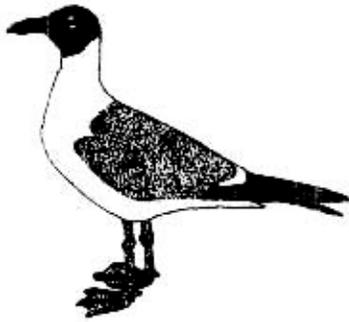
Rockweed
Fucus vesiculosus



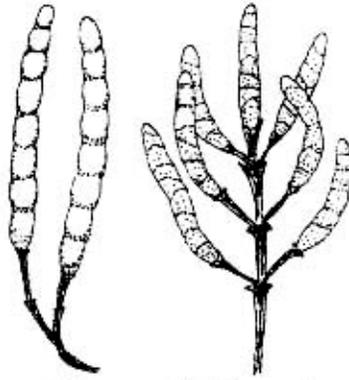
Spider Crab
Libinia emarginata



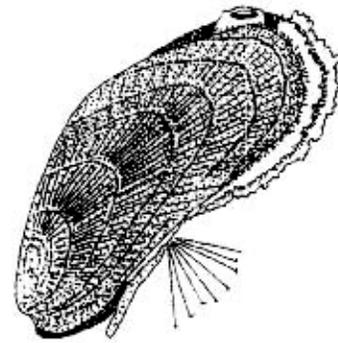
Saltmeadow Hay
Spartina patens



Laughing gull
Larus atricilla



Saltwort, Pickleweed
Salicornia virginica



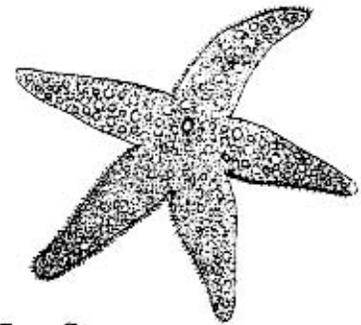
Ribbed Mussel
Geukensia demissa



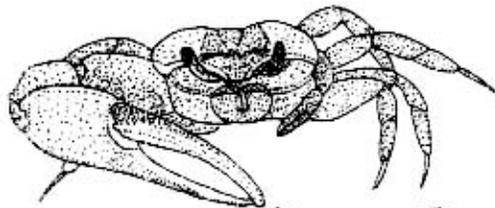
Marsh Elder
Iva frutescens



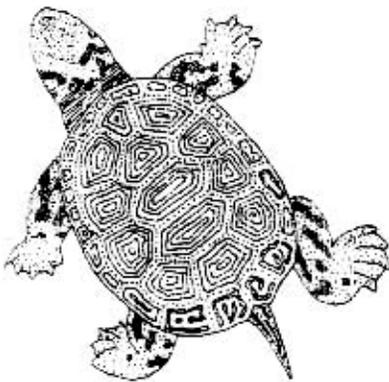
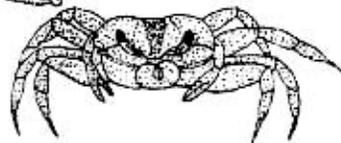
Summer Flounder
Paralichthys dentatus



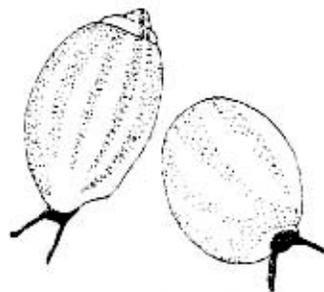
Sea Star
Asterias forbesii



Fiddler Crab
Uca species



Diamondback Terrapin
Malaclemys terrapin



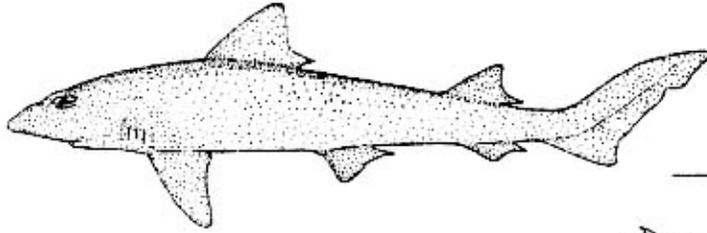
Salt Marsh Snail
Melampus bidentatus

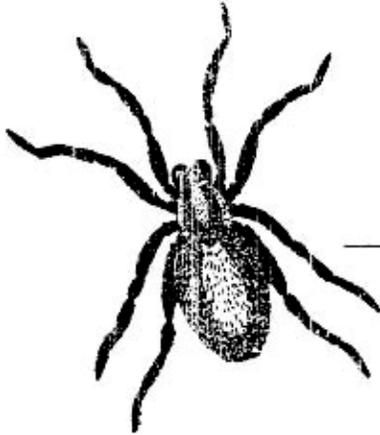


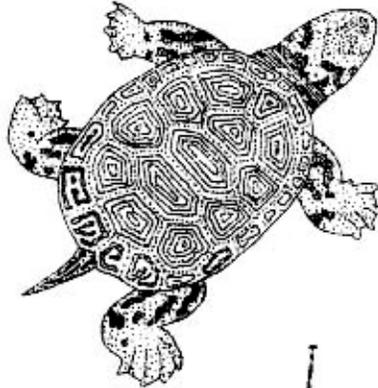
Poison Ivy
Rhus radicans

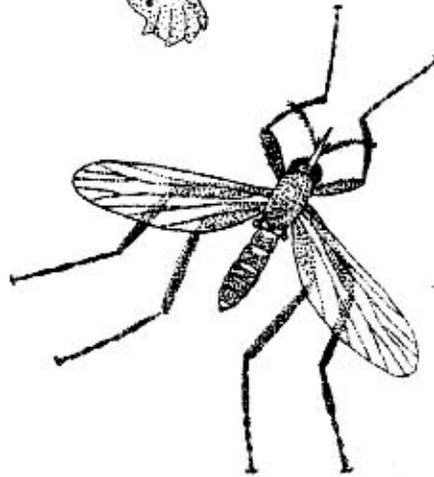
HOW MANY LEGS?

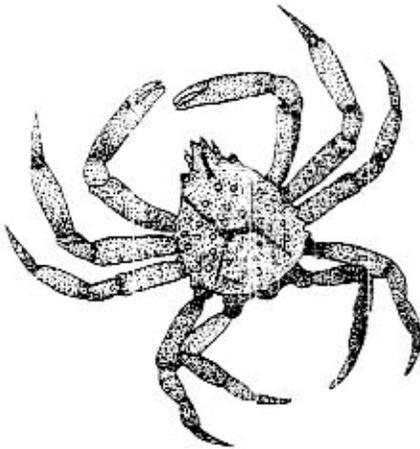
Count the number of legs on each marsh animal and write your answer in the space provided.

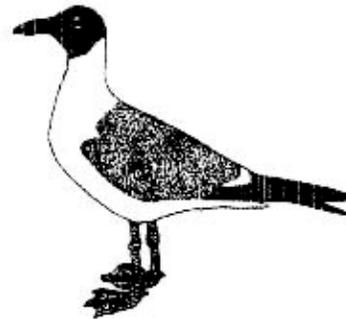


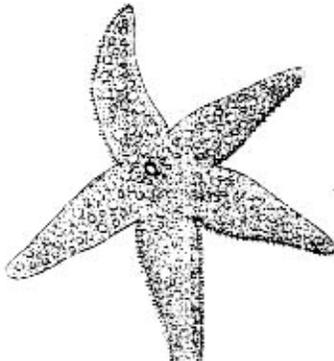












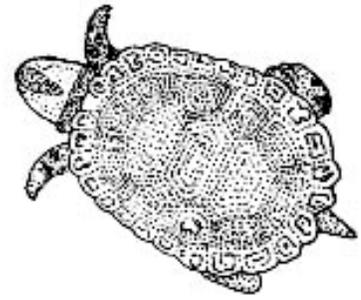
MARSH CRITTERS



Circle the animals that you might find in the salt marsh.

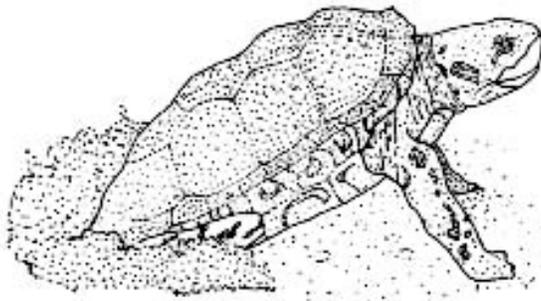
A-MAZE-ING TERRAPINS

The diamondback terrapin is the only reptile that spends its entire life in the salt marsh. They occur along the Atlantic and Gulf coasts from Cape Cod to Mexico. The shells of terrapins range in color from light brown to almost black. Light brown shells are usually marked with dark concentric lines. Skin color is also variable, ranging from black to light gray, marked with black specks or lines. Females and males also differ physically. Females are larger. The shells of females average about eight inches long. Average shell length in males is five inches. Females also have larger, broader heads, deeper shells, and shorter tails than the males.



The diet of terrapins is mostly small crabs, shrimp, salt marsh snails and periwinkles. They may occasionally scavenge dead fish as well. Terrapins spend most of their time in the bank to bask in the sun like pond turtles. Females leave the marsh each summer in search of sandy areas above the reach of the tide in which

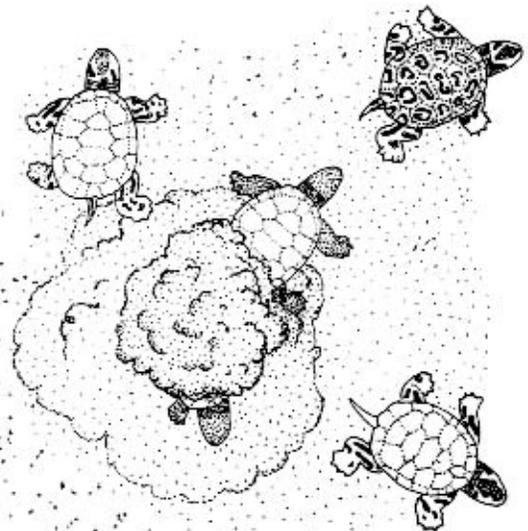
to lay their eggs. A shallow hole is dug with the hind legs. Eight to twelve eggs are laid. The female returns to the marsh after filling the nest hole and covering it with debris to hide it from predators. Many nests are still found and dug up by predators like raccoons.



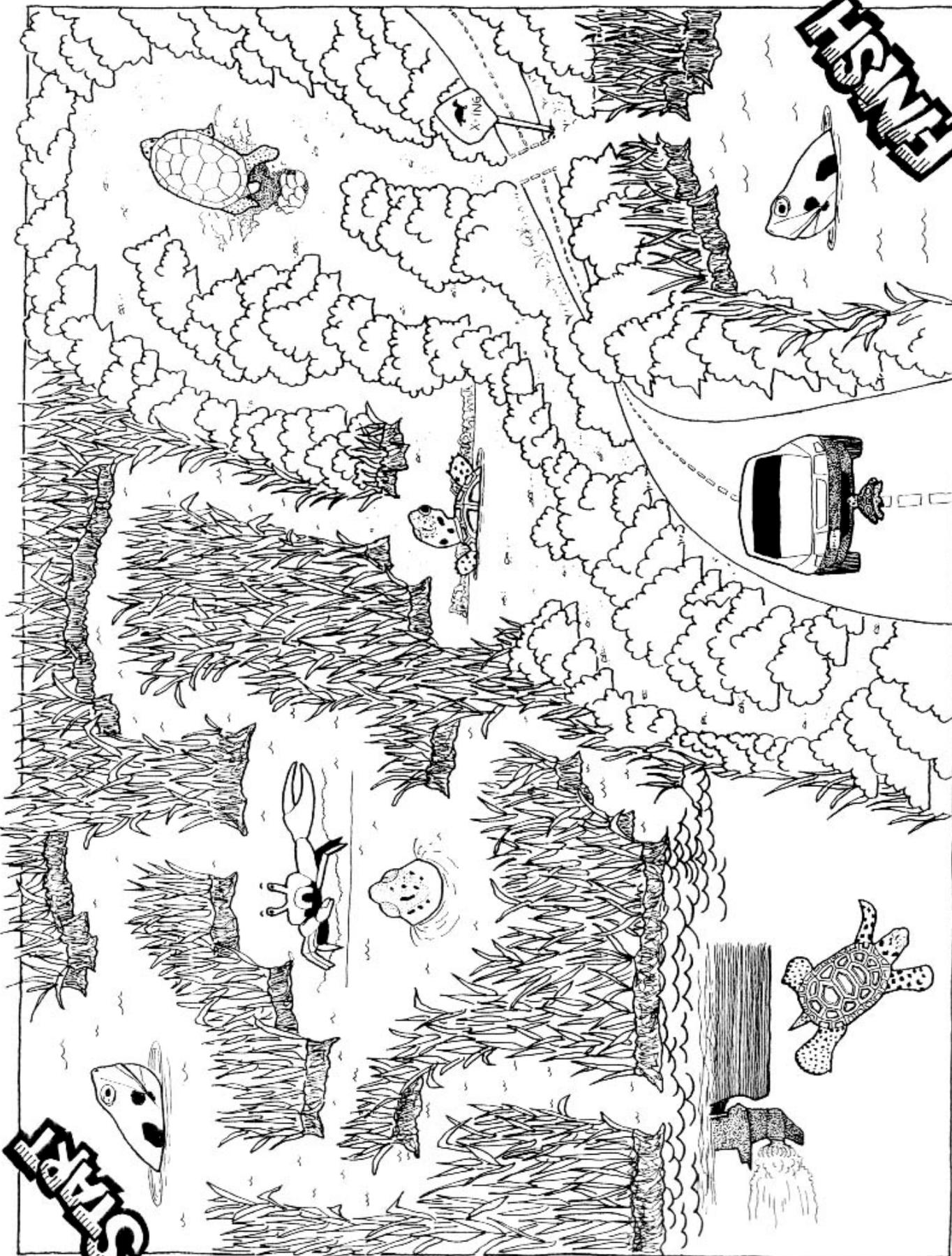
The eggs hatch in about sixty days. If they hatch in the summer when it is still warm the hatchling turtles, each about the size of a quarter, emerge from the nest and head right for the nearest marsh creek.

If the eggs were laid in July and hatch in the fall the hatchlings

may remain in the nest through the winter and emerge in the spring. Hatchlings must face many dangers in the marsh. Raccoons, large fish, and some birds eat baby terrapins. Boat propellers, drowning in crab traps, small sharks, bald eagles, and humans who like to eat terrapin stew are all dangers that adult terrapins must face. Many females are run over and killed by automobiles as they search for suitable nest sites.



FISHNE



STYLS
MILK & HONEY

FISH PRINTING

Fish printing, or gyotaku (pronounced ghio-ta-koo) as it is called in Japan, was invented in the 1800's as a way for fishermen to record their catch. Today fish printing is an art form. Your students will be creating t-shirts with fish. Remember that 60 to 70 percent of all commercially caught seafood depends on the marsh in some way.

MATERIALS:

fish- any fish that is fairly flat and has obvious scales will work well. Fresh fish kept on ice works best. Frozen fish should be thawed under cold water shortly before using.

Newspaper
paper towels
fabric paint
wide, stiff-bristled brushes and several fine-tipped ones

PROCEDURE:

1. Gently wash the fish with soap and water to remove mucous. Be careful not to damage the scales.
2. Dry thoroughly. Plug the mouth and gills with paper towels so the fish does not leak on the t-shirt.
3. Lay fish on a newspaper covered table. Paint the fish, brushing from head to tail. Take care not to use too much paint of the print will look like a fish shaped blob. Do not paint the eye. Paint the fins and tail last, they tend to dry quickly. When you are ready to print, brush the fish from head to tail. This will get the paint beneath the scales and spines and add more detail to your print.
4. Place your hands inside the t-shirt with the side to be printed down. Stretch the shirt so there are no wrinkles. Carefully place the shirt over the fish.
5. Have someone else carefully press the t-shirt on the fish, including the tail and fins. **Don't rub the shirt, just press.**
6. Carefully remove the shirt from the fish. Use a small brush to paint an eye on your shirt. Let the shirts dry overnight.
7. **Important:** Most fabric paints must be set in the fabric with a hot iron before washing. Otherwise the paint will wash out.

CRITTER CROSSWORD

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CLAM
 CRAB
 FISH
 GULL
 HERON
 OSPREY
 SEAHORSE
 SNAIL
 STARFISH
 TURTLE

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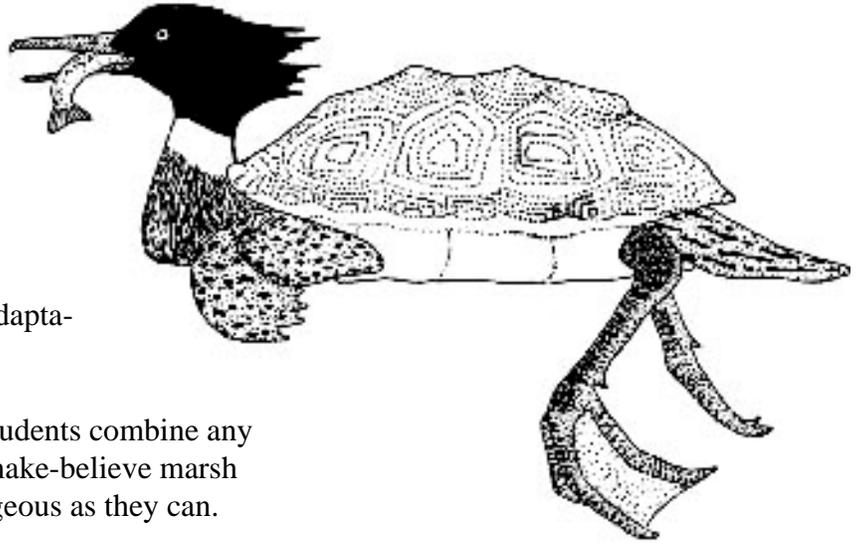
CREATE-A-CRITTER

Materials:

pictures of marsh animals
drawing paper
pencils, crayons, markers, etc.
Students with great imaginations

Procedure:

1. Using the pictures of marsh animals discuss the adaptations of marsh animals and how they help the animals survive. List the adaptations of each animal on the board.
2. After discussing the adaptations have the students combine any on the adaptations you discussed to create a make-believe marsh critter. Encourage the students to be as outrageous as they can.
3. When the animal is complete have the students draw the habitat that their animal would live in. They might draw the animal's food as well.
4. When all the students' critters are completed have them show the critters to the class. Each student should explain how his/her critter's adaptations help it to survive.
5. You may wish to create a bulletin board to display the marsh critters.



Vocabulary

Barrier Island: A narrow and usually long sandy island that forms along gently sloping shorelines; acts as a barrier between the mainland and the ocean.

Community: All the species that occur in the same habitat.

Cowlick: Tufts of grass twisted and turned to one side as if licked by a cow.

Decomposer: Any organism that feeds by degrading organic matter.

Ecosystem: A community of organisms and their physical environment interacting as an ecological unit.

Food Chain: A sequence of organisms through which energy is transferred through feeding.

Food Web: The network of interconnected food chains of a community.

Hydrophytes: Any plant adapted to live in water or very wet habitats.

Nutrient: Basic compounds of which organic material is composed.

Panne: A natural basin or depression, especially one containing water or mud, which may dry at certain times leaving a salt deposit.

Shorebird: Name for a large group of similar or related birds which typically have relatively long legs and bills, most of which migrate long distances and are often but not always found along shorelines.

Spoil Island: An island created by the dumping of material dredged from channels and creeks onto the marsh surface which eventually becomes populated by upland plants.

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