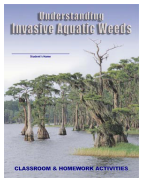


Understanding Invasive Aquatic Weeds – Questions

An Activity Booklet for Module 1~Silent Invaders http://plants.ifas.ufl.edu/education

A Collaboration of the Aquatic Plant Management Society http://www.apms.org/ and the UF/IFAS Center for Aquatic and Invasive Plants http://plants.ifas.ufl.edu/education

1. **This book discusses three forms of aquatic plants: floating, emergent and submersed.**

   When learning unfamiliar terms, it is often helpful to come up with Memory Cues to help you connect each word with its meaning. For example, a memory cue for "native" plants might be the phrase "Native American." From our history studies, we know that Native Americans lived in North America before Columbus arrived. So, the phrase "native" is a clue that "native plants" were here before Columbus arrived.

   A memory cue is anything that helps you remember. It can be silly or serious, as long as it helps you remember.

   Look at the definitions for these three words. On the lines below each, write a memory cue to help you connect each word with its meaning.

   a) The word **floating** means "to drift about on the surface of a liquid, free from attachment."

   What memory cue helps **YOU** link the word ***floating*** with the definition for **floating plants**?

   _____

   _____

   _____

   List three (3) other things that "float." _____

   b) The word **emergent** means "coming up through the surface of a liquid." What memory cue helps **YOU** link the word "***emergent***" with the definition for **emergent plants**?

   _____

   _____

   _____

   List three (3) other things that can "emerge" from something else. _____

   _____

   c) The word **submersed** means "covered with water." What memory cue helps **YOU** link the word "***submersed***" with the definition for **submersed plants**?

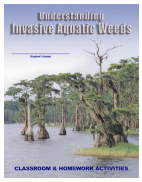
   _____

   _____

   _____

   List three (3) other things that can be "submerged." _____

   _____



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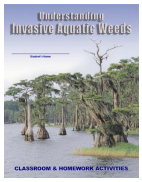
2. The first page of this booklet discusses several GOOD THINGS (pros) about native plants. The rest of the booklet discusses the many PROBLEMS (cons) caused by invasive plants.

The following table provides space for you to record only three (3) of the pros and cons of native and invasive plants that you've learned from reading this booklet. Consider which pros and cons you feel are most important, and record them in this table.

Good Things about Native Plants (Pros)	Problems Caused by Invasive Plants (Cons)
1.	1.
2.	2.
3.	3.



3. **Invasive plants often spread quickly in their new habitats. Based on your reading of this booklet, describe three (3) reasons that invasive plants can grow and spread more easily than the native plants, which belong in that habitat.**

Reason 1: _____

_____

_____

Reason 2: _____

_____

_____

Reason 3: _____

_____

_____

4. **Invasive plants have been introduced into Florida habitats in many different ways.**

<u>Method 1 - On Purpose</u>: Some people have chosen to carry invasive plants along with them when traveling to Florida or other parts of the United States.

<u>Method 2 - By Accident</u>: Other people have transported these plants without realizing it.

<u>Method 3 - Through Nature</u>: Something in nature spreads the invasive plants (wind, animals)

Think about the articles you read in this booklet. On the lines below, give one example of each of these methods, showing how invasive plants have traveled into or around our state.

Method 1: _____

_____

_____

Method 2: _____

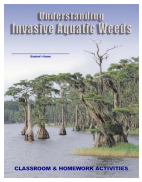
_____

_____

Method 3: _____

_____

_____



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5. **This booklet discusses four methods for controlling aquatic weeds: Physical, Mechanical, Biological, and Chemical. Match each word with one of the definitions below. Write the word next to its definition.**

   a. A man-made liquid is sprayed on invasive weeds to kill them. _____

   b. A living thing (like a plant-eating bug) is used to control an invasive weed._____

   c. A machine is used to chop, collect, and remove invasive weeds._____

   d. People pull weeds by hand or drain away water to remove invasive weeds._____

6. **Based on your reading of this booklet, why is "Integrated Plant Management" the most effective way to battle Florida's invasive aquatic weeds?**

_____
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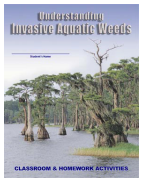
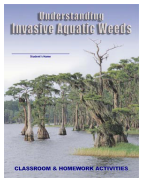


7. **This booklet discusses problems and solutions associated with five (5) of Florida's worst invasive weeds: Eurasian watermilfoil, giant salvinia, hydrilla, purple loosestrife, and water hyacinth. Choose two (2) of these plants and compare the following information about each:**

   (a) Why it was brought to Florida
   (b) Why it spreads so quickly
   (c) The biggest problems it causes
   (d) How habitat managers are dealing with these problems



Understanding Invasive Aquatic Weeds – Questions

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A Collaboration of the Aquatic Plant Management Society http://www.apms.org/ and the UF/IFAS Center for Aquatic and Invasive Plants http://plants.ifas.ufl.edu/education

8. **The booklet you've been studying was created by the Aquatic Plant Management Society** (www.apms.org) **and the UF/IFAS Center for Invasive and Aquatic Plants** (http://plants.ifas.ufl.edu). **These two educational groups are working together to inform people about invasive weed problems. They want to add the following web addresses to their own web site**.

   - ☐ Center for Invasive Species and Ecosystem Health http://www.invasive.org/
   - ☐ Ducks Unlimited www.ducks.org
   - ☐ Florida Aquatic Plant Management Society http://www.homestead.com/fapms/main.html
   - ☐ Florida Fish and Wildlife Conservation Commission/Invasive Plant Management Section -- http://myfwc.com/wildlifehabitats/habitat/invasive-plants/
   - ☐ Plant Management in Florida Waters http://plants.ifas.ufl.edu/manage
   - ☐ BASS Master Fishing Club http://sports.espn.go.com/outdoors/bassmaster/index

Choose three (3) of the websites listed above. On the lines below, describe how each of the three websites supports the goal of educating and informing people about aquatic invasive weed problems.

Name of website: _____

How it supports the author's purpose: _____

_____

_____

_____

Name of website: _____

How it supports the author's purpose: _____

_____

_____

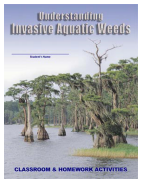
_____

Name of website: _____

How it supports the author's purpose: _____

_____

_____



Understanding Invasive Aquatic Weeds – Activity Book
Sunshine State Standards

A Collaboration of the Aquatic Plant Management Society http://www.apms.org/
and the UF/IFAS Center for Aquatic and Invasive Plants http://plants.ifas.ufl.edu/education

4th Grade

LA.4.1.5.1: TSW demonstrate the ability to read grade level text.
LA.4.1.6.1: TSW use vocabulary that is introduced and taught directly.
LA.4.1.6.2: TSW listen to, read, and discuss familiar and conceptually challenging text.
LA.4.2.2.1: TSW locate, explain, and use information from text features (e.g., table of contents, glossary, headings, charts, graphs, diagrams, illustrations).
SC.4.E.6.6: TSW identify resources available in Florida (water, phosphate, oil, limestone, silicon, wind, and solar energy).
SC.4.L.16.1: TSW identify processes of sexual reproduction in flowering plants, including pollination, fertilization (seed production), seed dispersal, and germination.
SC.4.N.1.4: TSW recognize ways plants and animals, including humans, can impact the environment.
SS.4.A.4.1: TSW explain the effects of technological advances on Florida.
SS.4.C.2.1: TSW discuss public issues in Florida that impact the daily lives of its citizens.
SS.4.G.1.4: TSW interpret political and physical maps using map elements (title, compass rose, cardinal directions, intermediate directions, symbols, legend, scale, longitude, latitude).
MA.4.A.6.4: TSW determine factors and multiples for specified whole numbers.
MA.4.G.3.1: TSW describe and determine area as the number of same-sized units that cover a region in the plane, recognizing that a unit square is the standard unit for measuring area.

5th Grade

LA.5.1.5.1: TSW demonstrate the ability to read grade level text.
LA.5.1.6.1: TSW use vocabulary that is introduced and taught directly.
LA.5.1.6.2: TSW listen to, read, and discuss familiar and conceptually challenging text.
LA.5.2.2.1: TSW locate, explain, and use information from text features (e.g., table of contents, glossary, index, transition words/phrases, headings, subheadings, charts, graphs, illustrations).
SC.5.L.17.1: TSW 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.
SS.5.G.4.1: TSW use geographic knowledge and skills when discussing current events.

6th Grade

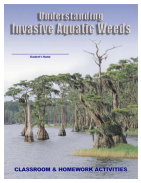
LA.6.1.6.1: TSW use vocabulary that is introduced and taught directly.
LA.6.1.6.2: TSW listen to, read, and discuss familiar and conceptually challenging text.
SS.6.G.1.4: TSW utilize tools geographers use to study the world.
MA.6.A.3.6: TSW construct and analyze tables, graphs and equations to describe linear functions and other simple relations using both common language and algebraic notation.

7th Grade

LA.7.1.6.1: TSW use new vocabulary that is introduced and taught directly.
LA.7.1.6.2: TSW listen to, read, and discuss familiar and conceptually challenging text.
SC.7.E.6.6: TSW identify the impact that humans have had on Earth, such as deforestation, urbanization, desertification, erosion, air and water quality, changing the flow of water.
SC.7.L.15.3: TSW explore the scientific theory of evolution by relating how the inability of a species to adapt within a changing environment may contribute to the extinction of that species.
SC.7.L.17.2: TSW compare and contrast the relationships among organisms such as mutualism, predation, parasitism, competition, and commensalism.
SC.7.L.17.3: TSW describe and investigate various limiting factors in the local ecosystem and their impact on native populations, including food, shelter, water, space, disease, parasitism, predation, and nesting sites.
SS.7.C.2.13: TSW examine multiple perspectives on public and current issues.
SS.7.G.5.1: TSW use a choropleth or other map to geographically represent current information about issues of conservation or ecology in the local community.

8th Grade

LA.8.1.6.1: TSW use new vocabulary that is introduced and taught directly.
LA.8.1.6.2: TSW listen to, read, and discuss familiar and conceptually challenging text.
SC.8.N.4.1: TSW explain that science is one of the processes that can be used to inform decision making at the community, state, national, and international levels.



SC.8.N.4.2: TSW explain how political, social, and economic concerns can affect science, and vice versa.
SS.8.A.1.2: TSW analyze charts, graphs, maps, photographs and timelines; analyze political cartoons; determine cause and effect.
SS.8.G.2.3: TSW use geographic terms and tools to analyze case studies of how selected regions of the United States have changed over time.
SS.8.G.5.1: TSW describe human dependence on the physical environment and natural resources to satisfy basic needs in local environments in the United States.
SS.8.G.5.2: TSW describe the impact of human modifications on the physical environment and ecosystems of the United States throughout history.
SS.8.G.6.1: TSW use appropriate maps and other graphic representations to analyze geographic problems and changes over time throughout American history.

9th - 12th Grades

LA.910.1.6.1: TSW use new vocabulary that is introduced and taught directly.
LA.1112.1.6.1: TSW use new vocabulary that is introduced and taught directly.
LA.910.1.6.2: TSW listen to, read, and discuss familiar and conceptually challenging text.
LA.1112.1.6.2: TSW listen to, read, and discuss familiar and conceptually challenging text.
LA.910.2.2.1: TSW analyze and evaluate information from text features (e.g., transitional devices, table of contents, glossary, index, bold or italicized text, headings, charts and graphs, illustrations, subheadings).
LA.1112.2.2.1: TSW analyze and evaluate information from text features (e.g., transitional devices, table of contents, glossary, index, bold or italicized text, headings, charts and graphs, illustrations, subheadings)
SC.912.E.7.8: TSW Explain how various atmospheric, oceanic, and hydrologic conditions in Florida have influenced and can influence human behavior, both individually and collectively.
SC.912.L.14.7: TSW relate the structure of each of the major plant organs and tissues to physiological processes.
SC.912.L.14.53: TSW discuss basic classification and characteristics of plants. Identify bryophytes, pteridophytes, gymnosperms, and angiosperms.
SC.912.L.17.1: TSW discuss the characteristics of populations, such as number of individuals, age structure, density, and pattern of distribution.
SC.912.L.17.2: TSW explain the general distribution of life in aquatic systems as a function of chemistry, geography, light, depth, salinity, and temperature.
SC.912.L.17.5: TSW analyze how population size is determined by births, deaths, immigration, emigration, and limiting factors (biotic and abiotic) that determine carrying capacity.
SC.912.L.17.6: TSW compare and contrast the relationships among organisms, including predation, parasitism, competition, commensalism, and mutualism.
SC.912.L.17.8: TSW recognize the consequences of the losses of biodiversity due to catastrophic events, climate changes, human activity, and the introduction of invasive, non-native species.
SC.912.L.17.13: TSW discuss the need for adequate monitoring of environmental parameters when making policy decisions.
SC.912.L.17.15: TSW discuss the effects of technology on environmental quality.
SC.912.L.17.16: TSW discuss the large-scale environmental impacts resulting from human activity, including waste spills, oil spills, runoff, greenhouse gases, ozone depletion, and surface and groundwater pollution.
SC.912.L.17.17: TSW assess the effectiveness of innovative methods of protecting the environment.
SC.912.L.17.20: TSW predict the impact of individuals on environmental systems and examine how human lifestyles affect sustainability.
SC.912.N.4.1: TSW explain how scientific knowledge and reasoning provide an empirically-based perspective to inform society's decision making.
SC.912.N.4.2: TSW weigh the merits of alternative strategies for solving a specific societal problem by comparing a number of different costs and benefits, such as human, economic, and environmental.
SS.912.C.2.10: TSW monitor current public issues in Florida.
SS.912.G.5.3: TSW analyze case studies of the effects of human use of technology on the environment of places.
SS.912.G.5.4: TSW analyze case studies of how humans impact the diversity and productivity of ecosystems.
SS.912.G.5.5: TSW use geographic terms and tools to analyze case studies of policies and programs for resource use and management.
SS.912.G.5.6: TSW analyze case studies to predict how a change to an environmental factor can affect an ecosystem.
SS.912.G.6.1: TSW use appropriate maps and other graphic representations to analyze geographic problems, changes over time.
MA.912.A.2.2: TSW interpret a graph representing a real-world situation.