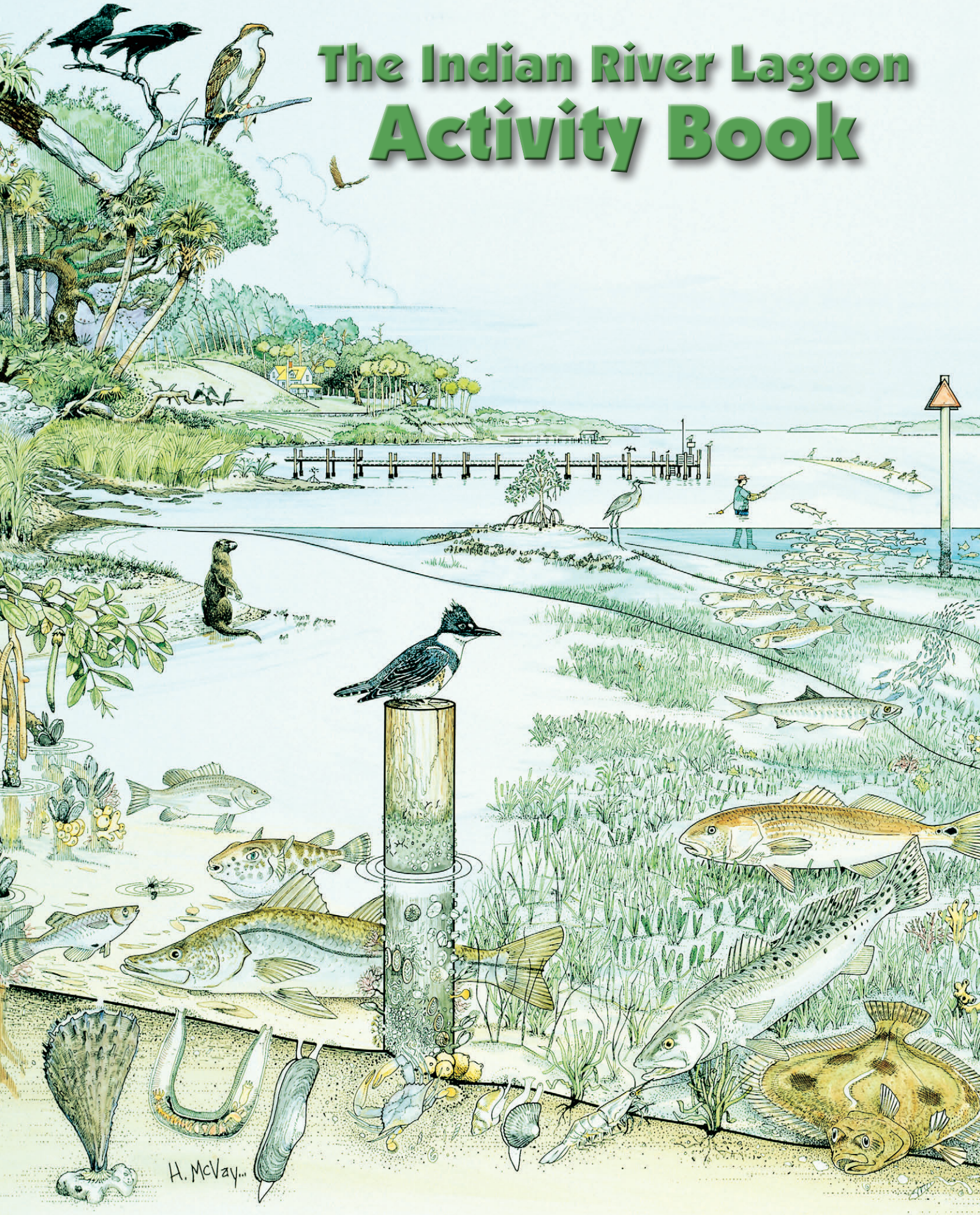
The Indian River Lagoon Activity Book



Dear parents and educators,

Question: What is 156 miles long, crosses six counties, has trees on stilts and underwater meadows, and contains more than 4,300 kinds of plants and animals?

Answer: The Indian River Lagoon.

What does the Indian River Lagoon mean to you? A place to escape to on weekends, a cool breeze, something that needs to be crossed to go to the beach, or a livelihood?

When asked what the lagoon meant to them, excited students raised their hands and exclaimed, "Jet skiing, boating, manatee watching, clamming and taking fishing trips with mom and dad."

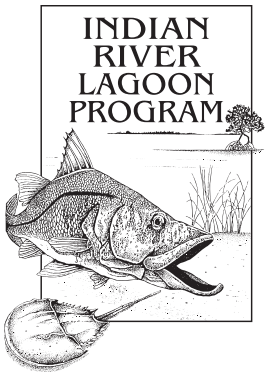
The lagoon is an important part of many people's lives. However, the delicate balance of life that exists along the shoreline and underwater goes unnoticed by the majority of people using the lagoon. This delicate balance of life which makes the lagoon so productive is being threatened by pressures from Florida's increasing population. The purpose of this activity book is to help young people gain a better understanding of the Indian River Lagoon and the interdependence of its plants and animals. Knowledge of its valuable resources is vital, for our young people will soon be the ones managing it.

Please take time to explore this activity book with your children. Let your children share with you the new knowledge they have gained. Their excitement is contagious!

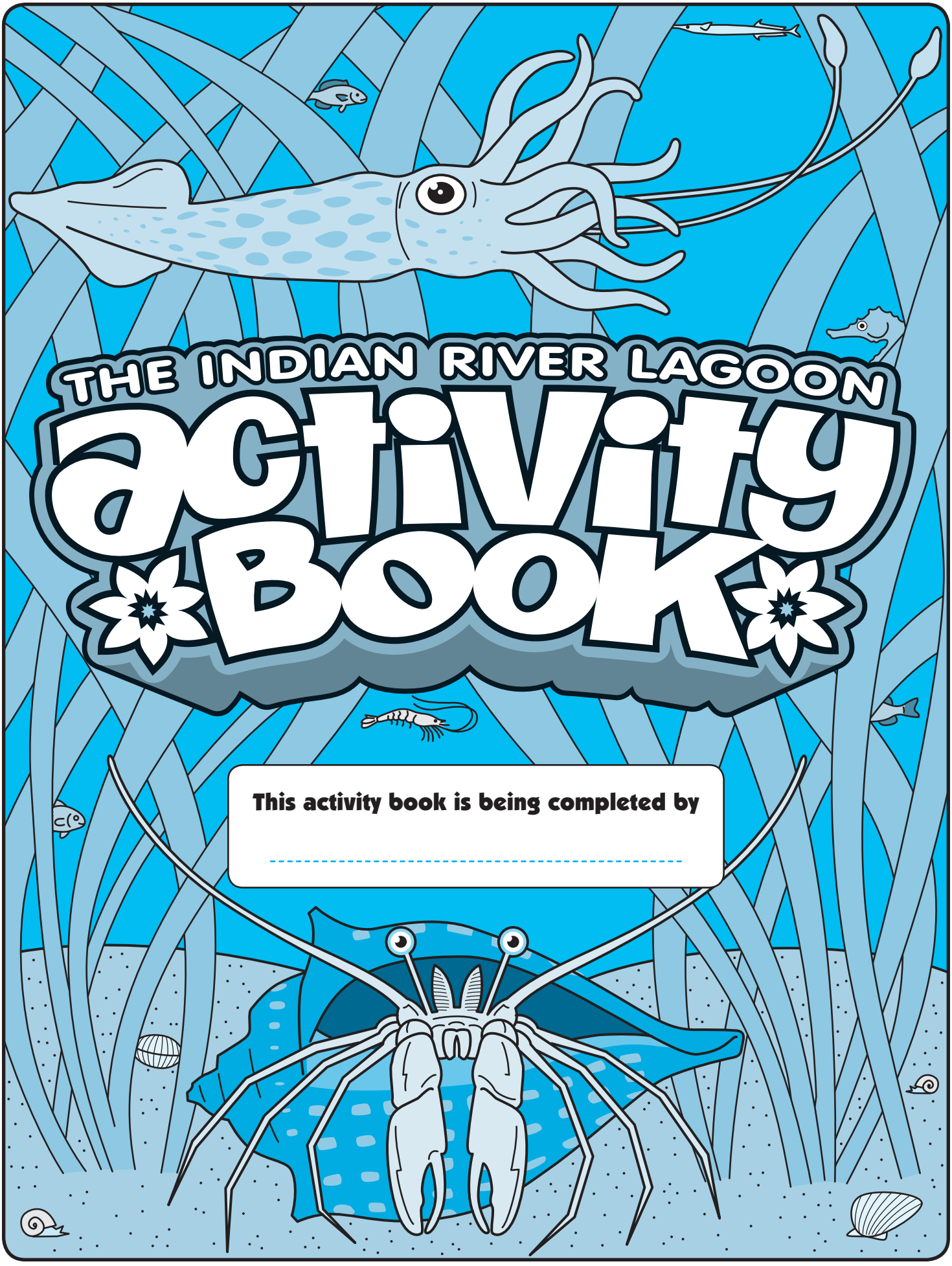
> *If a child is to keep alive his inborn sense of wonder ... he needs the companionship of at least one adult who can share it, rediscovering with him the joy, excitement and mystery of the world we live in.*
>
> – Rachel Carson
> *Silent Spring*

Sincerely,

St. Johns River Water Management District
Office of Communications and Intergovernmental Affairs



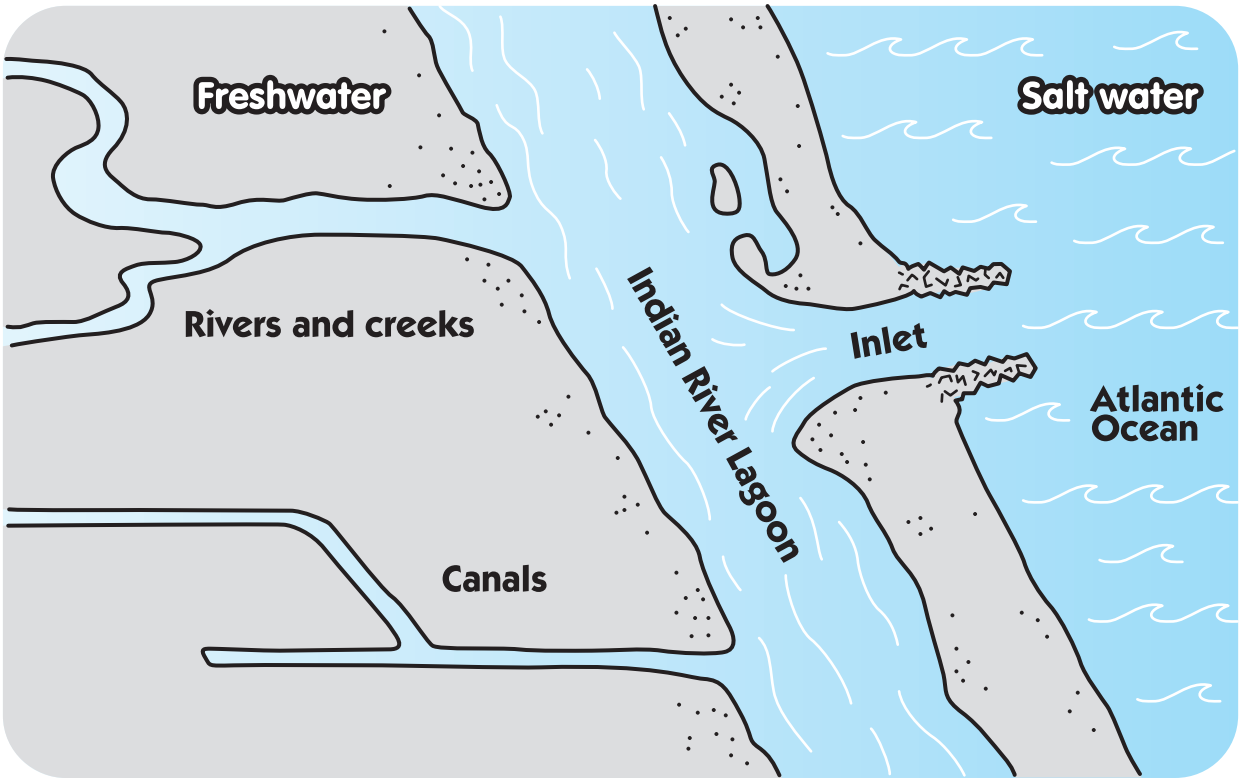
These materials were originally developed by the Florida Department of Natural Resources, now the Florida Department of Environmental Protection, in cooperation with the St. Johns River and the South Florida water management districts.


THE INDIAN RIVER LAGOON
activity
BOOK
This activity book is being completed by

The Indian River – An Exceptional Lagoon

That is quite a title, but the Indian River is quite a place. By studying this unit, you will learn why the Indian River is an exceptional, or special, lagoon and how you can preserve and protect this fragile **coastal** resource.

The Indian River is not really a river. The Indian River is actually a **lagoon** – a shallow body of water protected from the ocean by **barrier islands**.

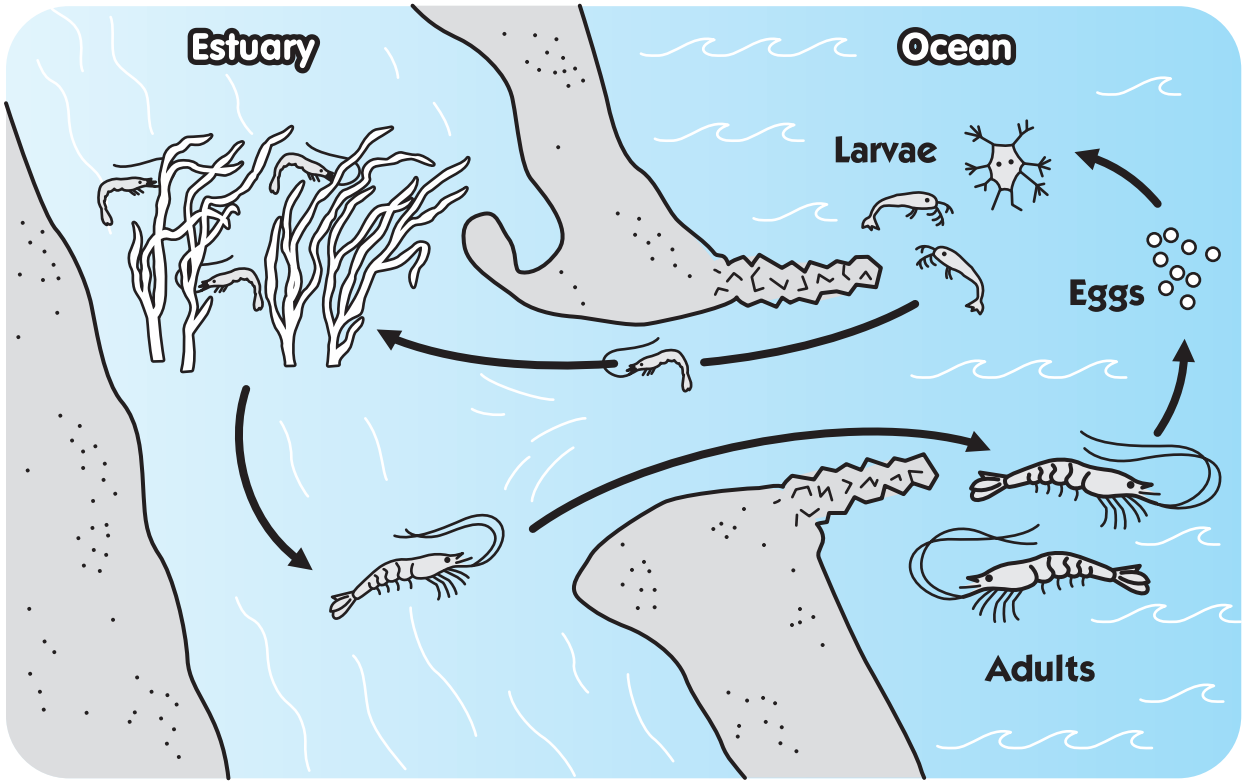


The Indian River Lagoon is also an **estuary**. An estuary is a body of water where fresh and salt water meet and mix. Freshwater enters the estuary through rivers, creeks and canals. Salt water enters from the ocean through **inlets**, or narrow openings between barrier islands.

Estuaries are full of life, and the Indian River Lagoon is no exception. The lagoon mangroves, marsh grasses and seagrasses provide food and shelter for a large variety of **organisms**. More than 4,300 **species** of plants and animals live in the Indian River Lagoon. One-third of all manatees in the United States make their home in the lagoon.

Many of the fish, shrimp and **shellfish** (for example, clams and oysters) that are important to Florida's economy must spend part of their lives in an estuary.

Shrimp, for example, **spawn**, or produce eggs, offshore as adults. The eggs hatch in the ocean and the **larvae** move toward shore. The young shrimp that survive this hazardous journey from the sea enter the estuary and hide among the seagrasses and **algae**. As the shrimp become adults, they leave the estuary and return to the sea, where the cycle begins again.



Striped mullet have a similar **life cycle**. Adults spawn offshore and young **(juvenile)** fish move into the estuary. In the winter they gather in groups called schools and return to the ocean to spawn. During this journey they become food for birds and ocean fish. Thus, the benefits of the estuary are far reaching.

In fact, the value of estuaries has reached all the way to Washington, D.C. Congress has declared it is in our nation's best interest to protect and preserve our estuaries — an important but **threatened** resource.

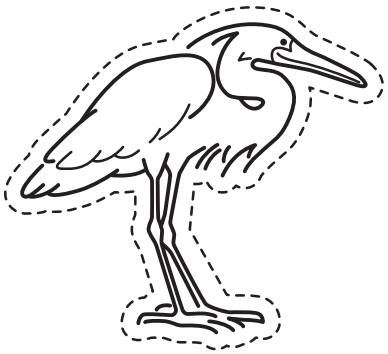
We are fortunate indeed to live so close to a beautiful estuary like the Indian River Lagoon. There are many different ways we can enjoy the lagoon, such as boating, fishing, bird-watching or viewing a spectacular sunset.

Let's take this opportunity to learn more about the Indian River Lagoon and its inhabitants so we will be able to take better care of it.

Make Your Own Estuary

Materials needed: Scissors, glue and crayons.

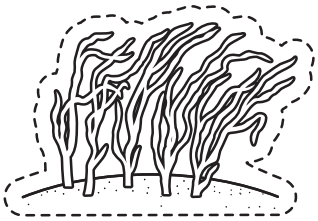
Directions: Cut this page out of the book. Cut out each plant, animal and environment. Glue each picture where it belongs on the next page. Color your estuary.



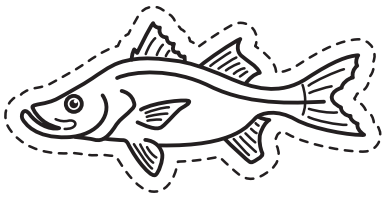
great blue heron

pelican

algae

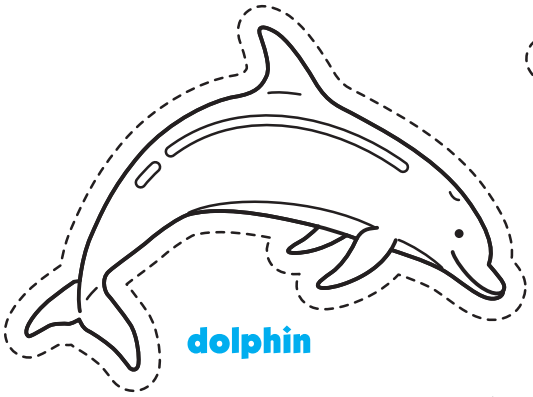


seagrass

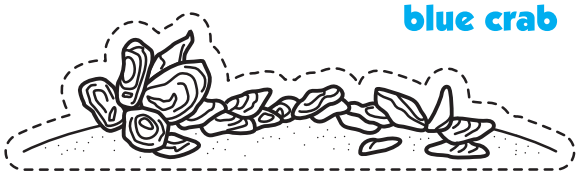


snook

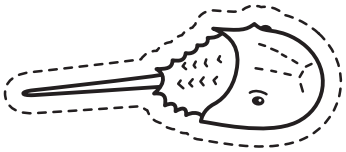
blue crab



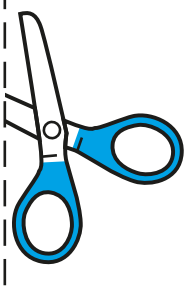
dolphin



oyster bar

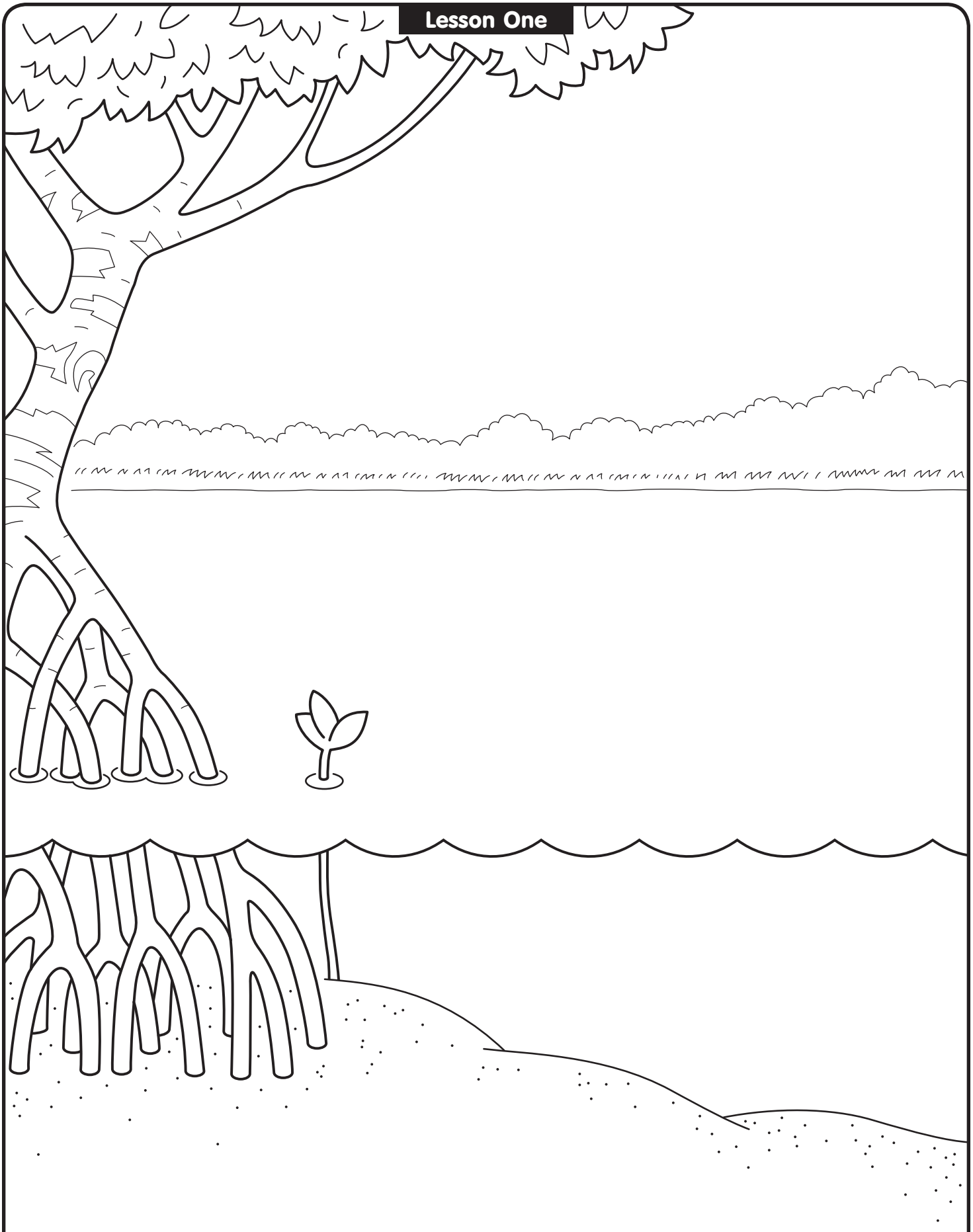


horseshoe crab



marsh grass

spoil island



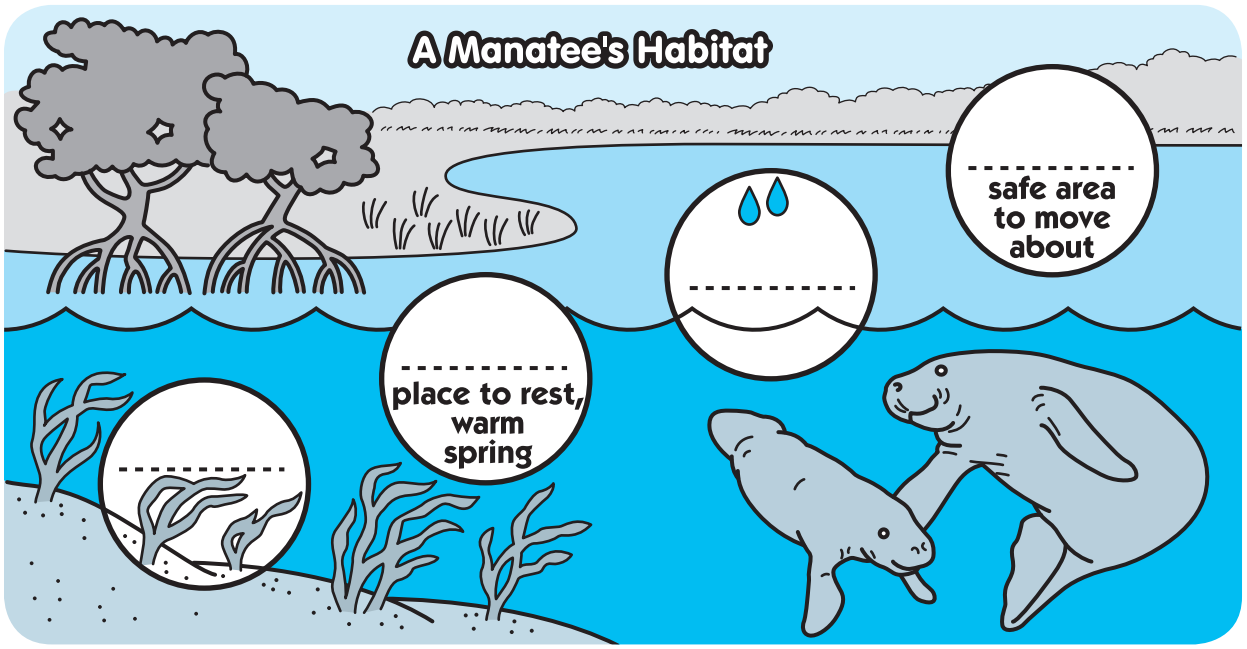
Habitat, Sweet Habitat

Humans require several basic things in order to live. Write down what you think these are.

Need	Where you find it
Example: Water	Well, lake, river

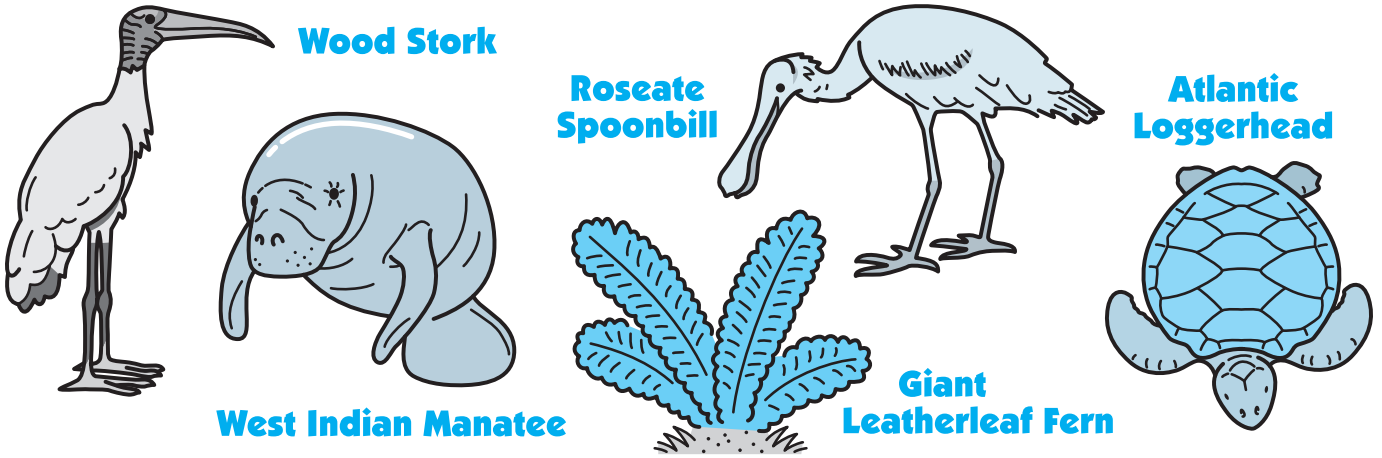
Other organisms have many of the same requirements. Plants and animals find what they need in their habitat. A **habitat** is the area where an organism is supplied with food, water, shelter and space.

The picture below shows what a manatee needs in its habitat. If one of the parts is missing, the manatee cannot survive. To help animals and plants, we need to first protect their home.



Directions:
Fill in the blank in each circle by matching each drawing or definition with the following words: **food, water, shelter, space**.

These are a few of the plants and animals in Florida that are listed as endangered or threatened. This means there are not many of them left. They are threatened by extinction. **Extinction** is when an entire type of animal or plant no longer exists — it has been lost forever.



Florida has more endangered and threatened animals and plants than any other state. In the Indian River Lagoon, 36 species are rare and endangered. The main reason is loss of habitat.

The natural habitat of many animals and plants is rapidly disappearing in Florida. Much of the loss happens when land is cleared for industry and houses.

Two important habitats in the Indian River Lagoon are declining. The Florida Department of Environmental Protection estimates that the lagoon has lost approximately 80 percent of its mangroves and 30 percent of its seagrass beds.

By learning more about the lagoon's habitats, how they are important and what affects them, we will be better equipped to protect them.

WHAT IF?

Directions: What would happen to manatees if different parts of their habitat were affected? Write down your ideas and then discuss them as a class.

What if people were always trying to approach manatees? (shelter)

What if the seagrass died because the water was cloudy? (food)

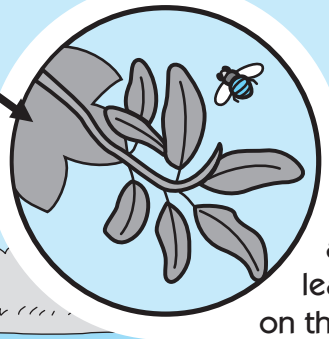
What if the water became polluted with **pesticides**, **herbicides** or other chemicals? (water)

What if there was no quiet place for manatees to rest or feed? (space)

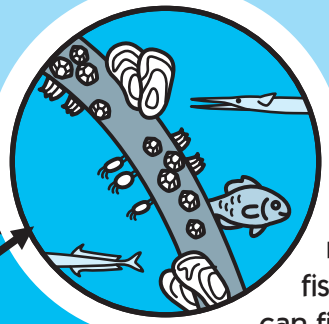
The Marvelous Mangrove

Mangroves grow along the shore of the lagoon and provide valuable habitat for many animals.

Birds nest in the branches or use the trees as a roost to rest.



Mangrove leaves are tough. Not many animals will eat the leaves while they are still on the tree. After the protein-rich leaves fall into water, they start to decay. Decaying mangrove leaves are an important food source for the small fish and other creatures in the lagoon.



The prop roots of the red mangrove provide a **nursery** area to young fish, or a place where they can find shelter from larger fish and find food. The prop roots also provide a place for oysters and barnacles to attach. A mangrove tree is a very busy place!

SEAGRASS SEARCH

Follow these directions until you reach the manatee munching on seagrass.

1. Are seagrasses the same as seaweeds? _____ **Yes** **Go to #12** _____ **No** **Go to #9**

2. **False**. Seagrasses are important for animals and people. **Now go to #11**

3. **True**. The beds of seagrass slow the waves and allow the **sediments** to sink to the lagoon's bottom. Are these thick seagrass beds avoided by juvenile fish and other young animals that grow or live in water? _____ **Yes** **Go to #6** _____ **No** **Go to #8**

4. **False**. In shallow water, boats can be a problem. **Now go to #5**

5. **True**. In shallow water, the propeller from a boat's motor can dig up the seagrasses. The boat may be damaged as well. It is important to avoid shallow seagrass beds. If you cannot avoid them, then drive very slowly and lift the motor. Are seagrass beds important to people? _____ **Yes** **Go to #11** _____ **No** **Go to #2**

6. **False**. Seagrass beds provide a nursery for young animals. **Now go to #8**

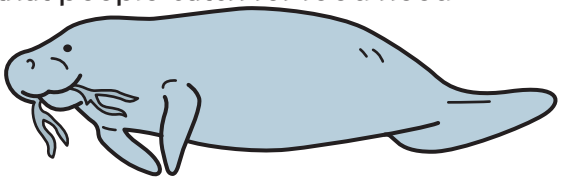
7. **False**. Seagrasses can help keep the water clear. **Now go to #3**

8. **True**. The seagrass beds provide places for the juveniles to hide from larger animals. The seagrasses also provide food. Many people use the lagoon along with the animals. Can boats be a problem for seagrasses? _____**Yes** **Go to #5** _____ **No** **Go to #4**

9. **True**. Seagrasses are flowering plants, unlike seaweeds, which are algae. Segrasses grow in the brackish (salty) waters of the Indian River Lagoon. Rainwater that runs too quickly off farms, roads and towns carries a lot of sediments (soil and other particles) into the Indian River Lagoon. These sediments make the water turbid, or cloudy. When the water is turbid, is this good for the seagrass? _____ **Yes** **Go to #10** _____ **No** **Go to #13**

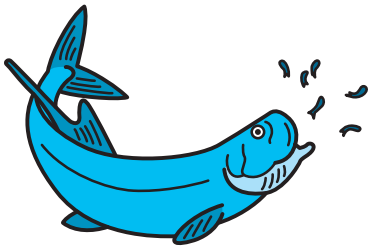
10. **False**. If the water is very turbid, it can kill the seagrass. **Now go to #13**

11. **True**. Most of the fish, clams, oysters and **crustaceans** that people catch for food need seagrasses at some point in their lives. Seagrasses also help keep the Indian River Lagoon clear and healthy.

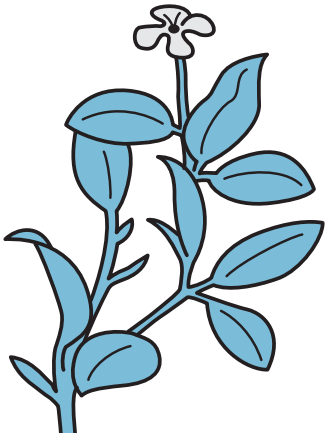


12. **False**. Seaweeds are algae. **Now go to #9**

13. **True**. High turbidity prevents sunlight from shining through the water to the seagrasses. Seagrasses need the sun's energy to produce food. Do seagrasses help keep the water clear? _____ Yes **Go to #3** _____ No **Go to #7**



What's for Supper?



All organisms need food in some form or another, but only plants can use the energy of the sun to make food. They use sunlight and **nutrients** to manufacture food and oxygen. Plants are called **primary producers** because they provide food for all animals.

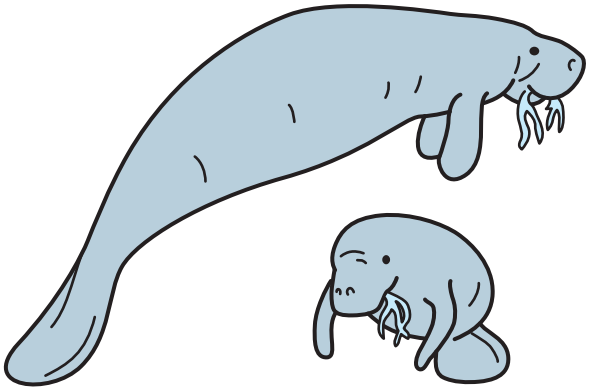
Animals are called **consumers** because they cannot make their own food in the way primary producers do. Consumers must get their energy in the form of food from either plants or other animals.

This flow of energy from the sun to plants → plant eaters → meat eaters is called a **food chain**.

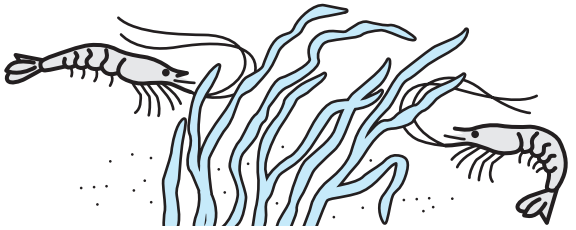
Primary producers in the Indian River Lagoon are mangroves, marsh grasses, seagrasses and algae. There are even primary producers floating in the water that are too small for you to see without a microscope. These microscopic plants, called **phytoplankton**, provide food for microscopic animals, called **zooplankton**, as well as for larger animals like clams and oysters.

Let's take a closer look at an example of a food chain. Plants are the first link in the food chain because they get their energy from the sun. In the previous lesson, we studied seagrass. It is an important primary producer in the Indian River Lagoon.

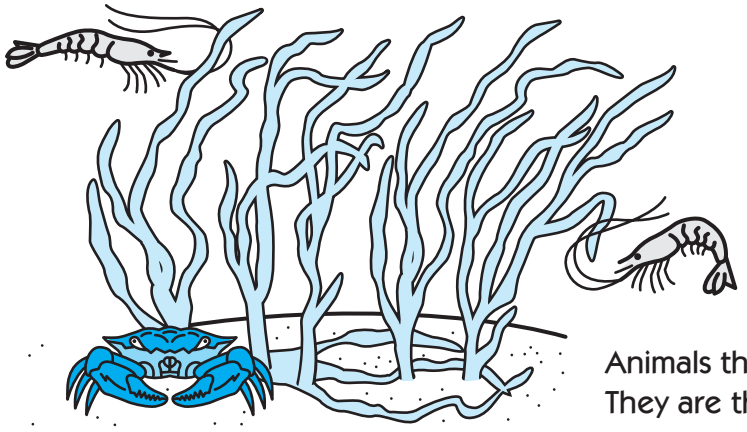
There are three ways in which seagrass provides food for animals in the lagoon. Some animals, such as manatees, eat the seagrass but generally do not harm the root system, thus allowing regrowth.

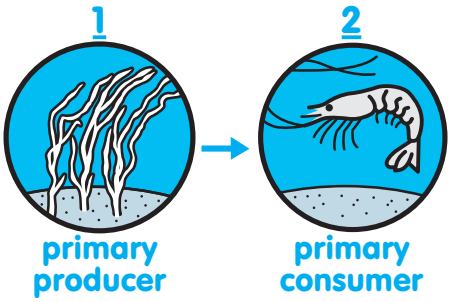


Other animals, such as shrimp and snails, eat algae that grow on the blades of seagrass.



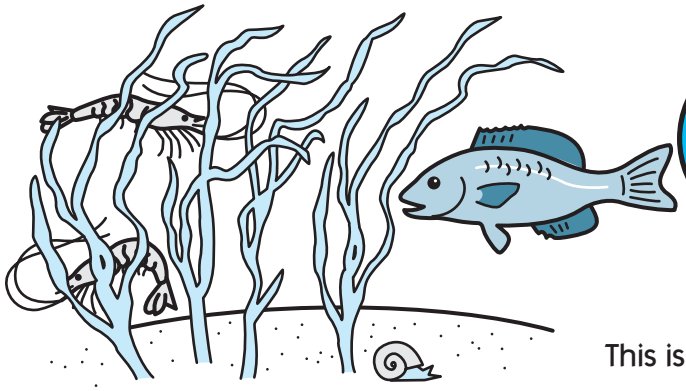
As seagrass grows, old leaves die and settle to the bottom of the lagoon, where they become covered with **microorganisms** — or tiny plants and animals. These microorganisms are called **decomposers** because they cause dead plants and animals to decay. This mixture of decaying dead leaves and animal remains covered with microorganisms is called **detritus**. This is the third way in which seagrass provides food. Crabs, clams and shrimp are a few of the animals that feed on detritus in the Indian River Lagoon.

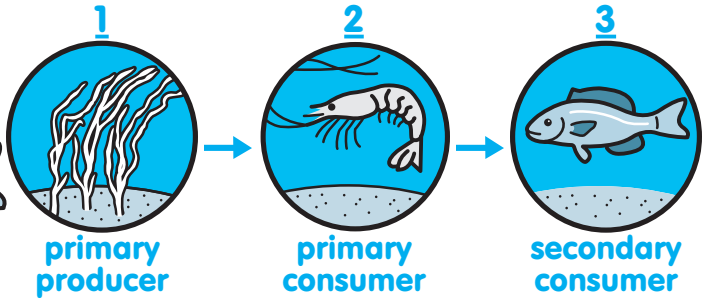




Animals that eat plants are called **primary consumers**. They are the second link in the food chain.

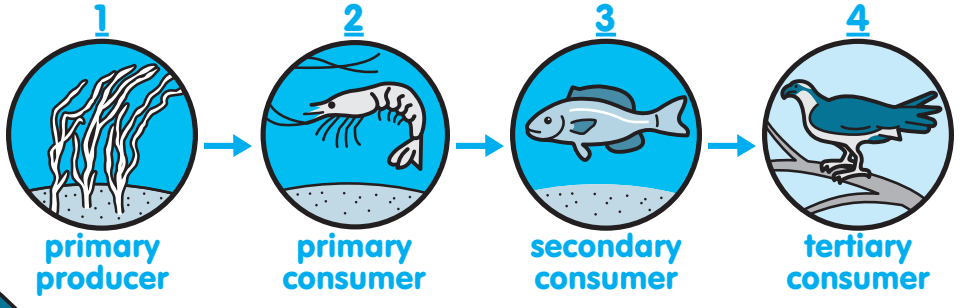
Animals that eat the primary consumers are called **secondary consumers**. In the lagoon, for example, a snapper would feed on shrimp and crabs.





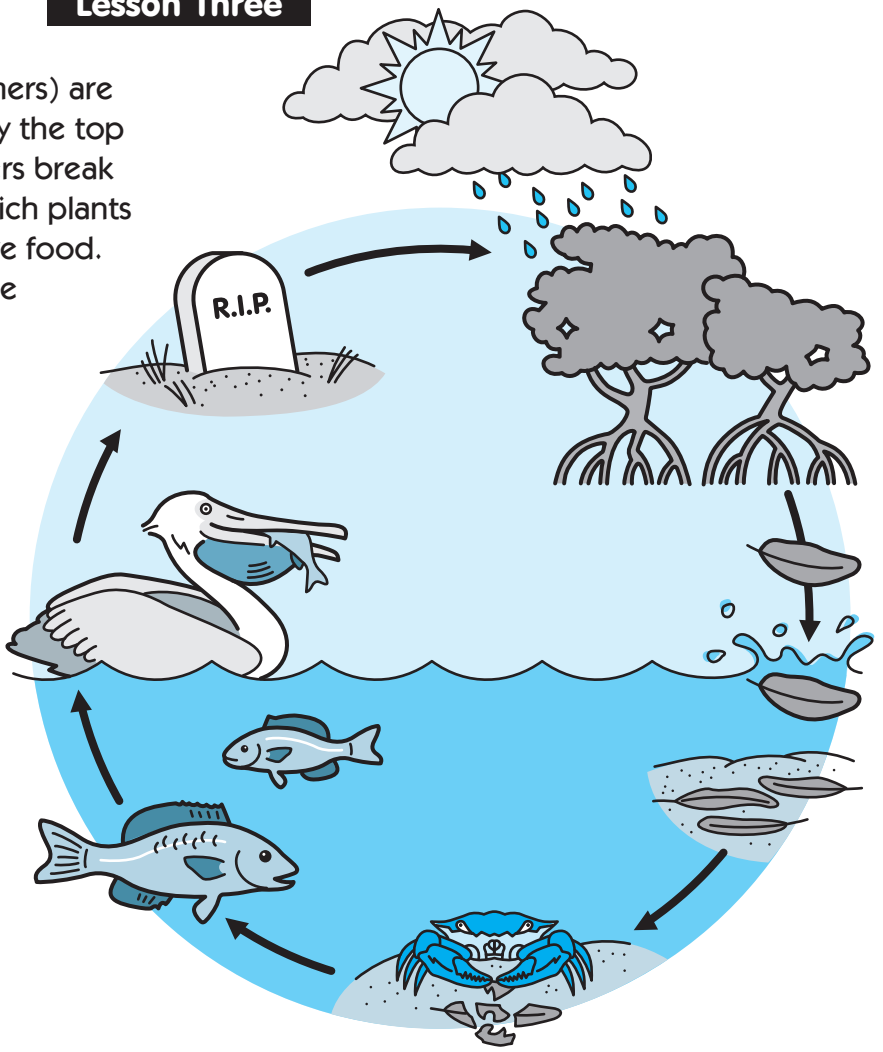
This is the third link in the food chain.

Animals that eat secondary consumers are called **tertiary consumers**.



An osprey becomes the fourth link in the food chain as it snatches the snapper out of the water.

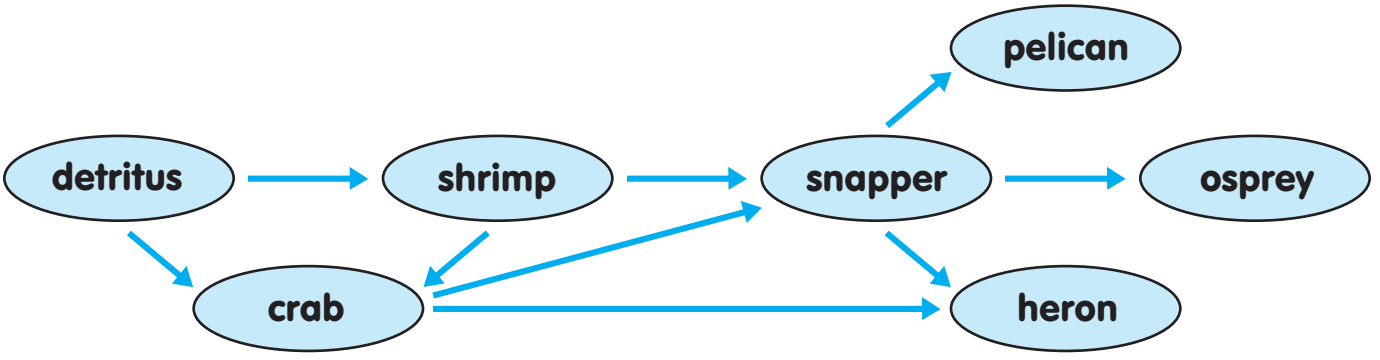
Only **top predators** (tertiary consumers) are safe from being eaten. But eventually the top predators die. Then the decomposers break the dead material into nutrients, which plants use again to grow and produce more food. The flow of energy completes a circle which repeats itself over and over.



Studying a food chain is an easy way of seeing how organisms depend upon each other. However, the process isn't always that simple. If more consumers are added to the food chain, it becomes more complex.

We can start out with a simple food chain like this:

But when we add a crab, pelican and heron, it begins to look more like a web than a chain.

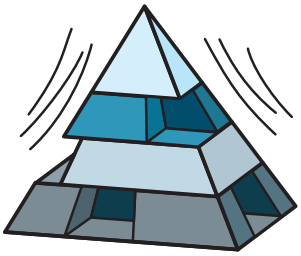


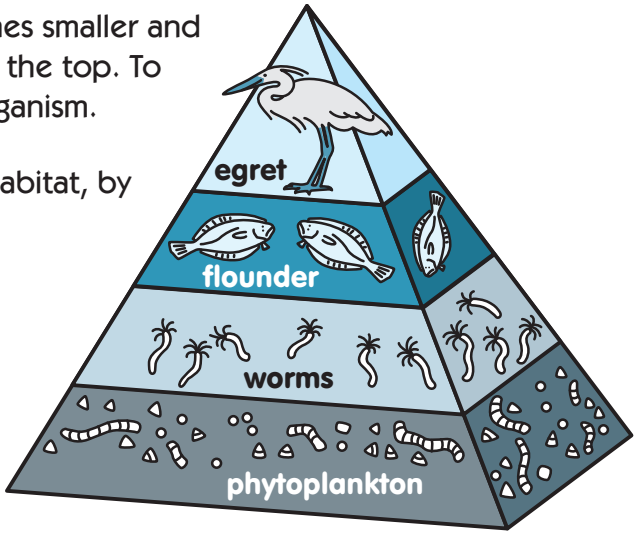
A **food web**, an interrelated group of food chains, is a more realistic way to view the flow of energy among organisms. In addition to understanding how energy flows through food chains and webs, it's important to realize what happens to the energy.

Plants and animals need to use some of the energy they obtain. Animals need energy to grow, move about and reproduce. When one animal eats another, it stores part of the original energy and uses the rest. Only a small part of the original energy gets to the top of the chain. This idea is best illustrated by a **pyramid of energy**.

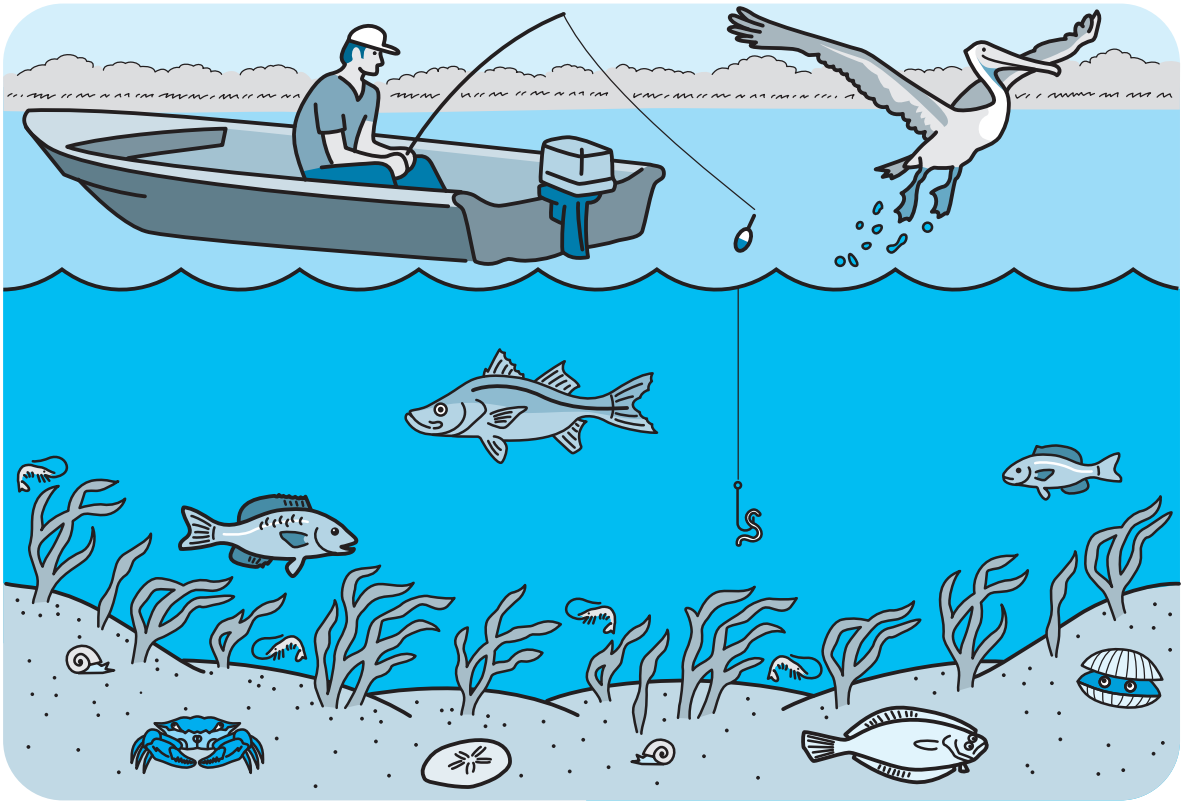
There are many organisms (primary producers) at the bottom of the pyramid. The amount of energy passed upward becomes smaller and smaller until only a few organisms can be supported at the top. To sustain life, every organism depends on every other organism.

If we remove too much of the pyramid by destroying habitat, by pollution or by over-fishing, what will happen?





Humans are also part of the food chain. We depend upon the lagoon for fish, clams, oysters and shrimp. When we disrupt the delicate balance, we affect not only the lagoon, but ourselves as well.



FAST FOOD CHAINS

This does not refer to hamburgers or hot dogs. In this activity you will see how many food chains you can make using a list of plants and animals found in the Indian River Lagoon.

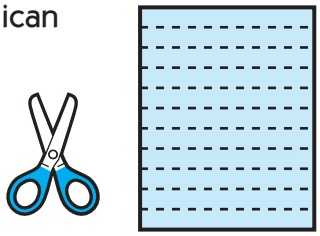
Materials needed: Several sheets of blank paper, scissors, tape or glue, and a pencil.

Directions:

1. Work together in groups of four or five. On a sheet of paper, write down a food chain using the list of plants and animals on the next page.

   Example: phytoplankton → barnacle → snapper → pelican

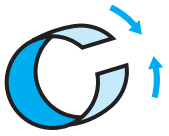
   (Hint: It may be easiest to start with a top predator — such as a pelican or raccoon — and work backwards.)



2. Cut a blank sheet of paper into strips about an inch wide.

3. Taking one strip of paper, write the producer on it.

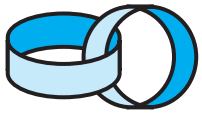
   phytoplankton



Make a link by taping or gluing the ends of the strip together.

4. On another strip, write the primary consumer that will eat the producer.

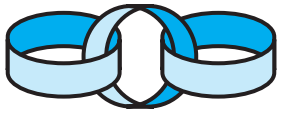
   barnacle



Add this link to your chain.

5. On the next strip, write the secondary consumer that will eat the primary consumer.

   snapper



Add this link to your chain.

6. Keep adding links until you reach a top predator (tertiary consumer).

   pelican

Add this link to your chain.

7. Write down more food chains using the list of plants and animals. Make as many different food chains out of paper as you can in the time limit set by your teacher.

PLANTS AND ANIMALS OF THE INDIAN RIVER LAGOON

Primary Producers (Plants)

seagrass

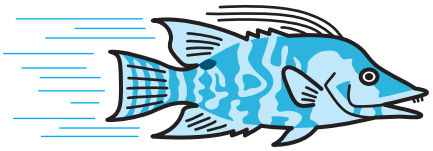
marsh grass — dead grass becomes detritus

mangroves — fallen leaves become detritus

algae

phytoplankton (plant plankton)

Consumers (Animals)



What They Eat

zooplankton	phytoplankton
barnacle	detritus, zooplankton, phytoplankton
clam	detritus, zooplankton, phytoplankton
shrimp	detritus, fish, algae
snail	algae, clams
worm	detritus, zooplankton, phytoplankton
blue crab	anything they can find, such as marsh grass, fish, detritus, worms and shrimp
fiddler crab	
hermit crab	
flounder	worms, fish, crabs, snails
mullet	plants, detritus
pipefish	zooplankton, tiny shrimp
sheepshead	clams, crabs
snapper	barnacles, crabs, fish, shrimp
stingray	worms, clams, crabs, fish
seagull	any plant or animal small enough for it to eat, dead or alive
heron, egret	fish, crabs
pelican	fish
osprey	fish
manatee	seagrass
raccoon	clams, crabs, fish
human	fish, crabs, shrimp, clams

People and the Lagoon

To better understand how people affect the lagoon, start by studying the map on the next page.

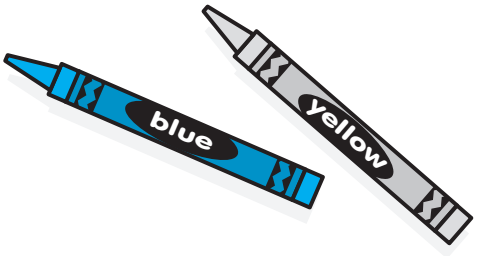
Materials needed: A pencil and blue, green, orange and yellow crayons.

1. What is the name of your state? _____
   Using a pencil, write it on the map.
2. What county do you live in? _____
   Using a pencil, write it on the map.
3. What is the name of the town you live in? _____
   Locate it or write it on the map and draw an orange circle around it.
4. The Indian River Lagoon is an _____,
   that is, a body of water where fresh and salt water meet and mix.
5. Freshwater enters through _____, _____

   and _____.

   How many creeks and canals can you find on the map? _____ Color them blue.
6. Salt water from the ocean enters through _____.

   How many inlets are there in the Indian River Lagoon? _____
   Color the ocean and inlets yellow.
7. Color blue in this square.
   Now color yellow over the blue.
   What color do you get when the
   two colors are combined? _____



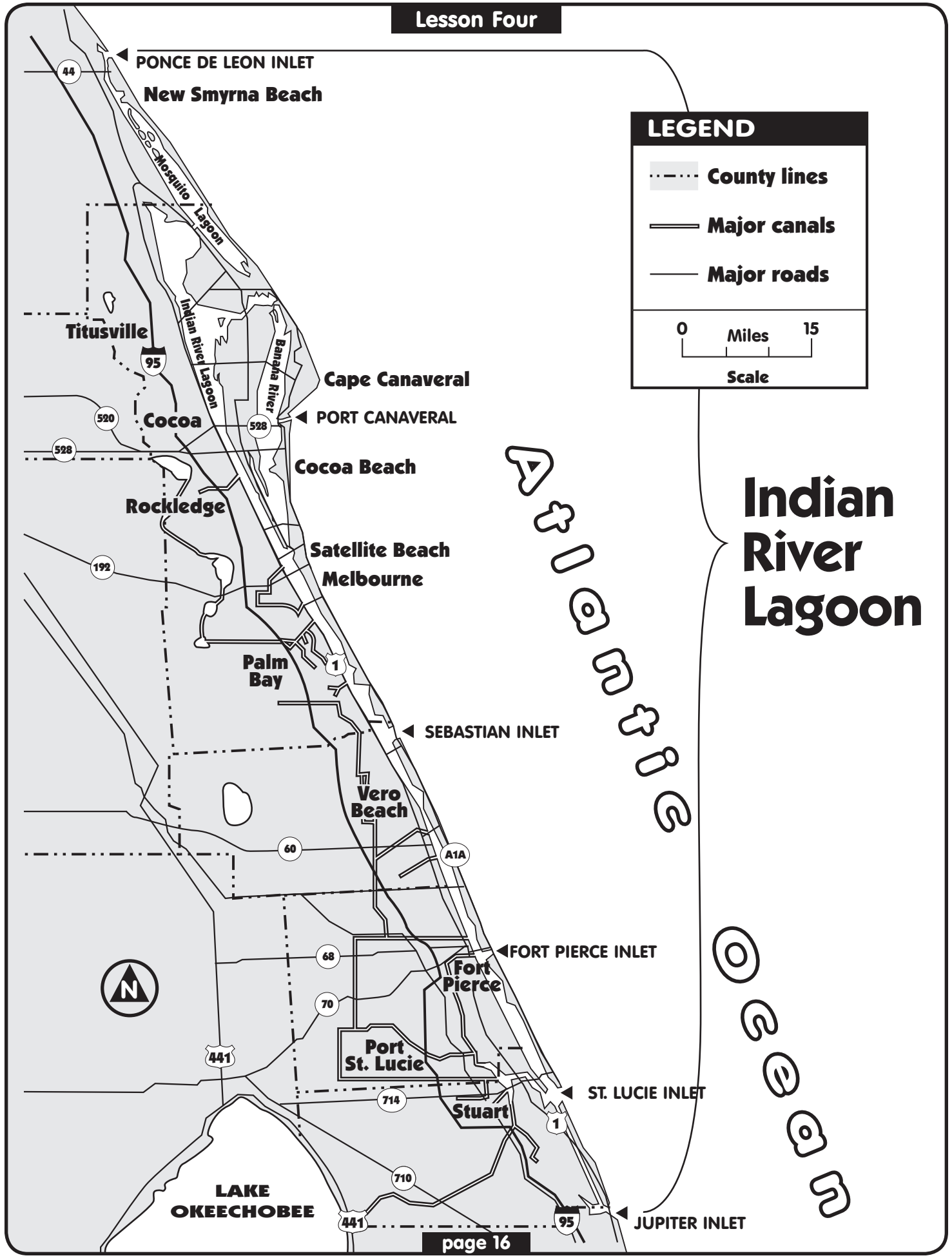
8. On your map, you colored freshwater blue and salt water yellow. Freshwater and salt water combine in the Indian River Lagoon, so color the lagoon green.

All over the world people like to live near estuaries. Why do you think this is so?

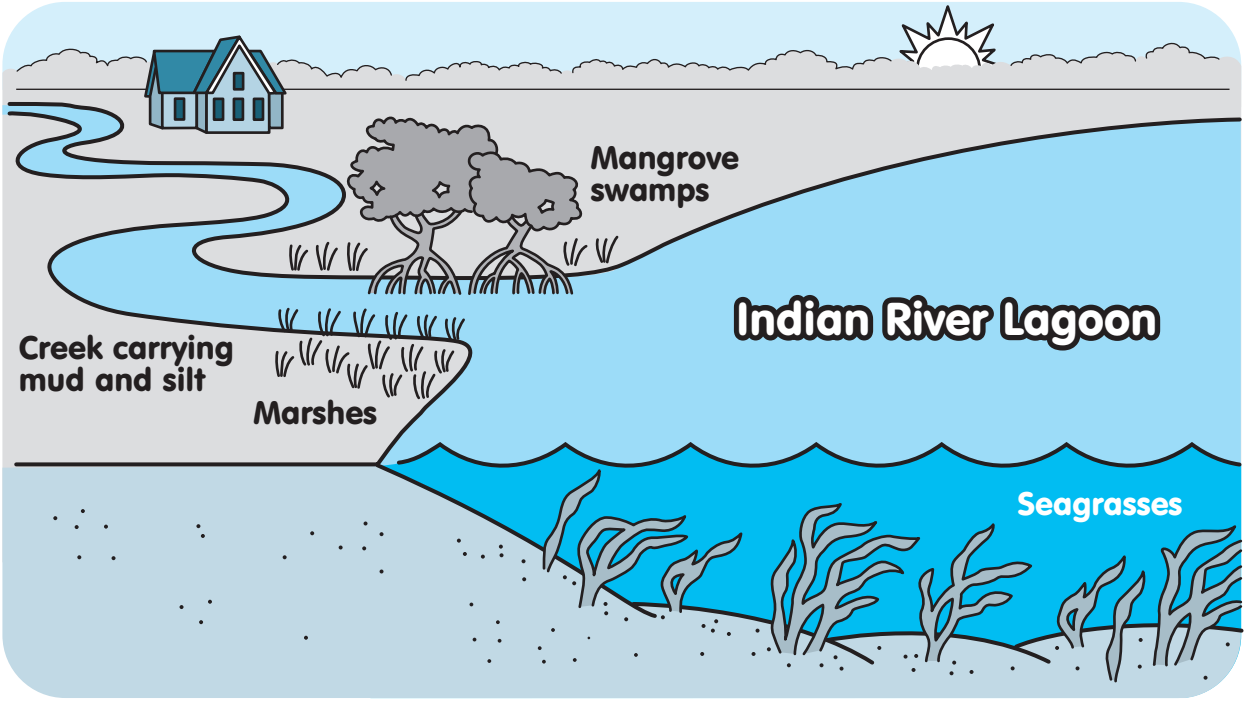
_____

Notice how many towns are built along the Indian River Lagoon.

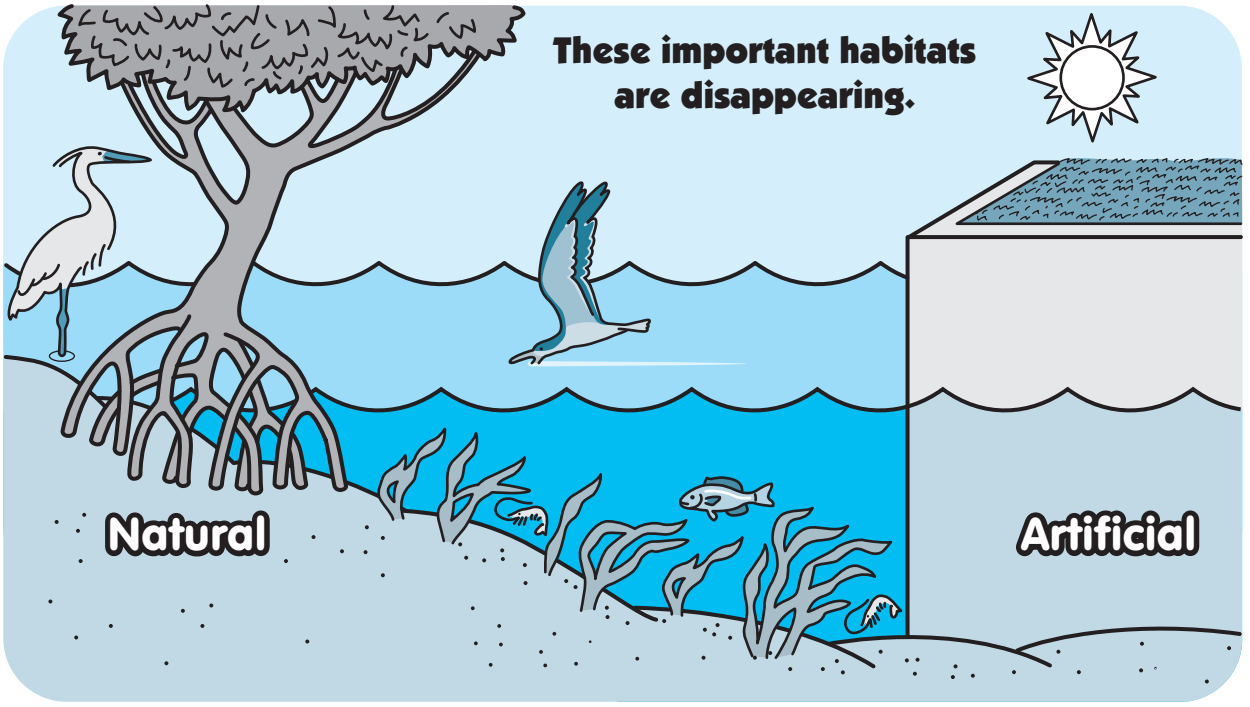
Many people are moving into the area every year. The increasing number of people is causing many problems for the lagoon.

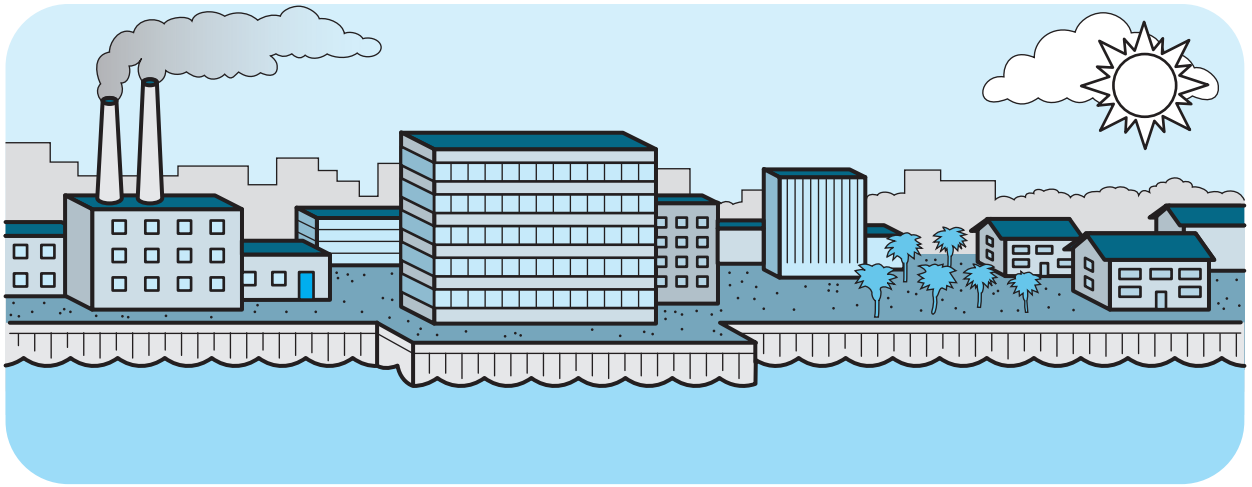

PONCE DE LEON INLET
New Smyrna Beach
Mosquito Lagoon
Indian River Lagoon
Banana River
Titusville
Cape Canaveral
PORT CANAVERAL
Cocoa
Cocoa Beach
Rockledge
Satellite Beach
Melbourne
Palm Bay
SEBASTIAN INLET
Vero Beach
FORT PIERCE INLET
Fort Pierce
Port St. Lucie
ST. LUCIE INLET
Stuart
LAKE OKEECHOBEE
JUPITER INLET
Atlantic Ocean
Indian River Lagoon
LEGEND
County lines
Major canals
Major roads
0 Miles 15
Scale
44
95
520
528
192
1
60
A1A
68
70
441
714
710
N

Plants growing along the lagoon's shore are very important to its health. Mangrove swamps and salt marshes cleanse the water flowing through them before it reaches the Indian River Lagoon.



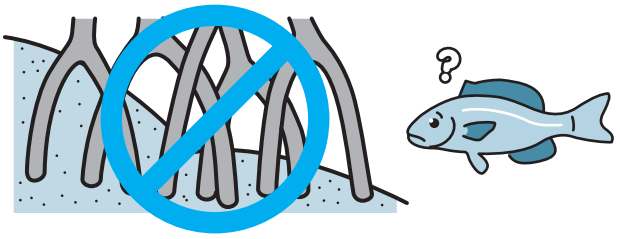
As water slowly passes through the swamps and marshes, mud and silt can settle out. Fast-growing marsh plants absorb excess nutrients that could cause problems for the Indian River Lagoon. Mangroves and salt marshes also provide a nursery area for young organisms and a food source for many of the animals that live in the lagoon.

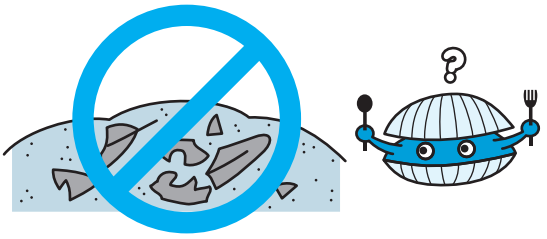




Marshes and swamps are shallow, and many have been filled with soil to make new land for houses and industry. Thousands of acres of mangroves were lost by the construction of mosquito impoundments, which is a method used to control mosquito populations. Dikes were built around high mangrove marshes and then filled with water so that the female mosquito would not be able to find any moist soil on which to lay her eggs. A **dike** is a bank or mound, usually of earth, built to control or confine water. The roots of the mangroves were covered with water, and the trees suffocated.

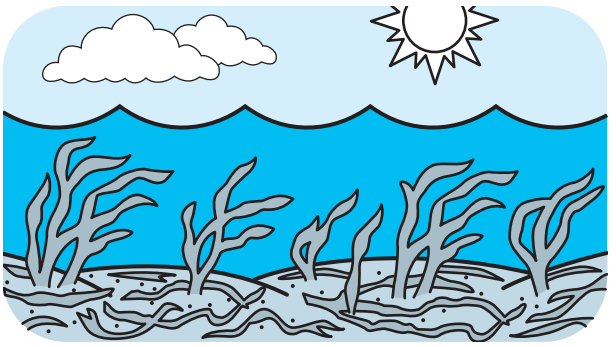
Loss of mangroves and marsh grasses removes some important producers from the lagoon's food chains and reduces the estuary's ability to function as a nursery. How would this affect the fish and clams that live in the lagoon? Would it affect all of the animals?

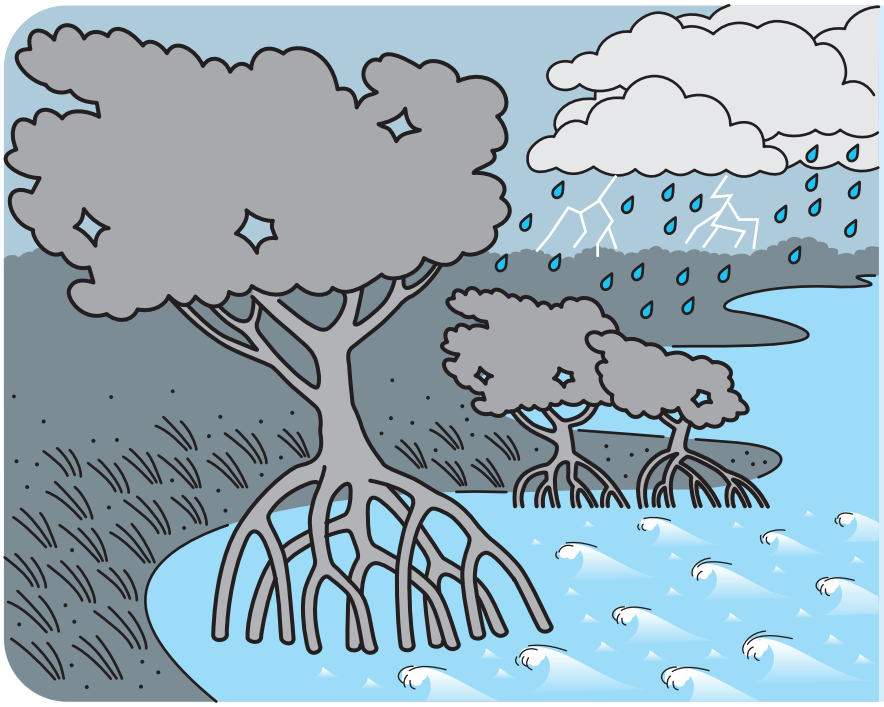




When these marshes and swamps are removed, turbid (cloudy) water flows directly into the lagoon. What does this do to the seagrass?

If the seagrass dies, who will be affected?

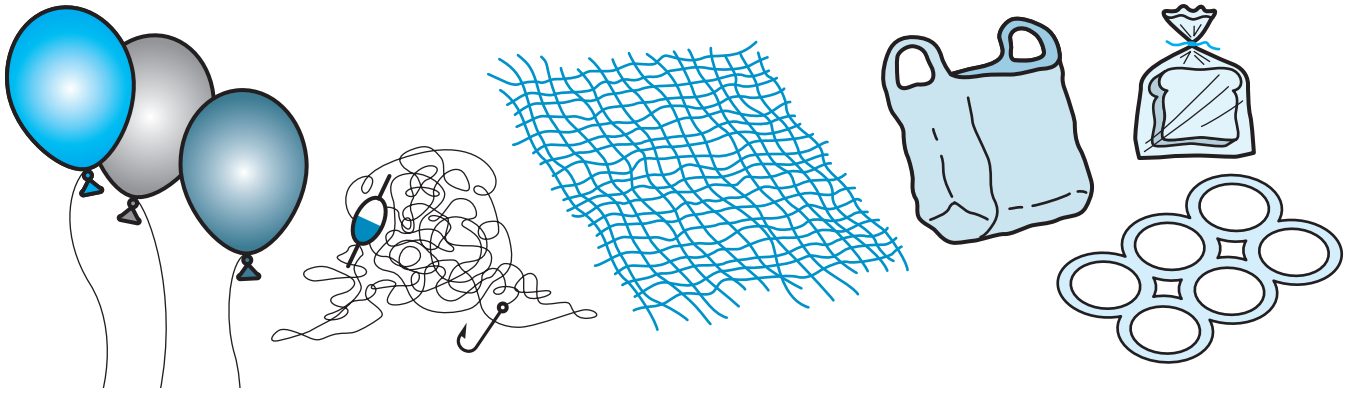




The roots of mangroves and marsh grasses hold the soil in place and keep the shore of the Indian River Lagoon from eroding, or washing away. This is especially important during storms. When these plants are removed, valuable shoreline protection is lost.

Litter is a problem on the **spoil islands** and throughout the lagoon. To many animals, litter looks like food. A floating plastic bag looks like a jellyfish to a hungry sea turtle. If large pieces of plastic are eaten, the animal's stomach becomes lined with it. This prevents digestion, and the animal will starve. Another type of litter which can be deadly to animals is discarded fishing line and nets. Animals can become trapped, which may result in death from drowning, starvation or strangulation. Plastics left in or near the water can kill many animals.

How long do you think it takes for plastic to rot? ----------



With the increasing numbers of people using the Indian River Lagoon and its resources, there is a need for conservation. **Conservation** is the protection and sensible use of our natural resources, such as forests, animals and estuaries. To protect the Indian River Lagoon, we need to understand how it works — how the lagoon's plants and animals are dependent on each other. We also need to know how people affect the lagoon through their activities. This information is collected through scientific research. After the information is collected, it needs to be shared with people through education.

How can information about the Indian River Lagoon be shared? List at least three ways.

1. ---------- 3. ----------

2. ---------- 4. ----------

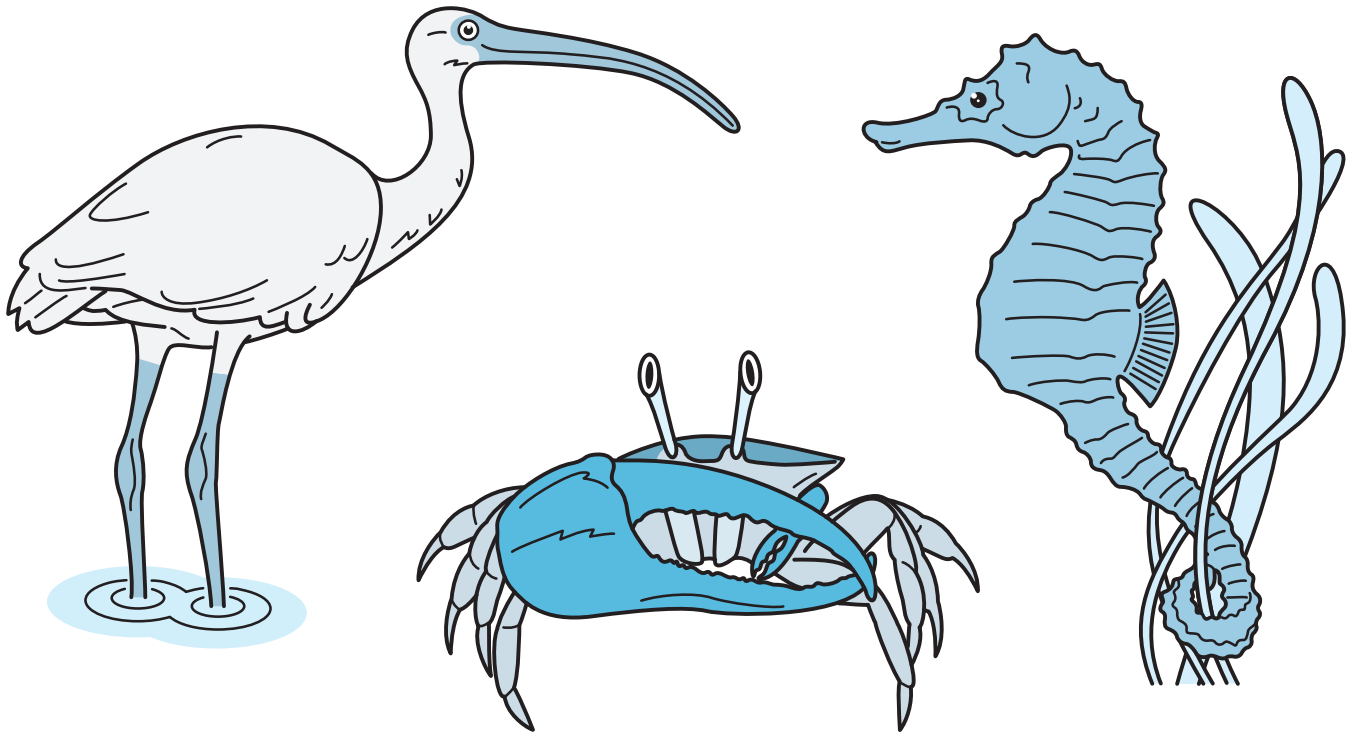
Will you help spread the news?

Gaining more knowledge about our natural resources can help us conserve them better. An example of this is the establishment of the Florida Aquatic Preserve Program. As people realized the importance of estuaries, they felt these special areas deserved better protection. As a result of this concern, much of the Indian River Lagoon system, consisting of the Indian River, the Banana River and the Mosquito Lagoon, has been designated as aquatic preserves.

Aquatic preserves are special areas of underwater lands and associated waters to be maintained in their natural condition. Aquatic preserves are managed by the Florida Department of Environmental Protection (DEP) for the people of Florida. DEP has special rules to protect mangroves, seagrasses and other plants and animals that live in the aquatic preserves.

For us to ensure that the Indian River Lagoon and its inhabitants have a place in Florida's future, we may have to refrain from doing certain things. There may be areas where we should reduce our boat speed to protect manatees, or places where we shouldn't build a dock or **dredge** in order to protect seagrasses. When we take care of the lagoon and its plants and animals by giving a little, we receive much in return.

Don't you think so?



WHAT'S WRONG?

Study the picture on the next page. Name at least five things wrong with the picture.

1. _____
2. _____
3. _____
4. _____
5. _____
6. _____
7. _____
8. _____

WHAT CAN WE DO?

Along with the privilege of enjoying the Indian River Lagoon comes the responsibility of taking care of it. Write down ways people can make the Indian River Lagoon a better place for plants and animals to live and for people to enjoy.

1. _____
2. _____
3. _____

What are some things your family could do?

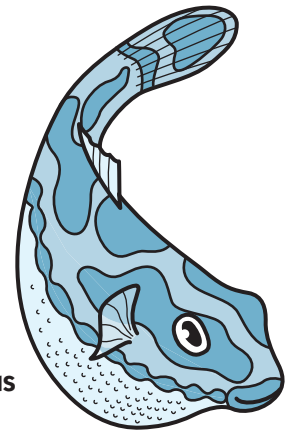
1. _____
2. _____
3. _____

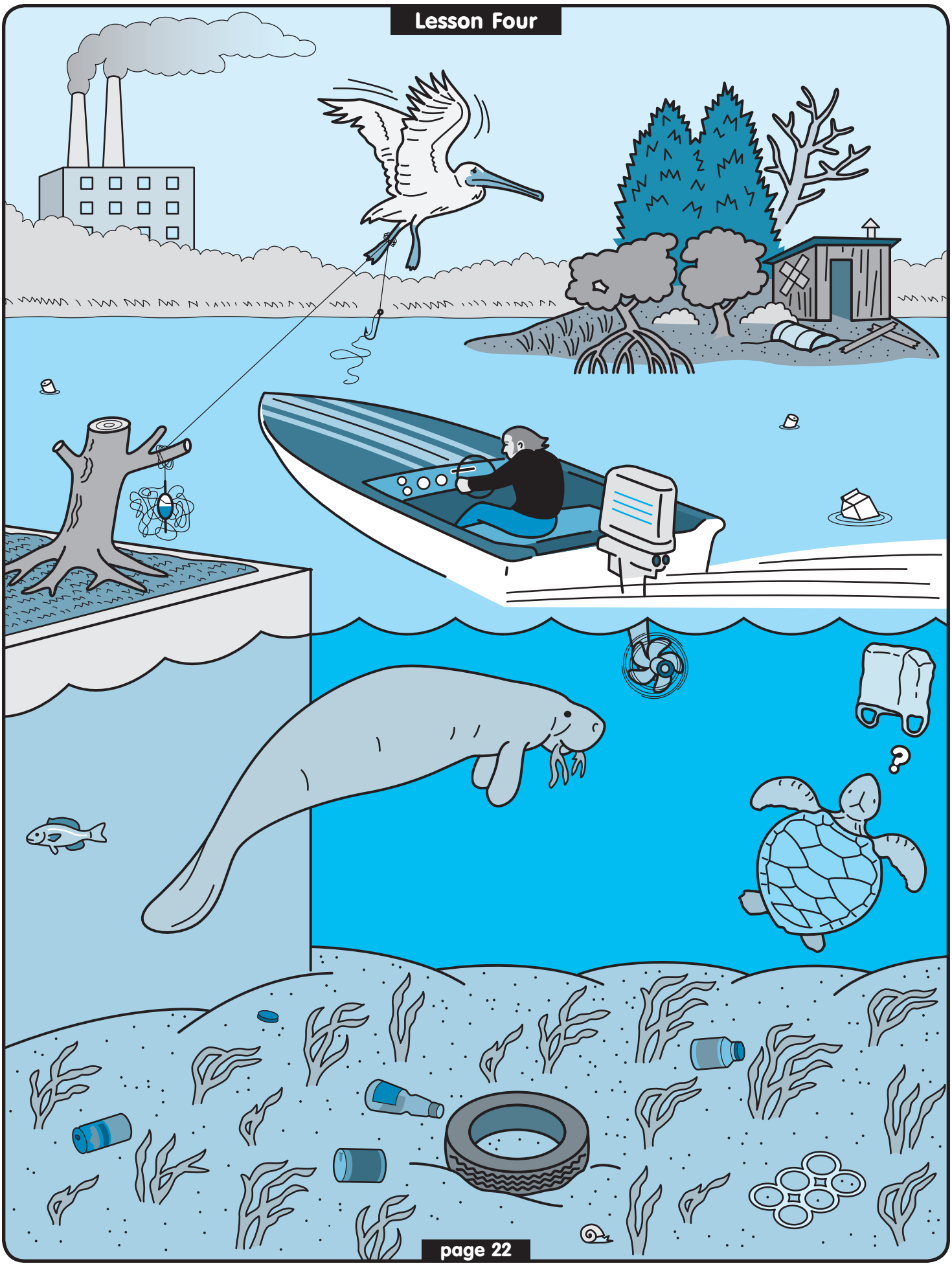
(Take these suggestions home and share them with your family.)

What can you do?

1. _____
2. _____
3. _____
4. _____

What can I do?
I am only one,
But I am one.
I cannot do everything,
But I can do something.
– Anonymous





Glossary

algae (AL - gee) — A plant or plantlike organism.

aquatic preserves (ah - KWAH - tik) — Special areas of underwater lands and associated waters to be maintained in their natural condition.

barrier islands — Long, broad, sandy islands lying parallel to a shore.

brackish (BRAK - ish) — Salty.

coastal — At, near or along a coast. A coast is where the land meets the ocean.

conservation (con - ser - VAY - shun) — The protection and sensible use of our natural resources, such as forests and estuaries.

consumers (con - SOOM - ers) — Organisms that eat plants or other animals.

crustaceans (crus - TAY - shuns) — A large class of animals, usually living in or near the water, having a hard, crust-like shell (exoskeleton). This group includes lobsters, crabs and shrimp.

decomposers (DEE - kum - POZE - ers) — Microorganisms that break down dead plant and animal matter.

detritus (de - TRITE - us) — A mixture of decaying plant and animal remains covered with microorganisms.

dike — A bank or mound, usually of earth, built to control or confine water.

dredge — Using a machine to deepen a waterway.

endangered — At risk of being injured, destroyed or lost.

estuary (ES - chew - air - ee) — A body of water where fresh and salt water meet and mix.

extinction (ik - STINK - shun) — When a type of animal or plant no longer exists — it has been lost forever.

food chain — The flow of energy from the sun to plants —> plant eaters —> meat eaters.

food web — An interrelated group of food chains.

habitat (HAB - i - tat) — The area where an organism is supplied with food, water, shelter and space.

herbicide ([H]ERB - i - cide) — A substance used to kill plants.

inlet — A narrow opening between barrier islands.

invertebrate (in - VERT - i - brate) — An animal without a backbone.

juvenile (JU - vah - nile) — An immature (young) organism.

lagoon — A shallow body of water protected from the ocean by barrier islands.

Glossary

larvae (LAR - vay) — The early stages of any animal that differs in form and appearance from the adult.

life cycle — The continuous sequence of physical changes that an organism passes through, from a fertilized egg to an adult that can reproduce.

microorganisms (MY - kro - or - ga - NIH - zums) — Tiny plants and animals.

nursery — A place where young animals can find food and hide from predators.

nutrients (NU - tree - ents) — Elements necessary for life and growth.

organism (or - ga - NIH - zum) — A living being: a person, animal or plant.

pesticide — A chemical used to kill pests, usually insects and rodents.

phytoplankton (FI - toe - PLANK - ton) — Microscopic plants that float in the water.

primary consumers — Animals that eat plants or detritus; the second link — and the first class of animals — in the food chain.

primary producers — Plants that use sunlight, water and nutrients to manufacture food; the first link in the food chain.

pyramid of energy — The amount of energy being stored and passed through the food chain. The most energy exists in the bottom layer of the pyramid and the least amount exists at the top.

secondary consumers — Animals that eat the plant-eating primary consumers; the third link in the food chain.

sediments (SE - deh - mints) — Fine particles, such as sand, silt and clay.

shellfish — An aquatic animal, such as a clam or oyster, having a shell or shell-like covering (exoskeleton).

spawn — To produce or deposit eggs.

species — A class of individuals that are more or less alike and that are able to breed and produce fertile offspring.

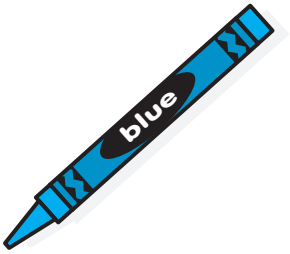
spoil islands — Islands that were formed when the Intracoastal Waterway was dug; soil was removed from the bottom of the lagoon and placed next to the channel.

top predators (PRED - ah - ters) — Animals at the top of the food chain. Most top predators have only one enemy — people. We may not eat all top predators, but we can kill or harm them by polluting or destroying their habitat.

tertiary consumers (TUR - she - air - ee) — Animals that eat the secondary consumers, also called the top predators; the fourth link in the food chain.

turbidity (tur - BIH - dih - tee) — A clouding of water caused by sediments.

zooplankton (ZO - eh - PLANK - ton) — Microscopic animals that float in the water.



Organism Checklist

Directions: Put a ✓ by each organism you find.

Cnidaria:

jellyfish

Mollusks:

clam
sea hare
oyster
snail

Crustaceans:

arrow shrimp
barnacle
beach hopper
blue crab
broken-back shrimp
fiddler crab
grass shrimp
hermit crab
horseshoe crab
mangrove crab
pink shrimp
spider crab

Fish:

anchovy
filefish
flounder
goby
mojarra
mullet
pigfish
pinfish
pipefish
puffer
seahorse
seatrout
sheepshead
snapper
stingray

Birds:

cormorant
egret
great blue heron
gull
osprey
pelican
wood stork

Plants:

algae
manatee grass
shoal grass
turtle grass
mangrove, black
mangrove, red
mangrove, white

Tunicate:

sea squirt

A FEW OF THE ANIMALS AND PLANTS COMMONLY FOUND IN THE HABITATS OF THE INDIAN RIVER LAGOON

MAMMALS
Atlantic bottlenose dolphin
manatee
marsh rabbit
otter
raccoon

REPTILES
American alligator
common garter snake
diamondback terrapin

FISH
anchovy
catfish (sea, gafftopsail)
flounder
grouper
mojarra
mullet
pinfish
pipefish
puffer
seahorse
seatrout
sheepshead
snapper
snook
stingray

TREES
Australian pine
Brazilian pepper
buttonwood
cabbage palm
mangrove, black
mangrove, red
mangrove, white

BIRDS
brown pelican
double-crested cormorant
egret (great, snowy, American, cattle)
fish crow
great blue heron
gull (herring, ring-billed, laughing)
osprey
roseate spoonbill
white ibis
wood stork

INVERTEBRATES
acorn barnacle
blue crab
clam
fiddler crab
mangrove tree crab
oyster
shrimp (arrow, broken-back, pink)
snail
spider crab

SEAGRASSES
Johnson's seagrass
manatee grass
paddle grass
shoal grass
star grass
turtle grass
widgeon grass

ALGAE
brown algae
green algae
red algae

For more information, contact:

St. Johns River Water Management District
Palm Bay Service Center
525 Community College Parkway, SE
Palm Bay, FL 32907
(321) 984-4950 or (800) 295-3264

Florida Department of Environmental Protection (DEP)
Aquatic Preserves – Fellsmere Office
1000 Buffer Preserve Drive
Fellsmere, FL 32948
(321) 953-5004

South Florida Water Management District
Martin / St. Lucie Service Center
210 Atlanta Ave.
Stuart, FL 34994
(772) 223-2600 or (800) 250-4100

DEP
Aquatic Preserves – St. Lucie Office
1801 SE Hillmoor Drive, No. C204
Port St. Lucie, FL 34952
(772) 871-7662

Restore a Florida Treasure

Hook up now at your local tag office

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Visit us on the Internet at itsyourlagoon.com.

2011-06-22