Wetland Neighbors

This booklet was created especially for you, to help you understand why the wetlands of the Californias are so important for people, plants and animals. Most of all, we want you to help conserve and protect these wild places so that everyone can enjoy their beautiful landscapes and natural richness.

Wetland Neighbors

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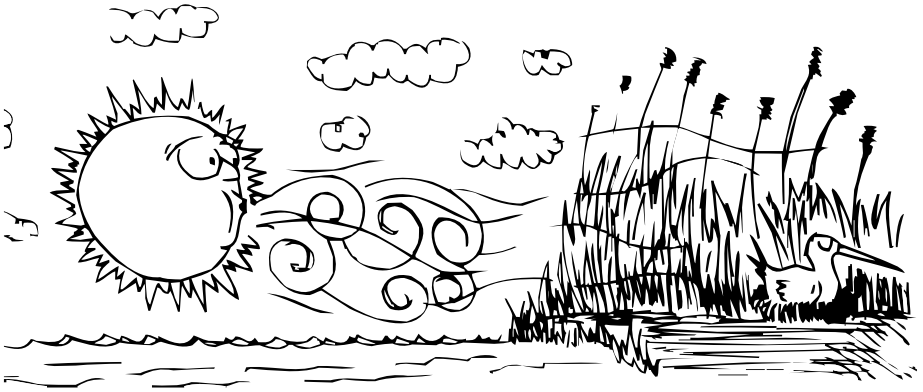
What is a Wetland?

Wetlands are areas covered with a shallow layer of water part of the time or all the time. They include mudflats, marshes, swamps, freshwater vernal pools, saltwater lagoons and estuaries.

Coastal wetlands are a favorite **habitat** for many **species** of birds and mammals. They provide abundant food, places to rest and refuge from natural and domestic **predators**. Wetlands also provide many valuable services for humans, such as filtering toxins, acting as sponges to absorb rainwater and prevent flooding and providing nursing grounds for fisheries.

Wetlands are also a favorite place for people. Human activities, such as agriculture, construction of freeways, water channels, ports, marinas and houses, have led to the loss of 90% per cent of southern California wetlands. Today, many people understand how valuable wetlands are. Wetland conservation has become an important movement in California and Baja California. Read on to find out more about why wetlands are vital to plants, animals, and people.

Wetland plants



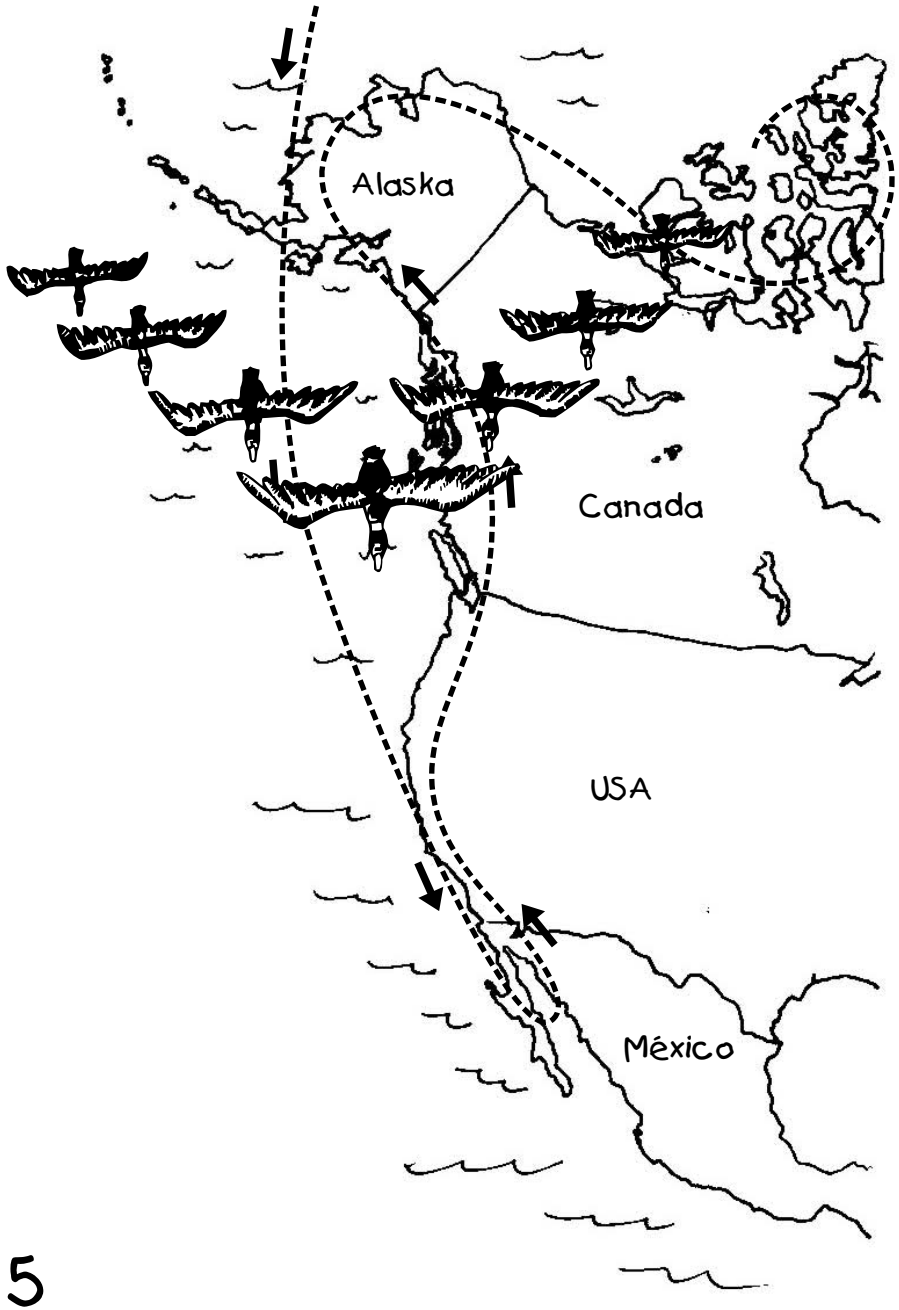
The special plants of saltwater estuaries and lagoons receive all of their nutrients from the **detritus** of the wetlands. They have developed means to neutralize the high concentration of salt in their environment. Many wetland plants excrete excess salt through pores in their stems and leaves.

Others dilute it with fresh water and store it in their stems. Coastal wetland plants are natural filters that help clean contaminants from the waters that flow down our rivers and the runoff that comes from our lawns, gardens and farms before this pollution reaches the sea. They are also a primary food source for a great variety of **invertebrates**, birds, reptiles and mammals.

Coastal Wetlands: an Important Resource for Birds...

Hundreds of thousands of **migratory** birds travel long distances from the arctic to as far as South America. Many raise their young in the coastal wetlands of California and Baja California. For birds traveling this long **Pacific Flyway**, coastal wetlands are like stops along a highway where these long-distance travelers can find food, rest and shelter.

Coastal wetlands are equally important for **resident** birds. Wetland habitats provide food, water, shelter and places to rear young for these birds who live all their lives along the coast of the Californias. The birds of our wetlands search the mudflats looking for invertebrates, such as crabs, snails, oysters and clams. They also feast on small fishes swimming in the channels.

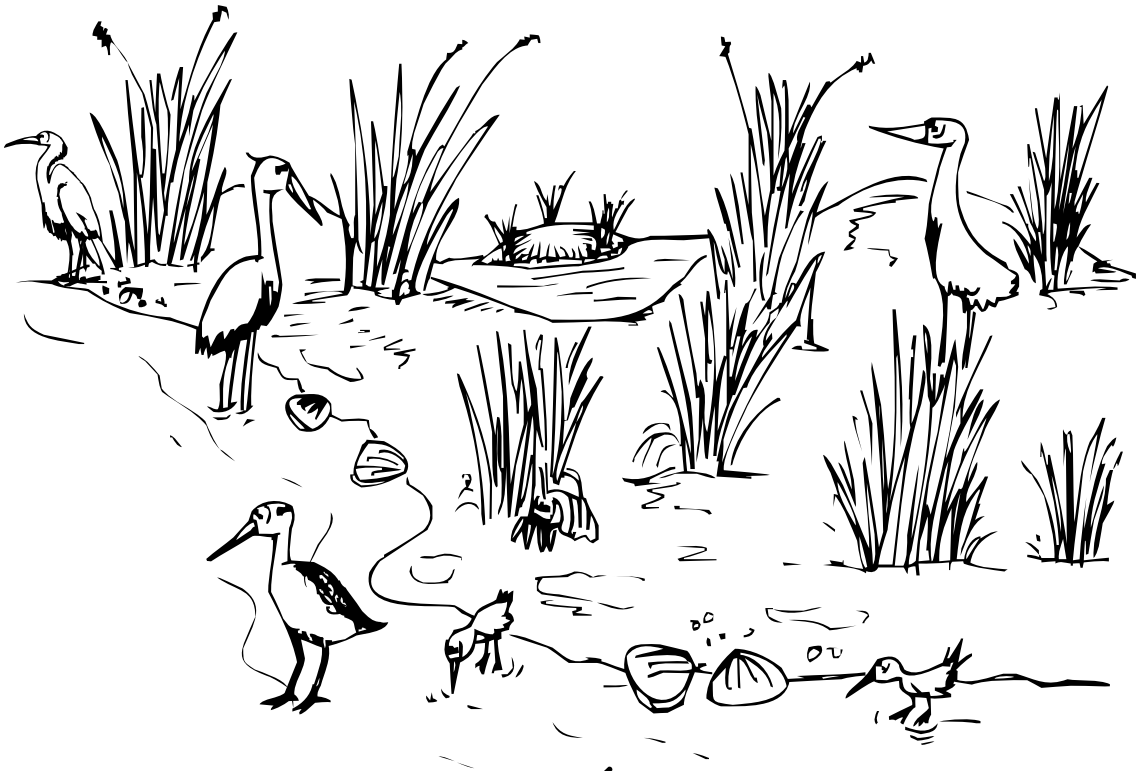


... and Other Species

Fresh and saltwater wetlands are places where all kinds of organisms develop, such as **plankton** and invertebrates, which make up a biologically diverse **food web**. Plankton feeds small creatures, which in turn become the food of bigger ones, creating a **food chain** that includes humans who eat many species of fish and seafood. In addition, grey whales feed directly on plankton.

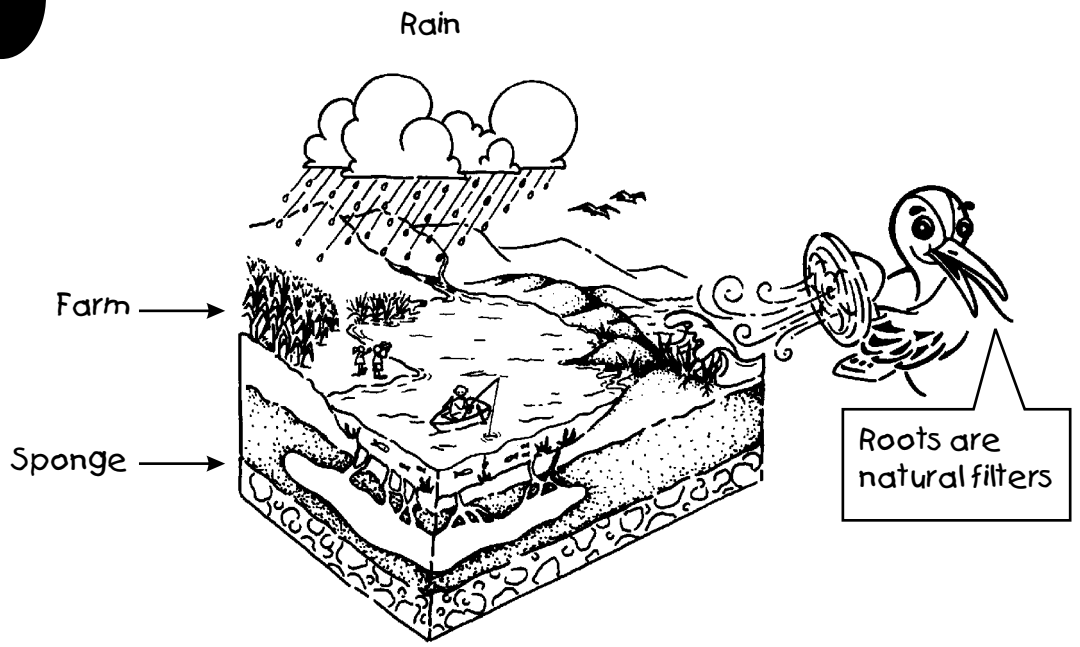
Thousands of gray whales travel more than 5,000 miles from their wintering grounds in Alaska to the quiet waters of coastal lagoons and wetlands in Baja California. There they mate and give birth to their calves. During winter, the shallow depths and high salt concentration of these coastal waters are perfect for helping the newborn whales float and learn to swim.

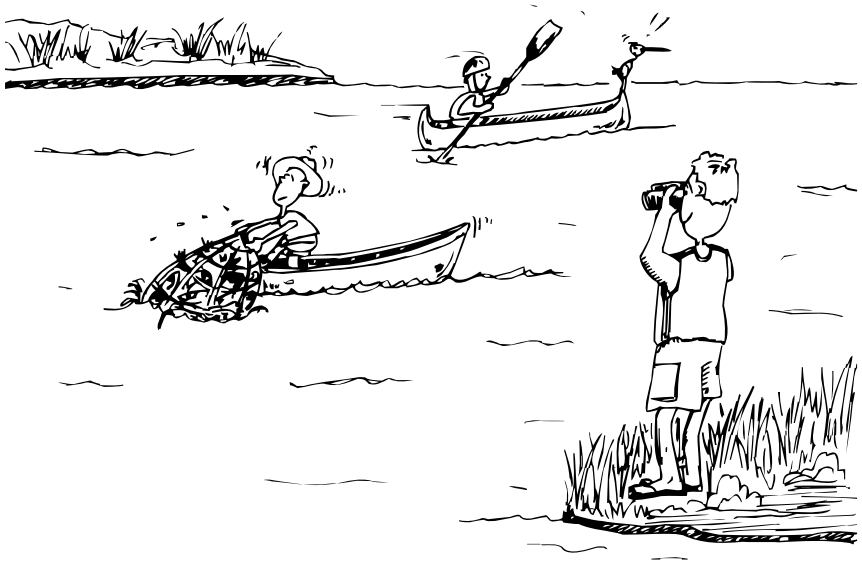
These same quiet, shallow waters, rich in **nutrients** and sheltered from heavy surf, are breeding grounds for a variety of fishes that find an excellent refuge against marine predators in coastal wetlands.



People Are Not an Exception

Wetlands are vital to people for many reasons. We use wetlands and surrounding areas for recreation, such as fishing, kayaking and bird watching, and for renewal of our spirit. Wetlands are also important for economic reasons such as **mariculture.**





Wetlands refill **aquifers** that allow rainwater to accumulate underground, and in the process, filter water that can then be used by people. Aquifers help stabilize the temperature for wildlife in wetlands. Larger wetlands can prevent flooding because they are natural barriers that help to decrease strong winds and ocean swells that hit shorelines. They also protect land further inland against strong river currents that can flood cities and farms. They are an excellent natural protection against hurricanes and storm surges.

Wetland Neighbors - Then and Now

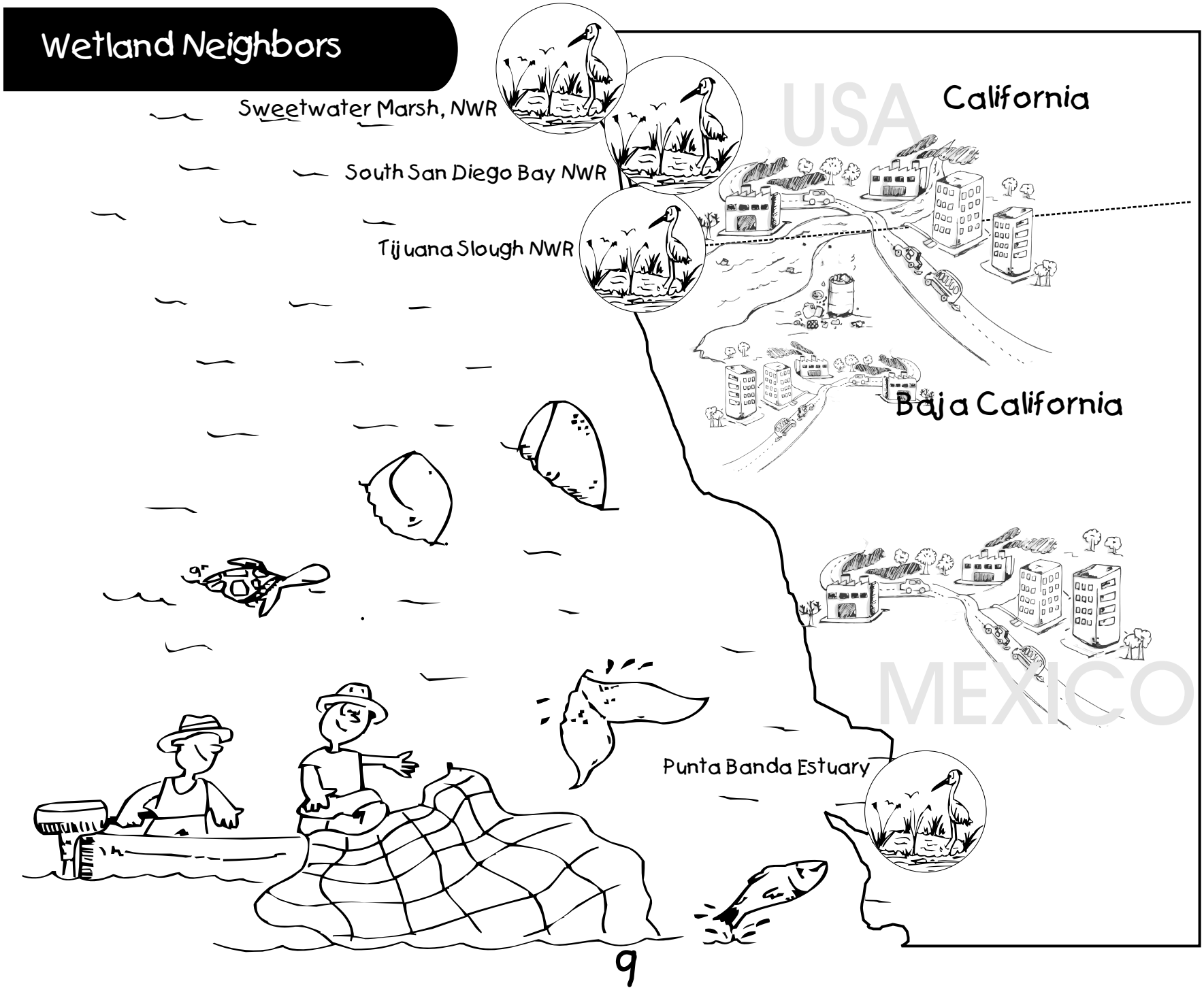
A long time ago there was no border dividing Baja California and California. Native peoples lived in settlements all along the coast and collected plants and seeds, built shelters from wetland rushes and reeds, and fished and hunted throughout the region.

The Kumeyaay people used native plants for their clothing and homes, and for food and medicine. One of the most common wetland plants they used was juncus, a strong flexible, reed that grows along rivers and in freshwater marshes. For hundreds of years they made baskets to store seeds, hold water and to use as cradles for babies. They still use this plant to make intricately decorated baskets.

Today, people on both sides of the border continue to share holidays and festivities, food, and many other cultural and economic activities. Mexicans live and work in United States, visit relatives or shop. Americans visit relatives in Mexico, vacation and retire there, shop and enjoy food and beautiful landscapes.

People on both sides of the border share a common **bioregion**, an area with the same type of climate, plants and animals. Our mountains, forests, rivers and wetlands are all a part of our bioregion. We also share responsibility to work together to recognize environmental challenges and to conserve, protect and restore our environment and its resources. One of our greatest environmental challenges is that of our disappearing wetlands.

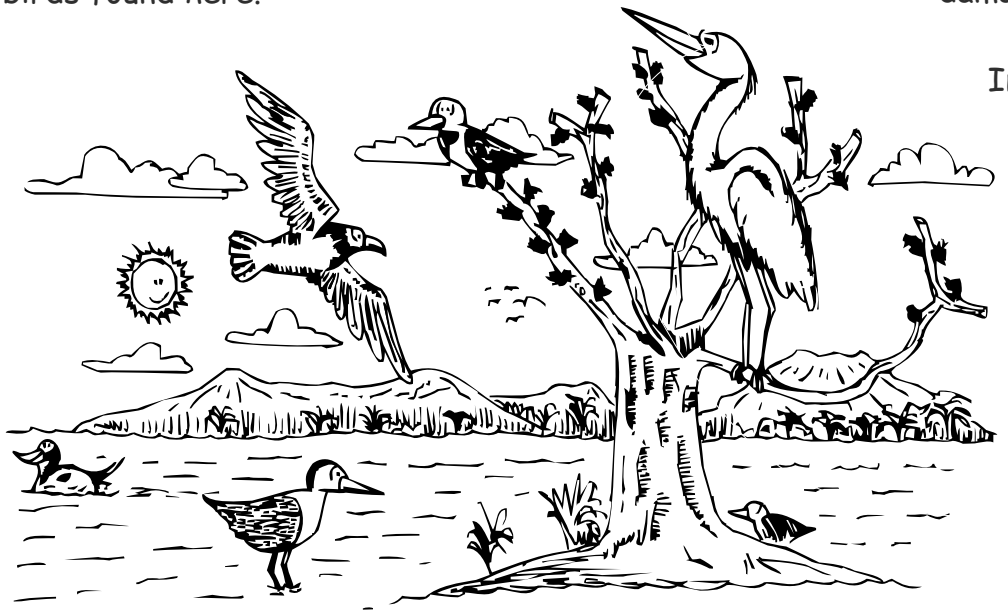
Wetland Neighbors



Punta Banda Estuary

Along the coast of Baja California there are still many relatively undisturbed coastal wetlands that are the main refuge, nesting and feeding area for a wide diversity of birds, mammals, fishes and plants. One of these is Punta Banda **Estuary** at the south end of Bahía de Todos Santos at Ensenada.

Punta Banda Estuary is an almost **pristine** wetland that provides habitat for hundreds of species of birds. California least terns, California brown pelicans and the light-footed clapper rail are three **endangered** species of birds found here.



Punta Banda Estuary is also habitat for mammals, reptiles and insects. It is the main nursery for some of the most important marine species used by sport fishers and regional commercial fisheries, providing seafood such as halibut, oysters, abalone and sea urchin.

Despite its biological richness and value to the region, Punta Banda Estuary is constantly **threatened** by urban development and boat marina construction. In addition, activities that some visitors enjoy, such as jet-skiing, motor boating, and riding motorcycles on the dunes, can damage or destroy habitat and endanger animals.

In order to stop these threats, concerned community members, local authorities, schools, and non-profit organizations, such as Pro Esteros, coordinate their activities. Together, they monitor nesting sites, educate the public, and promote legal actions to protect and preserve the wetland.

Tijuana Estuary: Working Hand in Hand

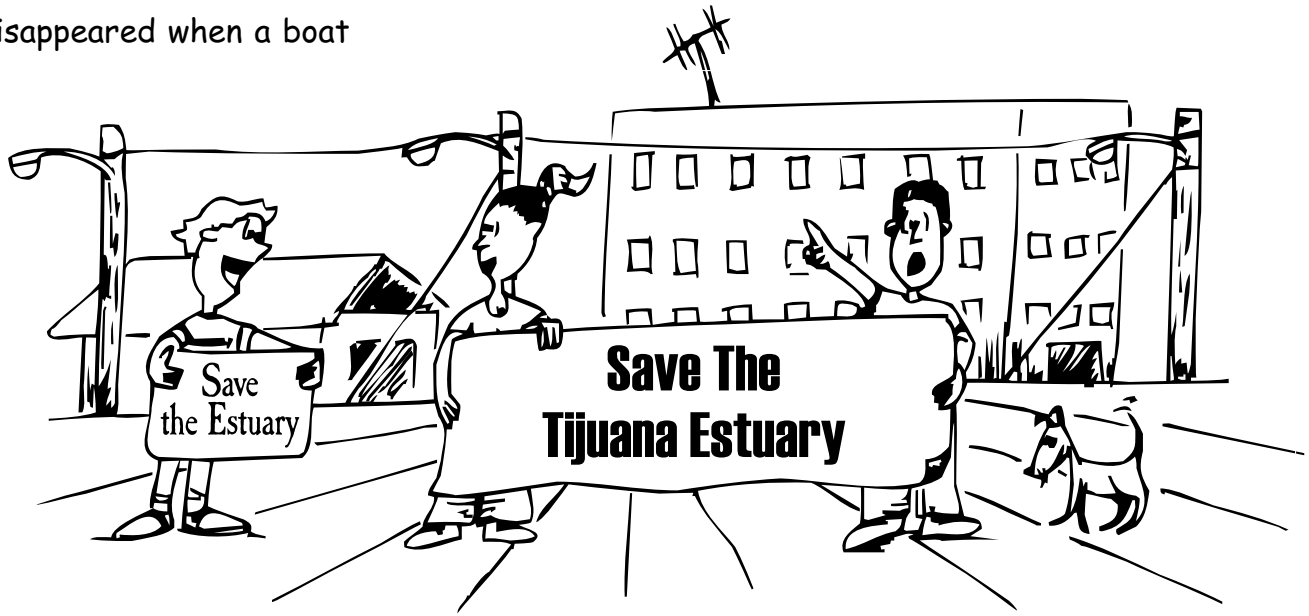
The Tijuana Slough Refuge is located within the Tijuana River National Estuarine Research Reserve. The U.S. Fish and Wildlife Service, California State Parks and the National Oceanic and Atmospheric Administration all share management responsibilities.

The Reserve and National Wildlife Refuge comprise a 2,500-acre wetland located where Tijuana River meets the sea in Imperial Beach. It is southern California's only coastal estuary not bisected by freeways or rail lines. The Reserve's habitats include open water, tidal salt marsh, sand dune, riparian, freshwater pools and upland surrounded by residential neighborhoods. Despite being so close to houses and roads, estuaries like this are among the most productive **ecosystems** on earth.

The Tijuana Estuary National Wildlife Refuge

Over 370 species of birds have been sighted on the refuge and in the Tijuana River Valley. Endangered species like the California least tern, least Bell's vireo, California brown pelican and light-footed clapper rail, and an endangered plant, salt marsh bird's beak, can all be found within the Reserve. The western snowy plover, a threatened species, is a year-round resident and nests on refuge beaches.

The Tijuana River Estuary almost disappeared when a boat marina and restaurant complex were planned for the site, but local citizens worked with the community and U.S. Fish and Wildlife Service to have the slough and its uplands protected as a National Wildlife Refuge. A year later, the entire estuary was protected as a National Estuarine Research Reserve.



Tijuana Estuary Visitor Center

The Tijuana Estuary Visitor Center offers activities to the public, such as guided nature and bird walks, videos, crafts and environmental education workshops without charge.

Indoor exhibits interpret the estuary, and an award-winning native plant garden demonstrates the importance of native plants and their present and former uses for native people. The garden is open to the public seven days a week, and the Refuge offers four miles of trails for bird watching and exercise. One of the trails, open sunrise to sunset, leads to the Tijuana River Mouth.

Wetlands are so important that in 1971, many countries attended a convention at Ramsar, Iran, where they signed a treaty to provide for international cooperation for protecting and preserving wetlands. There are currently over 150 countries with a total of over 1,600 Ramsar wetland sites in the world. The Tijuana Estuary recently joined over 20 other Ramsar sites in the United States.

Because San Diego has a **Mediterranean climate,** coastal plants bloom in the winter and spring after winter rains, and this is when the refuge comes alive with color. Native plants like deerweed, sages, lemonadeberry, sumac, beach evening primrose, and verbena are fragrant harbingers of the coming spring.

Winter, spring and fall are the best times to see large numbers of different bird species that migrate from the north and find refuge in the estuary. The Reserve is an essential link for migratory birds traveling the Pacific Flyway.

South San Diego Bay Refuge - a Vital Link to Other Wildlife Areas.

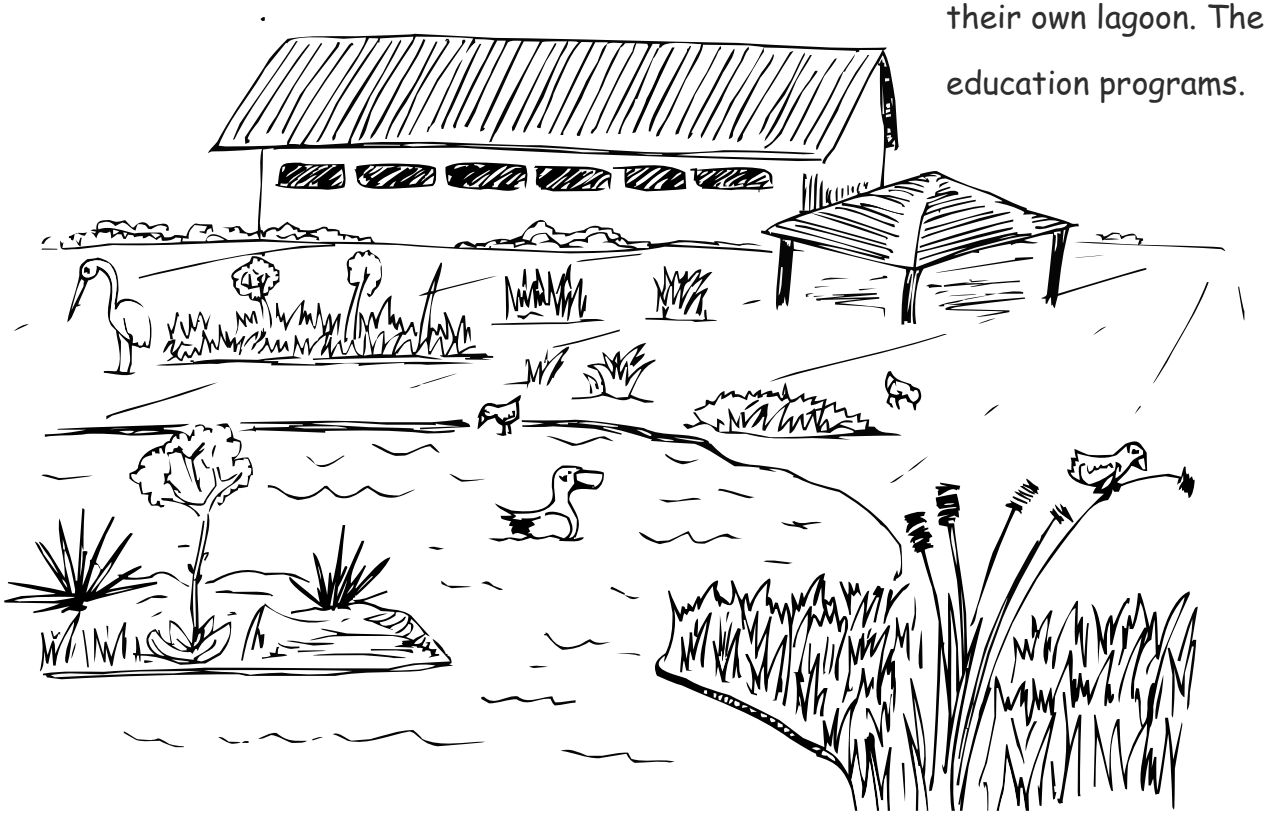
As the City of San Diego expanded, 90% of coastal wetlands in north and central San Diego Bay were filled, drained or diked. In order to conserve and restore the remaining wetlands, local citizens and the U.S. Fish and Wildlife Service established a series of National Wildlife Refuges -Tijuana Slough, Sweetwater Marsh and the South San Diego Bay. These refuges conserve and restore the last remaining coastal wetlands in southern California. We have already learned about the Tijuana Slough Refuge.

The South Bay Refuge protects thousands of shorebirds and waterfowl migrating along the Pacific Flyway, as well as the bay's resident species. With rare eelgrass beds - a food source for endangered green sea turtles - and the largest **contiguous** mudflat in southern California, the Refuge is a supermarket for thousands of resident and over-wintering waterfowl, seabirds, and shorebirds, as well as other plant and animal species.

Sweetwater Marsh Refuge

On the east side of south San Diego Bay, Sweetwater Marsh supports many of the same plant and animal species as the Tijuana Slough and South Bay Refuges. Over 250 bird species have been sighted here, and Palmer's Frankenia, a rare salt marsh plant, can also be found in this refuge.

Surrounded by numerous gardens, the Chula Vista Nature Center provides visitors with the opportunity to experience the marsh through interpretative and interactive exhibits, guided nature and bird walks, and a shark and ray exhibit. Visitors can also observe hawks, owls and eagles in outdoor aviaries and sea turtles in their own lagoon. The center also offers environmental education programs.



CHULA VISTA
NATURE
CENTER

What's for Dinner?

Notice how many different ways shorebirds feed. Using what you have learned during your visit to a wetland and the diagram on the following page, fill in the chart below. Possible food items include insects, shrimp, tiny crustaceans, crabs, worms, clams and snails.

Picking things off the surface
These shorebirds are looking for_____. Species_____.

Shallow probing in the mud
These shorebirds are looking for_____. Species _____.

Mid-depth probing in the mud
These shorebirds are looking for_____. Species _____.

Deep probing in the mud
These shorebirds are looking for_____. Species _____.

What other birds do you see? What feeding styles do they use? Possibilities include spearing fish, crushing open shelled animals, diving for fish, filtering small animals in the water through a bill, catching flying insects or seizing prey with feet.

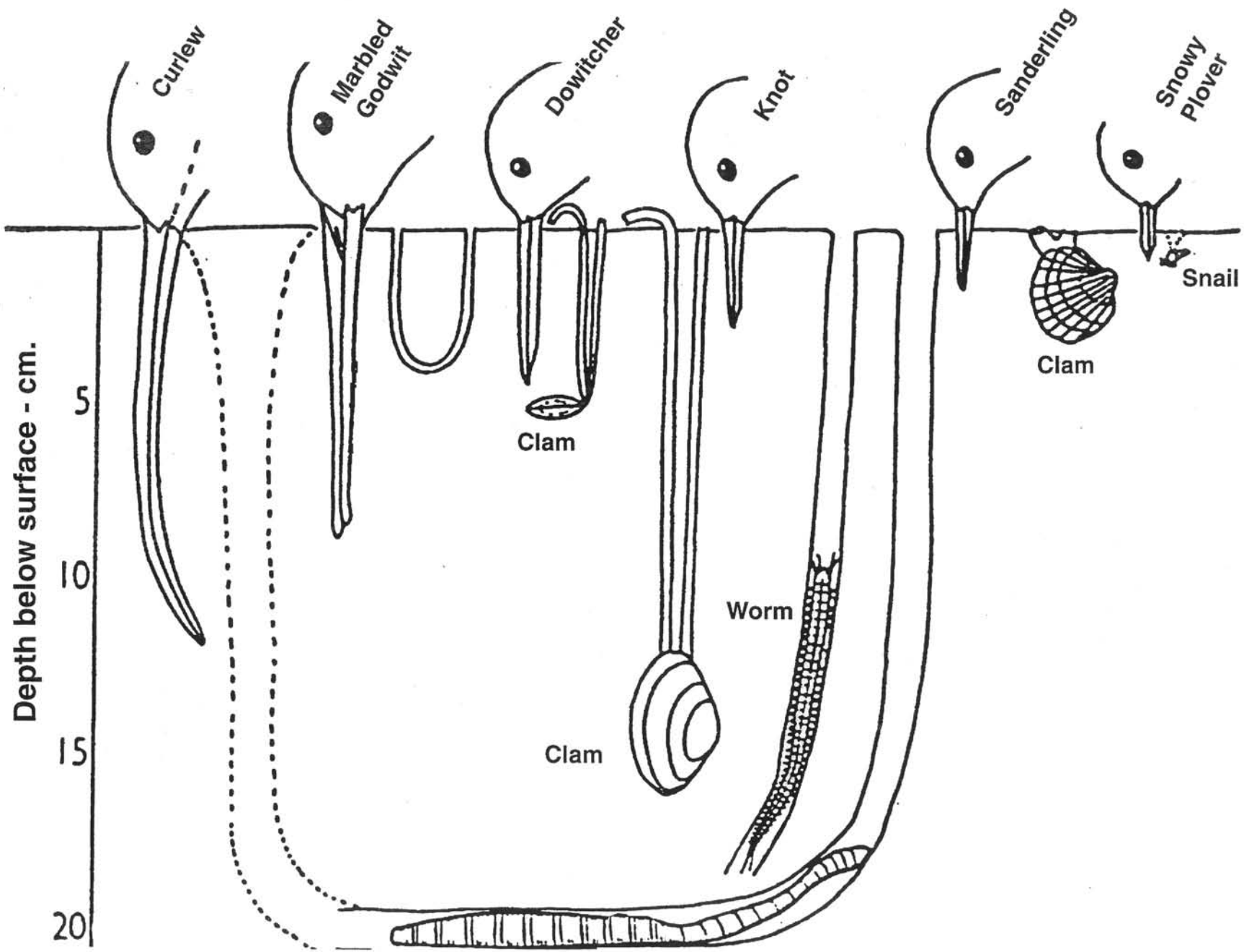
Name or description of bird _____ Feeding style and food item _____

Name or description of bird _____ Feeding style and food item _____

Name or description of bird _____ Feeding style and food item _____

Name or description of bird _____ Feeding style and food item _____

Name or description of bird _____ Feeding style and food item _____


Curlew
Marbled Godwit
Dowitcher
Knot
Sanderling
Snowy Plover
Snail
Clam
Clam
Clam
Worm
Depth below surface - cm.
5
10
15
20

Wetlands Treasure Hunt

How many of these things can you find?

Describe them.

Draw and label a few of your favorite things.

1. An animal track. _____

2. A plant that conserves water in its tissues. _____

3. A bird that hunts by standing still. _____

4. A plant with salt on its leaves. _____

5. An endangered species. _____

6. A bird that hunts while flying. _____

7. Something that looks like lettuce. _____

8. An animal with an exoskeleton. _____

9. A bird hunting for food in the mud. _____

10. Something left by humans. _____

11. An animal with a shell. _____

12. A bird that eats while swimming. _____

Plant Scramble

Unscramble the letters to fill in the blanks! Turn the page upside down to see the answers..

1. I am a salt accumulator. I live in the wet marsh.
   I am _ _ _ _ _ _ _ _ _ _.
   k l e e e p c i d w

2. Clapper rails hide their nests in me.
   I am _ _ _ _ _ _ _ _ _.
   s r o s d r g c a

3. Insects love me, especially my small pink flowers.
   I am _ _ _ _ _ _ _ _ _ _ _.
   a a l l i k h e t h a

4. My delicate flowers last for a long time.
   I am _ _ _ _ _ _ _ _ _ _.
   e s a r l e r e n v d

5. I grow where there is fresh water.
   I am _ _ _ _ _.
   w o l i l w

6. I like fresh water, too. I have teeth!
   I am _ _ _ _ _ _ _.
   u m l e t f a

7. Some people say I smell really bad, but the harlequin bug loves me.
   I am _ _ _ _ _ _ _ _ _ _ _.
   d l p o d e b a r d

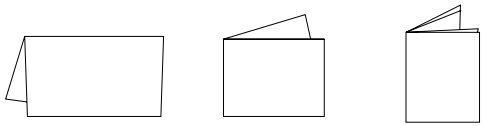
8. I wonder if you could make pancakes from me!
   I am _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _.
   T f l a t p o w c b k e t a h u

9. I'm sunny all the time.
   I am _ _ _ _ _ _ _ _ _ _ _ _ _.
   s b u h n f u s w e r o l

Answers:

1. pickleweed
2. cordgrass
3. alkali heath
4. sea lavender
5. willow
6. mule fat
7. bladderpod
8. flat-top buckwheat
9. bush sunflower

Field Guide Activity



Making your very own "Mini Field Guide for Birds" is as easy as 1, 2, 3, 4!
1. Carefully tear out the "Mini Field Guide for Birds" on the next page. 2. Fold it in half lengthwise. 3. Fold it in half again, this time crosswise. 4. Fold it in half crosswise one more time. Now use your field guide to identify birds and fill in the chart below.

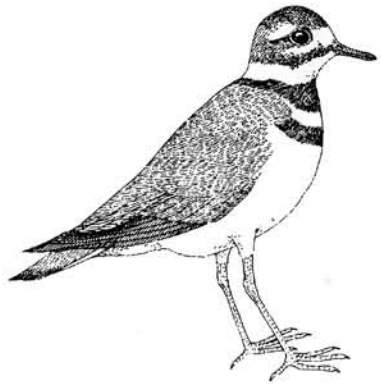
Bird's name	Where did you see it?	What was it doing?	What kind of feet does it have?	What kind of beak does it have?	What do you think it eats?

Now follow the directions above to make your "Mini Field Guide to Animal Tracks" and check off the tracks you find.

__Squirrel __Cottontail rabbit __Duck __Opossum __Great blue heron __Raccoon __Mourning dove __Coyote

Killdeer

Mostly runs along the shore looking for food. Makes a ear piercing sound.



Great Blue Heron

Uses his beak to spear his food while wading in the ponds.

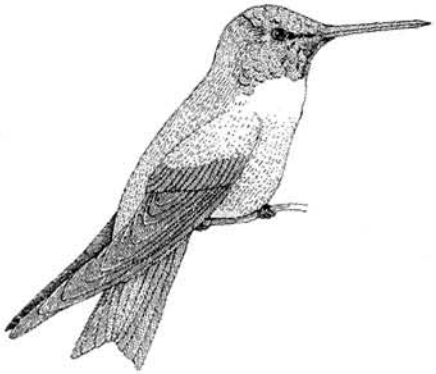
Ring-billed Gull

Most comon gull in San Diego during the winter months.

Mini Field Guide to Birds

Anna's Hummingbird

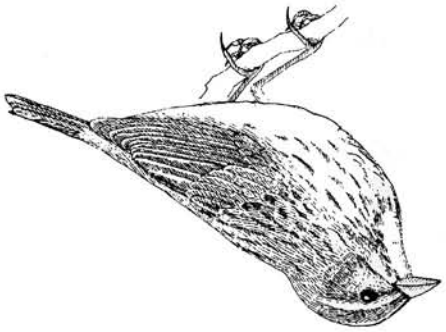
Seen in the uplands or where there are flowers blooming.



Revised 10/99
Curr,Mini Field Guide

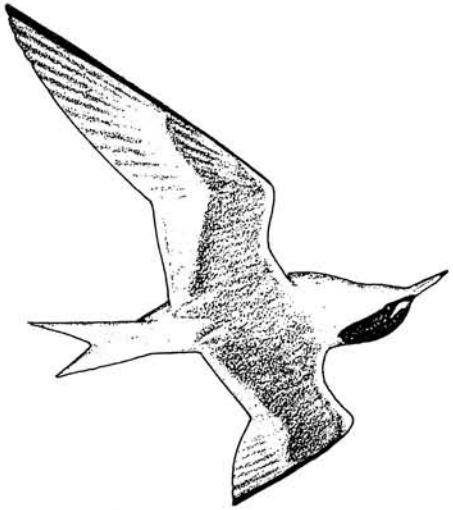
Savannah Sparrow

This *endangered* bird lives and nests in salt marsh pickleweed.



Least Tern

Migrates to San Diego in summer to nest on the sandy beaches.
Endangered

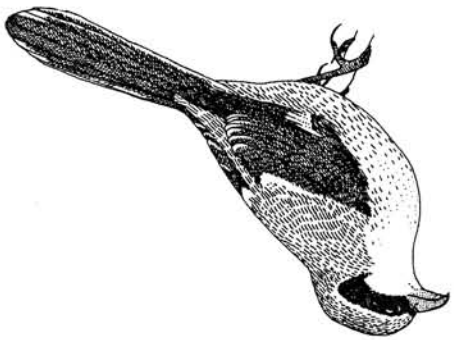


Red-Tailed Hawk

Often seen perched on power poles or soaring high in the sky.
Eats rodents & Reptiles

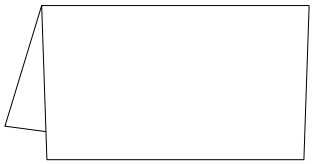
Loggerhead Shrike

Seen on wires & low perches. Eats insects, small mice & reptiles.



How to fold the mini guide into a booklet

1. Carefully cut or tear at the dotted line to remove from book.



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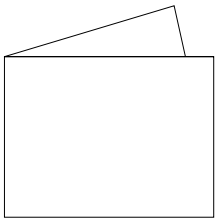

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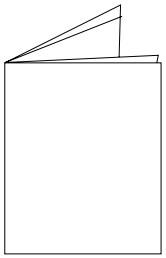


4. Then fold in half crosswise again.

Mini Field Guide to Animal Tracks

Opossum

Front Feet hold food while opossums eat.

Great Blue Heron

The tallest grey bird in the marsh.

Raccoon

Raccoons eat clams, crabs and insects.

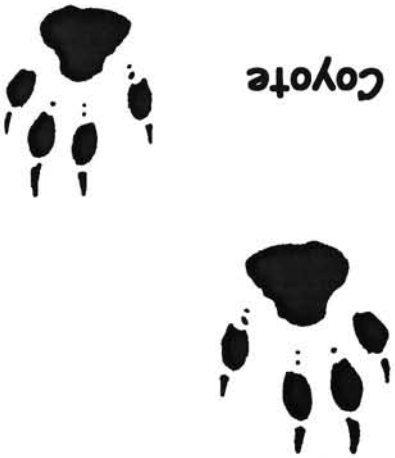
Duck

Only dabbling ducks walk on the ground

Morning Dove

Doves walk around on the groundand look for seeds. Feathers make sound when they start a flight.

Coyote



The largest predator of the Sweetwater Marsh.

Squirrel

Squirrels eat soft plants and live in holes in the ground.

Cottontail Rabbit

Back feet

Why are the back feet ahead of the front feet?

Front feet

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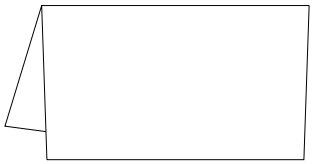

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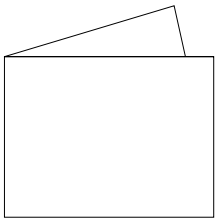

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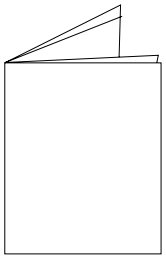
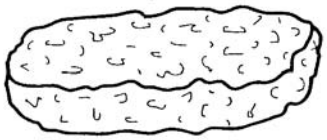


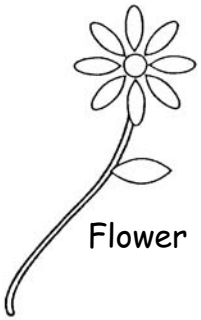
4. Then fold in half crosswise again.

Wetlands Metaphors

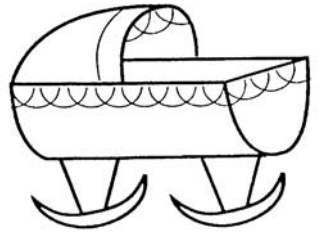
Metaphors are a way to compare unrelated things, such as "Ana María is as happy as a clam." Below are pictures of items seemingly unrelated to wetlands. Can you figure out how these items compare to a wetland? In other words, think about what each item does. Then, drawing on what you have learned about wetlands, compare that item's function to how a wetland might function in that same way.



Sponge

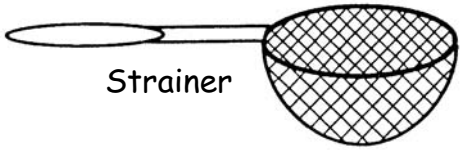


Flower

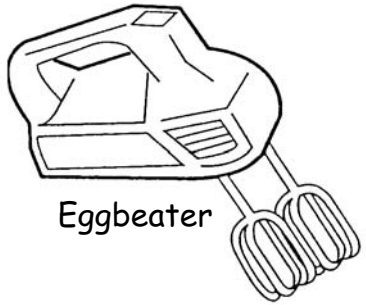


Cradle

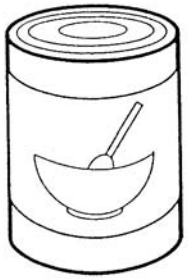
Pillow



Strainer



Eggbeater



Can of soup

Answers:
Sponge: Wetlands help prevent floods, absorb water and hold moisture.
Cradle: Wetlands provide shelter and a place to raise young.
Pillow: Wetlands provide a resting place for migratory birds and a home for resident wildlife.
Strainer: Wetlands strain out debris and pollution.
Eggbeater: Wetlands mix and cycle nutrients.
Flower: Wetlands are beautiful places.
Can of soup: Wetlands provide nutrients (food) for wildlife.

Wetlands Memories

The name of the Wetland I visited is:_____

Scientists use their senses to make observations. How many things can you observe in each of the following categories? Write or draw them:

I saw….

I smelled…

I heard…

I felt…

Write a paragraph about your visit to a wetland. What was most interesting to you? What did you like best? Why are wetlands important?

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Glossary

Aquifers: Places underground were water filtered from the surface is accumulated.

Bioregion: An area of the same type of animals, plants and climates.

Contiguous: Sharing a common border, touching.

Detritus: Remains of animals and plants after they die and decompose.

Food chain: The flow of energy from the sun to plants and then to animals that eat them.

Food web: A system of connected food chains.

Ecosystem: A set of living organisms, their physical environment and the interactions between them.

Endangered: A plant or animal that could be at risk of disappearing forever.

Estuary: A place where fresh water from rivers mixes with the salt water of the ocean.

Habitat: A place where animals or plants live, and find food, water, shelter and adequate conditions to reproduce.

Invertebrate: Animals without a backbone, including animals with a hard exoskeleton, such as crabs and clams.

Nutrients: Substances that provide nourishment for growth and the eminence of life.

Glossary (cont.)

Mariculture: The cultivation of fish and other marine life for food.

Migratory: Animals that travel long distances from one area to another, depending on the season, to find food and reproduce.

Mediterranean Climate: Hot, dry summers and warm, moist winters.

Pacific Flyway: The route along the west coast of North, Central and South America that birds follow in their migrations.

Plankton: Microscopic or tiny animals and plants that live floating in the water.

Pristine: An area that is in it's original condition, unspoiled.

Predator: An animal that hunts another and feeds upon it.

Resident: An animal that always lives in the same area.

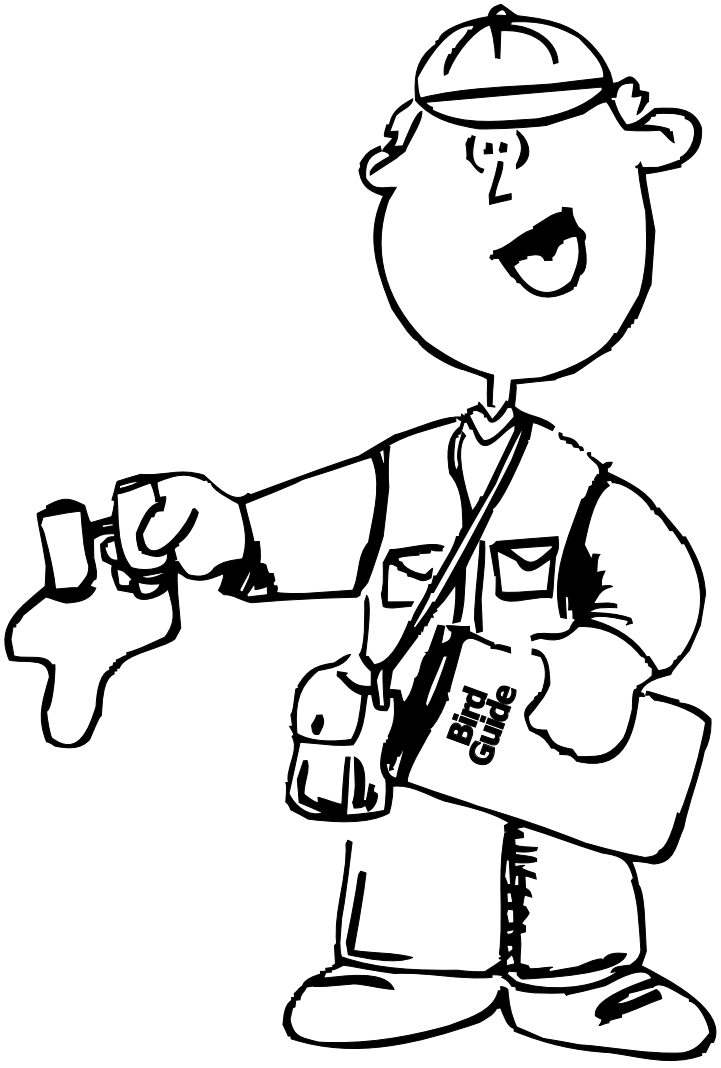
Species: A group of similar organisms capable of producing offspring.

Threatened: Any living species that may become endangered if not protected or provided adequate habitat.

Now that you know a lot about wetlands, you are ready to help us to protect them by becoming a

Wetlands Protector.

You have learned the potential threats for wildlife in wetlands. Write down some of these threats and what you can do to protect plants and animals from them:



Certifies

That _____

has become a

Wetlands Protector

For completing all the activities contained in the "Wetland Neighbors" book, visiting Californias' bioregional wetlands, and committing to help conserve and protect them on behalf of present and future generations.

Visited wetlands:

Punta Banda Estuary	Tijuana Estuary NWR	South San Diego Bay NWR	Sweetwater Marsh NWR