

Module 1 ~ Silent Invaders (MS/HS)

Emersed Plants Reading Activity



Name: _____ Class Period: _____ Date: _____

Directions: Read the passage and use the information you've learned to answer the questions below using complete sentences.

Emersed plants are rooted in shallow water with much of their vegetative growth above the water. They are found in all Florida waters and grow in wet or submersed (underwater) soils near the edge of a body of water such as a river, lake, stream, marsh, or pond. These plants generally live from the water's edge out to where the water is 1 to 3 meters deep (about 3 to 10 feet). The area from the shoreline out into the lake where emersed plants grow is called the **emersed zone**. This zone may be anywhere from a few feet to hundreds of feet wide, depending on how deep the water is. Bulrush, cat-tail, maidencane, duck potato and pickerelweed are a few examples of **native** emersed plants.

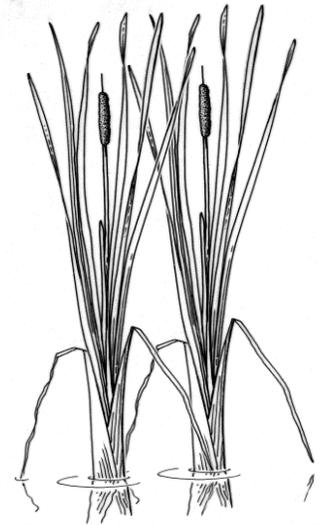
Emersed plants have many important functions. They provide **habitat** (places to live and hide) and food (such as seeds and leaves) for fish and other animals. The underwater parts of emersed plants provide places to hide and rest for small animals such as crayfish, tadpoles, snails, and minnows, or even some mammals like raccoons in near-shore areas. Some of these small animals in turn serve as prey for bigger fish that people like to catch, such as largemouth bass. The above-water parts of taller emergent plants like bulrushes and cattails can serve as nesting places for birds like the flycatcher and the endangered Everglades snail kite. Birds also eat the seeds of emersed plants like bulrushes, smartweed, and aquatic grasses.

Emersed plants also help reduce shoreline **erosion**. They can play an important role in protecting the shoreline area from wave action. By breaking up waves and spreading out some of the waves' energy, masses of emersed plants growing close together can protect the sediment on the bottom and at the edge of the water from being broken or stirred up and washed away in fast-moving water.

If there are too many plants growing together they can use up so much water they actually lower the level of the water in the lake, pond, or swamp. Emersed plants use water through **transpiration** – taking in liquid water through the roots and releasing water vapor from tiny pores in their leaves. **Evapotranspiration** is the combined loss of water from evaporation at the surface of the water and transpiration of the plants growing in the water.

Emersed plant communities can change in various ways along with changing water levels. When periods of low water levels are followed by a rapid rise, large numbers of emersed plants may be uprooted. This can be caused by sudden, heavy rainfall or a big storm such as a tropical storm or a hurricane. Uprooted plants can form floating plant islands called **tussocks**. Tussocks vary in size from small free-floating mats to enormous stationary floating islands that can support large, woody-stemmed plants. These floating islands can cause significant navigational hazards and can block access to parts of the waterbody.

However, tussocks can also provide good wildlife habitat. These floating emersed plant islands may be made up of a variety of different native and non-native plants. They can provide shelter and food for creatures including alligators, muskrats, and amphibians like frogs and toads. Alligators can use tussocks as nesting areas. The muskrat, whose diet includes all sorts of small animals and plants, likes to eat sedges, rushes, cattails, and



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willow, among other types of emerged plants that make up floating islands. Water birds and fish have less uses for tussocks. They mainly just look for food and shelter along the edges of tussocks that face open water.

High water levels that last a long time can reduce the number of emerged plants growing in a body of water. Many emerged or “**emergent**” plants cannot survive once too much of the body of the plant is underwater for too long. When leaves and stems of an emerged plant are cut off from sunlight and air by being underwater too long, its life processes begin to shut down and it can die.

Long-lasting high water levels can reduce the number and diversity (number of different types) of emerged plants in Florida water bodies. When native emerged plants die off from abnormally high water levels, it can encourage the growth of larger or stronger **non-native** and **invasive** plants. Loss of native emerged plant groups due to higher water levels means a loss of habitat for native animals that depend on having a number of different kinds of these plants for food and shelter along the edges of water bodies. Often these kinds of changes are caused by human activities, such as digging channels in rivers and the use of dikes, pumps, and dams to change, slow or stop the flow of water between wetlands.

In periods of low water, leaves and other dead or decaying parts from emerged plants can build up and eventually cause still or slow-moving water bodies such as lakes and ponds to become shallower. If this process of lowering water levels goes far enough, a lake or pond can be turned into a swamp or marsh. Eventually the marsh itself may start to disappear, leaving behind a buildup of dead plant matter known as peat. Peat is made up of slowly-decaying plant matter that builds up over long periods of time in water-logged soil. It forms in wetland areas where the soil and water tend to have a higher level of acids and lower levels of oxygen and other natural chemicals that plants depend on. These conditions slow down both plant growth and plant decay, leading to the slow buildup of layer upon layer of plant matter, both living and dead. Peat is mostly made up of the decaying remains of sedges, grasses, ferns, mosses and other emerged plants that grow in these very wet soil conditions.

The average amount of emerged plant matter in a water body is one of several measurements that scientists can use to figure out the water body's overall level of **biological** health--that is, how much life it can grow and keep alive at any one time. Other measurements used include algae levels, bacteria counts, and the amount of **submersed** (underwater) plant matter. Plant matter measurements can be figured out by finding the average weight of fresh, live emerged plants growing in one square meter of a lake or pond's bottom area, and then multiplying that by the total square meter measurement of the bottom.

When emerged plants grow close together or in clumps it can also cause problems. Some emerged plants, such as cattails, can become so thick that they prevent the movement of water. This can cause algae growth and a loss of oxygen in the water, which makes the water unhealthy for fish and other underwater creatures. Both **native** and **non-native** plants can also make boat channels narrower or even block them, which makes it dangerous for people to drive boats through.

Emerald Plants Reading Activity (MS/HS) – answer in complete sentences.

1. State in your own words at least three characteristics that describe an emerged plant.

Any four of the following are OK:

- They live in shallow waters / near the edge of a water body.
- Most of their vegetative growth is above the water surface.
- They provide habitat and food for fish and other animals.
- Emerged plants help reduce shoreline erosion.



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- Many emersed plants cannot survive long if too much of their plant parts are covered with water.
- Emerged plants can break loose and form floating plant islands called tussocks.

2. What can you say about the functions that emersed plants perform?

Emerald plants provide shelter for fish as well as food and habitat for other wildlife such as crayfish, tadpoles, snails, frogs, birds, and fish, or raccoons. Emerald plants also help to reduce shoreline erosion.

3. Summarize what happens to emersed plant communities when periods of low water are followed by a rapid rise in water level. Why can this be a problem?

When periods of low water are followed by a rapid rise in water level, large numbers of emersed plants may be uprooted. This can be caused by sudden, heavy rainfall or a big storm such as a tropical storm or a hurricane. Uprooted plants can form floating plant islands called tussocks. These floating islands can cause significant navigational hazards and can block access to parts of the waterbody.

4. What can result from the accumulation of emersed plant debris?

Dead and decaying parts of emersed plants can build up and eventually cause still or slow-moving water bodies such as lakes and ponds to become shallower. If this process of lowering water levels goes far enough, a lake or pond can be turned into a swamp or marsh. Eventually the marsh itself may start to disappear, leaving behind a buildup of dead plant matter known as peat.

5. There are several measurements that are used to assess a water body's overall biological productivity. Name three of them.

The average amount of emersed (above-water) plant matter; algae levels; bacteria counts; and the amount of submersed (underwater) plant matter.

The following is a list of suggested standards that pertain to this activity. This list is provided as a reference to incorporate and expand upon as needed.

Next Generation Sunshine State Standards

4th Grade

SC.4.N.1.4: Recognize ways plants and animals, including humans, can impact the environment.

5th Grade

SC.5.L.17.1: Compare and contrast adaptations displayed by animals and plants that enable them to survive in different environments such as life cycles variations, animal behaviors and physical characteristics.



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Common Core State Standards

4th Grade

Common Core Code	FL Common Core Code	Common Core Standard
RI.4.1	LACC.4.RI.1.1	Refer to details and examples in a text when explaining what the text says explicitly and when drawing inferences from the text.
RI.4.4	LACC.4.RI.2.4	Determine the meaning of general academic and domain-specific words or phrases in a text relevant to a grade 4 topic or subject area.
RF.4.3	LACC.4.RF.3.3	Know and apply grade-level phonics and word analysis skills in decoding words.
RF.4.4	LACC.4.RF.4.4	Read with sufficient accuracy and fluency to support comprehension.
L.4.4	LACC.4.L.3.4	Determine or clarify the meaning of unknown and multiple-meaning words and phrases based on grade 4 reading and content, choosing flexibly from a range of strategies.

5th Grade

RI.5.1	LACC.5.RI.1.1	Quote accurately from a text when explaining what the text says explicitly and when drawing inferences from the text.
RI.5.4	LACC.5.RI.2.4	Determine the meaning of general academic and domain-specific words and phrases in a text relevant to a grade 5 topic or subject area.
RF.5.3	LACC.5.RF.3.3	Know and apply grade-level phonics and word analysis skills in decoding words.
RF.5.4	LACC.5.RF.4.4	Read with sufficient accuracy and fluency to support comprehension.
L.5.4	LACC.5.L.3.4	Determine or clarify the meaning of unknown and multiple-meaning words and phrases based on grade 5 reading and content, choosing flexibly from a range of strategies.

6th Grade

RI.6.1	LACC.6.RI.1.1	Cite textual evidence to support analysis of what the text says explicitly as well as inferences drawn from the text.
RI.6.4	LACC.6.RI.2.4	Determine the meaning of words and phrases as they are used in a text, including figurative, connotative, and technical meanings.
L.6.4	LACC.6.L.3.4	Determine or clarify the meaning of unknown and multiple-meaning words and phrases based on grade 6 reading and content, choosing flexibly from a range of strategies.
RST.6-8.4	LACC.68.RST.2.4	Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context relevant to grades 6–8 texts and topics.

7th Grade

RI.7.1	LACC.7.RI.1.1	Cite several pieces of textual evidence to support analysis of what the text says explicitly as well as inferences drawn from the text.
RI.7.4	LACC.7.RI.2.4	Determine the meaning of words and phrases as they are used in a text, including figurative, connotative, and technical meanings; analyze the impact of a specific word choice on meaning and tone.
L.7.4	LACC.7.L.3.4	Determine or clarify the meaning of unknown and multiple-meaning words and phrases based on grade 7 reading and content, choosing flexibly from a range of strategies.
RST.6-8.4	LACC.68.RST.2.4	Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context relevant to grades 6–8 texts and topics.

8th Grade

RI.8.1	LACC.8.RI.1.1	Cite the textual evidence that most strongly supports an analysis of what the text says explicitly as well as inferences drawn from the text.
RI.8.4	LACC.8.RI.2.4	Determine the meaning of words and phrases as they are used in a text, including figurative, connotative, and technical meanings; analyze the impact of specific word choices on meaning and tone, including analogies or allusions to other texts.
L.8.4	LACC.8.L.3.4	Determine or clarify the meaning of unknown and multiple-meaning words or phrases based on grade 8 reading and content, choosing flexibly from a range of strategies.



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RST.6-8.4	LACC.68.RST.2.4	Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context relevant to grades 6–8 texts and topics.
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Sources:

UF/IFAS Center for Aquatic and Invasive Plants: <http://plants.ifas.ufl.edu/>

Plant Management in Florida Waters: An Integrated Approach: <http://plants.ifas.ufl.edu/manage/>

Common Aquatic Plants of Lake Okeechobee: Identification, Value, and Management: <http://edis.ifas.ufl.edu/ag371>

Creating Wildlife Habitat with Native Florida Freshwater Wetland Plants: <https://edis.ifas.ufl.edu/fa007>

