

# Junior Refuge Ranger

*Don Edwards San Francisco Bay  
National Wildlife Refuge  
Alviso*



This Adventure Booklet  
belongs to

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# How to Become a Junior Refuge Ranger

**Part A:** All ages complete pages 2-6

**Part B:** Starts on page 7

Ages 7 and under complete 2 activities

Ages 8-10 complete 3 activities

Ages 10 and up complete 4 activities

**Part C (optional):** Just for Fun activities start on page 16.

When you are finished, bring your completed activity book to the front desk.

## Program Rewards

- 1) Upon completion of this activity booklet, you will receive a certificate of completion and a Junior Refuge Ranger badge.
- 2) Wildlife Collector's Cards: For each completed activity in Part B, you will receive a Junior Refuge Ranger Wildlife Collector's Card that features one of the animals or plants on the refuge. Complete all the activities in Part B to collect all of the cards (optional).

## A Junior Refuge Ranger is a person who:

- Cares about the conservation of native wildlife and its habitat.
- Is knowledgeable about the wildlife and plants that the refuge is protecting.
- Recognizes the importance of refuges for both wildlife and the community.
- Is environmentally conscious—does “green” things.
- Is ready to share this information with others to make a difference!

# What is a refuge?

I think a wildlife refuge is (hint: think about the word “refuge”) \_\_\_\_\_



## Don Edwards San Francisco Bay National Wildlife Refuge



A **wildlife refuge** is a place for protecting plants, wildlife, and endangered species. We'll talk more about endangered species on the next page.

Another goal of the refuge is to promote nature study and education for people like you! Come and attend the refuge's free programs and events which are listed in the Tideline, our quarterly newsletter.



Photo by Pelican Media

The Don Edwards San Francisco Bay National Wildlife Refuge protects me, Salty, the salt marsh harvest mouse!

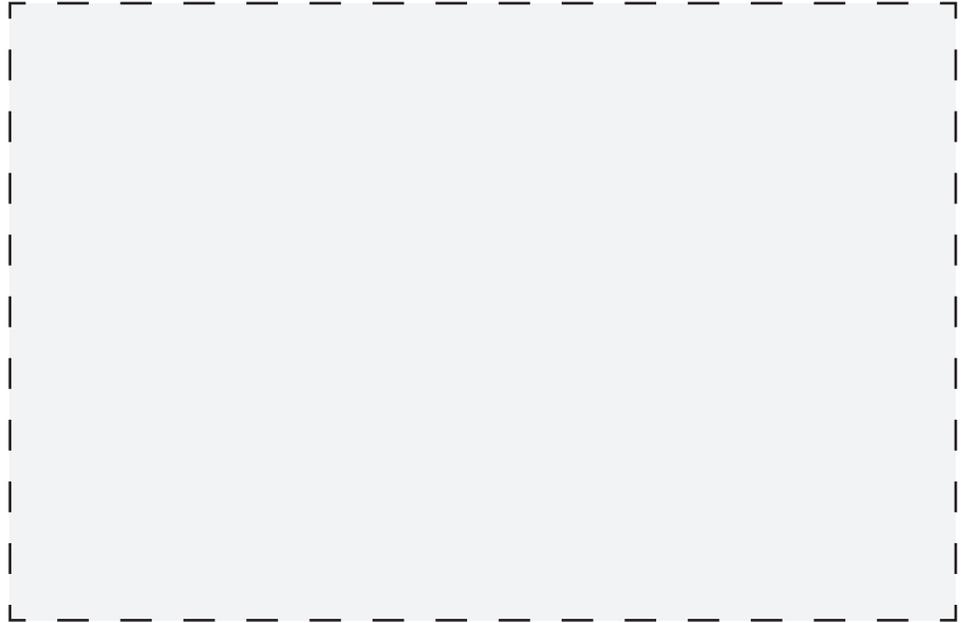
**Fun Fact:** Created in 1972, *the Don Edwards San Francisco Bay National Wildlife Refuge was the first urban national wildlife refuge ever created on the West Coast!*

# Endangered Species and Habitats



Hello!  
I am Ricky the  
Ridgway's Rail, an  
endangered species that is  
protected by Don Edwards  
National Wildlife Refuge.

Think about the place where  
you live. What does it look  
like? Draw a picture of your  
home, or habitat, below.



*What is an endangered species? Well,*  
an **endangered species** is a type of plant or animal that is so  
few in number that it is in danger of becoming extinct. If no one helps  
save an endangered species, it could vanish forever.

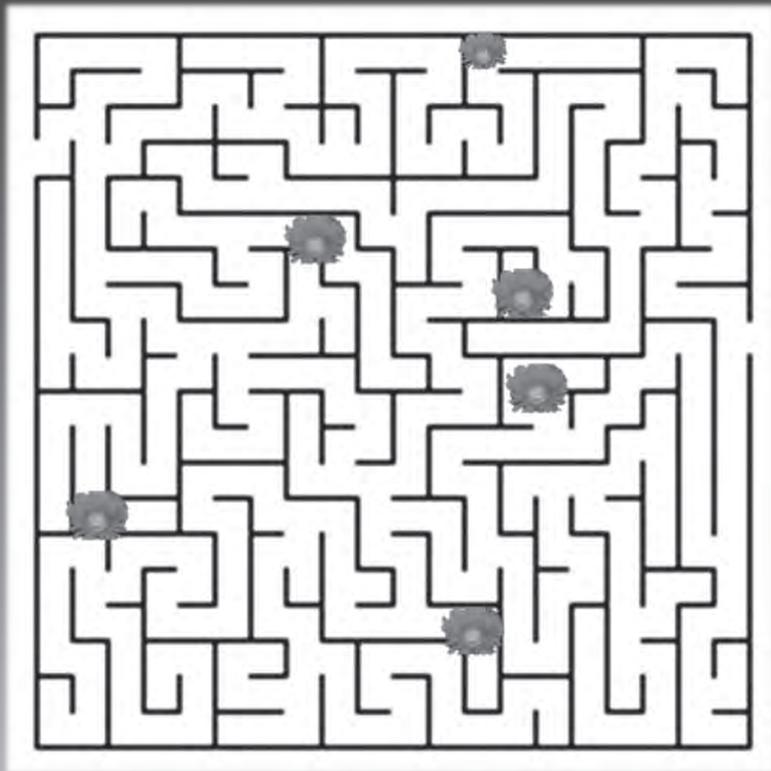
We need to save the **habitats**, or homes of native plants and animals,  
so that they do not become extinct. A refuge protects the habitats of  
native plants and animals and restores land altered by humans.

# THE EVIL INVASIVE SPECIES

*Once upon a time there was a healthy marsh full of native plants and animals. One day a visitor arrived....a plant from another land...an invasive species. The invasive species had no natural predators, so it began to take over, destroying Salty's home. Nothing could stop it. Can you help?*

The native species are looking for the refuge nursery, which is safe from the invasive species. Be careful to avoid the invasive species on your journey.

Start

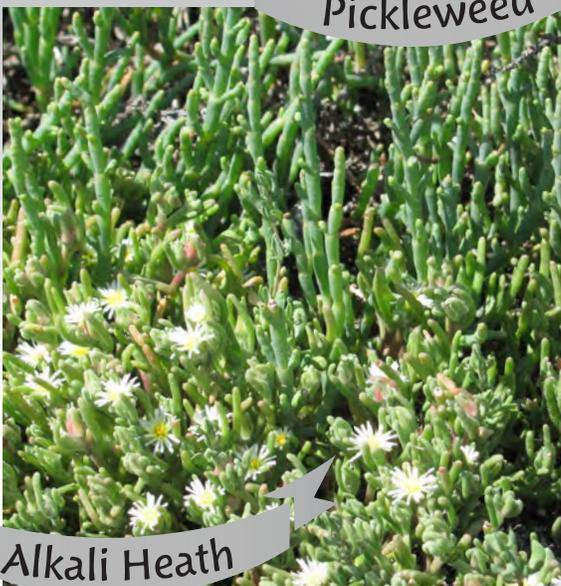


Nice job!  
You have arrived at the plant nursery.

? What else can you do? ?

*You can help save native species by volunteering at the refuge. You can come to the refuge to plant native species or to remove invasive species.*

Pickleweed



Alkali Heath

Photo by Lynnea Shuck

Now, look for these native species on the refuge:

1. Pickleweed
2. Alkali Heath

**When you find them, you will also find Salty's home!**

**Hint:** The picture below shows what you should be looking for.

# Conserve and Preserve!

The actions of humans have altered wildlife habitat. Pollution and development contributed to the loss of 85% of native marsh habitat. Now it is your turn to help!

In the blank space below each conservation tip, write down one idea about how you will conserve and preserve.

**Tip 1:** Start a compost bin in your kitchen where you can put leftover fruit and vegetables.

*I will \_\_\_\_\_ to decrease waste.*

**Tip 2:** Plant native plants in your garden to make a home for native animals. The refuge has an annual native plant sale.

*I will \_\_\_\_\_ to make native species welcome.*

**Tip 3:** Do not throw trash or pollutants on the sidewalk. When these items are washed down the storm drain, they flow directly into the bay. This harms marine life, not to mention that we eat the fish that are eating our pollutants! Gross!

*I will \_\_\_\_\_ to keep bay water clean.*

**I pledge to act upon the suggestions that I created above.**

**X**

*Sign here*



Photo by Bill Purcell

**Fun Fact:** *American Avocets are usually found in the salt pond, slough, and salt marsh. You can see their beautiful mating plumage (feathers) in spring and summer.*

# Plant Spotlight: Pickleweed

Hello again!

I'm Salty, the **salt marsh harvest mouse**. I live in the salt marsh. My favorite place to hang out is in a plant called **pickleweed**. In fact, I'm surrounded by it now! Can you see the pickleweed?

Color the pickleweed!



Photo by Pelican Media



Pickleweed is my source of food, and I have to say, it is quite tasty. I spend almost all of my time among the pickleweed in the salt marsh, including sleeping!

# Note: Part B (Activities 1-7) starts here

Ages 7 and under complete 2 activities in this section.

Ages 8-10 complete 3 activities in this section

Ages 10 and up complete 4 activities in this section

## Activity 1: Attend a Program

Attend a program to learn more about my home!



Photo by Pelican Media

Date of program: \_\_\_\_/\_\_\_\_/\_\_\_\_

Signature of program leader:

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*From wetland walks to animal talks, the Refuge offers all kinds of fun programs. Want to learn more about where and when they are? Check our quarterly Tideline newsletter or ask the front desk.*

**Fun Fact:** *There are over 560 wildlife refuges spread across the entire United States!*

Name of the program that I attended:

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One cool thing that I learned at the program:

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# Activity 2: Go Hiking!

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Taking a walk is a great way to see the plants and animals that live on the refuge. There are lots of short trails nearby for you to try.

- 1) Choose a trail from the maps at the back of this booklet. We suggest the New Chicago Marsh trail for young explorers.
- 2) You can check out binoculars and a bird list from the front desk before departing on your hike. Be sure to bring water!

**Draw a picture of your favorite scene/view from your hike.**

Name of trail: \_\_\_\_\_

Date: \_\_\_/\_\_\_/\_\_\_

# Activity 3: Exploring Habitats

For this activity, you need to visit three different habitats at the refuge. Be sure to stop by and visit my habitat, the salt marsh!



## Habitat Mix and Match!

Draw lines to match each animal or plant below to its habitat. A clue is given next to each plant or animal. If you need help, a summary of the habitats can be found at the back of this booklet.

1. Pickleweed—Salty's habitat!
2. Jackrabbit—likes it high and dry!
3. Microscopic animals—like it damp and moist
4. Brine shrimp—like super salty water!
5. Challenge question: Black-crowned Night-Heron

- A. Salt Marsh
- B. Salt Pond
- C. Upland
- D. Mudflats
- E. Slough

# Activity 4: Count Those Birds!

Over 280 species of birds visit our refuge each year. The refuge is located on the **Pacific Flyway**, which is a **migration route**. You can think of the Pacific Flyway as a highway for birds.

The refuge acts as a rest stop for birds, where they can recharge on the way to and from South America and Alaska.

If the refuge didn't exist, the birds wouldn't have a place to refill on food and water or to rest. It would be like taking a week-long road trip without stopping for a break. This would make the trip impossible. So you can see, the refuge is essential for the survival of many migrating birds.



## Part I:

Help Salty fall asleep! Instead of counting sheep, Salty is counting birds. Can you help him? Pick a spot and stand there for 5 minutes and count all the birds you see. We suggest the back porch of the education center. Don't forget to take binoculars! 1bird...2 birds...3 birds...

*Count your birds here:*

zzzzzzzz...Salty has fallen asleep. Nice job!

**Parents:** The next page provides information about some of the birds that are often seen at the refuge. Bird species and their appearances vary by season. The front desk can tell you which birds you will most likely see and can help you identify the birds you saw during the activity. Be sure to take note of its shape, habitat, and coloring.

# The Birds

## Northern Shoveler



I can be seen in the salt marsh, salt pond, and slough. Look for the male's brown side: This will help you tell me apart from a Mallard.

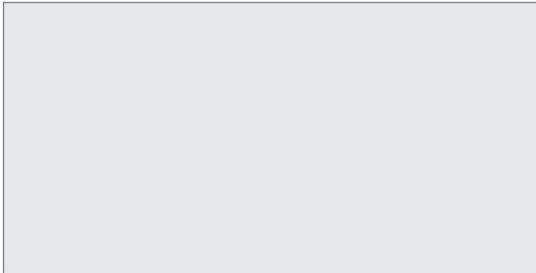
## Turkey Vulture



My red head and curved beak make me distinctive. I am usually seen soaring in the air looking for dead animals to eat. My wings form a shallow "V."

## Part II:

**Basic Bird Identification Activity:** Choose one bird that you saw today. Draw the shape of the bird in the box below.



- Is the bird chunky/slim?
- Is its tail short/long?
- Is its beak short/long?
- Is its beak flat and dull/pointy and sharp?

2) Which habitat did you see it in? \_\_\_\_\_

Hint: You can review habitats in Activity 3.

3) Coloring: What is the color of its beak? \_\_\_\_\_

Its legs? \_\_\_\_\_

4) Any distinctive patterns or colors? \_\_\_\_\_

5) Look at the pictures and descriptions above and see if your bird is a match. If not, the front desk can help you identify your bird based on the information you filled out above.

## Ruddy Duck



I spend most of my time in the salt pond and slough. During mating season, my bill turns from grey to blue. Look for my white cheeks!

## Other Birds to Look For:

### Great Blue Heron



### Snowy Egret



### Black-necked Stilt



### American Avocet

### Great Egret



**Fun fact:** Ducks usually have flat, rounded beaks and spend their time in the water, like the Ruddy duck at the top of this page.

# Activity 5: Plants and Wildlife

The uplands habitat is the higher and drier area that is directly around the visitor center. Walk slowly on an uplands trail such as the Marsh View Trail. Look all around and up and down! Record the animals and plants you see on the lines below. Then draw a line to the box on the right column that describes the animal or plant. You'll be looking for butterflies, lizards, rabbits, and much more!

**Example:** *Turkey Vulture* — — — — — →

1) \_\_\_\_\_

2) \_\_\_\_\_

3) \_\_\_\_\_

4) \_\_\_\_\_

5) \_\_\_\_\_

6) \_\_\_\_\_

→ Flying (birds, butterflies,)

Crawling (bugs and lizards)

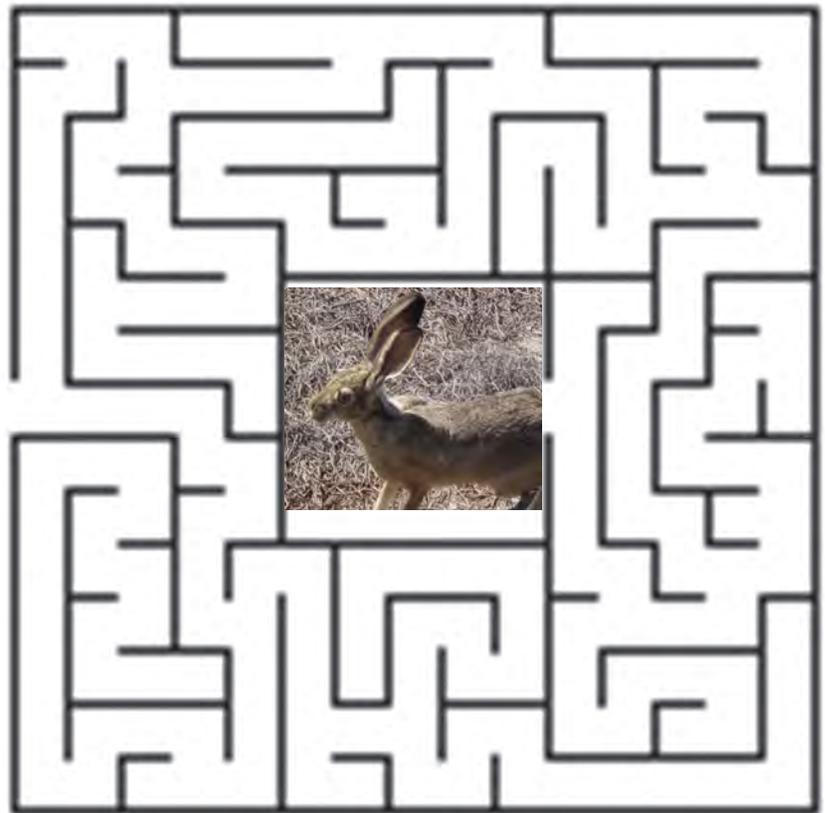
Stationary (plants)

Hopping (jackrabbits)

Other (specify to the right of the blank)

The jackrabbit needs to get back to his habitat, the uplands. Can you help?

**Uplands**



# Activity 6: Water and Drawbridge, the Refuge's Ghost Town



In 1926 Drawbridge was a bustling town in the southeast corner of the bay. Today, it is empty. What happened?

## Water Troubles

Three reasons why water is important:

1.

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2.

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3.

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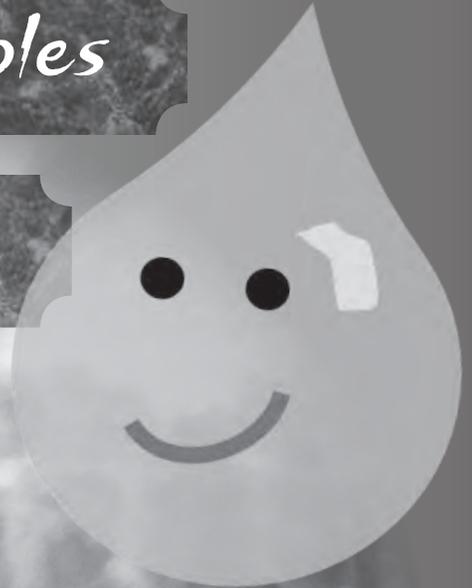
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There used to be lots of fresh water stored underground—below Drawbridge—in places called **aquifers**. People used this water and stored it in a water tower.

Do you see the water tower in the picture?

**Hint:** There is an arrow pointing to it.

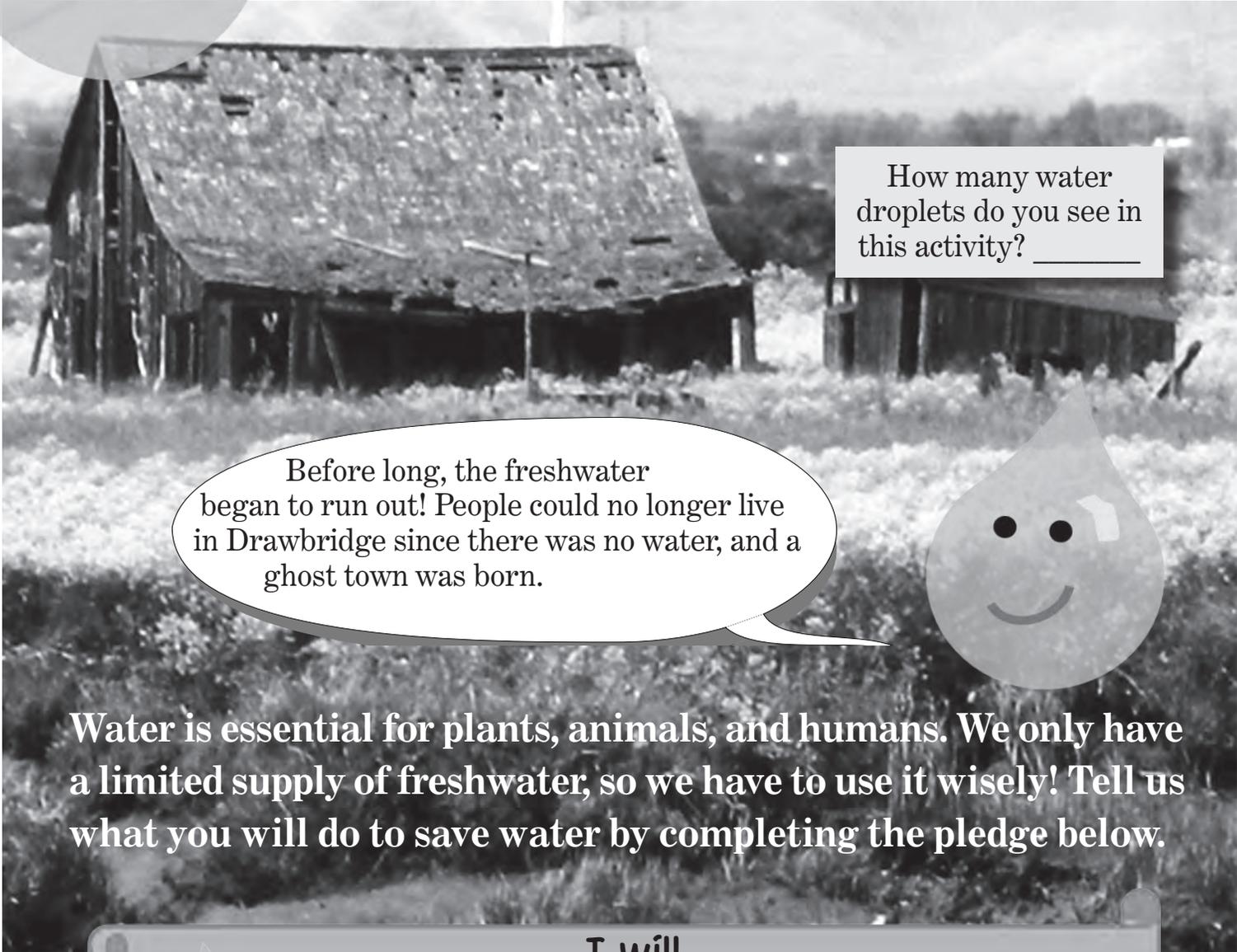




But the residents and nearby farms took so much water out of the aquifer, that soon the ground began to sink! Do you notice anything odd about the house below?



*It's sinking! That porch is way below the ground!*



How many water droplets do you see in this activity? \_\_\_\_\_

Before long, the freshwater began to run out! People could no longer live in Drawbridge since there was no water, and a ghost town was born.



**Water is essential for plants, animals, and humans. We only have a limited supply of freshwater, so we have to use it wisely! Tell us what you will do to save water by completing the pledge below.**

I will \_\_\_\_\_  
to conserve water  
X \_\_\_\_\_



**Parents:** *How can I see Alviso's Drawbridge?*  
Today, there is no public access to Drawbridge, however, families can safely view the ghost town from the end of the Drawbridge spur of the Mallard Slough Trail (4.5 miles round trip.)

## Activity 7: Nature Art

Nature has inspired many famous artists and writers, including John Muir and Jack London. Now it's your turn to create! Either write a poem/story or draw a picture inspired by the refuge.



# Just for Fun!

## Interview a Ranger

Talk to someone who works or volunteers at the refuge and ask him or her the following questions:

1. What do you do for the refuge? \_\_\_\_\_

2. What do you like best about working at the refuge? \_\_\_\_\_



*See the refuge by bike! Check the Tideline for docent-led bicycle tours of the refuge.*

## The Experience

The Don Edwards San Francisco Bay National Wildlife Refuge is a special place for plants, wildlife, and the community. We hope that it has become a special place for you too!

*The most interesting thing I learned:*

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*The best part of my visit:*

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# Wildlife Spotlight!

Have you seen a small bird with a forked tail, orange/red throat, a pale underside, and dark blue feathers? You have spotted a **Barn Swallow**!

These graceful birds enjoy nesting under cliff ledges and under the eaves of buildings. You may even be able to spot a nest here at the refuge!



**Did you know...**

*The oldest Barn Swallow  
lived to be 8 years old!*

# Habitat Glossary

Circle the numbers of the three habitats you visited.



1. **UPLANDS**—The uplands are areas that are higher and drier than the rest of the habitats. That is, the uplands are at a higher elevation and therefore are drier in nature. Here you will see California poppies, jackrabbits, butterflies, lizards and foxes!
2. **SLOUGH**—Sloughs are water channels that connect inland water to the ocean. Here you might see birds such as coots, black-crowned night herons (at dusk) and ruddy ducks.
3. **MUDFLAT**—Mudflats are full of life—microscopic animals! There can be 40,000 microscopic organisms in just one handful of mud. Zooplankton, diatoms, bacteria, and protozoans are just a few of the kinds of little critters you'll find in this habitat.
4. **SALT MARSH**—This habitat is one of the most productive on earth. One special aspect is that it has the ability to filter out pollutants from the water before the water flows to the bay.
5. **SALT POND**—Salt ponds are man-made for the production of salt. Yes, the same salt that you and I eat! Through a process called **evaporation**, each pond becomes even more salty than the one before it. Brine shrimp live in the saltiest ponds, providing food for birds like phalaropes and black-necked stilts.



*Congratulations! This certificate recognizes  
\_\_\_\_\_ as a Junior Refuge  
Ranger at the Don Edwards San Francisco  
Bay National Wildlife Refuge*



*Come visit me  
again soon!*

# Pledge

I, \_\_\_\_\_, promise  
to protect native wildlife and their habitats,  
to continue learning about the importance of  
National Wildlife Refuges for both wildlife and the community, and  
to take action in my personal life to be environmentally conscious.

I am ready to share this information  
with others and make a difference!

## Mission

The Junior Refuge Ranger program was established summer 2013 for the Don Edwards San Francisco Bay National Wildlife Refuge. The goal of the program is to teach children the significance of wildlife refuges and the importance of being an environmentally aware citizen.

I conceived of this plan in spring 2013 when I realized that educating young people is an important priority of the refuge. It will be these children that will go on to preserve and protect refuge lands in coming decades. It will be these children that will become our world's leaders. It is my hope that this program inspires children to explore nature at refuges nationwide while having fun and learning a lot! This natural curiosity is what will bring creativity and success to the future of environmental sustainability and future of the world.

Lynnea Shuck

**U.S. Fish & Wildlife Service  
Environmental Education Center  
Don Edwards San Francisco Bay  
National Wildlife Refuge  
1751 Grand Blvd  
Alviso, CA 95002  
408/262 5513**

**[www.fws.gov/refuge/don\\_edwards\\_san\\_francisco\\_bay](http://www.fws.gov/refuge/don_edwards_san_francisco_bay)**

**February 2015**



*Special thanks to Lynnea Shuck, without whose energy and enthusiasm this booklet would not exist.*