

FLORIDA'S BEACHES AND SHORES





Florida Department of Environmental Protection
Division of Environmental Resource Permitting
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TO PARENTS AND TEACHERS:

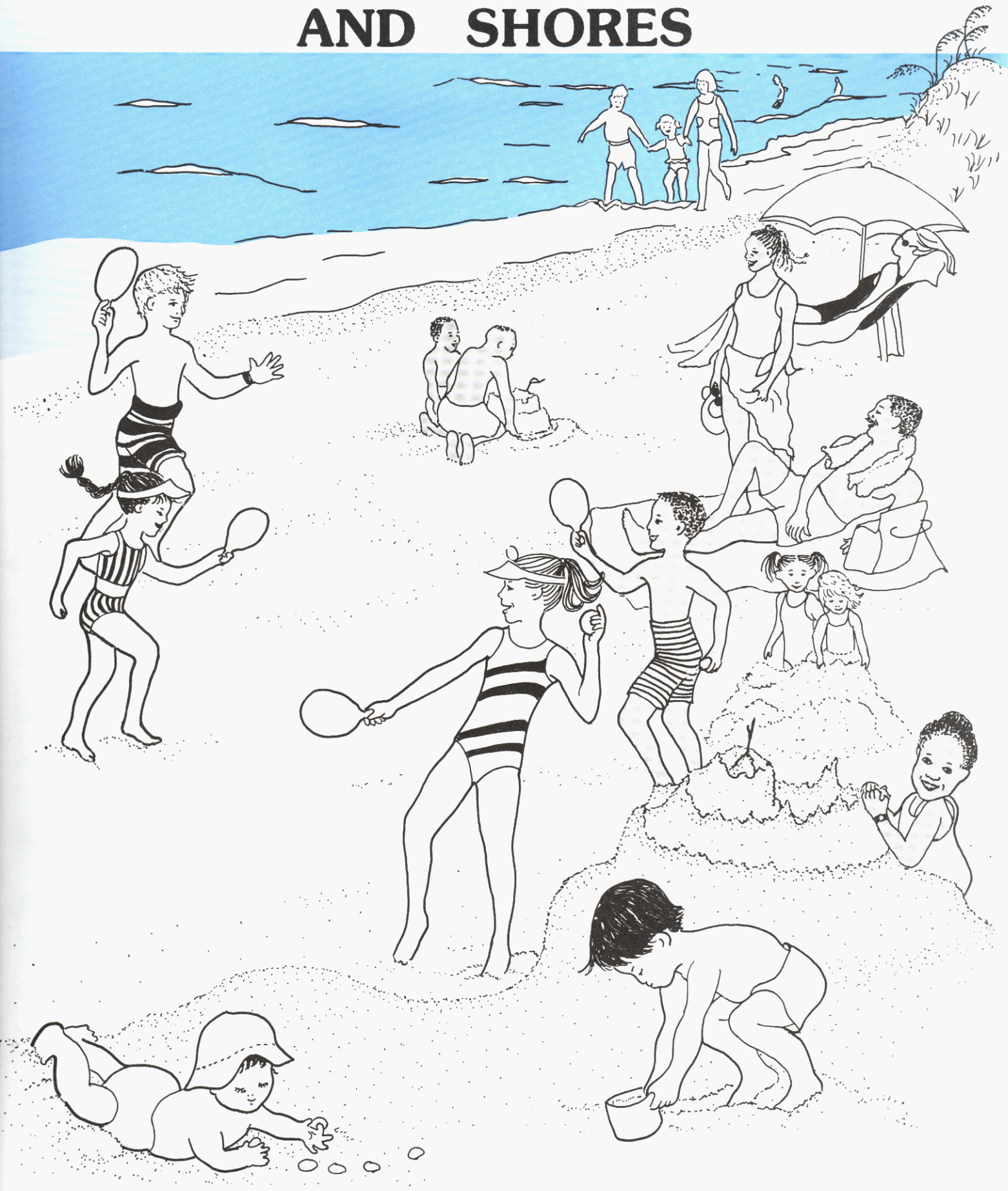
Everyone enjoys visiting Florida's beaches, however few recognize the complex interaction of factors which affect this ever changing environment. Wind and waves are continually altering the shape of the shoreline and dunes. These in turn influence the coastal habitat and the resident plant and animal species. All of these are affected in some way by human actions.

This booklet is intended to enrich the student's knowledge of Florida's sandy beaches and surrounding coastal environment. It attempts to present the issues affecting the beach and dune system in an interesting and creative way. Through the information and activities presented in this booklet, the author hopes to instill an awareness in students of our coastal environment and offer suggestions towards protecting the natural resources associated with Florida's beaches.

An answer key is located on page 20 of this booklet.



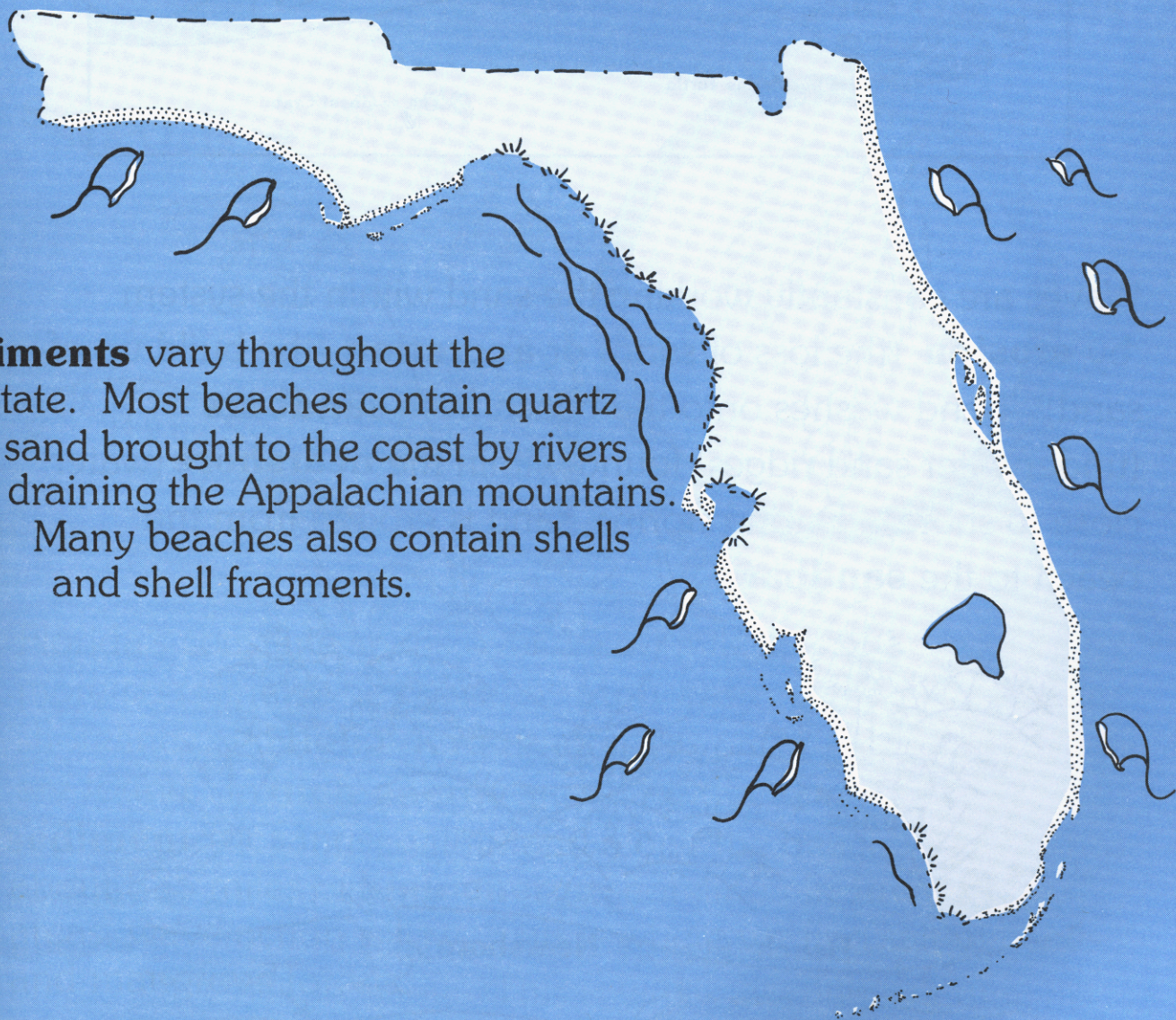
FLORIDA'S BEACHES AND SHORES



Over the years people have been attracted to Florida's coast. They are drawn there by plentiful sea life and a pleasant climate. Many people live, work and play at the coast.



Florida's coastline spans over 1,260 miles. Only Alaska has more coastline. The coast has **high energy** and **low energy** shorelines. **High energy** shorelines are where sandy beaches are found. In **high energy** areas, wind and waves work **sediment** (or sands) within and along the beach. Florida has about 825 miles of **high energy** shoreline. In **low energy** areas, wave action is low. This is where we find salt marshes and mangrove forests.

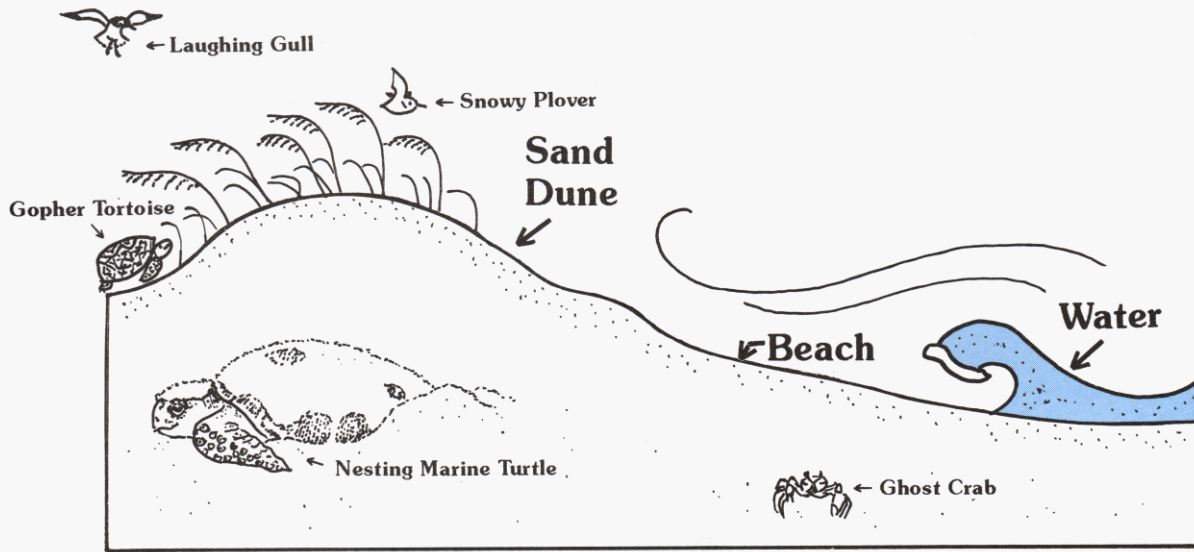


Sediments vary throughout the state. Most beaches contain quartz sand brought to the coast by rivers draining the Appalachian mountains. Many beaches also contain shells and shell fragments.

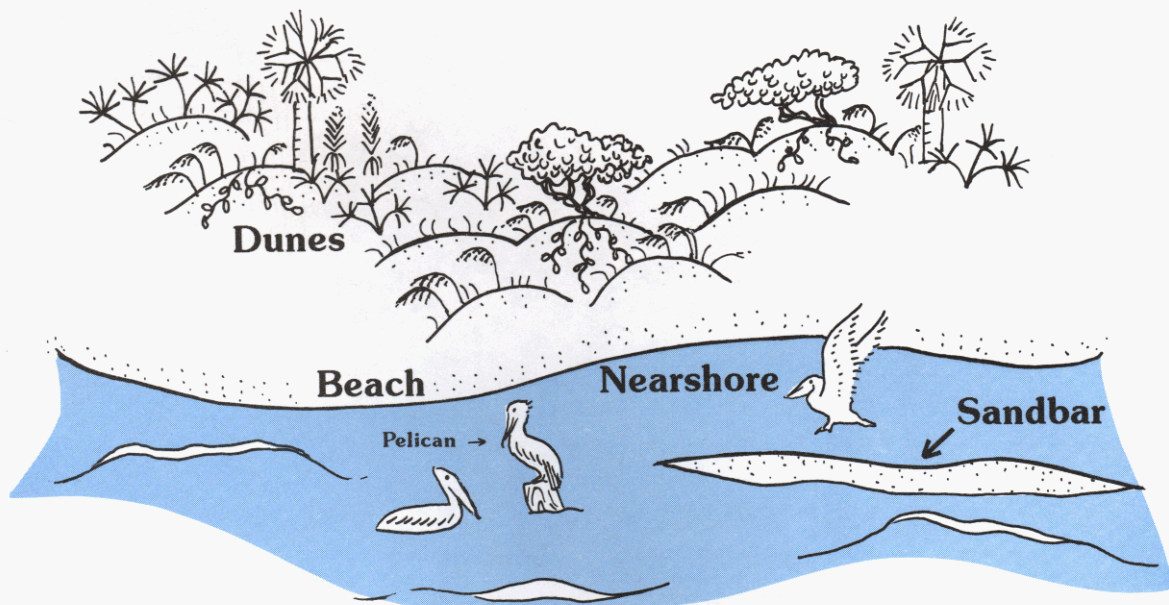
Where do we find sandy beaches?

Sandy beaches are found along _____ energy shores.

The beach and dune system is a dynamic (or changing) environment. Together, the beach and dunes are subject to change from wind, waves, tides and storms.

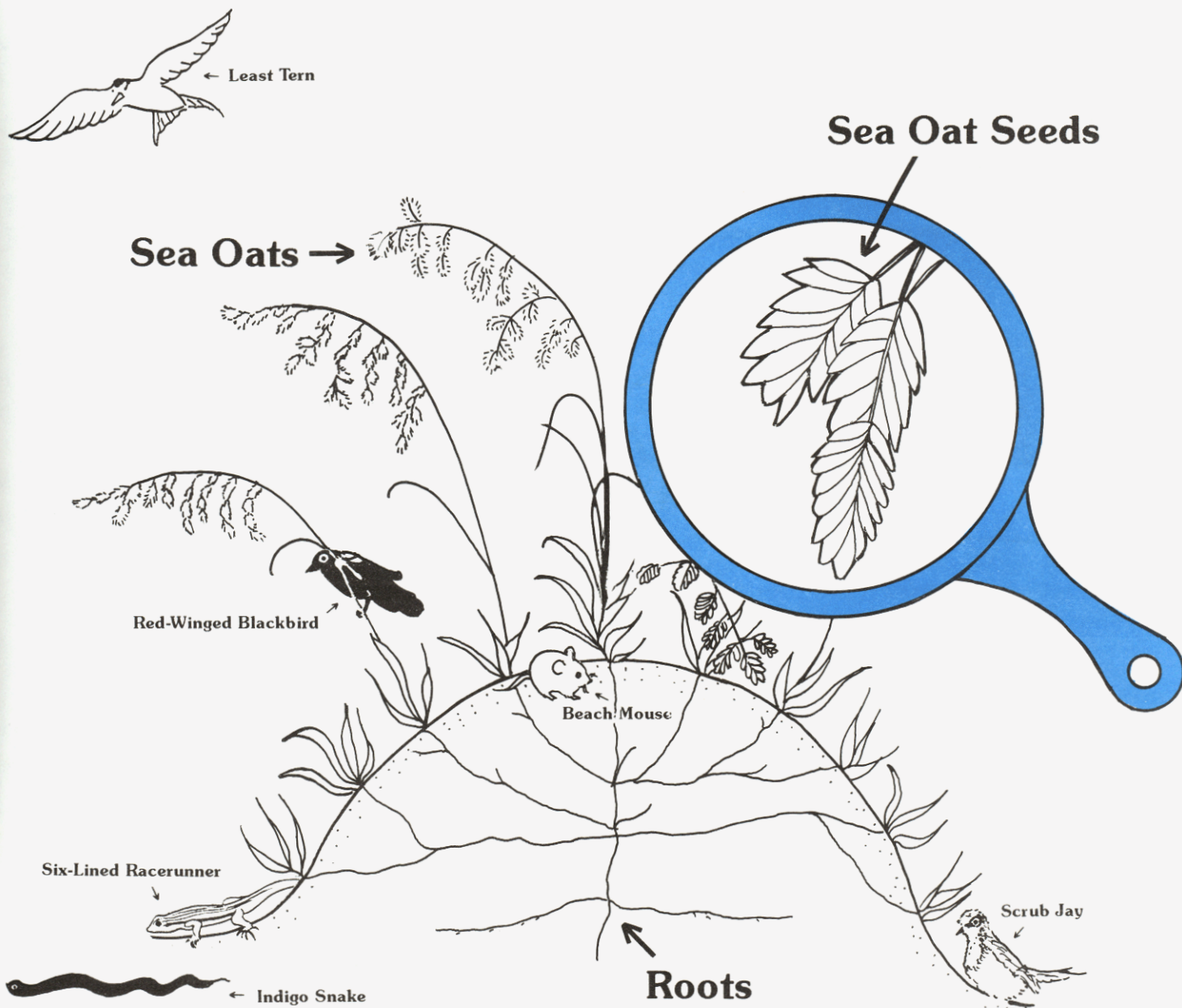


Waves are constantly working the sand within the system by **erosion** (the loss of sand) or **accretion** (the build up of sand). Sand washes onto the beach from **sandbars** (underwater sand ridges) found within the **nearshore** (water close to shore). During storms, sand is eroded from the beach to the **sandbars**.



The build up of sand on the beach is called

Wind plays an important role in the creation of sand dunes. Sea oats are one of the most important dune plants. They and other dune vegetation trap and hold wind blown sand with their leaves and roots to form dunes. Dunes serve as reservoirs (storage places) for sand. They replace sand lost from the beach by **erosion** due to storms.

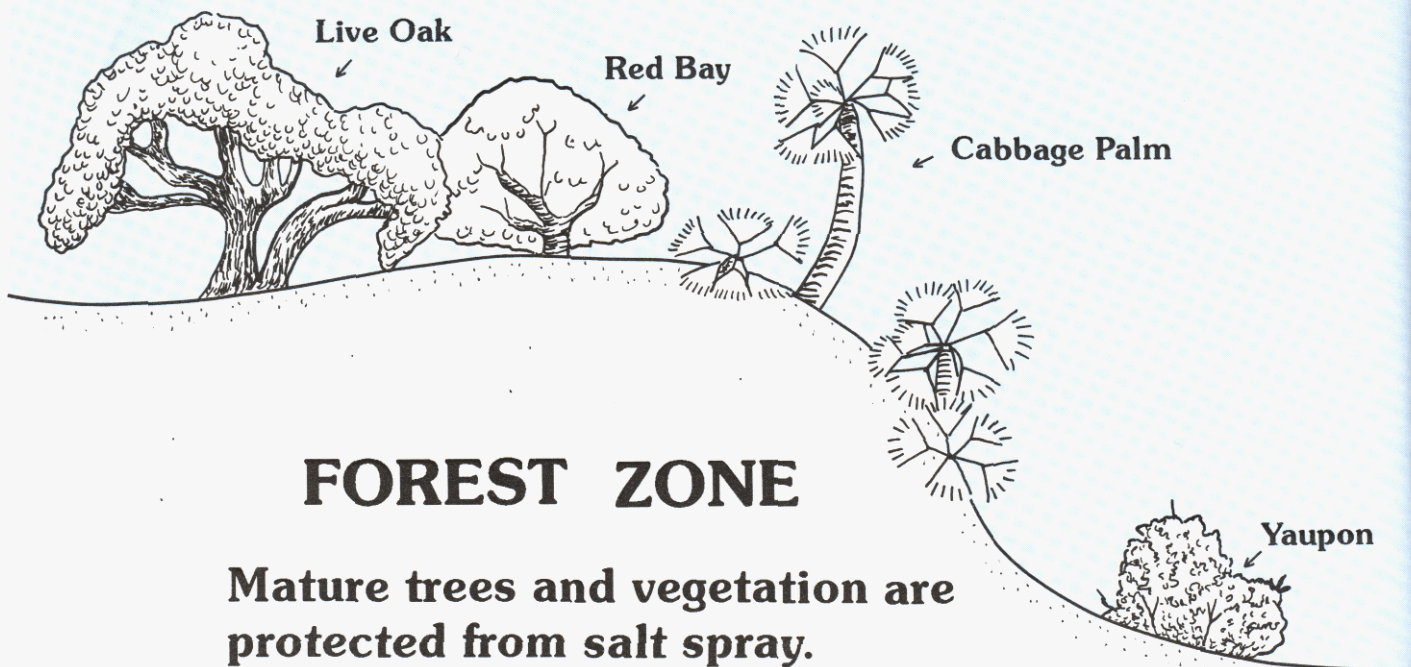


How do Sea oats help to form and stabilize (keep stable) sand dunes?

They help by trapping and holding the sand in place with their _____ and _____.

Vegetation is important to a healthy dune system. It stabilizes sand and provides a **habitat** (place to live) for coastal animals. Plants and animals originating along the coast are **native** to the system. Less than 35% of **native** dune vegetation remains undisturbed due to development (building) along Florida's coast.

Here are some common native plants found in the coastal environment and their vegetation zones.



FOREST ZONE

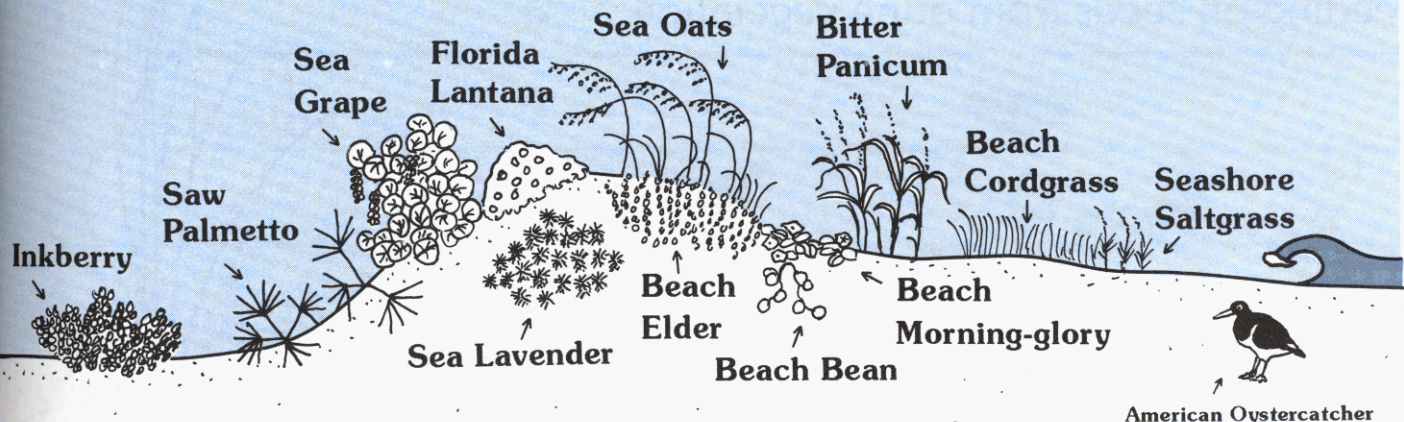
Mature trees and vegetation are protected from salt spray.

SCRUB

Here plants and shrubby dune vegetation are protected from salt spray.

Draw a line to connect each plant to its vegetation zone.

Beach Morning-glory	Pioneer Zone
Beach Cordgrass	
Red Bay	Scrub Zone
Inkberry	
Sea Oats	Forest Zone
Florida Lantana	
Live Oak	
Yaupon	



ZONE

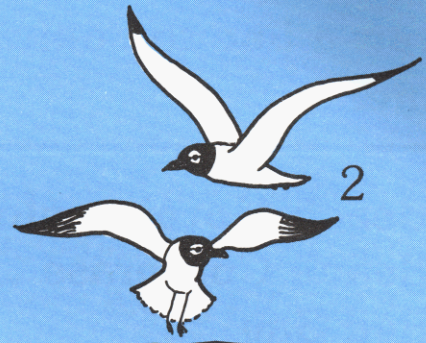
trees are low
to sea winds

PIONEER ZONE

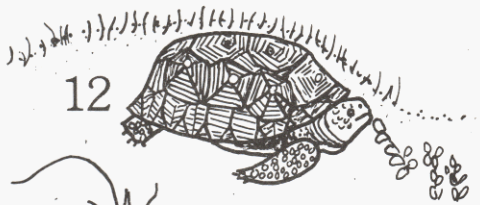
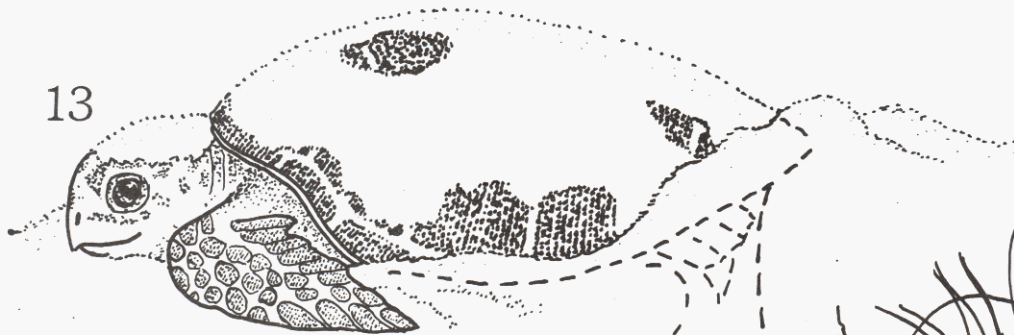
Like the pioneers were the first to settle the west, these are the first plants on the beach and the dunes they help to form.

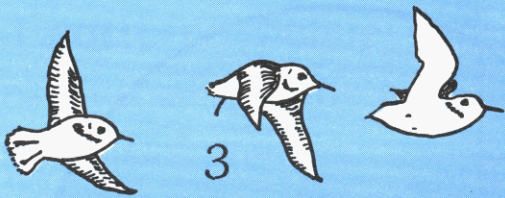
American Oystercatcher

Black Skimmer with Chick

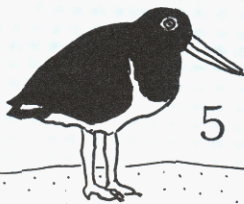


Many animals depend on the beaches and dunes for all or part of their lives. Beaches are used by resident (they live here) and migratory (visiting) shorebirds for resting, foraging (eating) and nesting. Marine turtles come ashore in the summer to nest on the beach. Beach mice inhabit (or live in) the dunes feeding on seeds from dune vegetation.



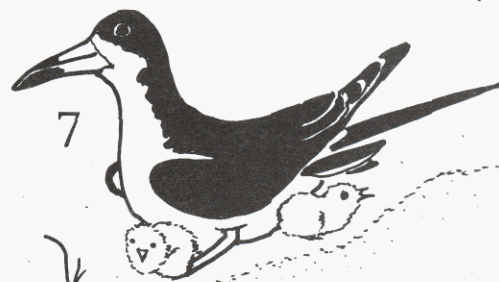


Over 30 animals considered rare within the state inhabit the beach and nearby **habitats**. There are also a number of common ones.

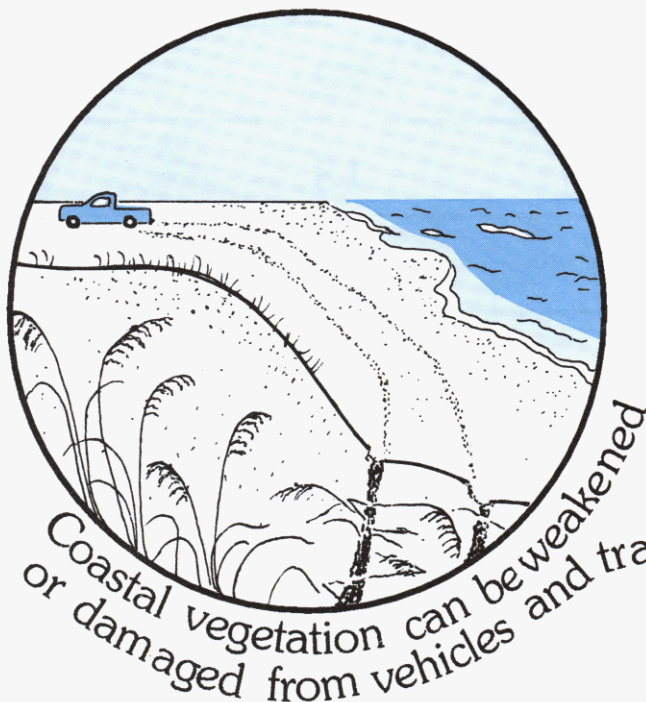
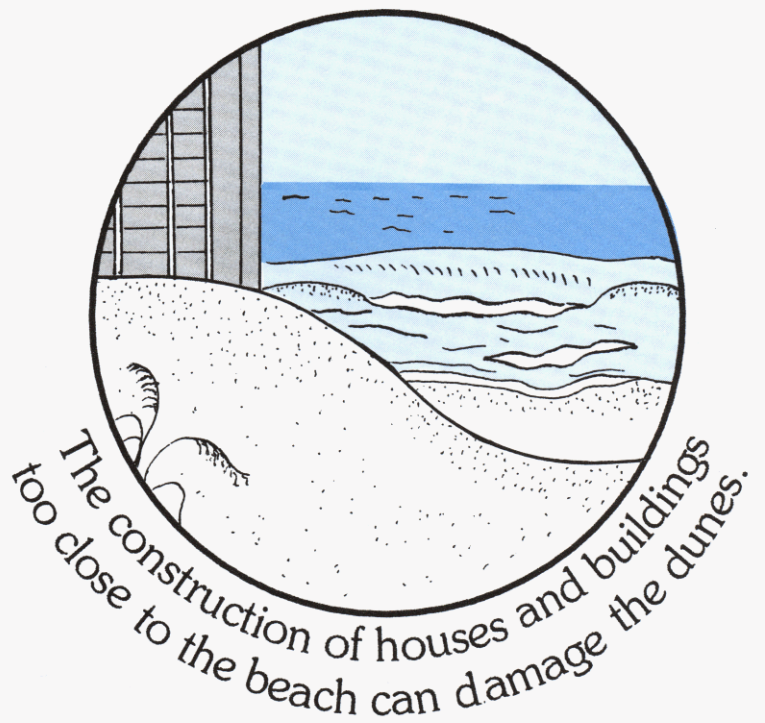
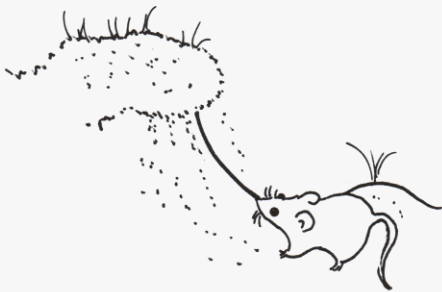


How many common or rare animal species, shown in earlier pages of this book, can you name in this picture?

- | | | |
|-------------------------|-----------|-----------|
| 1. _____ | 6. _____ | 11. _____ |
| 2. Laughing Gull | 7. _____ | 12. _____ |
| 3. _____ | 8. _____ | 13. _____ |
| 4. _____ | 9. _____ | 14. _____ |
| 5. _____ | 10. _____ | |



Unfortunately, our attraction to the coast can harm the beach and dune system.

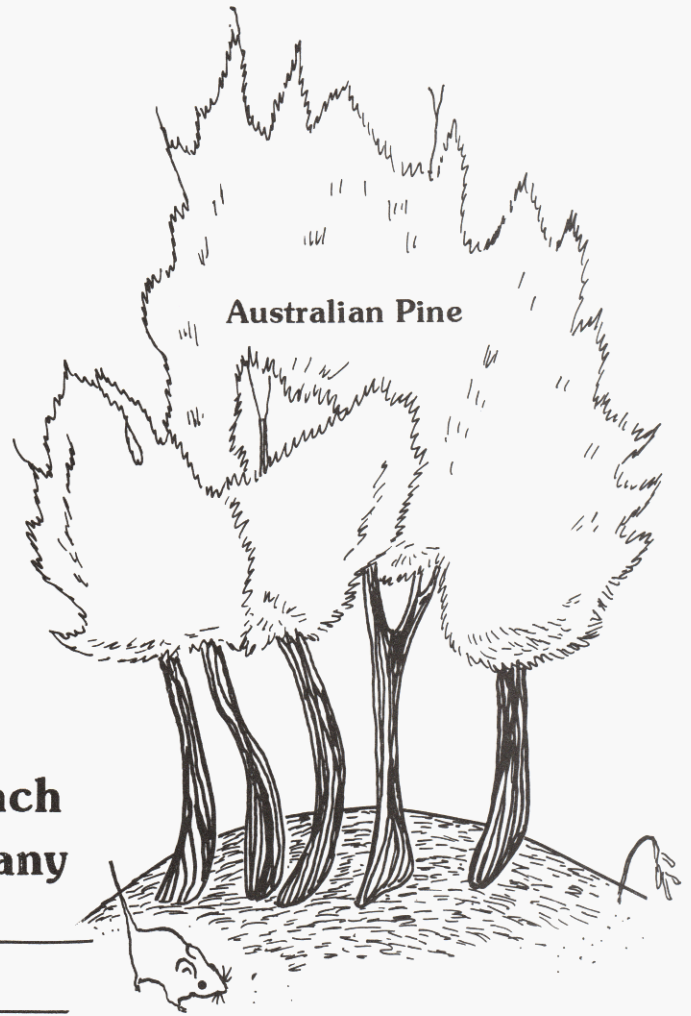


When crossing a dune always use a dune walkover if possible.

Dune Walkover



Exotic (not native) species such as Australian Pine also damage the coastal environment by displacing (taking the place of) **native** vegetation. **Native** vegetation stabilizes the dunes and provides **habitat** to coastal animals.



1. Why can't the beach mouse find any Sea Oats? _____

2. An Australian Pine is an example of an _____ species.

By using the _____.

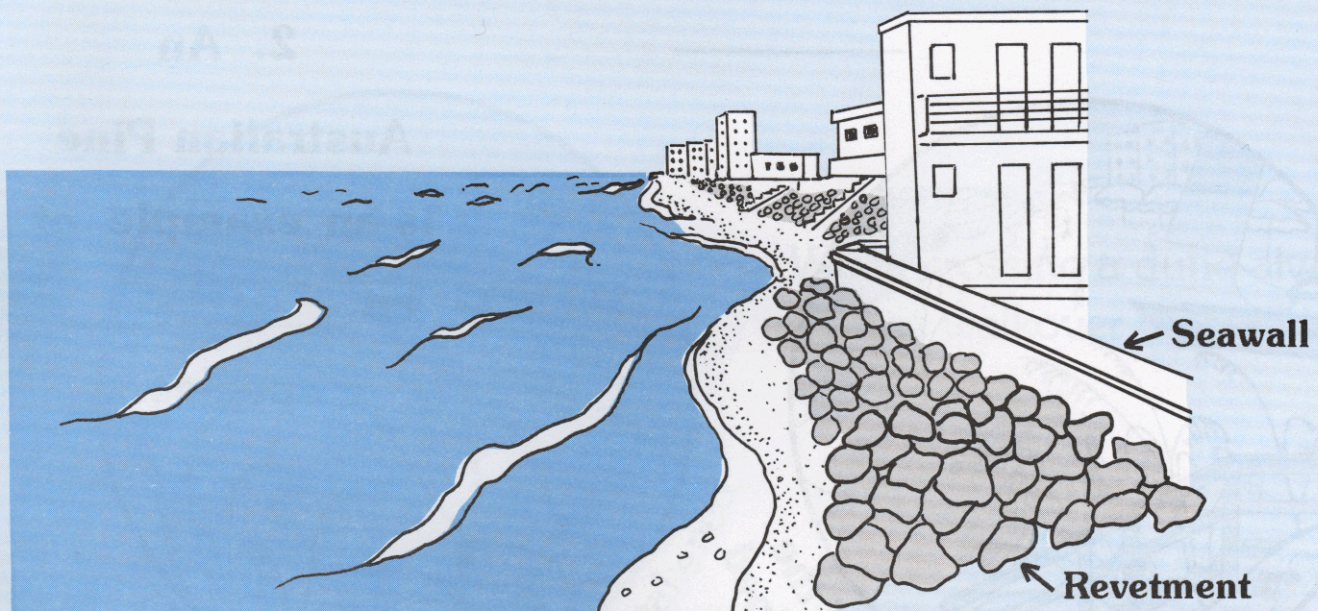


3. How could the owner of the footprints in the picture have helped to preserve the coastal vegetation?

Although walking across a dune seems harmless, vegetation may be damaged, creating a path to the beach. This path lures others to use it, making the path grow wider and deeper with use. In time the dune may disappear or erode as vegetation stabilizing it is damaged by foot traffic.



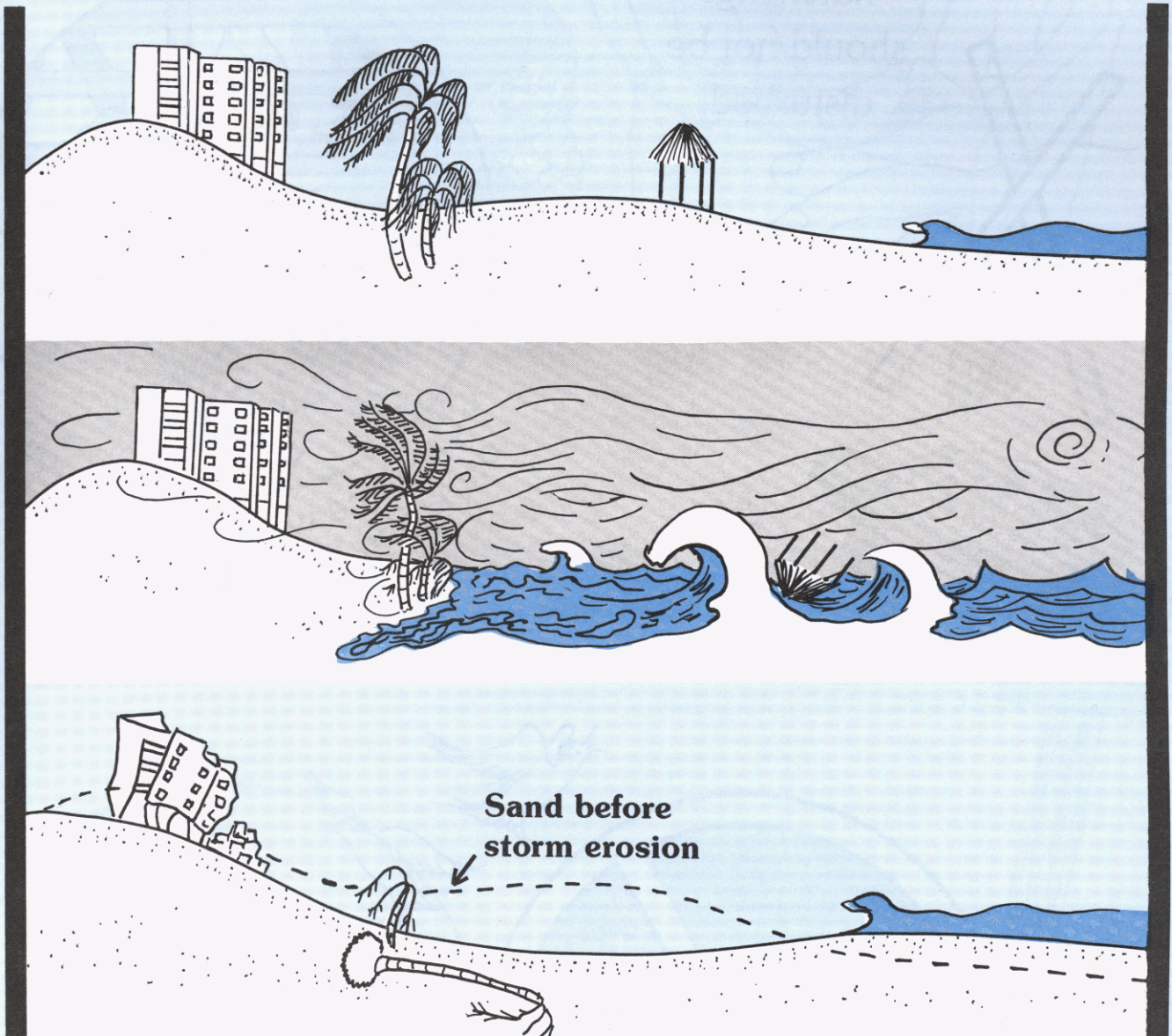
Draw an arrow to point the best way to leave the beach.



Loss of a healthy dune can cause the beach to become narrow or disappear. When this happens the natural protection from waves and storms is lost. Often **seawalls** and **revetments** (shore protection structures) are built to protect buildings and properties from damage from waves and storm waters.

Natural disturbances and major storms can cause great harm to beaches and dunes. Buildings and property can also be threatened.

BEFORE STORM

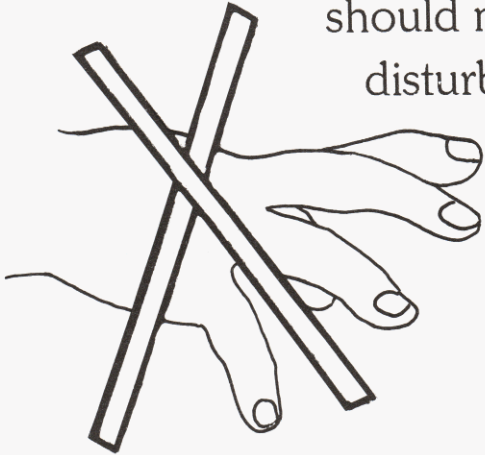


AFTER STORM

When the fragile dune system is damaged, **erosion** (the loss of sand) may begin. This threatens the **habitat** of plants and animals. Natural protection from storms as well as the beach we all enjoy may be lost.

When visiting the beach

Marine turtles or their hatchlings should not be disturbed.

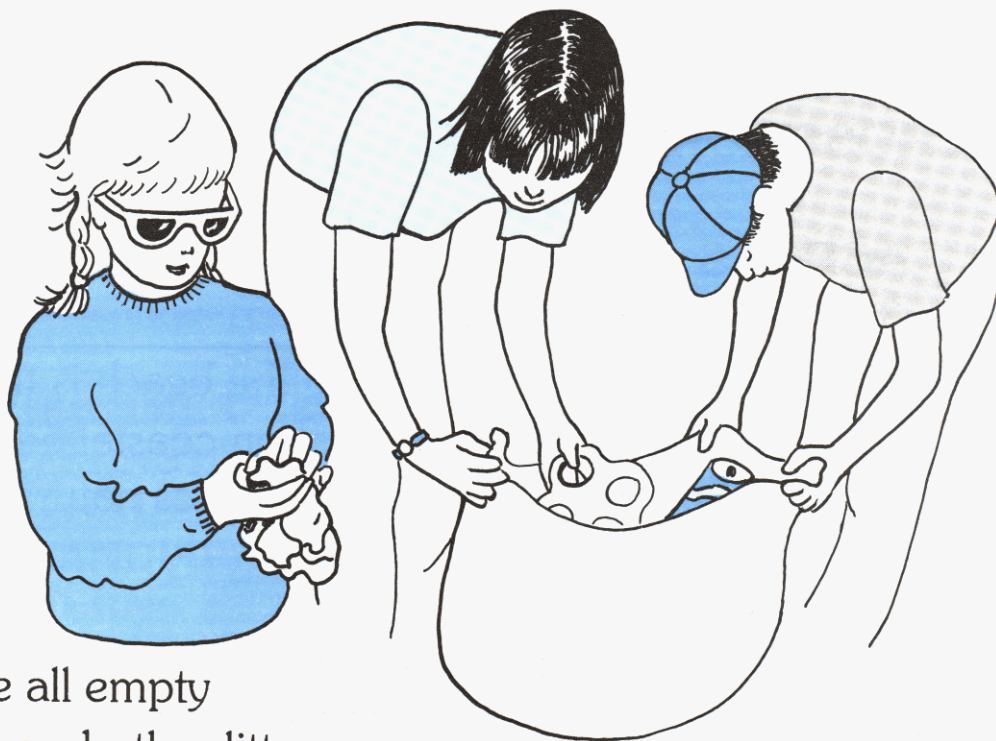


Use dune walkovers to avoid damaging the coastal vegetation.



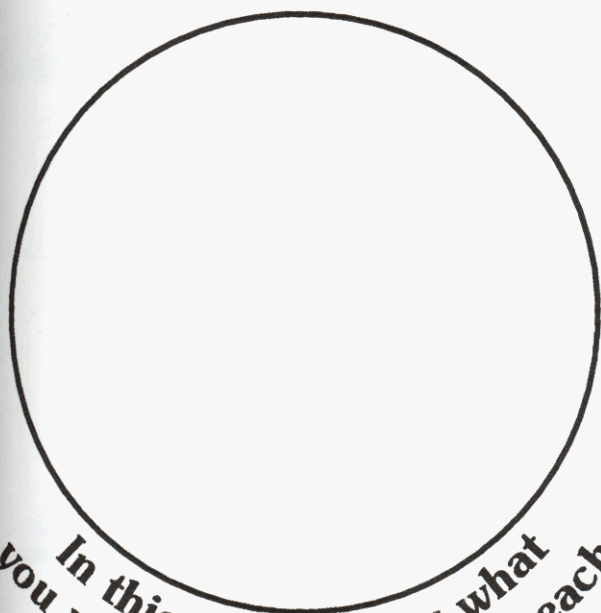
Dogs and cats may disturb shorebirds and should not be allowed to roam the beach.

always remember:



Take home all empty cans, wrappers, and other litter you may have brought.

Stay clear of nesting and resting birds on the beach.



In this circle draw what you would do to help the beach.

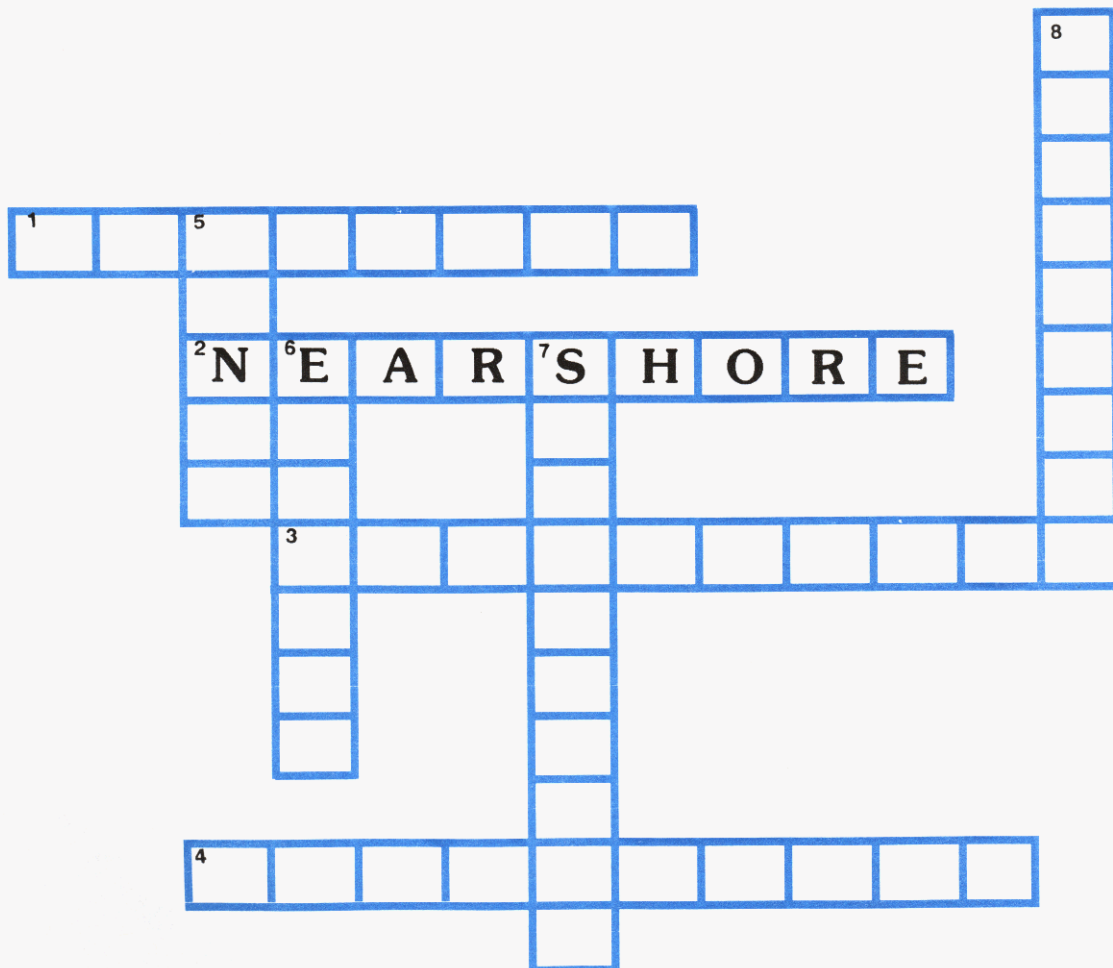
CROSSWORD PUZZLE

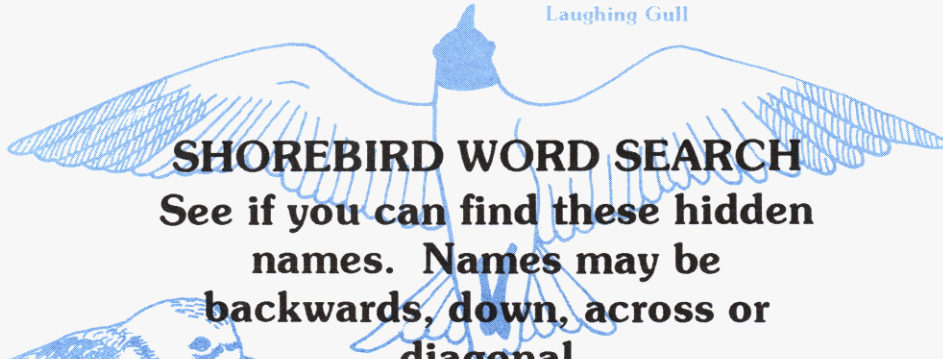
ACROSS

1. Sand is also known as _____.
2. The shallow water adjacent to the beach is the nearshore.
3. _____ rest, forage and nest on coastal beaches.
4. The beach and dune system provides natural _____ from storms.

DOWN

5. Buildings too close to the beach can damage the _____.
6. During storms, the loss of sand from the beach is known as _____.
7. Beach and dune systems are found along high energy ____.
8. Always use dune _____ to avoid damaging the vegetation.





SHOREBIRD WORD SEARCH

See if you can find these hidden names. Names may be backwards, down, across or diagonal

- SKIMMER
- TURNSTONE
- SANDERLING
- SANDPIPER
- TERN
- OYSTERCATCHER

- PELICAN
- DUNLIN
- PLOVER
- WILLET
- GULL



Ruddy Turnstone



Black Skimmer



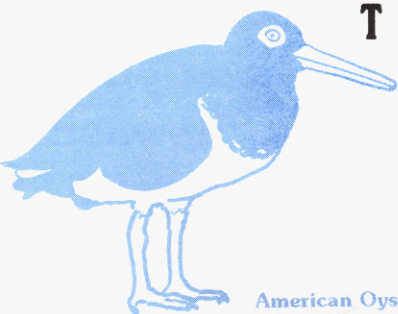
Sanderling



Willet



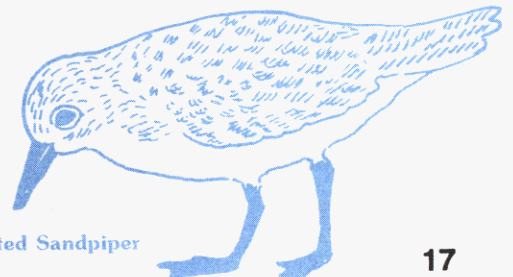
Brown Pelican



American Oystercatcher

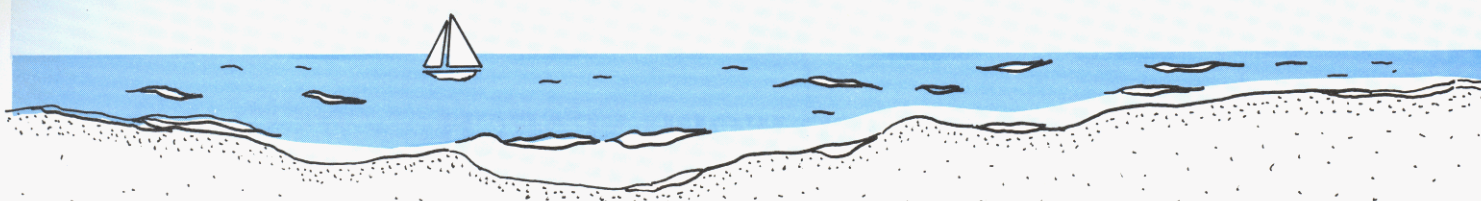


Dunlin

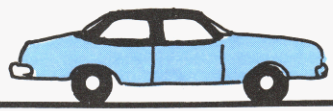
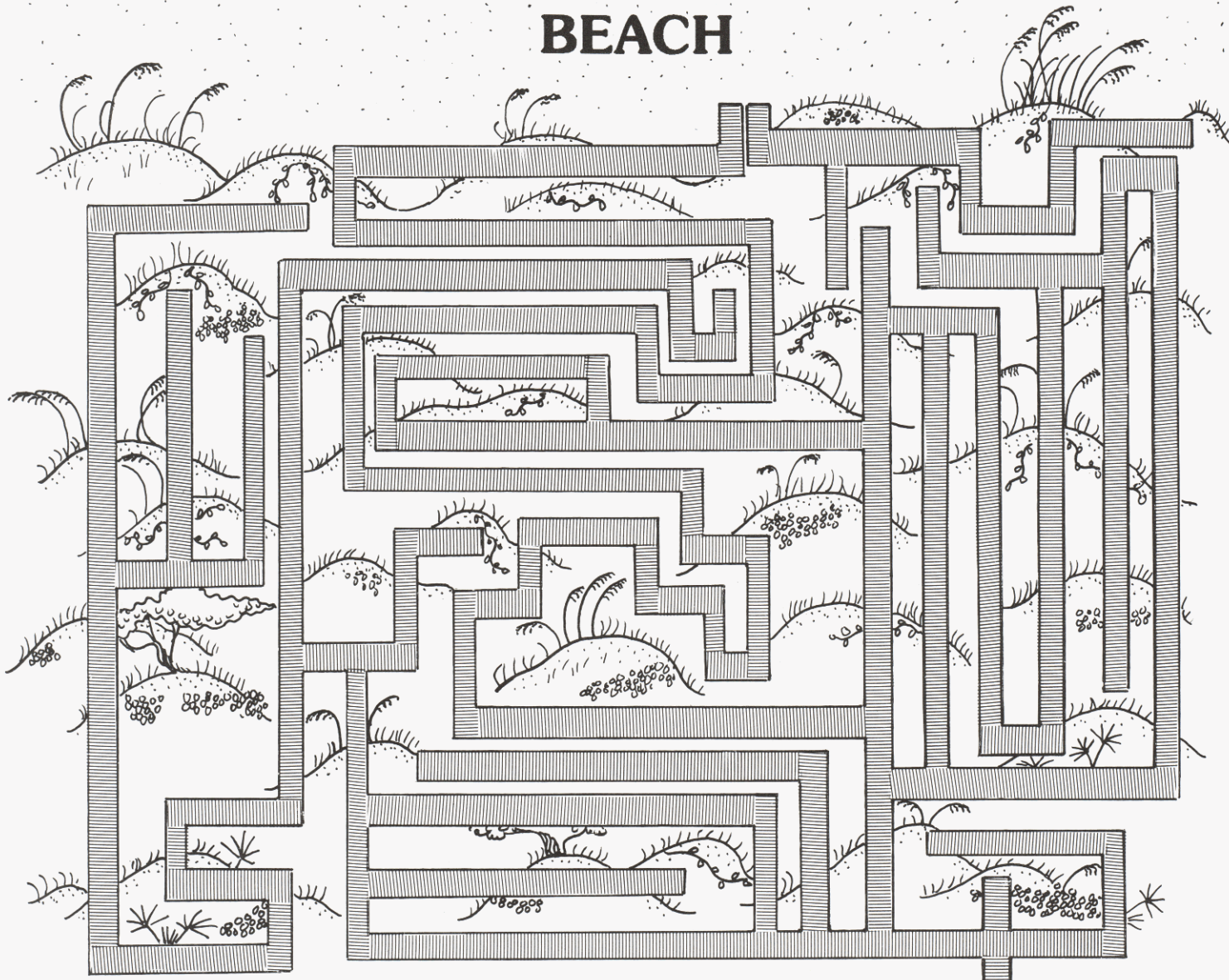


Semipalmated Sandpiper

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



BEACH



PARKING



See if you can help the Smiths find their way on the dune walkover to the beach.



Glossary of Words Relating to the Coast

Accretion - the build up of sand

Coast - beach or shoreline

Dune Walkover - wooden walkway built over dunes to protect vegetation from trampling by foot traffic

Erosion - the loss of sand

Exotic - plants and animals that are not native to Florida

Habitat - a place where plants and animals live

High Energy Shoreline - where wind and waves work the sand to create beaches

Low Energy Shoreline - where wave action is low, resulting in little or no sandy beaches

Native - plants and animals naturally found in Florida

Nearshore - the water close to shore

Revetment - a shore protection structure made of large rocks to protect buildings and property from the damage from waves and storm waters

Sandbars - underwater sand ridges

Seawall - a concrete or steel wall used as a shore protection structure

Sediment - sands, shell, silt, any grainy material moved by currents or waves



Answer Key

Page 3

high

Page 4

accretion

Page 5

leaves and roots

Page 7

Pioneer Zone

Beach Morning-glory

Beach Cordgrass

Sea Oats

Florida Lantana

Scrub Zone

Inkberry

Yaupon

Forest Zone

Red Bay

Live Oak

Pages 8 and 9

1. Least Tern
2. Laughing gull
3. Snowy Plover
4. Pelican
5. American Oystercatcher
6. Red-winged Blackbird
7. Black Skimmer with chicks
8. Scrub Jay
9. Ghost Crab
10. Beach Mouse
11. Six-lined Racerunner
12. Gopher Tortoise
13. Nesting Marine Turtle
14. Indigo Snake

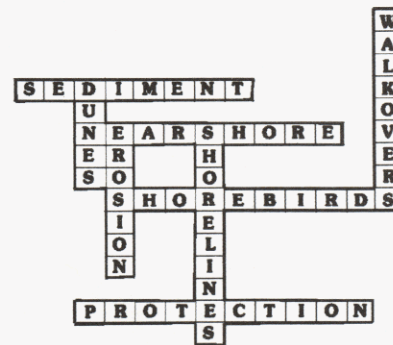
Page 11

1. The Australian Pines have taken the Sea Oats place.
2. exotic
3. dune walkover

Page 12

The arrow should point toward the dune walkover.

CROSSWORD PUZZLE



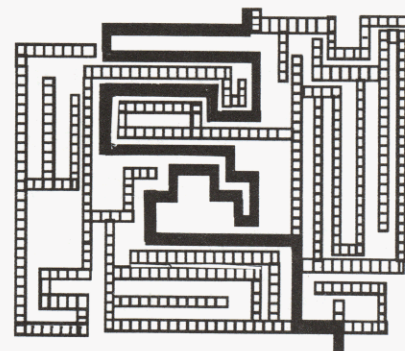
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SHOREBIRD WORD SEARCH



Page 18

DUNE WALKOVER MAZE



For additional information about Florida's beaches and shores contact the Florida Department of Environmental Protection, Division of Environmental Resource Permitting, Bureau of Beaches and Coastal Systems, 3900 Commonwealth Boulevard, Tallahassee, Florida 32399-3000.

Your local library may also contain books about the coastal environment. Some books to look for include:

Bannan, Jan G. Sand Dunes. Carolrhoda Books, Inc. 1989.

Glaser, Michael. The Nature of the Seashore. Knickerbocker Publishing. 1986.

Jennings, Terry. Sea and Seashore. Children's Press. 1989.

Kirkpatrick, Rena. Look at Shore Life. Raintree Publishers. 1985.

Lye, Keith. Coasts. Silver Burdett. 1988.

Malnig, Anita. Where the Waves Break: Life at the Edge of the Sea. Carolrhoda Books. 1985.

Parker, Steve. Seashore. Knopf. 1989.

VanMeter, V.B. Florida's Sea Turtles. Florida Power and Light Company. 1983.

Wharton, Anthony. Discovering Sea Birds. Watts/Bookwright Press. 1987.

Here are some things you can do to help the beach.

-Participate in coastal clean up activities through programs such as **Adopt-A-Shore** .

-Assist with dune planting activities in your community.

-Share this booklet with your friends and parents.

