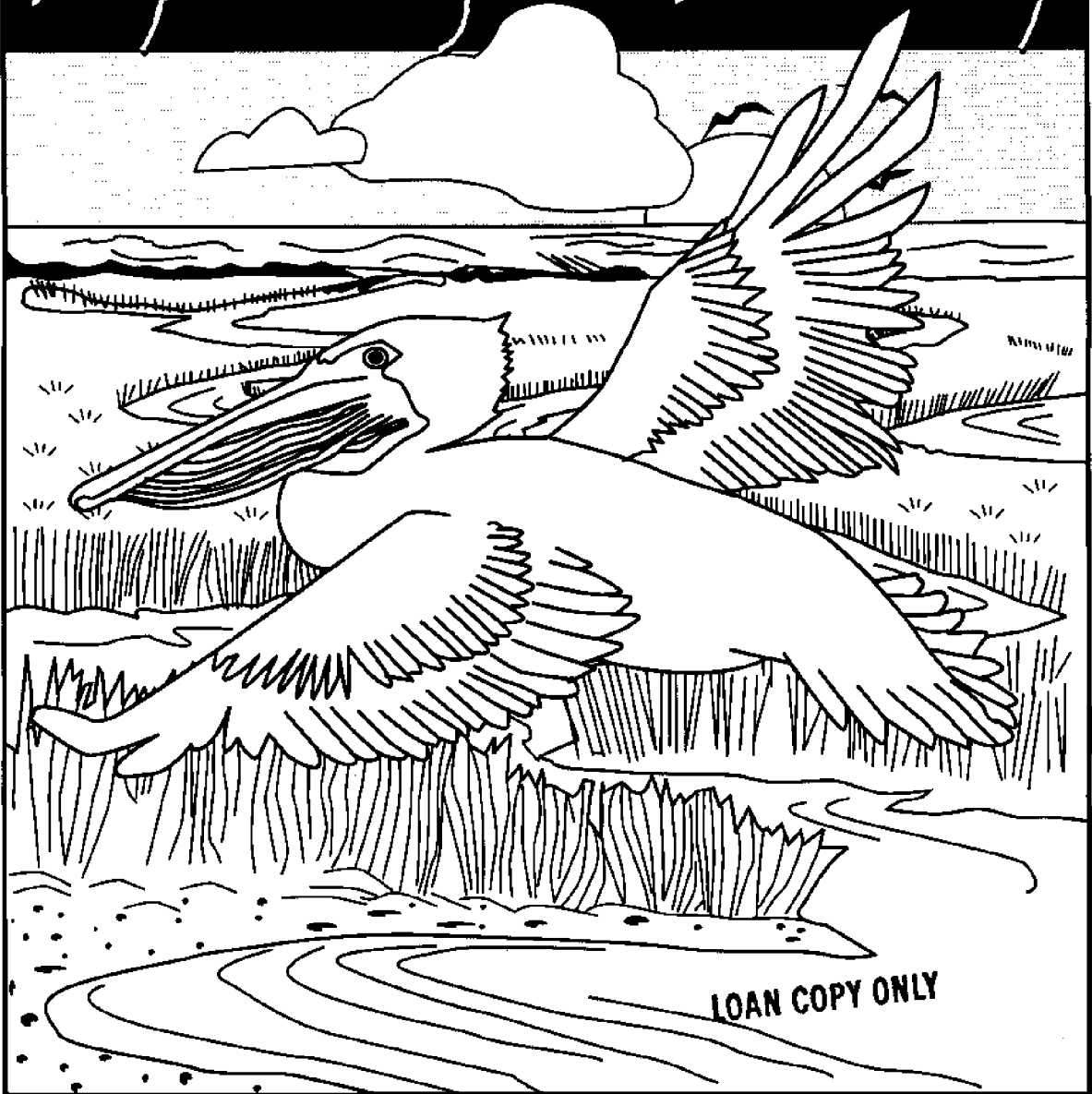


# Exploring an Estuary



LOAN COPY ONLY

## Where Rivers Meet the Sea

# Solve the Secret Message

A	B	C
D	E	F
G	H	I

	J	
K		L
	M	

N	O	P
Q	R	S
T	U	V

	W	
X		Y
	Z	

J . □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □

AN ESTUARY

▽ □ □ □ □ ▽ □ □ □ □ □ □ □ □ □

▽ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □

^ □ □ □ □ ▽ □ □ □ □ □ □ □ □ □ □ □ □ □

□ □ □ □ □ □ □ □ □ □

□ □ □ □ □ □ □ □

*This code was used over 100 years ago during the Civil War. Soldiers in prisons smuggled messages to their friends on the outside with this code, called the Pigpen Cipher.*

# Watersheds in Mobile and Baldwin Counties

Dog River  
Watershed

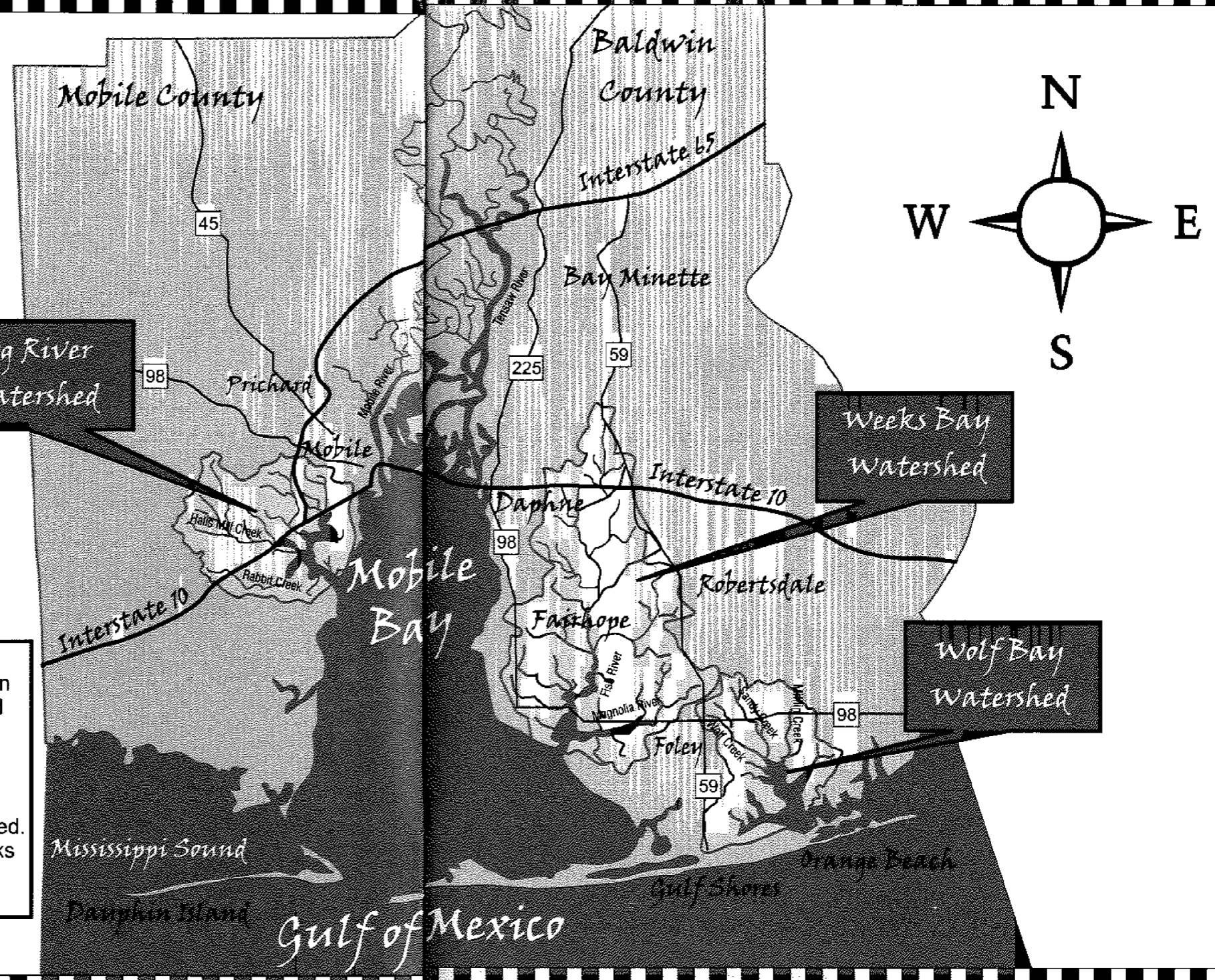
Weeks Bay  
Watershed

Wolf Bay  
Watershed

Is your Watershed highlighted  
on this map?  
Put an X on the appropriate  
location of your home.

The fresh water which flows into Mobile Bay comes from many rivers which drain from land in Mississippi, Tennessee and Georgia. Land through which a river drains into a larger body of water is called a watershed.

Remember, all land is part of a watershed. Watersheds can be small, like the Weeks Bay Watershed, or large like the Mississippi River Watershed.



# Estuarine Crossword Puzzle

All the things shown here can be found in Mobile Bay.  
See if you can find them in the crossword puzzle.

Choose from these words.

estuary  
nursery  
brackish  
salt marsh

plankton  
rivers  
Gulf of Mexico

oysters  
nets  
fiddler crabs

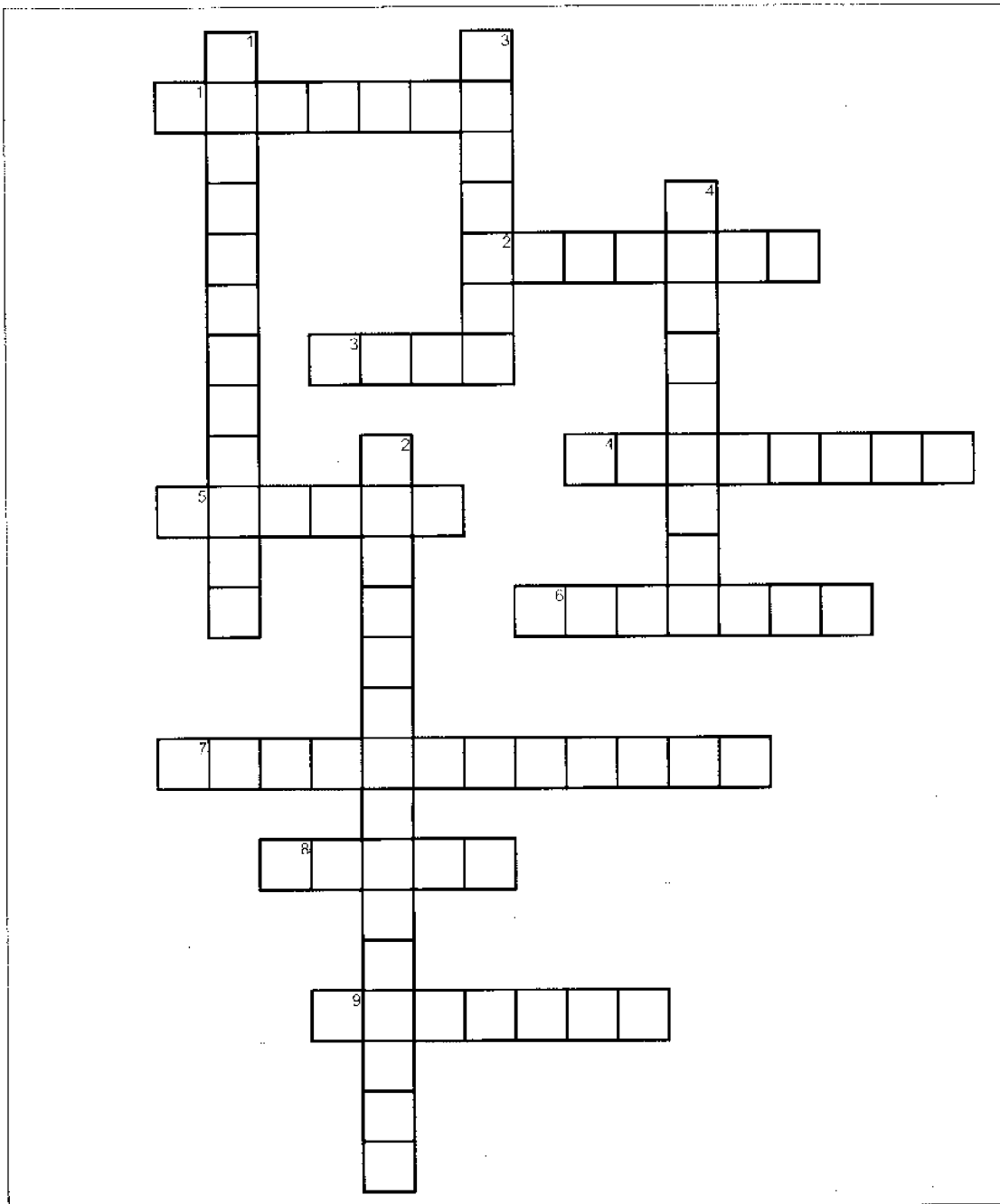
Great Blue Herons  
fishing  
clean

Across

1. An estuary is called a \_\_\_\_\_ to the ocean because baby shrimp, crabs and fish live there.
2. A place like Mobile Bay, where rivers meet the sea, is called an \_\_\_\_\_.
3. Shrimp boats have large \_\_\_\_\_ called trawls, which they use to catch shrimp.
4. Tiny plants and animals that live in the waters of estuaries and are food for larger animals are called \_\_\_\_\_.
5. Many \_\_\_\_\_ bring thousands of gallons of freshwater into Mobile Bay each day.
6. If you go \_\_\_\_\_ in the bay you might be lucky enough to catch a flounder, redfish or a speckled trout.
7. These crabs "fiddle around" in the salt marsh. The male crab has a giant claw that he waves to attract female crabs.
8. Wetlands help to \_\_\_\_\_ the water that runs into the bay.
9. Freshwater and saltwater combine in the bay to make \_\_\_\_\_ water.

Down

1. Saltwater enters Mobile Bay from the \_\_\_\_\_.
2. These "large" birds wade through the water and spear fish with their long beaks.
3. These animals live in a "bed" and filter many gallons of water through their bodies each day.
4. A type of grassy wetland that provides food and shelter for animals of the estuary.



# The A-Mazing Life of Blue Crabs

Help the blue crabs find their way through this life history maze. Wise choices will keep you on the right track. Wrong ones may lead you (and the crabs) into trouble. At dead ends, go back and try again.

START

Adult blue crabs mate in the upper estuaries where the water is not so salty.

The average life span of a blue crab is 3 years.

FINISH



After a second winter buried under the mud, most crabs reach maturity, and are ready to start the cycle over again.

People find blue crabs a tasty treat. 2.5 - 3.5 million lbs. of blue crabs are caught each year from Alabama estuaries.

Female crabs migrate to the areas where salt water enters the bay. Here between one and two million eggs hatch!

Animals such as arval fish consume many of the zoeae.

Crabs eat almost anything, including worms, plants, small clams and crabs, some fish and detritus.

The tiny crab larvae are called zoeae and are carried from the estuaries to shallow ocean waters.



Heron love to eat blue crabs, especially those who have just molted and have soft shells!



After several more molts, the blue crabs are good swimmers, and the size of a dime.



The small crabs begin migrating toward deeper, warmer water as winter approaches.

After about 2 weeks, the megalopae molt and become "first crabs". They now look just like adult crabs, but each is only as big as a match tip!



The next molt transforms the zoeae into megalopae which re-enter the estuary system.

Wind and currents help determine how many crabs re-enter the protective waters of the estuaries.

Floating with the plankton, the zoeae eat smaller plants and animals and grow quickly, molting 7 to 8 times in 4 to 6 weeks.



# Presto On!... Presto, Off!

## Take a Guess.

You can save up to 20,000 gallons of water a year by not letting the water run. That's enough to fill:

- A) A garbage can    B) A big truck    C) A swimming pool

Imagine pumping water or hauling it from a well every time you wanted to brush your teeth, like they used to in the old days. It was hard work! Life is easier now. We can just turn on a faucet and...presto...water! In fact, it's so easy to get water that we let gallons of it go down the drain without thinking! We need a little water-saving magic: Presto, on!...and Presto, off! Don't go with the flow!



## Did You Know

- Water comes out of the faucet faster than you think. For example: While you're waiting for water to get cold enough to have a drink, you could fill six half-gallon milk cartons!
- If you leave the water running while you brush your teeth, you can waste five gallons of water. That's enough to fill 13 cans of soda!

## What You Can Do

- When you're thirsty: If you like cool water, why not leave a bottle of it in the refrigerator instead of letting the water run? You'll save water, and still have a cool drink.
- When you brush your teeth: Just wet your brush, then turn off the water...and then turn it on again when you need to rinse your brush. You'll save up to nine gallons of water each time! That's enough to give your pet a bath.
- When you're going to take a bath: Plug the tub before you let the water run, so you don't waste any.

## See For Yourself

1. How long do you think it will take to fill a milk carton with water? To find out, get an empty half-gallon milk carton and a grown-up with a watch to time you.
2. Open the milk carton and hold it under the faucet.
3. Turn on the faucet and time it.
4. How long did it take to fill the carton? Imagine that all over the United States, people are letting the water run like that. Don't be one of them!

P.S. Don't waste that water by pouring it down the sink pour it on a thirsty plant instead.  
Good Work!

# Hold On Tight!

Take a Guess.

Which of these things shouldn't you do with balloons!

- A) Celebrate a Birthday    B) Decorate at a carnival    C) Feed them to whales

Helium balloons! Big, bouncing, bobbing...Oops! One got away. There it goes, into the sky, getting smaller and smaller...until it's just a speck. Then you blink and it's gone.

Where do helium balloons go? Off into outer space? Not quite. Actually, when they lose their helium, they come back to Earth. And that can be a problem for birds and other animals.

## Did You Know

- When helium balloons are released, they are often blown by strong winds into the ocean. Even if the sea is hundreds of miles away, balloons can still land there. Sometimes sea creatures think balloons are food and eat them.

Sea turtles, for example, eat jellyfish - which look and wiggle just like clear balloons. If a turtle makes a mistake and eats a balloon, the balloon can block its stomach. So the turtle can starve to death.

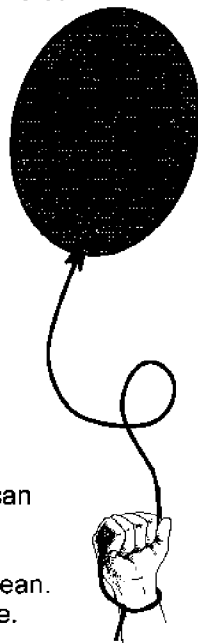
- Whales sometimes accidentally swallow balloons that are floating in the ocean. The balloons get stuck inside the whale's stomach, and can kill the creature.

## What You Can Do

- 1.) Try not to let go of your helium balloons.
- 2.) Tie them to your wristwatch, your shoe, your wrist, or anything handy.
- 3.) If your school plans to let lots of balloons into the air during a celebration, tell them about the dangers to sea animals. Most people don't realize that creatures can be harmed by balloons.

## See For Yourself

Test your strength: see how hard you need to pull to break a balloon in two. It probably won't be easy, and you may not be able to do it. That doesn't mean you are weak; it means balloons are made of strong material; another reason why they are so dangerous for sea creatures.





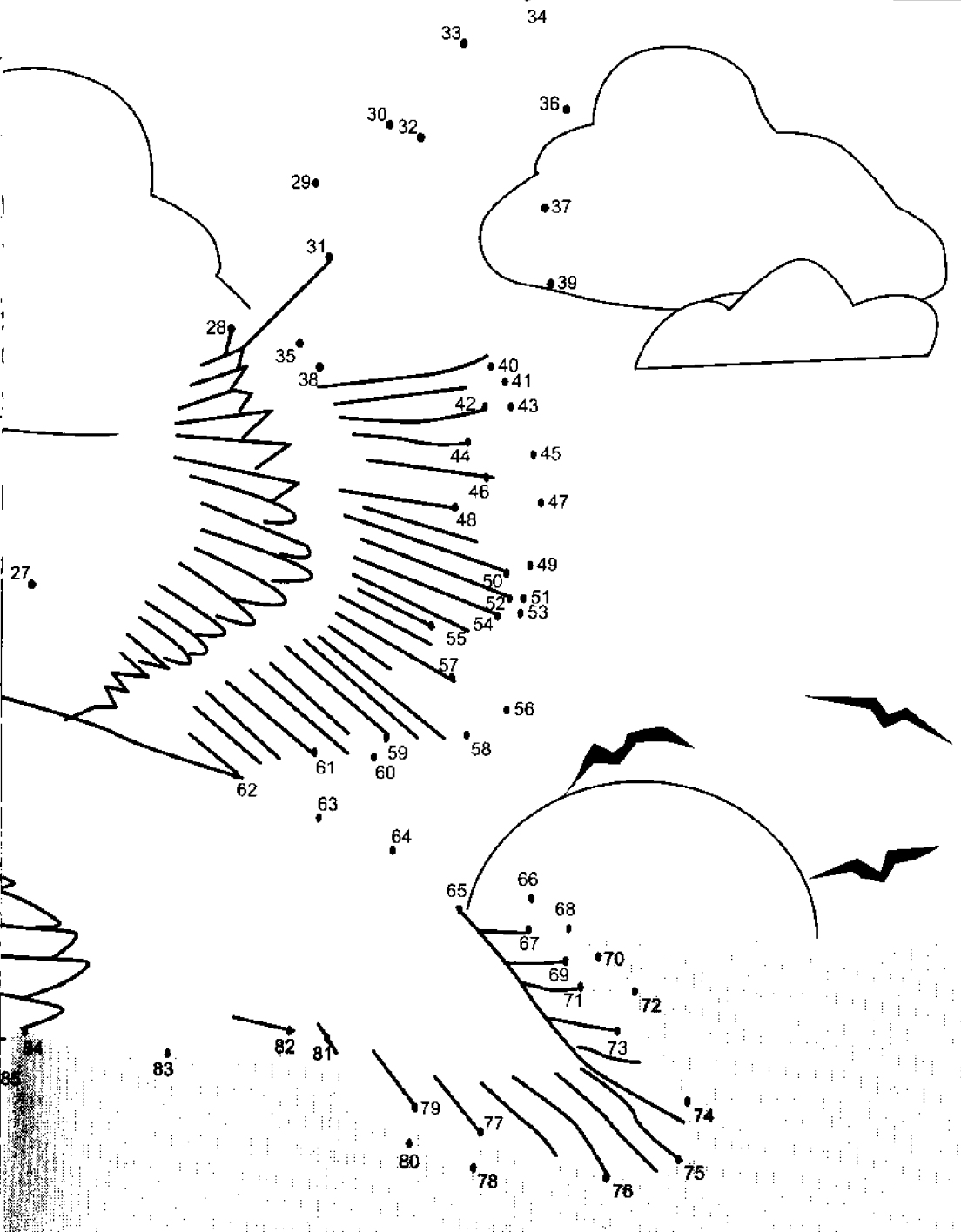
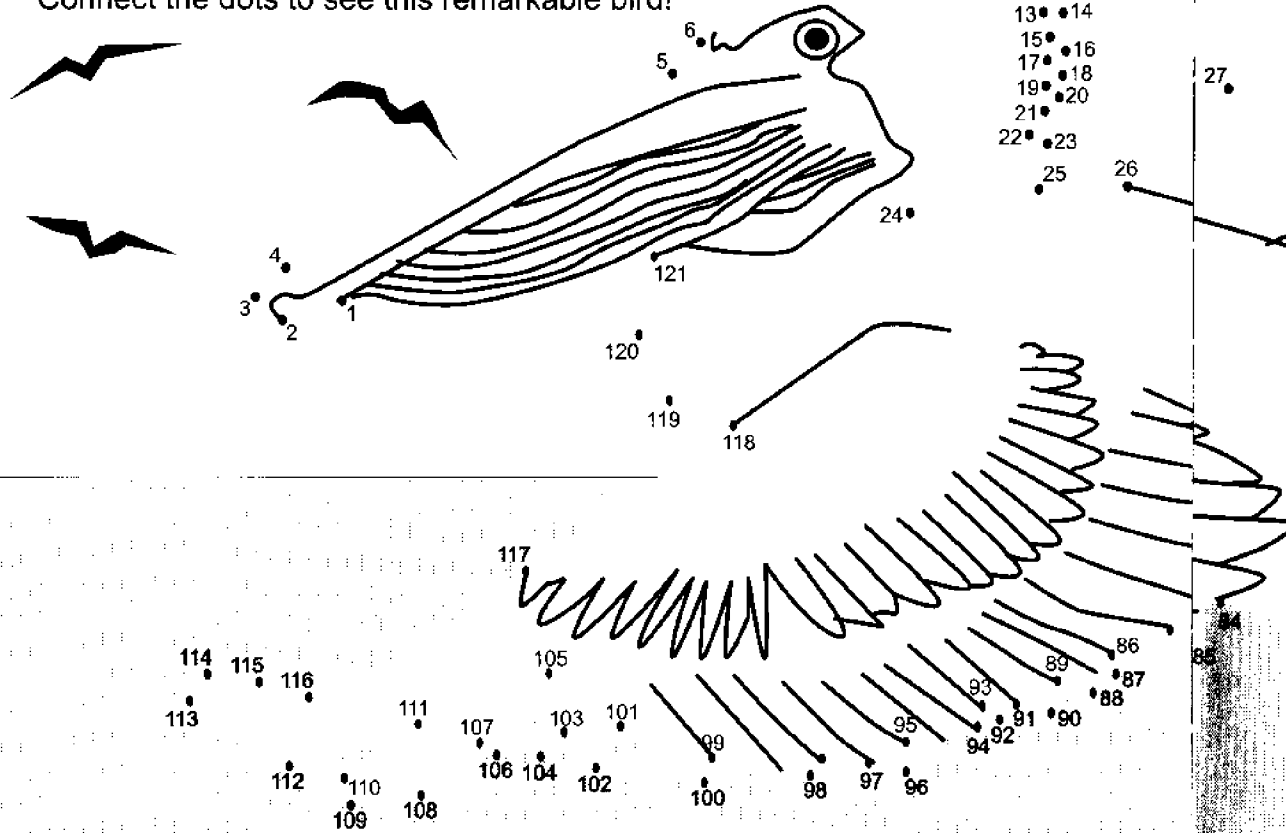
# Dot-to-Dot

Brown Pelicans were once abundant in Coastal Alabama. The species had almost disappeared by 1959, because of the use of the pesticide D.D.T.

In 1970, they were officially listed as an endangered species. Since that time, the use of D.D.T. has been banned in the United States. Now, these birds have made a dramatic comeback in Alabama.

Today, thousands of Brown Pelicans nest on Gaillard Island in Mobile Bay.

Connect the dots to see this remarkable bird!



# Answer Page

## Solve the Secret Message

Page 1

An estuary is a body of water where fresh water from rivers mixes with salt water from the ocean.

## Hold On Tight!

Page 9

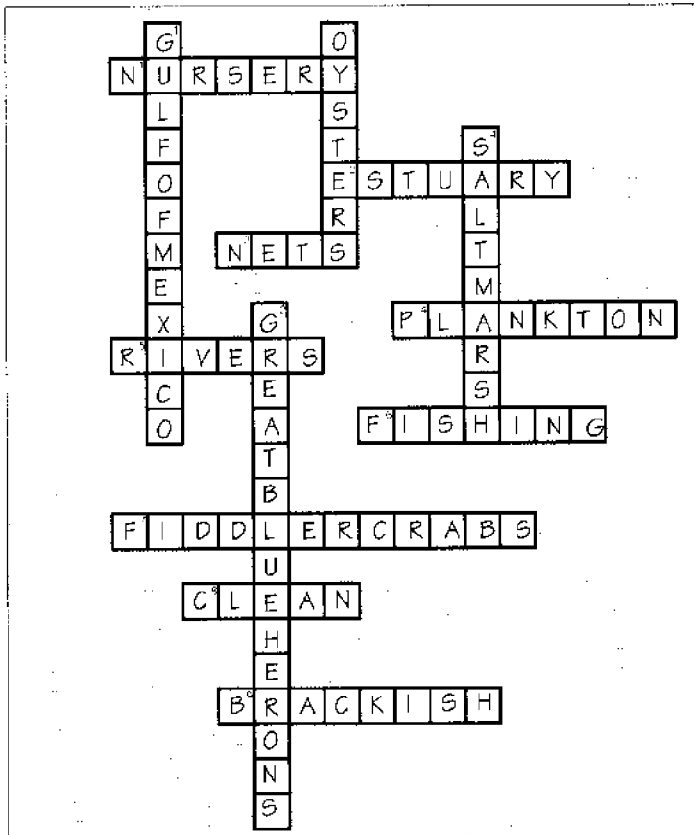
Answer: C. Feed them to whales.

## Presto On!... Presto Off!

Page 8

Answer: C. You can save enough water to fill a swimming pool.

## Crossword Puzzle



**Weeks Bay National Estuarine Research Reserve**  
11300 Highway 98 • Fairhope, AL 36532  
251-928-9792

Funding for this program was provided by a grant from the William T. Grant Foundation and made possible by the World Wildlife Fund and Mobile Bay Watch/Bay Keeper, Inc. Funding was also provided in part by a grant from the National Oceanic and Atmospheric Administration, Office of Ocean and Coastal Resource Management (Award #NA980Z0152) and is partly a result of research sponsored by the Mississippi-Alabama Sea Grant Consortium, and NOAA, Office of Sea Grant, Department of Commerce, under Grant #NA86RG0039. Also made possible by Weeks Bay National Estuarine Research Reserve and Baldwin County Board of Education.



RECEIVED  
NATIONAL SEA GRANT LIBRARY  
DEC 05 2001  
Pell Bldg. URI Bay Campus  
Narragansett, RI 02882 USA