

## 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.



12

## 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.



13

## 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.

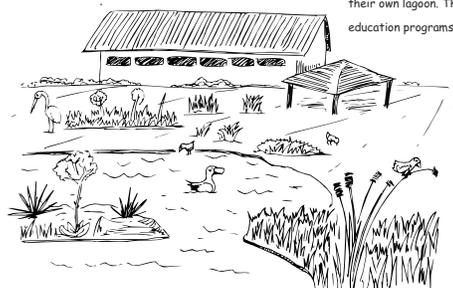


14

## 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.



15



### 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 \_\_\_\_\_

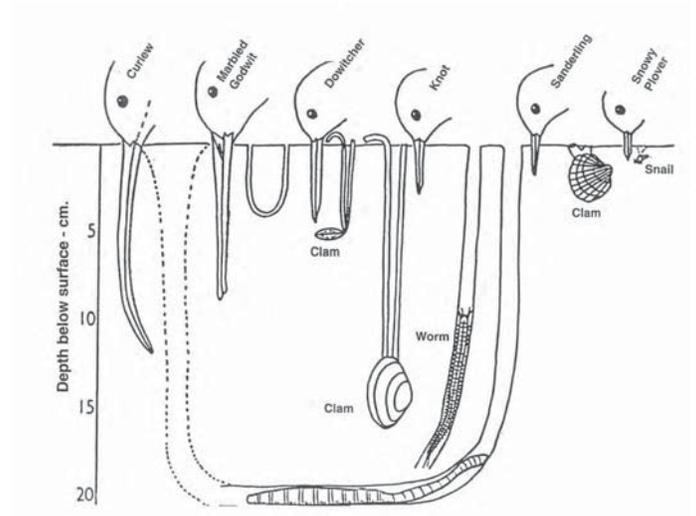
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16



17

### 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. \_\_\_\_\_



18

### 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 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 l i 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

19

## 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

### Mini Field Guide to Birds



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



**Red-Tailed Hawk**  
Often seen perched on power poles or soaring high in the sky. Eats rodents & reptiles.



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



**Savannah Sparrow**  
This endangered bird lives and nests in soft marsh pickleweed.



**Anna's Hummingbird**  
Seen in the uplands or where there are flowers blooming.



**Ring-billed Gull**  
Most common gull in San Diego during the winter months.



**Great Blue Heron**  
Uses his beak to spear his food while wading in the ponds.



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

### How to fold the mini guide into a booklet

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



2. Fold in half lengthwise.



3. Then fold in half crosswise.



4. Then fold in half crosswise again.

### Mini Field Guide to Animal Tracks



**Coyote**  
The largest predator of the Sweetwater Marsh.



**Morning Dove**



**Raccoon**  
Raccoons eat clams, crabs and insects.



**Great Blue Heron**  
The tallest grey bird in the marsh.



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



**Cottontail Rabbit**  
Why are the back feet ahead of the front feet?



**Duck**  
Only dabbling ducks walk on the ground.



**Opossum**  
Front Feet hold food while opossums eat.