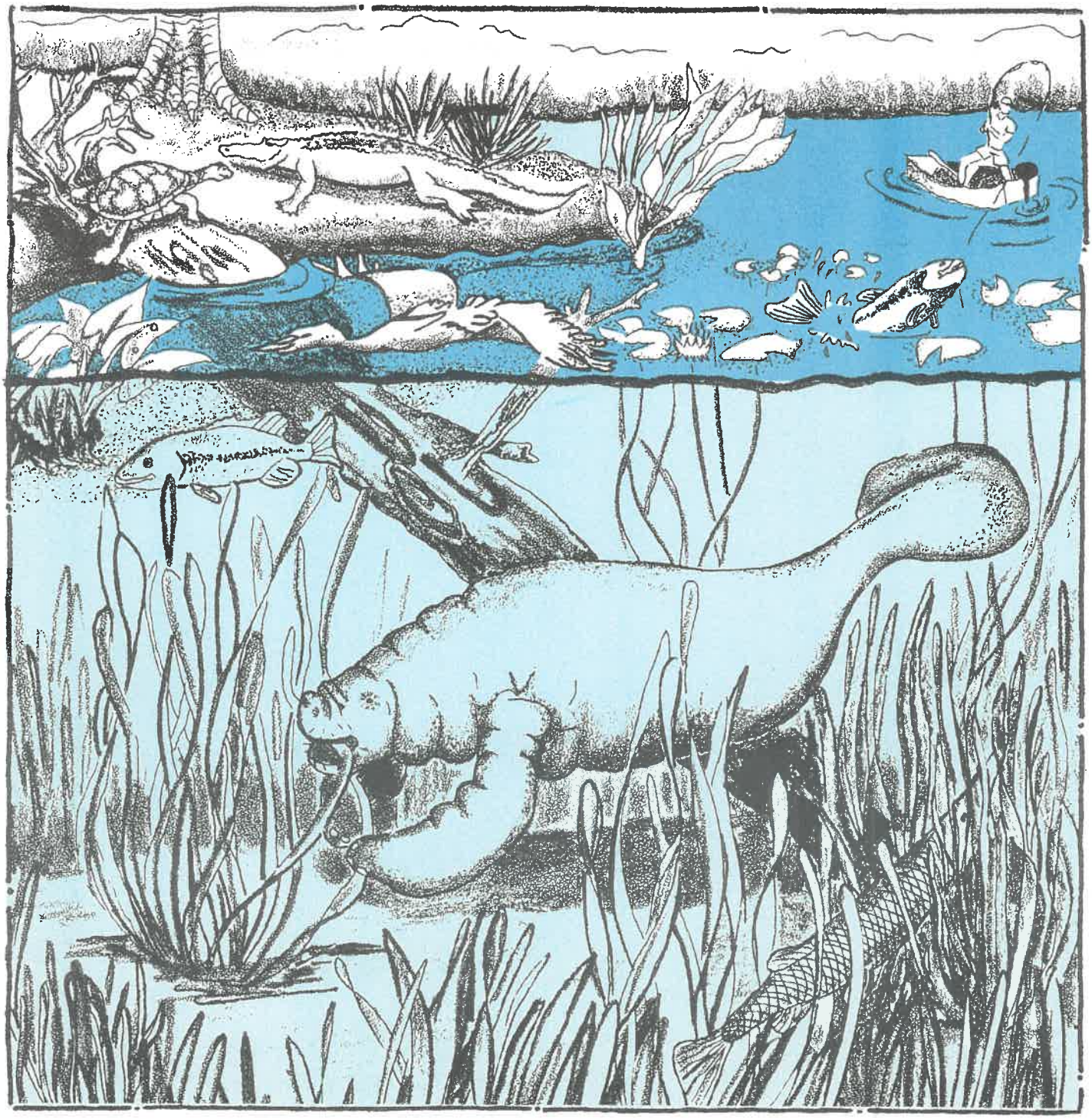
Aquatic Plants



the Underwater Forests of Lakes and Rivers

Contents

Aquatic Plants

the Underwater Forests of Lakes and Rivers

A coloring and activity book describing the role of aquatic plants in freshwater ecosystems.

Florida Department of Environmental Protection

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Florida is fortunate to possess an abundance of uniquely diverse lakes, rivers, and wetlands. Aquatic plants make up a fundamental component in these freshwater ecosystems. Fish and wildlife populations depend on aquatic vegetation; plants also directly affect water quality and help prevent shoreline erosion. In addition to statewide native plant management and exotic plant control programs. The Bureau of Aquatic Plant Management, within the Department of Environmental Protection, informs and educates the public on plant management issues.

Now more than ever, our young people must become aware of and learn to respect our state's natural resources. The value of native aquatics plants in freshwaters is commonly overlooked because of a few notorious, usually exotic, nuisance plants. Most often, all aquatic plants are referred to as "weeds", regardless of their impacts on ecosystem.

The purpose of this book is to help teach students that aquatic plants play an essential role in Florida's freshwaters. Common ecological terms are defined in an aquatic plant context. We have also stressed that exotic plants are unwanted in state waters, and have provided tips for preventing their spread. Although this material is presented in a fun way, some concepts may be difficult for students to grasp, and therefore, an adult's direction may enhance learning. Answers to questions and activities are found on the last two pages of this book. Fourth and fifth graders should profit most from this exercise.

Just like plants on land, aquatic plant (plants in water) make their own food. This process is called ***photosynthesis***.

What are the three things needed for photosynthesis? (hint: look in the picture for clues)

1. _____

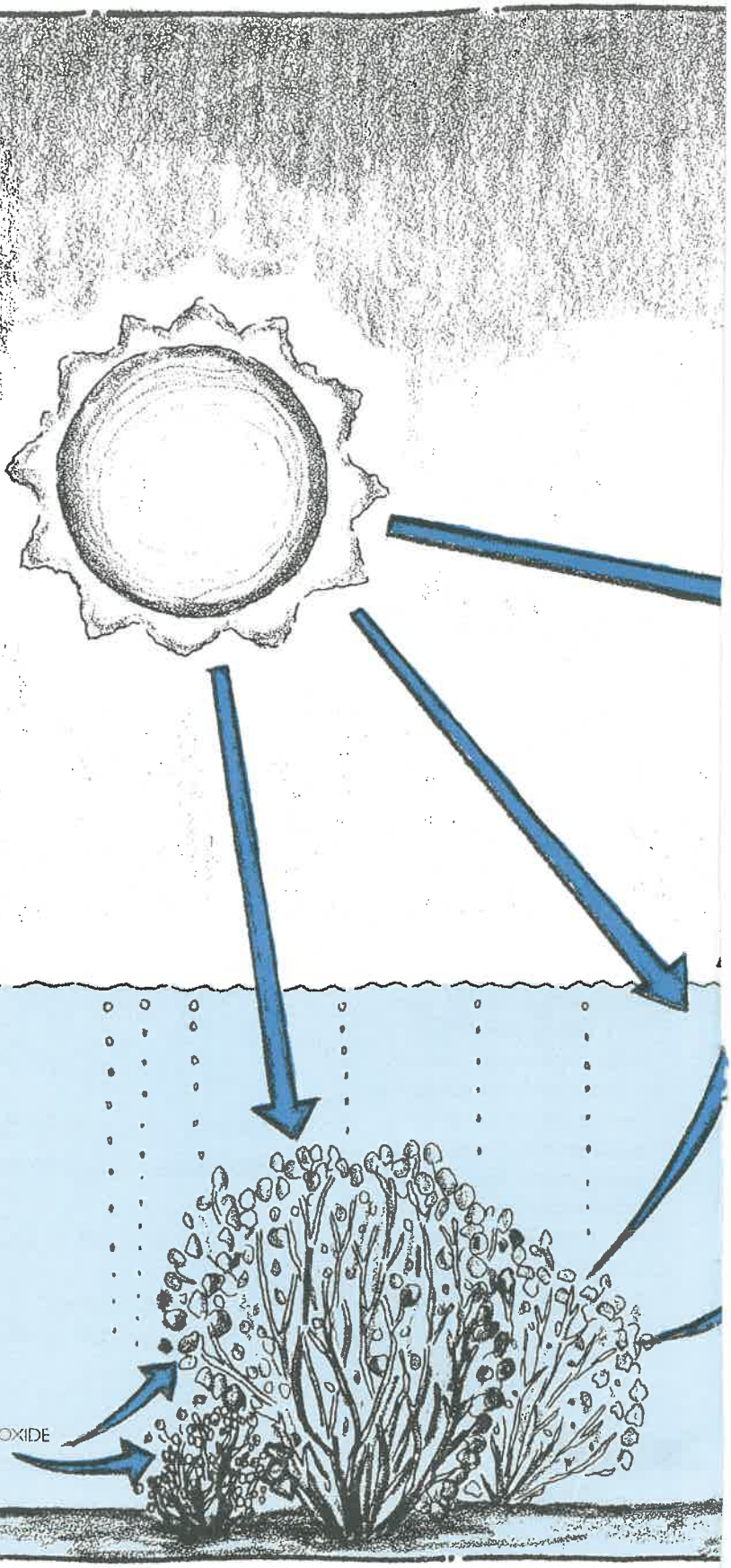
2. _____

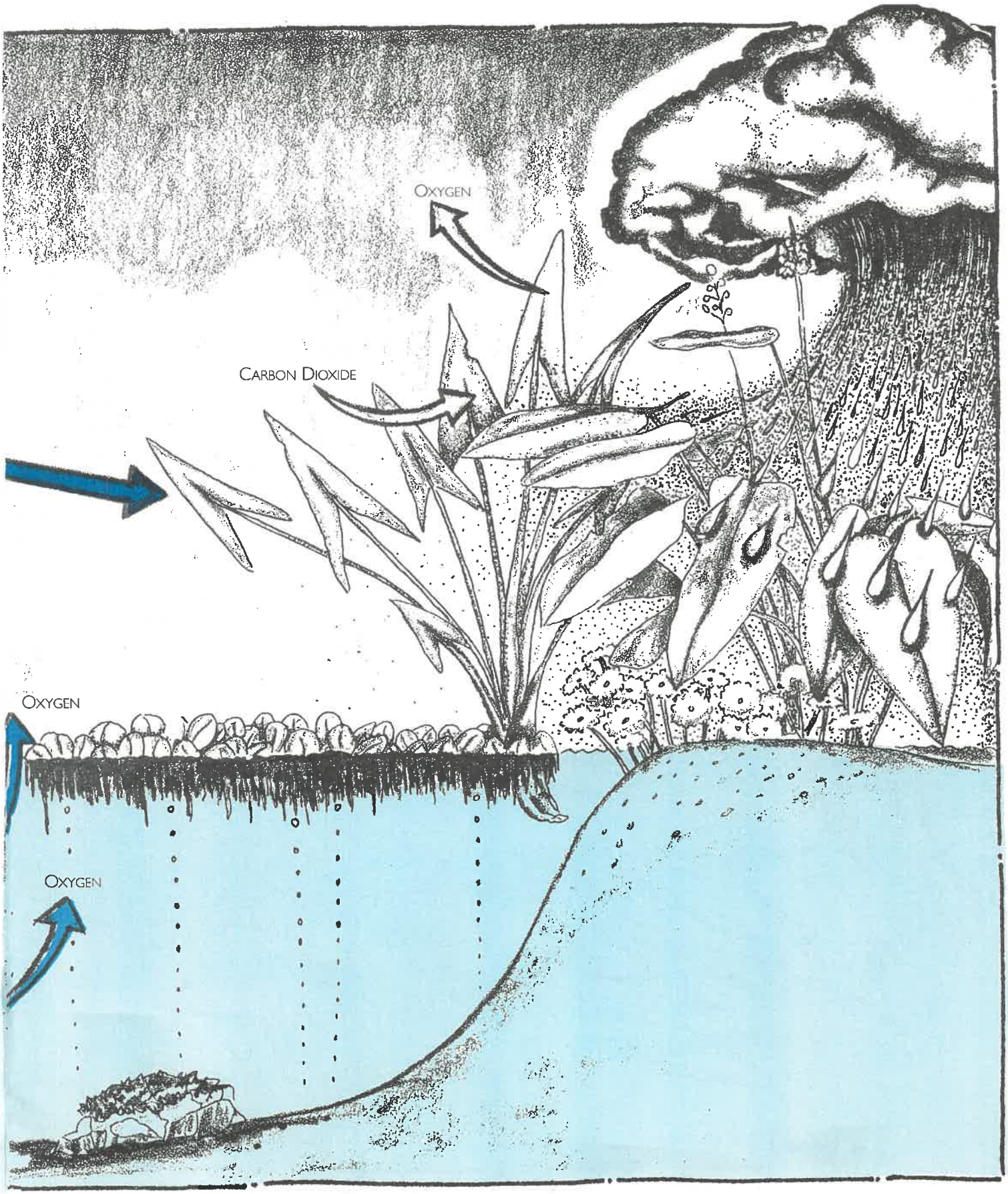
3. _____

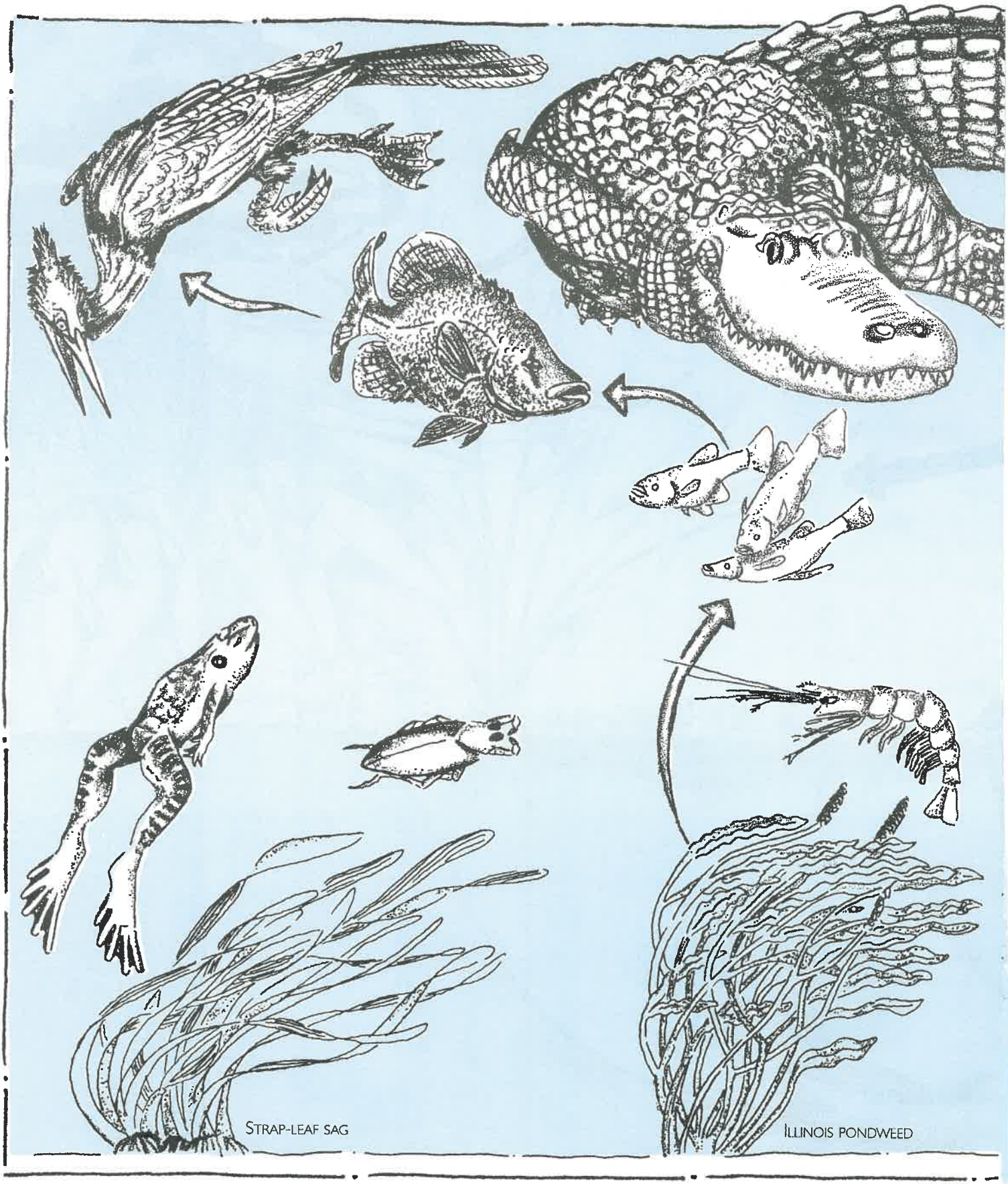
Plants that grow on land get their carbon dioxide from the air. Plants that grow underwater are able to get carbon dioxide (or bicarbonates) out of the water.

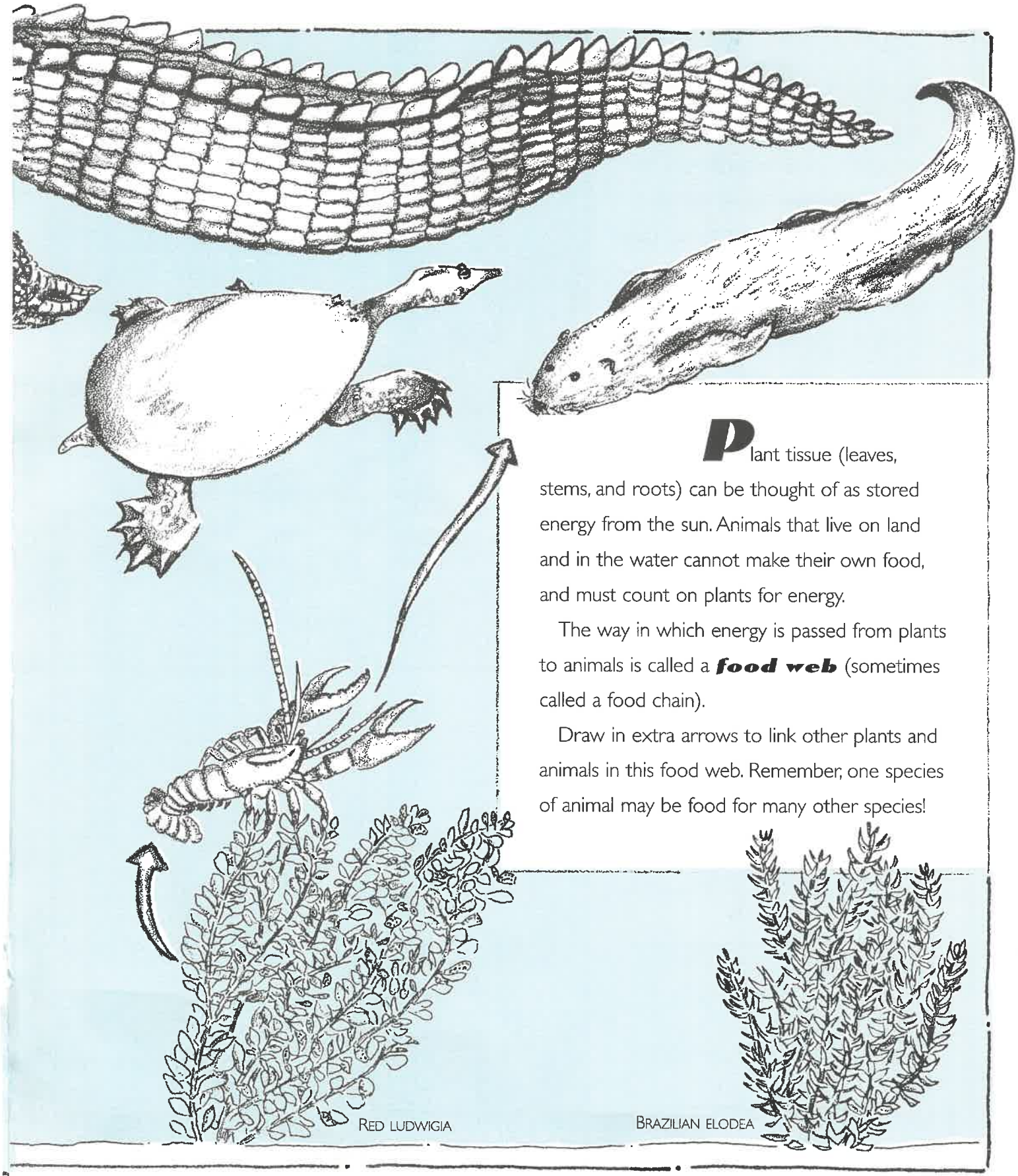
When underwater plants make their own food, they release into the water something that can be used by animals. What is it?

4. _____




OXYGEN
CARBON DIOXIDE
OXYGEN
OXYGEN


STRAP-LEAF SAG
ILLINOIS PONDWEED



Plant tissue (leaves, stems, and roots) can be thought of as stored energy from the sun. Animals that live on land and in the water cannot make their own food, and must count on plants for energy.

The way in which energy is passed from plants to animals is called a ***food web*** (sometimes called a food chain).

Draw in extra arrows to link other plants and animals in this food web. Remember, one species of animal may be food for many other species!

Plants and animals that share the same non-living (or physical) environment make up an ***ecosystem***. The air that surrounds us and the land that we stand on is part of our non-living environment.

A lake or river can be called an ecosystem, and so could an aquarium or fishbowl.

Plants and animals in an ecosystem affect each other, and also affect their non-living environment. In the ecosystem below, how do plants affect their non-living environment (the water)?

1. _____

_____

_____

2. _____

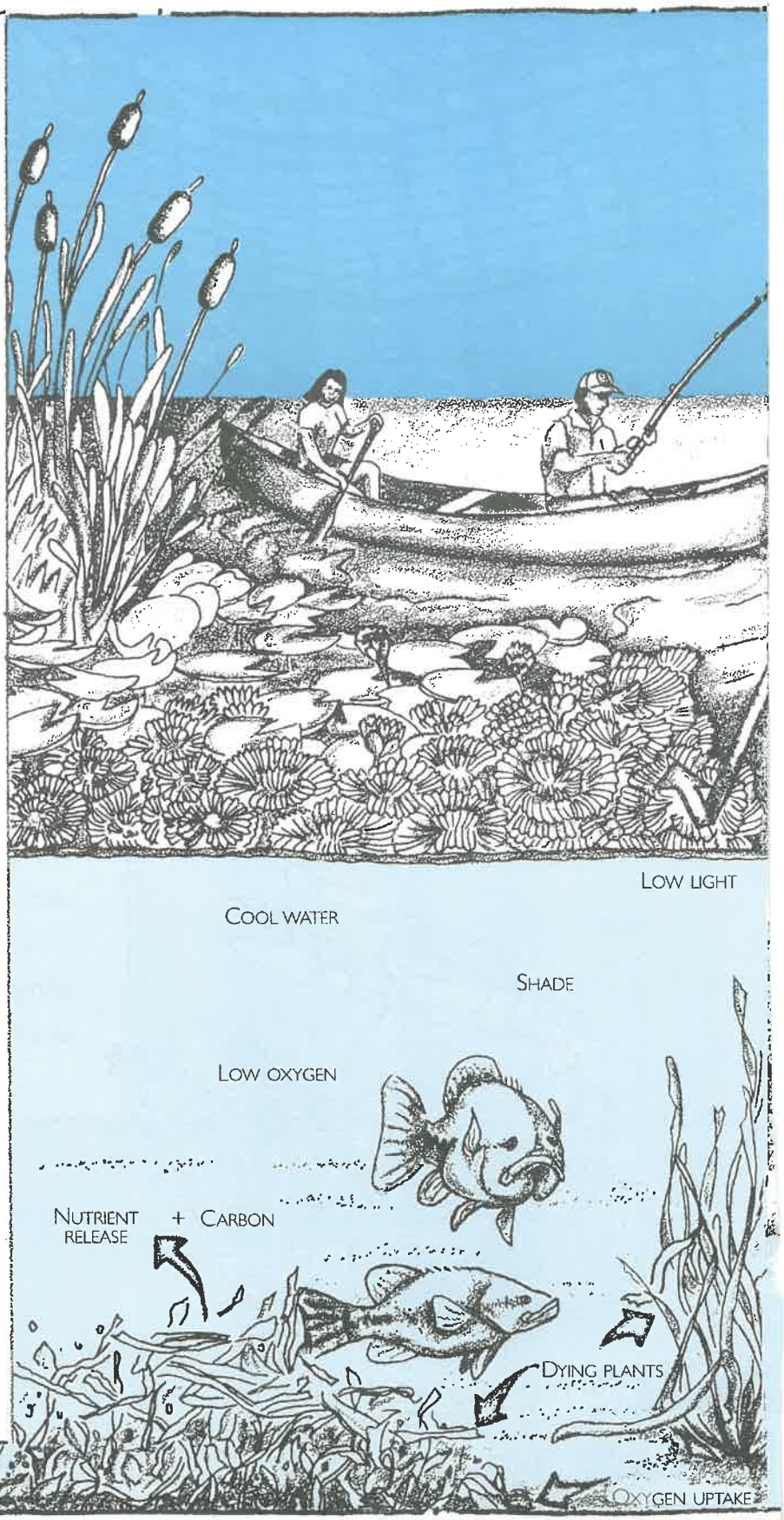
_____

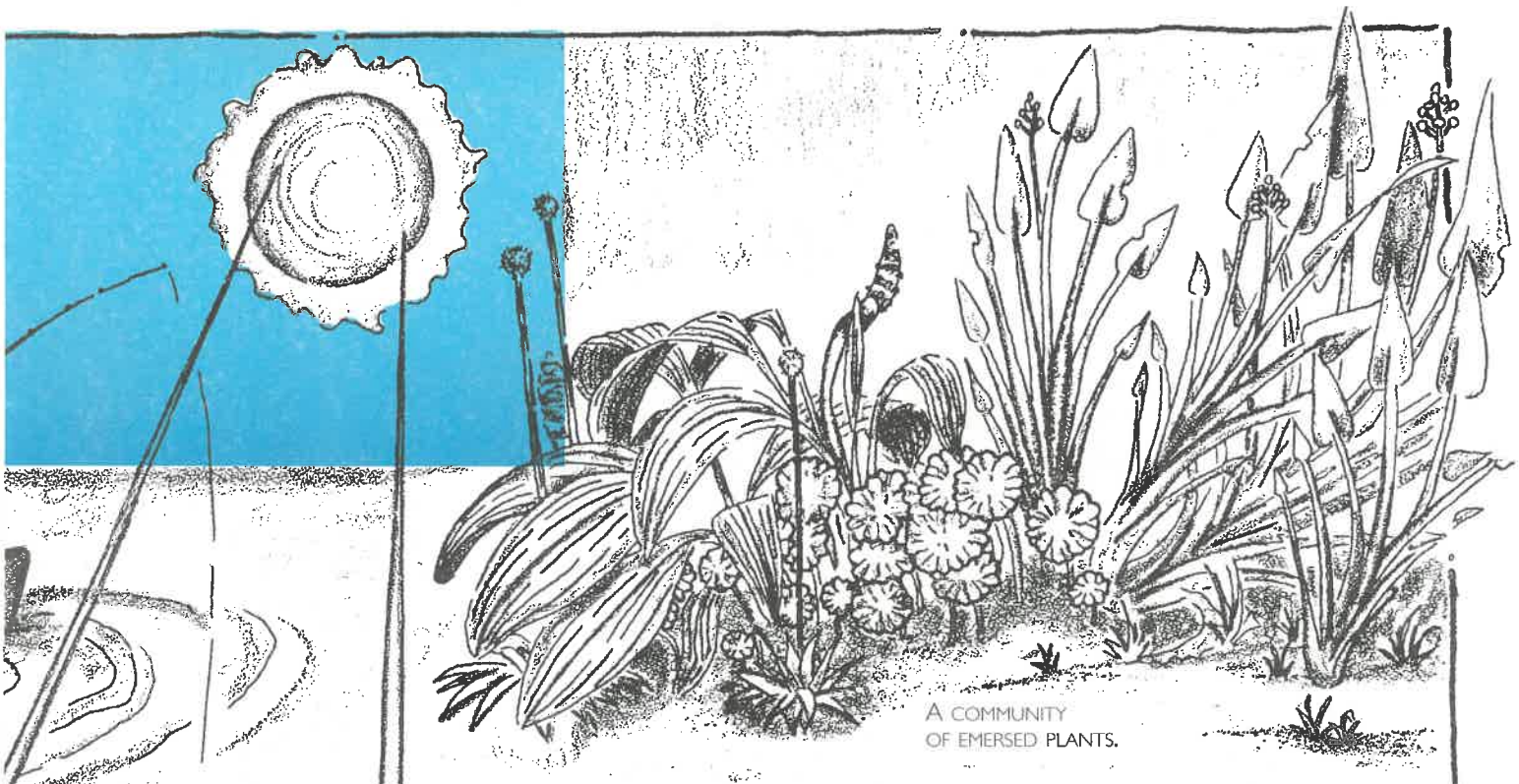
_____

3. _____

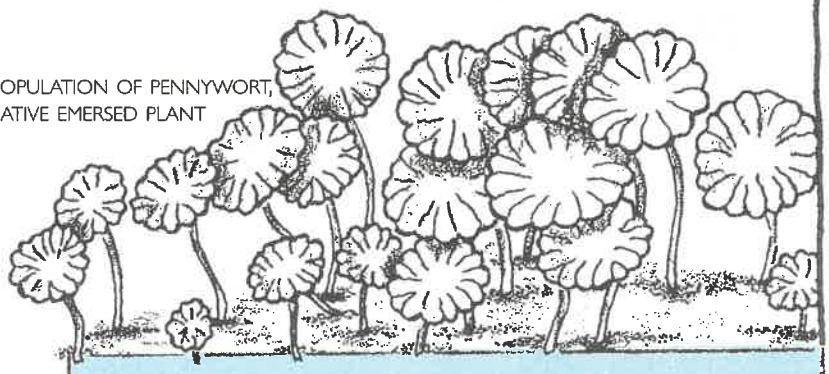
_____

_____

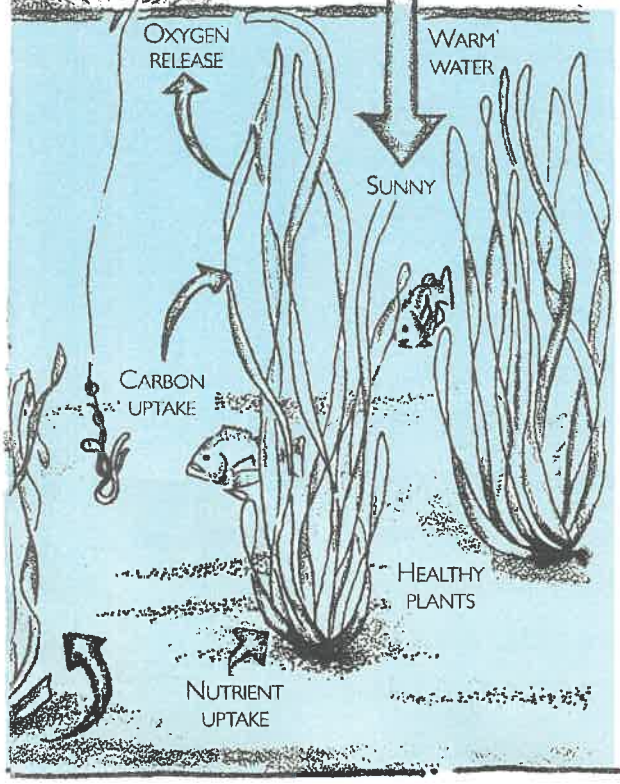




A COMMUNITY OF EMERSED PLANTS.

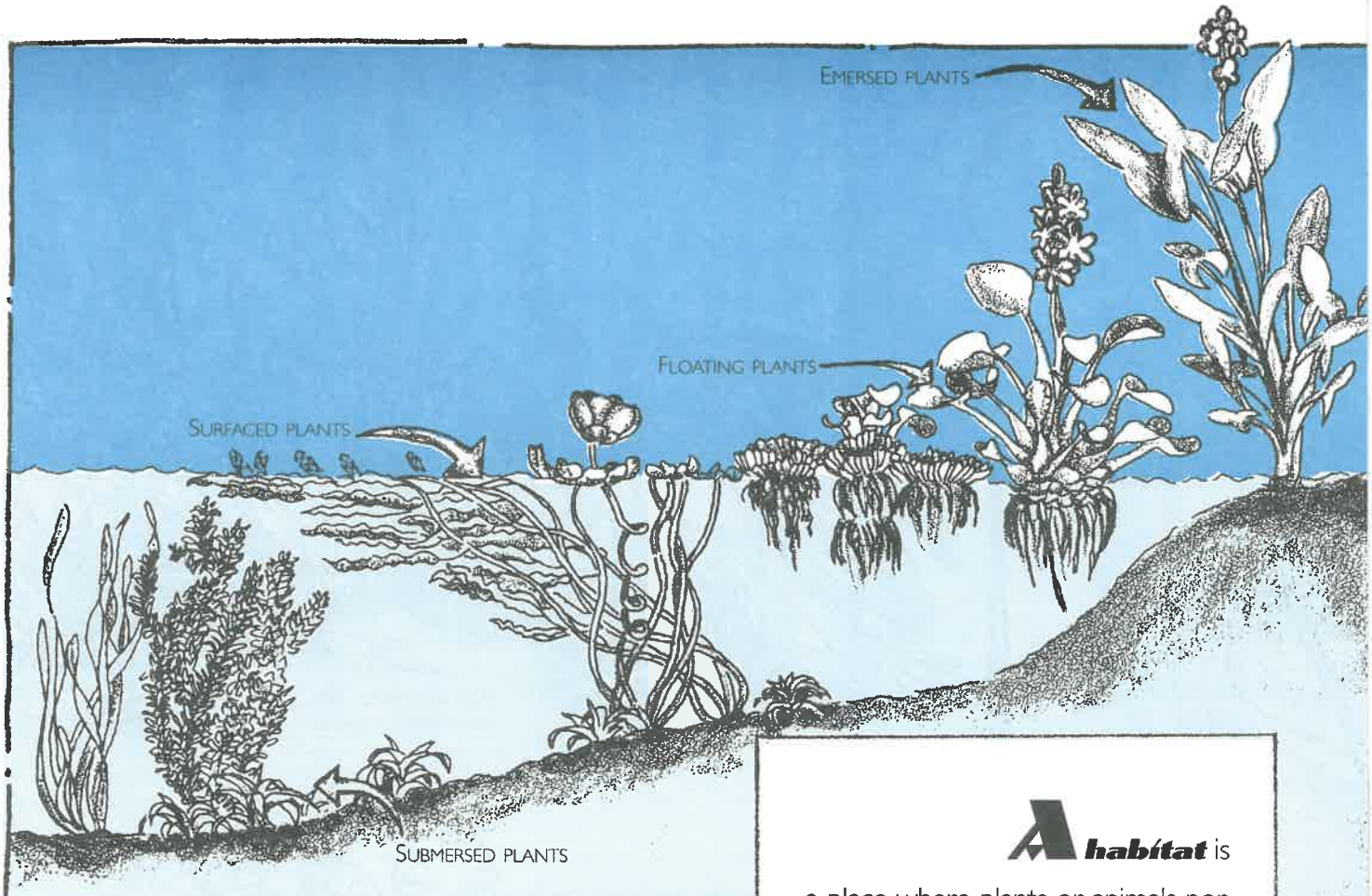


A POPULATION OF PENNYWORT, A NATIVE EMERSED PLANT



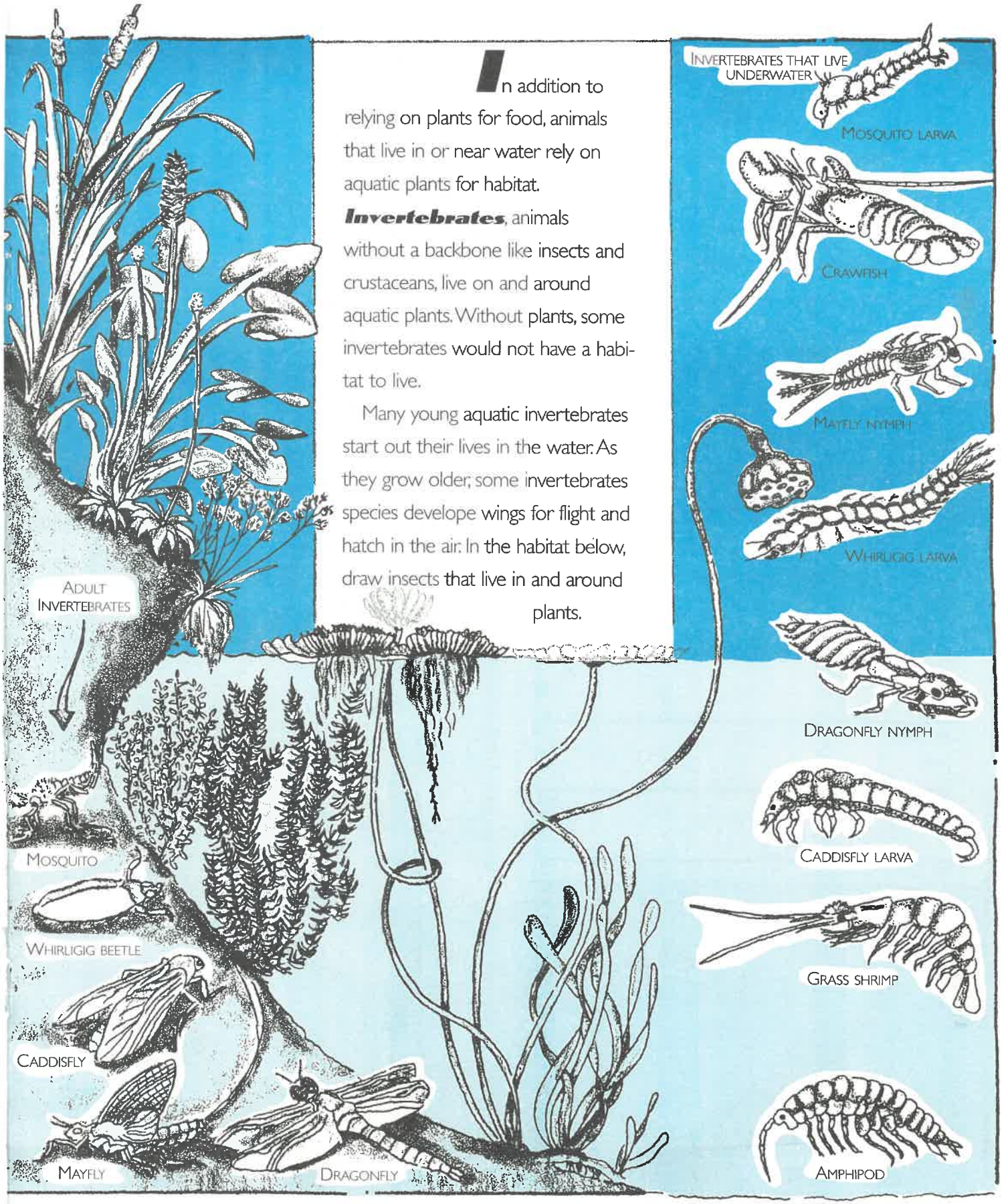
Plants (and animals) of the same species make up a ***population*** in an ecosystem.

A plant ***community*** is made up of all plant populations in a lake or river. Find and circle the pennywort population in this plant community. How many other plant populations are there?



A *habitat* is a place where plants or animals normally live. Some plants grow completely underwater (submersed) and other plants grow out of water (emersed). Some plants even spend their entire lives floating on top of the water.

Certain plants grow best in a flowing water, like a river, and other plants do well in still water, like a swamp. In the space to the left, sketch a habitat near your home that has aquatic plants in it. Label the plants that are floating, submersed and emersed.


In addition to relying on plants for food, animals that live in or near water rely on aquatic plants for habitat. **Invertebrates**, animals without a backbone like insects and crustaceans, live on and around aquatic plants. Without plants, some invertebrates would not have a habitat to live.
Many young aquatic invertebrates start out their lives in the water. As they grow older, some invertebrates species develope wings for flight and hatch in the air. In the habitat below, draw insects that live in and around plants.
INVERTEBRATES THAT LIVE UNDERWATER
MOSQUITO LARVA
CRAWFISH
MAYFLY NYMPH
WHIRLIGIG LARVA
DRAGONFLY NYMPH
CADDISFLY LARVA
GRASS SHRIMP
AMPHIPOD
ADULT INVERTEBRATES
MOSQUITO
WHIRLIGIG BEETLE
CADDISFLY
MAYFLY
DRAGONFLY

Aquatic plants and the invertebrates living around them attract larger, more complex animals. Fish, reptiles, amphibians, birds and mammals are animals with a backbone, called **vertebrates**. Different kinds of plant communities attract different species of vertebrates.

How many vertebrates do you see in this picture? Label all of the vertebrates by group. Remember: the large groups are fish, birds, mammals, reptiles and amphibians.

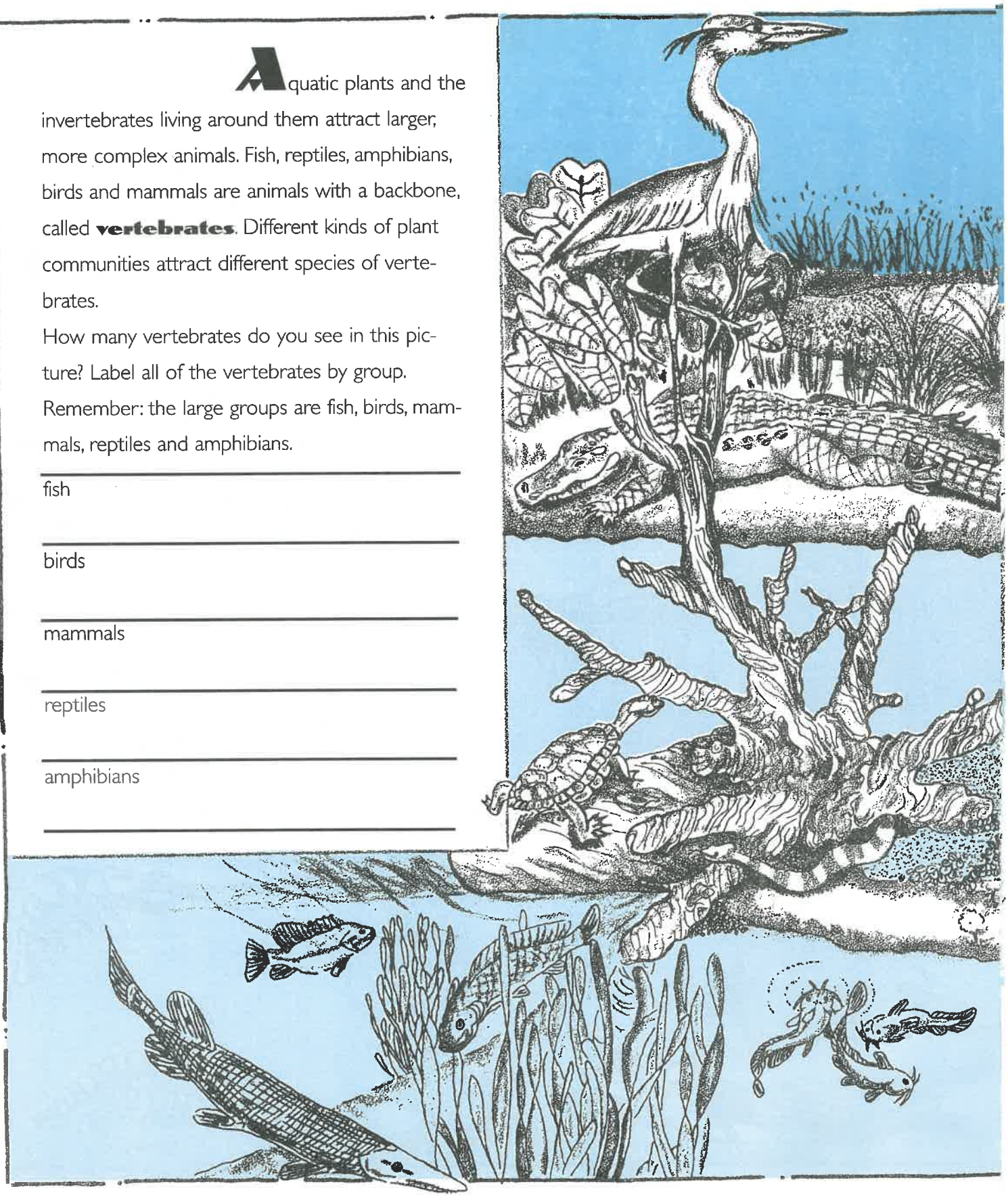
fish

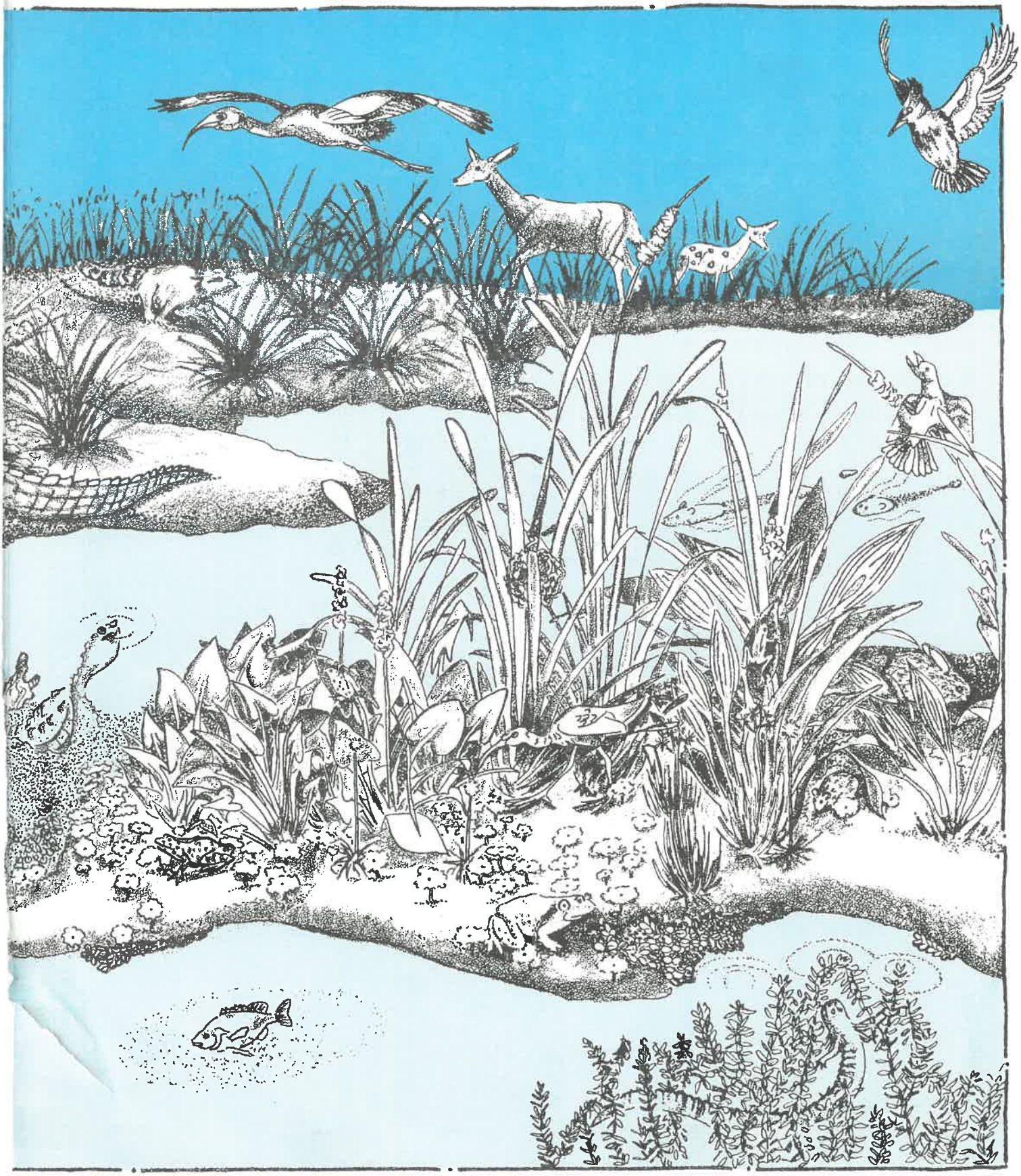
birds

mammals

reptiles

amphibians



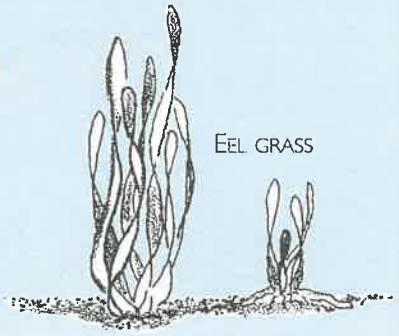


Plants that have been living in Florida's lakes, rivers, and wetlands for hundreds of years are called ***native***. Plants that are not native to Florida are called ***exotic***. Exotic plants were brought to Florida from other continents like Asia, Africa and South America.

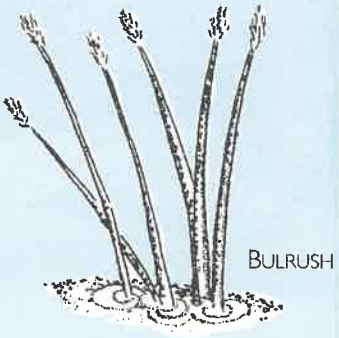
Below are some common native and exotic plants found in Florida's lakes, rivers and wetlands. In the space provided, draw and label two plants found in your favorite aquatic habitat.

Native Aquatic Plants


Pickerelweed

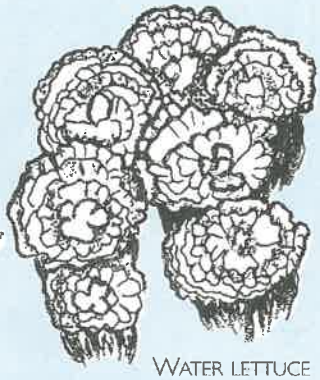

Eel grass


Fanwort


Bulrush

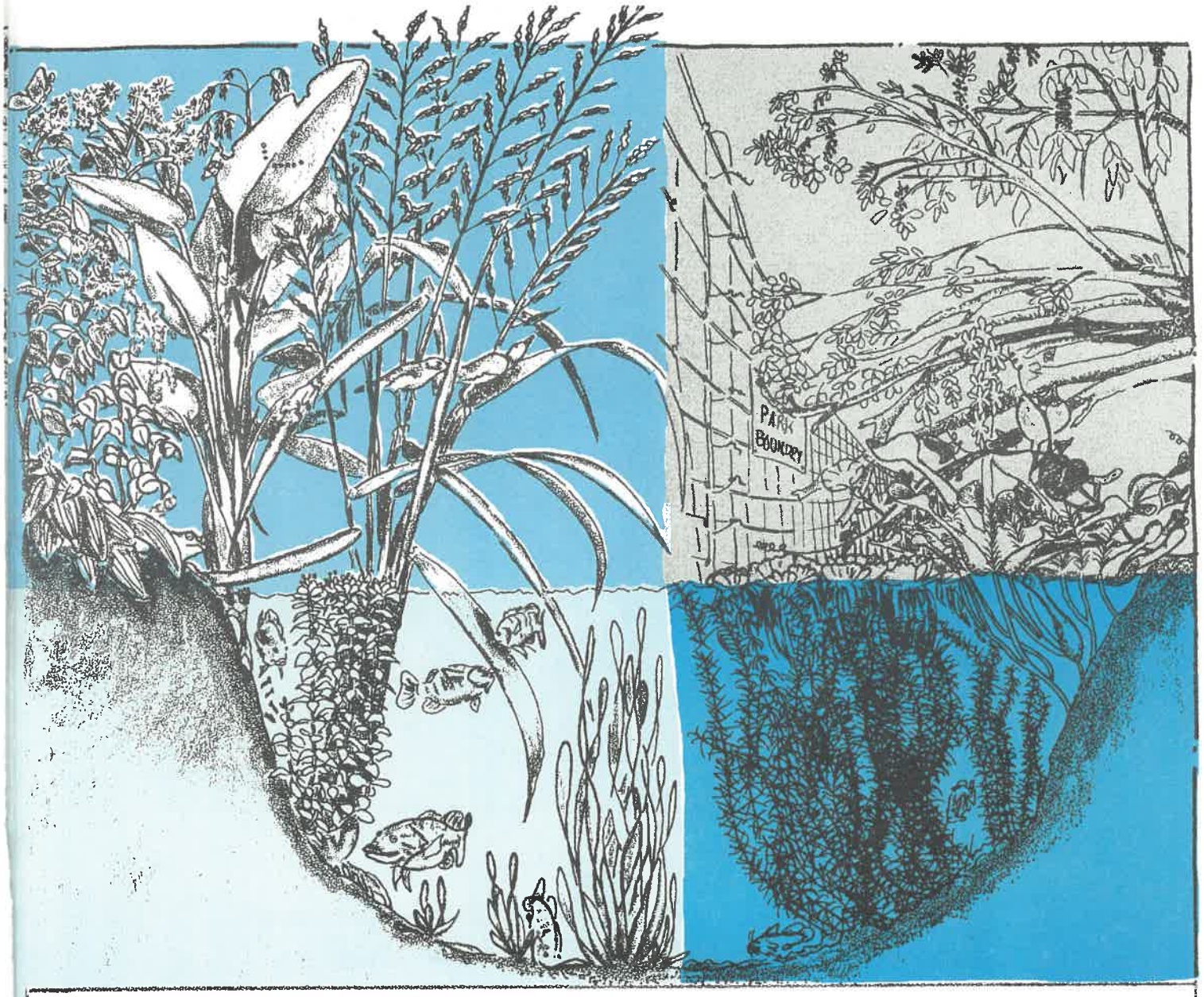
Exotic Aquatic Plants


Melaleuca


Water lettuce


Hydrilla

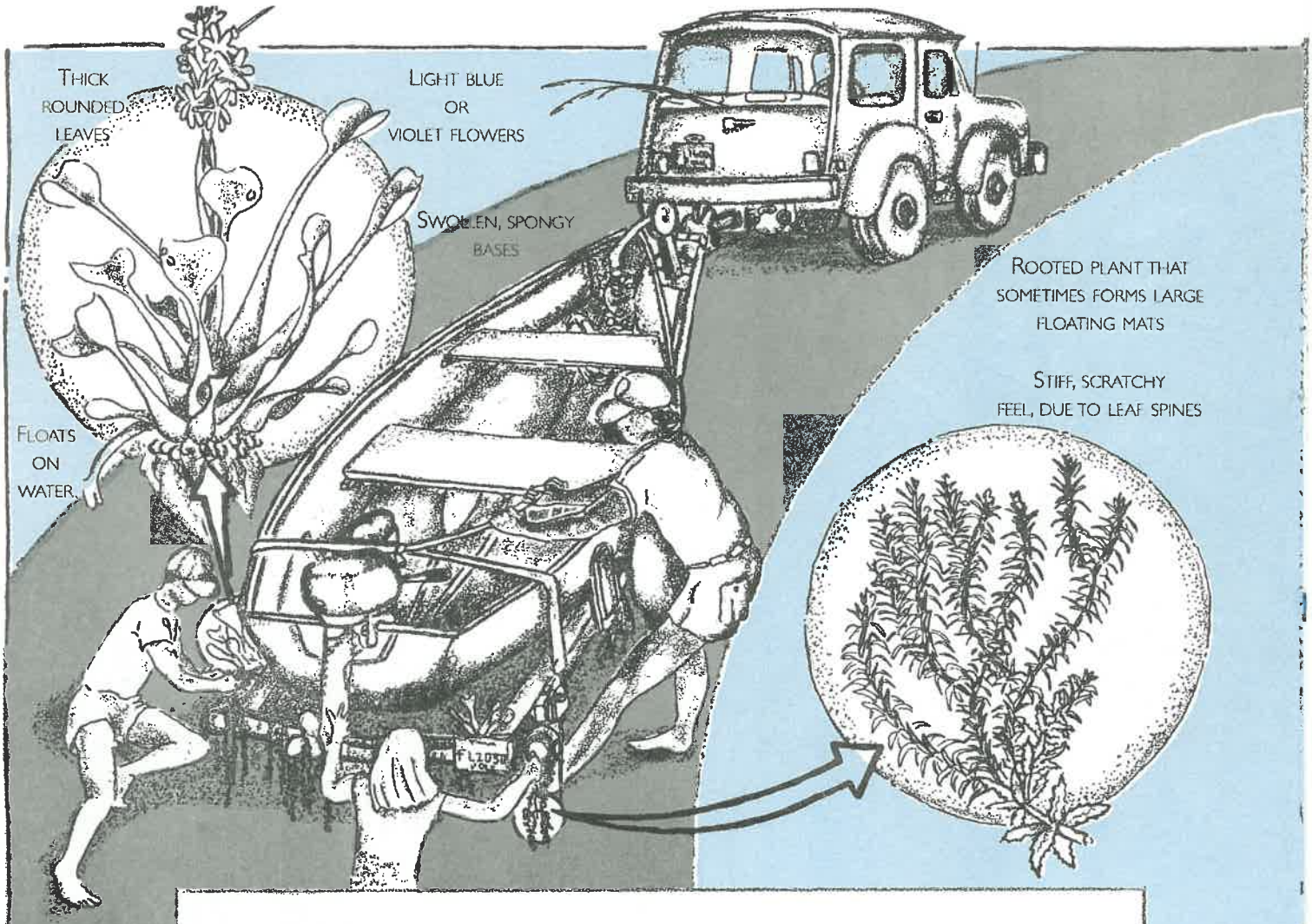

Waterhyacinth



Although plants of all different species make up habitat for invertebrate and vertebrate animals, exotic plants are not wanted in Florida's waters. Many exotic plants grow very well in Florida and usually take over areas where native plants live.

Most animals that live in native plant habitats are less common in exotic plant habitats. Exotic plants can reduce fish and wildlife populations.

In addition to harming fish and other vertebrates, what are some other ways that exotic plants affect swimmers and boaters?



"How can I help stop the spread of exotic plants?" After boating with your parents, make sure all plants are removed from the boat, motor and trailer. Small pieces of plant stuck on a trailer can live for weeks, and may be moved to another lake or river. Often, this is how exotic plants start in Florida waters.

Second, never empty your home or school aquarium into a lake, river or wetland. Many aquarium plants sold in pet stores are exotic.

What are the names of the two exotic plants being removed from the boat trailer?

1. _____ 2. _____

Aquatic Plant Word Search

Find these words hidden in the wetland:
photosynthesis, food web, ecosystem, population, community, habitat, invertebrate, vertebrate, native, exotic. Words can be across, down or diagonal.

S D R N Z U D N N C A X Y O H T
Y C T I N O I A I U Q W B A C V
F O O D W E B T P G U Z Y X X D
L M C V H E O I R K E Q D O A I
N M O V E X P V B N O E E S C I
Q U H G E X H E O Y Q V J U I C
Q N M C X R O I C F S N Q R B B
E I N V E R T E B R A T E D U N
G T Y Z O A O E C M F F Z R V R
L Y K P L R S F B O V I P E B X
F V D U A J Y M F R S H Y Q T I
C E P N I W N L S V A Y Z A X T
Y O B Q N L T L P C O T S O A H
P U S Z N T H O Y X E L E T S Q
K O L Y H Z E E Y Z V L I B E X
O Z S B X N S D H A O B B I Q M
H P L M K E I N O J A W F C W E
D R Y R J O S Z V H V D O D F Z

Key

pages 2 and 3

1. light from the sun
2. air or water containing carbon dioxide gas
3. water
4. oxygen

pages 4 and 5

Important! The arrows on these pages are only examples of how energy can be passed from plants to animals. Many more combinations exist. Check with your teacher to see if your arrow placements are correct.

pages 6 and 7

1. Growing plants take up nutrients and carbon dioxide, and also release oxygen.
2. Dying plants release nutrients and carbon, and also take up oxygen.
3. Floating plants provide shade and reduce water temperature.

page 10 and 11

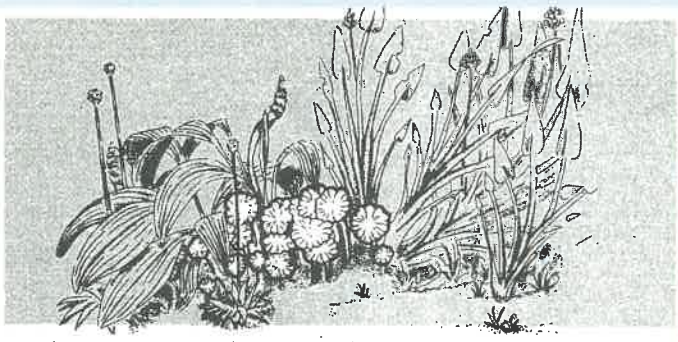
Fish: 1. largemouth bass; 2. spotted gar; 3. bowfin or mudfish; 4. madtom catfish; 5. redbreast sunfish.

Birds: 6. great blue heron; 7. white ibis; 8. belted kingfisher 9. king rail; 10. red-winged blackbird.

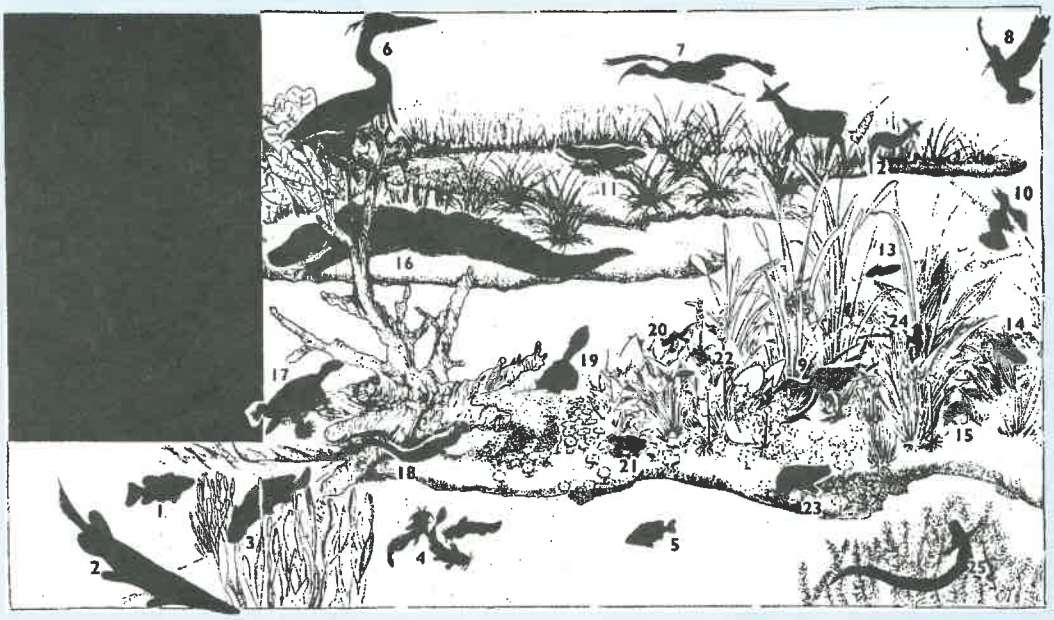
Mammals: 11. raccoon; 12. white tailed deer; 13. otter; 14. marsh rabbit; 15. cotton rat.

Reptiles: 16. alligator; 17. yellow-bellied terrapin; 18. cottonmouth moccasin; 19. snapping turtle; 20. green anole.

Amphibians: 21. leopard frog; 22. barking tree frog; 23. bullfrog; 24. green tree frog; 25. greater siren



A pennywort population in a plant community (page 7).



page 13

Exotic plants can smother lakes and rivers making boat navigation difficult and swimming unpleasant.

page 14 and 15

1. waterhyacinth -- a floating exotic plant.
2. hydrilla -- a submersed exotic plant.

S D R N Z U D N N C A X Y O H T
Y C T I N O I A I U Q W B A C V
F O O D W E B T P G U Z Y X X D
L M C V H E O I R K E Q D O A I
N M O V E X P V B N O E E S C I
Q U H G E X H E O Y Q V J U I C
Q N M C X R O I C F S N Q R B B
E I N V E R T E B R A T E D U N
G T Y Z O A O E C M F F Z R V R
L Y K P L R S F B O V I P E B X
F V D U A J Y M F R S H Y Q T I
C E P N I W N L S V A Y Z A X T
Y O B Q N L T L P C O T S O A H
P U S Z N T H O Y X E L E T S Q
K O L Y H Z E E Y Z V L I B E X
O Z S B X N S D H A O B B I Q M
H P L M K E I N O J A W F C W E
D R Y R J O S Z V H V D O D F Z

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