

NEW CHICAGO MARSH WALK (3-6)

Overview: Students observe and describe natural objects found in the salt marsh, participate in a sensory hike through the salt marsh.

Content Standards Correlations: Science p. 308

Grades: 3-6

Key Concept: The salt marsh provides a unique habitat for a specialized group of plants and animals. Endangered species, such as the salt marsh harvest mouse, depend on the salt marshes of the San Francisco Bay for their existence.

Objectives: Students will be able to:

- use their senses to observe and describe the salt marsh habitat in terms of what they see, smell, hear, feel, and taste.
- name two plants and one endangered animal that lives in the salt marsh.
- name one way to help protect the salt marsh.

Materials:

Provided by the Refuge:

- Discovery Box containing natural objects found in the salt marsh
- 1 set of six footsteps
- 1 display of salt marsh plant samples
- 1 salt marsh plant book
- 1 bird identification chart
- 1 container of salt
- 12 clipboards

Provided by the educator:

- copies of *New Chicago Marsh Walk Data Sheet* on p. 248 and pencils (one per student)

TIME FRAME FOR CONDUCTING THIS ACTIVITY

Recommended Time: (30 minutes)

Discovery Box (7 minutes)

- lead the activity to focus attention, build observation and descriptive skills

Plant Display (5 minutes)

- identify and describe salt marsh plants

Walk with Footsteps (16 minutes)

- walk on the boardwalk through the marsh
- stop and follow instructions on each “footstep” lead a brief
- wrap-up about the salt marsh habitat

Travel Time (2 minutes)

- walk back to the back deck to meet your next group

HOW THIS ACTIVITY RELATES TO THE REFUGE'S RESOURCES

What are the Refuge's resources?

- significant wildlife habitat
- endangered species
- migratory birds

What makes it necessary to manage the resources?

- Loss of salt marsh habitat for endangered species and migratory birds due to development such as landfills, salt ponds, buildings, roads, airports, and etc.

What can students do to help?

Refuge staff acquire and preserve wetland habitat, but we need your help.

- Reduce, reuse, and recycle, decreasing the need for landfills
- Adopt a wetland or an endangered species
- Teach others about the importance of the salt marsh habitat.



Western Meadowlark

SUPPORTING INFORMATION FOR THIS ACTIVITY

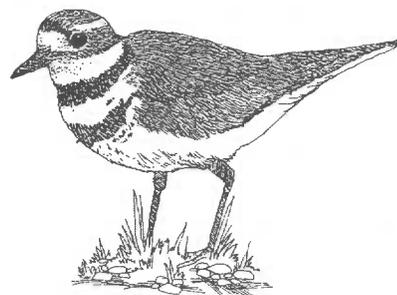
Salt Marsh Habitat

- Tidal salt marshes once surrounded the entire San Francisco Bay.
- More than 80% of the salt marsh surrounding South San Francisco Bay have been lost due to human development. Salt marshes have been dredged, drained, and filled; landfills, roads, salt ponds, airports, and other buildings have been built on top of former salt marshes.
- Historically, all salt marshes around San Francisco Bay were tidal wetlands, serving as a transition zone between the bay or slough and the upland habitat.
- At the Environmental Education Center (EEC), New Chicago Marsh is a nontidal, managed salt marsh.
 - The slough channels feeding New Chicago Marsh were connected to the Bay prior to the 1960s.
 - The construction of levees (to create salt ponds) disconnected the sloughs in New Chicago Marsh from Coyote Creek and therefore from the Bay as well.
 - To maintain this important habitat, Refuge staff installed a water gate that can be opened to allow Bay water to flow slowly into the marsh during the dry season. In this nontidal marsh, there are no distinct plant zones.
- The plants in the salt marsh are low-growing and have adapted to living in salty, water-logged soils.
 - These plants are called halophytes, meaning salt loving. Pickleweed is a prominent plant that is very salt tolerant.
- The salt marsh is an important habitat for many animal species. Animals use the salt marsh for food and shelter. Many species, especially those that are endangered, depend on the salt marshes of the San Francisco Bay for their survival.
 - At the EEC, the endangered salt marsh harvest mouse ("Salty") lives in New Chicago Marsh.
 - Other small mammals that are found in the marsh include rabbits, voles and shrews.
 - Many resident and migratory birds

depend on the salt marsh for feeding and/or nesting, these include a variety of ducks, geese, plovers, egrets, herons, and northern harriers (marsh hawks).

How New Chicago Marsh Got Its Name

- In 1890 P.H. Wheeler, an enterprising developer, moved his watch manufacturing operations to Alviso, seeking to finance his troubled business with the sale of lots in what he enthusiastically called "New Chicago." Wheeler purchased the land that now surrounds the Environmental Education Center.
- With the aid of San Jose real estate men and politicians, a large part of Alviso, including the tidal salt marsh, was subdivided into 4,000 lots with streets named after those in "old" Chicago -- Michigan Avenue, Dearborn, Grand Boulevard, etc. With Alviso being touted as an up-in-coming manufacturing center, over 3,500 lots were sold by the summer of 1890.
- One lucky person won a lot in the New Chicago subdivision while at the Victory Theater in San Jose. However, when he came out to Alviso to see his prize, the lot was under water! Since he was unable to determine which one was his, he refused to pay the taxes and lost the lot.
- When the promised dredging of Alviso Slough failed to begin, reducing the probability of Alviso becoming a major deep water port in the south Bay, investors became nervous. Wheeler's scheme turned into a fiasco and the plans for the development of what is now called New Chicago Marsh ended with the bankruptcy of the San Jose Watch Company.
- In January 1968, the town of Alviso was annexed into the city of San Jose, California. And in 1974, the 365-acre New Chicago Marsh became the first parcel of land to be purchased for, and protected by, the newly established Don Edwards San Francisco Bay National Wildlife Refuge.



HOW TO LEAD THIS ACTIVITY BY FOLLOWING THE "DO, READ, ASK" TEACHING FORMAT

Do

Meet the group at the plant display at the top of the wooden ramp.

Read

"Welcome to the New Chicago Marsh Walk. In this activity we are going to take a hike to explore the salt marsh habitat. You are going to use all of your senses to observe and describe objects and the salt marsh itself."

Discovery Box (5 minutes)

Do

To prepare the students for observing and describing the salt marsh habitat, use the Discovery Box. Gather students in a semi-circle.



Read

"We are going to begin developing our 'sharp eyes' and practice describing objects. This is a Discovery Box. It contains objects that you might find in the salt marsh."

Do

Open the Discovery Box. One at a time, hold up each object and name it.

Read

- "Now that you know what the objects are, I will open the Discovery Box and walk around the circle so that everyone can look inside.
- "Look at all the objects in the box. Do not touch them.
- "In your mind, choose one object. You will be describing that object to the rest of the group.
- "You need to know its size, color, texture, shape, and any design or pattern on it.
- "You are going to describe it to the rest of the group without saying what the object is or how it is used.

- "Don't point to it or tell anyone what you have chosen. Everyone will try to guess what you are describing."

Do

Open the Discovery Box. Walk around the circle so that everyone can look inside. Close the box. Select a student to describe his/her object.

Read

"Remember to describe your object by its size, shape, color, texture, and any design or pattern on it. Don't say what it is or where it comes from. The rest of you need to listen carefully and raise your hand when you think you know what it is."

Do

- After several hands are raised, have the student describing the object choose someone to guess. - After the object has been correctly guessed, take it out of the box and show the whole group. Allow several students to describe their objects.

Read

"Now that you're experts at describing objects, let's take a look at some salt marsh plants."

Plant Display (5 minutes)

Do

Use the salt marsh plant display to help students identify plants in the salt marsh. Have the students gather around the plant display.

Read

"I'm going to show you samples of plants that you will find in the salt marsh. Your job is to look closely at the samples while I describe them so you can answer questions I will ask about their features."

Do

Hold up one plant sample at a time, and give the following descriptions:

Pickleweed

Ask

? **Does anyone know what this plant is?**
(Pickleweed.)

Read

- "Pickleweed is smooth and segmented. For most of the year it looks like a series of tiny grey-green pickles attached end to end.
- "In the winter, much of the pickleweed turns orange, red, purple, or brown. In summer, tiny flowers can be seen where the segments branch."

Ask

? How would you describe the way it looks now?

Alkali Heath

Read

- "Alkali heath can be seen growing in patches throughout the marsh. It has a delicate, woody stem and tiny leaves.
- "In spring and summer the leaves are a pale green. Small lavender flowers bloom in mid-summer. In fall and winter the leaves become brown and dry."

Ask

? How would you describe the way it looks now?

Australian Saltbush

Read

- "Australian saltbush grows in clumps close to the ground. In spring and summer its leaves are silver-green.
- "In late summer and fall, tiny red fruits can be seen at the base of the leaves, next to the stem. In the fall and winter, Australian saltbush turns a light brown color."

Ask

? How would you describe the way it looks now?

Salt grass

Read

"Salt grass is light green for most of the year, except in winter when it turns light tan. It is easily identified by its long, sharp needle-like leaves."



Salt grass

Ask

? How would you describe the way it looks now?

Ice Plant (*Spring through Fall only*)

Read

- "Ice plant is a low-growing plant covered with tiny, glistening bead-like structures that are swollen with water.
- "When the new growth appears in the spring it looks a lot like pickleweed, only without the segments. In the summer and fall the plant turns red and sparkles like rubies."

Ask

? How would you describe the way it looks now?

Brass Buttons (*Spring Only*)

Read

- "Brass buttons are quite easy to recognize. This marsh plant blooms in the spring with spongy yellow flowers that resemble the center of a daisy.
- "This plant is not indigenous to California -- it was introduced from southern Africa."

Ask

? How would you describe the way it looks now?

Read

- "We are now ready to begin our hike. As we walk, we will come across footsteps placed on the boardwalk.
- "We will stop at each one, read it, follow the *Marsh Survival* worksheet"

Do

Pass out worksheets and pencils (*these must be provided by the educator*) with the clipboards. Have students put their names on the worksheet.

Marsh Walk with Footsteps (18 minutes)

Do

- Walk down the ramp to the boardwalk in New Chicago Marsh. Stop at the first footstep and have a student read it aloud.
- Give students time to write answers to the questions at each footstep.

Student Read Footstep #1:

“Look around in the salt marsh. Find pickleweed and point to it.”

Ask:

? **Has anyone tasted pickleweed?** How do you *think* it tastes? (Salty and bitter from salt and minerals in the soil.)

Do

Pass out a small sample of the pickleweed to each student. Have students taste it and share their thoughts with the group. (The leader has a bag of pickleweed; **students do not pick pickleweed.**)

Ask

? **What *does* pickleweed taste like?** (Salty, like pickles, icky, bitter, great!)

Read

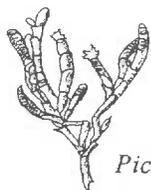
- “The soil in the salt marsh habitat is still salty because of past contact with the salt water of the Bay.
- “Pickleweed has smooth, segmented stems that look like a series of tiny pickles attached end to end.
- “It has special cells for getting rid of the salt; that is why it can live in the salt marsh. These cells transport the salt to the tip of the stem which will eventually turn red or orange and fall off.”

Ask

? **What endangered animal lives in the salt marsh and eats pickleweed?** (Salt marsh harvest mouse.)

Read

- “Salt marsh harvest mice are vegetarians, feeding on pickleweed.
- “Unlike most animals, they have specialized kidneys that allow them to drink salt water.
- “It is a tiny creature, small enough to perch on your finger. It is a nocturnal animal and therefore rarely seen.”



Pickleweed

Do

Walk with the students along the boardwalk. Stop and have another student read the next “footstep” aloud.

Student Read Footstep #2

“Close your eyes for 30 seconds. Listen for both natural and human-made sounds.”

Ask:

? **What natural sounds did you hear? If you heard bird sounds, raise your hand. What human-made sounds did you hear? Which sounds were the loudest?**

Do

Continue along the boardwalk. Stop and have another student read the next “footstep” aloud.

Student Read Footstep #3

“Look at the horizon around you. Name the things you can see that displaced the salt marsh habitat.” (Landfill, industrial parks, office buildings, homes, salt ponds, roads, parking lots)

Ask:

? **What happened to the animals that used to live in the salt marsh?** (Many died, some relocated, and two species became endangered -- salt mouse harvest mouse and California clapper rail)

Do

Continue along the boardwalk. Stop and have another student read the next “footstep” aloud.

Student Read Footstep #4

“Close your eyes. This time, concentrate on your sense of smell. Think of one or two words to describe how the salt marsh smells.” (musty, like rotten eggs, salty, ocean-like)

Do

Ask each student to give their description of salt marsh smells. After everyone has responded walk to the next “footstep”.

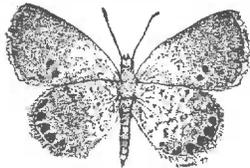
Student Read Footstep #5

“Look closely at the plants. Name all salt marsh plants you can see.”

Australian saltbush

Read (and point to the plants)

- “Australian saltbush has adapted to living in the salt marsh. It has specialized glands on its leaves to “sweat” out the salt.
- This plant serves as the favorite food of the western pygmy blue butterfly, the smallest butterfly in North America.



Western Pygmy Blue Butterfly

Ask

? **Do you see any of these tiny butterflies around the Australian saltbush?** (*Summer and Fall only*)

Alkali heath

Read (and point to the plant)

“Alkali heath is a low shrub that can grow four to twenty inches high. Alkali heath also “sweats” out extra salt through specialized glands on its leaves.”

Ask

? **Can you see any flowers on the alkali heath?** (Flowers can be seen summer through fall)

Salt grass

Read (and point to the plant)

“Salt grass is easily identified by its long, sharp needle-like leaves.”

Ask

? **Does it look similar to a plant that grows around houses?** (Grasses for lawns)

Read

“Draw and label your favorite salt marsh plant on your *New Chicago Marsh worksheet*.”

Do

When students are finished drawing their plants, walk to the last “footstep”, located on the observation platform.

Student Read Footstep #6

“Rub some salt between your fingers. Describe how it feels.”

Do

Give each student a bit of salt to feel.

Ask

? **What shape is a salt crystal?** (Square)

Do

Show salt crystal sample.

Read

“Fill in the last part of your *New Chicago Marsh worksheet* using six words to describe Salty’s salt marsh home. Make sure to include all five senses: touch, taste, sight, smell, and hearing.”

Examples

- (1) Valuable, green, musty, salty, damp, musical.
- (2) Quiet, sunny, warm, salty, smelly, unique.

Wrap-Up (3 minutes)

Do

Have one or two students share what they have written.

Ask

? **Why is the salt marsh important?** (It provides a unique habitat that supports many forms of life, some found nowhere else in the world.)

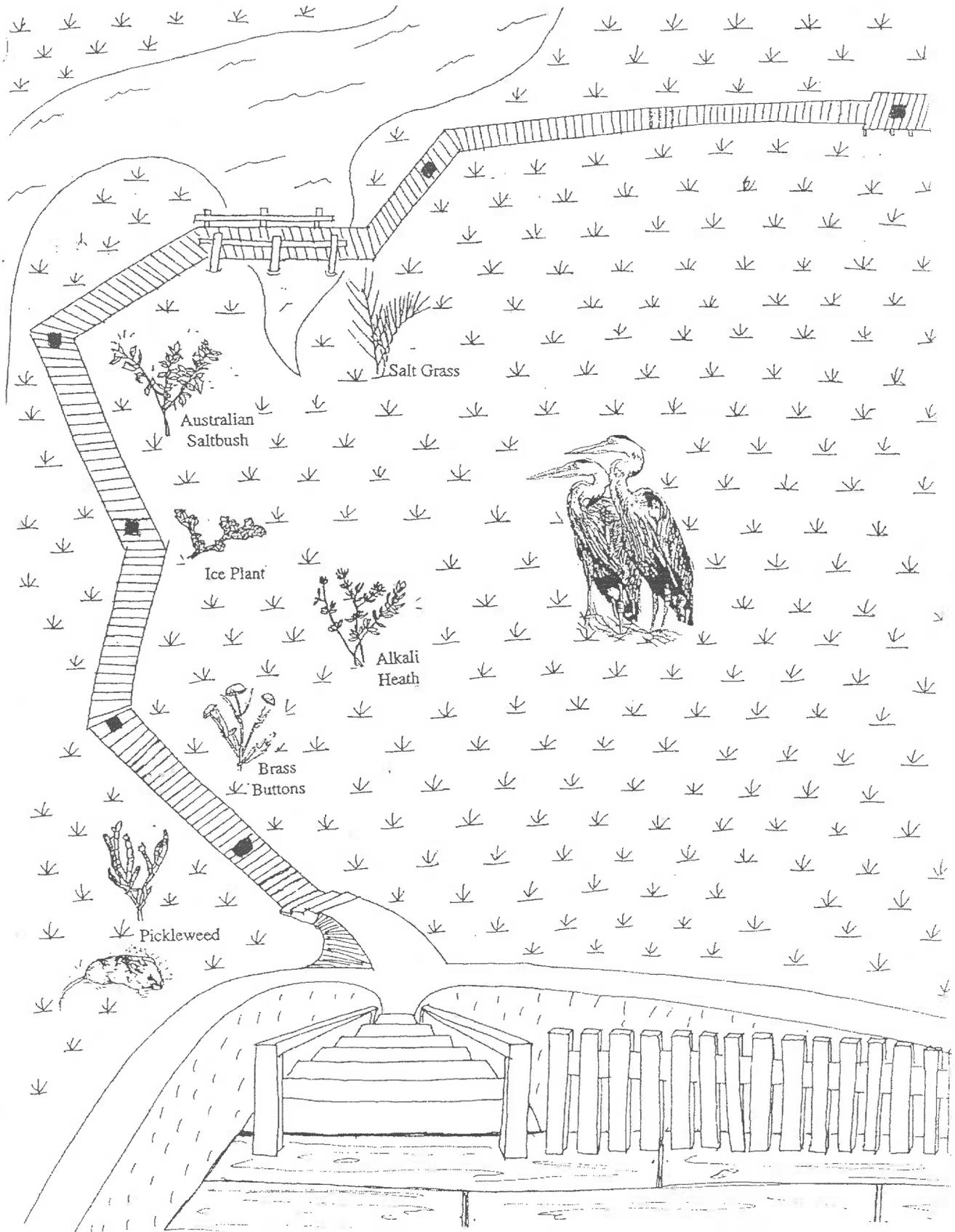
? **What can you do to protect Salty’s salt marsh home?** (Accept all reasonable answers. Include: do not litter, only enter the salt marsh if you have special permission and the key to Salty’s home, tell others about the salt marsh and why it is important.)

Travel Time (2 minutes)

Do

- Collect the clipboards, sheets and pencils. Give the student worksheets to the educator at the end of the field trip.
- Send students and their chaperone to their next station. Quickly return to the top of the ramp to meet your next group.

NEW CHICAGO MARSH WALK MAP (3-6)



NEW CHICAGO MARSH WALK DATA SHEET

Student name _____

5. Draw your favorite plant.

5. How can you remember salt grass?

Footstep 6

6. How does salt feel?

Footstep 5

4. How does the marsh smell?

Use 6 words to describe Salty's home



touch _____ smell _____

taste _____ hearing _____

sight _____

Footstep 4

3. What happened to the animals?

3. What displaced the marsh?

Footstep 3

2. What sounds do you hear?

Footstep 2

1. How does pickleweed taste?

1. What endangered species eats pickleweed?

Footstep 1