

## LESSON 4

# RAILROADS, CATTLE, COTTON FIELDS AND THE ENVIRONMENT



**Students will gain an understanding of the local environment through time by participating in a game that demonstrates how historical events affected the natural environment in the Santa Cruz Valley.**



# 4



## LESSON OVERVIEW

Students will gain an understanding of the local environment through time by participating in a game that demonstrates how historical events affected the natural environment in the Santa Cruz Valley.

### Subjects

Social Studies and Science

### Standards

History and Nature of Science

Personal and Social Perspectives in Science  
Life Science

### Objectives

Students will:

1. Define endangered, extinct, extirpated, riparian and threatened.
2. Discern historical events that affect the environment.
3. Discuss wildlife management strategies.

### Preparation

Cut-out and pre-sort animal cards on *Master Page 4.5* by species and place in an envelope. Make a reference copy of *Master Page 4.4*.

### Time

One 60-minute session.

### Vocabulary

endangered, extinct, extirpated, riparian, species, threatened

# RAINROADS, CATTLE, COTTONFIELD AND THE ENVIRONMENT

## TEACHER BACKGROUND INFORMATION

With water flowing year-round, the Santa Cruz River is the life-blood for myriad animals, insects, trees, plants and grasses. Populations of white-tailed and mule deer; javelina; mountain lion; bobcat; jackrabbit; desert cottontail; rock squirrel; valley pocket gopher; opossum; coyote; gray fox; raccoon; badger; spotted, striped, hooded and hog-nosed skunk; porcupine; white-throated woodrat and gray shrew all rely on the river. Native trees such as netleaf hackberry, honey mesquite, Arizona ash, Fremont cottonwood, walnut, Gooding willow, Mexican elder (elderberry) and catclaw acacia are common to the valley. Hundreds of insects, grasses and plants coexist in the mesquite-Bosque (mesquite woodland) and riparian environment.

During prehistoric and Spanish settlement periods, the natural environment was, for the most part, fairly stable and had abundant plants and animals mainly because the population was low. In addition what are today endangered, extirpated, or threatened species were common. This list includes monkey springs pupfish, river otter, jaguar, Mexican (gray) wolf, ferruginous pygmy owl, barking frog, Sanborn's long-nosed bat, willow fly-catcher, Gila topminnow, large flowered blue star, Wigger's milkweed vine, yellow-billed cuckoo and Santa Cruz star leaf.

The environment of the Santa Cruz Valley was not dramatically affected until the late 1800s. Prior to this time, human population remained relatively small (at least partially due to Apache attacks), and technologies did not have a great impact.

## RAILROADS, CATTLE, COTTONFIELDS AND THE ENVIRONMENT

With the arrival of the railroads and immigrating Americans, the Industrial Revolution and the surrender of Geronimo, the environment took a turn for the worse.

In the mid to late 1800s, cattle operations, railroads and cotton farms took their toll on the environment. Large herds of cattle were brought into the area and some ranchers attempted to raise as many animals as possible without effectively managing the rangeland. The cattle ate and trampled native plant species and, because the herds were so large, many native plants were unable to reseed. Other introduced or “exotic” species competed for space. Wildlife was for the most part thought of as something to be used. Wolves, coyotes, large cats, raptors and other animals were considered threats and were often shot when seen. People sometimes hired hunters to track and kill predators.

New technologies came to the area with the railroad and the citizens of the Arizona Territory mostly saw a higher standard of living. Travel and movement of commerce improved and supplies were more readily available. However, technology also brought money and greed. Large companies and land owners often took from the land everything they could, destroying habitat and killing wildlife as they did so.

The technologies and inventions encouraged large-scale agriculture and cotton farming. Habitat was destroyed and the river was tapped to irrigate huge fields of cotton that depleted the soil.

So it was that the large cattle operations, railroads and agriculture negatively impacted the environment along the Santa Cruz. Most important, however, is not as much how this occurred, but why.

What was the motivation behind the new inventions and technologies?

Were they essentially good?

How does human character come into play here?

By exploring these ideas, students will gain understanding and insight into how future generations might better manage our environment.

### VOCABULARY

**Endangered species** - A species that is in imminent danger of extinction. Example: grey wolf and jaguar.

**Exotic** - A species that was introduced from a different area or habitat. For example, Johnson Grass.

**Extinct** - A species that has ceased to exist. Example: dinosaurs.

**Extirpated** - a species that has been removed from a specific area but continues to exist elsewhere. Example: wolf, beaver and otter.

**Riparian** - referring to the ecological zone adjacent to a body of water.

**Threatened** - a designation given to species that are having a hard time maintaining their populations and may eventually become endangered or extinct.

## RAILROADS, CATTLE, COTTONFIELDS AND THE ENVIRONMENT

1. Cut-out and pre-sort individual “species cards” on *Master Page 4.5*. Place all cards of the same species in a titled envelope. Example, place all the Mountain Lion cards in the same envelope, etc.

### **MOUNTAIN LION**

2. Discuss and define vocabulary words. See Teacher Background information on Page 4.2.
3. Use all cards and give each student at least one. (In smaller classes give students two or more of the same species cards.)
4. Ask all students with the same species card to form groups. (All deer get together, all coyotes, etc.) Explain that the number of cards each student has represents the population of each given species (there are six deer, four bear, etc.)
5. Tell students that you are going to read some statements that describe various historical events. One by one, read each bold print statement on *Master Page 4.4*. Do not read the answer in parentheses to the students. They are teachers notes only. After reading each statement, discuss whether the event affected the environment and how. Was the effect positive, negative or neutral? Discuss all possibilities. If it neutrally or positively affected the environment, do nothing and read the next statement.

If it adversely affected it, ask each species group to give up one card, representing a percentage of their population.

6. As you read events, students will find that species populations are diminished or removed. These represent species that are extirpated, threatened and endangered. Those remaining with healthy populations represent survivors such as coyotes, raccoons, deer and javelina. Discuss why these animals survived and others did not. What happened to the other animals? What conclusions can be made about how historical events affect wildlife? Are there any other events that did, or will, affect or shape environmental history? Discuss the concepts of extinct, endangered, threatened and extirpated.

7. Play one or more rounds using the statements under **FUTURE EVENTS** on the bottom of *Master Page 4.4*. Predict and discuss the results.



### **Enrichment**

- Study individual species to determine why some animals survive better than others.
- Activity: “How many trees in a forest,” Project Learning Tree.
- Take a field trip to the Santa Cruz River and its environs. (Call Tumacácori National Historical Park or Tubac Presidio State Historic Park for information.)

## **HISTORICAL EVENTS AND THE ENVIRONMENT**

**The Civil War** - *(The devastations of war ravaged the east and south but not here in Arizona with the exception of Picacho Peak.)*

**Railroads** - *(Railroads bring people, commerce and new technologies to Arizona. People are able to import and export crops, wildlife [fur and meat] and livestock.)*

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**Yellowstone is Declared a National Park** - *(In 1872, Yellowstone became the first National Park. Today there are more than 370 parks and monuments.)*

**Big Cattle Operations** - *(With the railroad and the push west came operations that moved thousands of cattle and other livestock across Arizona.)*

**Tumacácori National Monument is Dedicated in 1908** - *(Tumacácori is one of fifteen parks or monuments established during Theodore Roosevelt's administration.)*

**Land is Cleared to Grow Cotton and Raise Cattle** - *(Farms expanded to large scale operations.)*

**Governor Safford Starts a State-Wide Public School System** - *(Possible long-term positive impact in that educated people help to bring about positive change.)*

**Modern Technology Allows People to Utilize Underground Water** - *(Water pumps, swimming pools, golf resorts, lawns, automatic washers, etc. allow people to pump water out of the Santa Cruz River aquifer at unprecedented rates.)*

## **FUTURE EVENTS**

**Rio Rico is the Place - 2,000 New Houses are Built**

**The Area Along the Anza Trail, Between Tumacácori and Tubac, is  
Managed as a Nature Preserve**

**Two Million People Now Live in the Santa Cruz Valley**

**RAILROADS, CATTLE, COTTONFIELDS & ENVIRONMENT - MASTER PAGE 4.5**

|                      |                      |                      |                      |                      |
|----------------------|----------------------|----------------------|----------------------|----------------------|
| <b>RACCOON</b>       | <b>RACCOON</b>       | <b>RACCOON</b>       | <b>RACCOON</b>       | <b>RACCOON</b>       |
| <b>RACCOON</b>       | <b>RACCOON</b>       | <b>MOUNTAIN LION</b> | <b>MOUNTIAN LION</b> | <b>MOUNTAIN LION</b> |
| <b>MOUNTAIN LION</b> | <b>MOUNTAIN LION</b> | <b>JAGUAR</b>        | <b>JAGUAR</b>        | <b>JAGUAR</b>        |
| <b>COYOTE</b>        | <b>COYOTE</b>        | <b>COYOTE</b>        | <b>COYOTE</b>        | <b>COYOTE</b>        |
| <b>COYOTE</b>        | <b>BEAR</b>          | <b>BEAR</b>          | <b>BEAR</b>          | <b>BEAR</b>          |
| <b>DEER</b>          | <b>DEER</b>          | <b>DEER</b>          | <b>DEER</b>          | <b>DEER</b>          |
| <b>DEER</b>          | <b>BEAVER</b>        | <b>BEAVER</b>        | <b>BEAVER</b>        | <b>BEAVER</b>        |
| <b>OTTER</b>         | <b>WOLF</b>          | <b>WOLF</b>          | <b>JAVELINA</b>      | <b>JAVELINA</b>      |
| <b>JAVELINA</b>      | <b>JAVELINA</b>      | <b>JAVELINA</b>      | <b>JAVELINA</b>      | <b>JAVELINA</b>      |

NOTES