

## A Parade of Grasses

Watch the segment online at <http://education.savingthebay.org/a-parade-of-grasses>

Watch the segment on DVD: Episode 1, 42:32–46:00

Video length: 3 minutes 46 seconds

### SUBJECT/S

**Science**

**History**

### GRADE LEVELS

4–5

9–12

### CA CONTENT STANDARDS

#### Grade 4

##### *Life Sciences*

3.b. Students know that in any particular environment, some kinds of plants and animals survive well, some survive less well, and some cannot survive at all.

3.c. Students know many plants depend on animals for pollination and seed dispersal, and animals depend on plants for food and shelter.

##### *History – Social Science*

3. Describe the Spanish exploration and colonization of California, including the relationships among soldiers, missionaries, and Indians (e.g., Juan Crespi, Junipero Serra, Gaspar de Portolá).

#### Grades 9–12

##### *Biology/Life Sciences – Ecology*

6.a. Students know biodiversity is the sum total of different kinds of organisms and is affected by alterations of habitats.

6.b. Students know how to analyze changes in an ecosystem resulting from changes in climate, human activity, introduction of nonnative species, or changes in population size.

### VIDEO OVERVIEW

The early visitors and settlers of the San Francisco Bay Area greatly impacted the flora and fauna of the region.



In this segment you'll learn:

- about the impact Spanish, Russian, and American fur traders had on the sea otter population.
- how native perennial grasses were replaced by exotic annual grasses.
- about the role livestock played in changing the native landscape.

### TOPIC BACKGROUND

In October 1769, Captain Gaspar de Portolá's expedition came upon San Francisco Bay while searching for Monterey Bay. This incredible discovery led to an era of Spanish colonization that lasted until Mexican independence in 1821, when Alta California became a Mexican province. California remained a part of Mexico until 1848, when the signing of the Treaty of Guadalupe Hidalgo ended the Mexican American War and California became a part of the United States. California earned statehood on September 9, 1850.

Even before the 1848 discovery of gold in California dramatically altered California's history, the early colonizers had made substantial changes to the Bay Area's landscape. The Spanish established Franciscan missions, presidios for military protection, and pueblos. Mexican California was a time of great cattle ranches, or ranchos.

During these years, livestock depleted the native plants, and humans and cattle spread exotic grasses. These annual exotic grasses replaced most of the native wildflowers and grasses, which included many long-lived, perennial grass species. In addition, by 1810, Russian and American fur traders were hunting sea otters and fur seals in incredible numbers off the California coast. These actions resulted in diminished animal populations and a very different landscape. To this day, sea otters do not live in San Francisco Bay.

Although sea otters and numerous other species remain threatened, some animal and plant populations have recovered. Exotic grasses, in addition to other nonnative plants, still dominate much of the San Francisco Bay Area. Native plant restoration projects are being carried out all over the Bay Area.

## VOCABULARY

**annual**

a plant that lives for only one growing season or year

**exotic**

from another part of the world

**fauna**

animals

**flora**

plants

**perennial**

a plant that lives for more than one season or year

**type conversion**

the changing of one thing into something else entirely

## PRE-VIEWING ACTIVITIES

**Grades 4–5**

- In groups, students discuss how humans have affected the flora and fauna of the San Francisco Bay Area. How is today's Bay Area different from the Bay Area before 1769?

**Grades 9–12**

- Go for a walk around your school grounds and record descriptions of the plants and grasses you find.

## VIEWING ACTIVITIES

**Grades 4–5**

- Watch this segment the first time with no sound. Pay special attention to the images. As a class, speculate what the segment is about.
- Watch the segment a second time with sound. Do the images take on a different meaning?

**Grades 9–12**

- Watch the segment beginning from "The arrival of Europeans marked an era of unprecedented change in the landscape as well." Take notes while viewing the segment.

## POST-VIEWING ACTIVITIES

**Grades 4–5**

- The beginning of this segment shows early drawings of plants and animals. Practice nature drawing techniques in the schoolyard, a garden, or a park. Try to capture as much detail as possible.
- Research an animal population that was threatened, but has recovered. What methods, if any, were employed to help the animal population recover? Present findings to the class.
- How do grasses spread their seeds? Explore seed adaptations through a seed dispersal design challenge activity. Download the activity from: <http://www.thetech.org/education/programs/classroom/>.

**Grades 9–12**

- Use the following questions to discuss the notes students took while they were watching the segment:
  - Why are so many exotic grasses able to survive in the San Francisco Bay region? What adaptations do they have?
  - What role did humans play in perpetuating exotic grasses and other exotic plants?
  - Do humans still perpetuate the spread of exotic grasses? How so?
  - Why are organizations working to restore parts of the San Francisco Bay Area with native plants?
  - What benefits do native plants provide?
- Research an exotic grass that is well established in the San Francisco Bay region. Where does it come from? How did it get here? What native plants did it replace? What is being done to remove it? Find out which organizations are working to eradicate it and how to get involved.
- Take a second walk around your school grounds. Are the plants and grasses you noticed on your first walk native or exotic? Use field guides and the Internet to identify at least two species. Are there any native plants on your school grounds?

## ABOUT THE AUTHOR

**Phaela Peck** is a science teacher, environmental educator, and writer based in San Francisco. She has an M.A. in environmental education and has developed curricula for numerous science and environmental education organizations in the Bay Area.

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## ADDITIONAL RESOURCES

**California History Online**, California Historical Society

<http://www.californiahistoricalsociety.org/timeline/>

Click through an interactive California timeline to find more information about historical topics of interest.

**Early History of the California Coast**, National Park Service

<http://www.nps.gov/history/nr/travel/ca/intro.htm>

The National Park Service provides a brief overview of the history of the California coast.

**Golden Gate National Parks Conservancy**

<http://www.parksconservancy.org/>

Find out about conservation and restoration work being done in the Golden Gate National Recreation Area. Information about volunteering and school programs is also available.

**History of the Farallon Islands**, Farallon National Wildlife Refuge

<http://www.fws.gov/SFBAYREFUGES/Farallon/History.htm>

This website provides a brief overview of the history of the Farallon Islands.

**Sea Otters**, Monterey Bay Aquarium

<http://www.montereybayaquarium.org/efc/otter.aspx>

Learn more about sea otters and the work being done to protect them. A link to a live sea otter webcam is also available.

**Wildland Vegetation**, East Bay Regional Park District

<http://www.ebparks.org/stewardship/plants>

The East Bay Regional Park District offers information, checklists, and photo guides on California native plants and wildflowers.

## CREDITS

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**NARRATOR:** Visiting expeditions not only documented the native people of San Francisco Bay, but the region's unique flora and fauna: the striking California poppy, the California quail, and a marine mammal soon to vanish from San Francisco Bay entirely—the sea otter. Systematically hunted as early as 1785, by 1810, small Spanish operations were overrun by larger Russian and American ones fanning over the entire California coast.

**ED UEBER:** There were around 215,000 sea otters killed in a five- or seven-year period in the early 1800s in the Bay. They went out to the islands and then, by 1817, they stopped going out there. But they had already taken 250,000 to 270,000 animals—fur seals—killed them out there.

**KEN LAJOIE:** By 1830 or so, the sea otter was pretty much gone from the San Francisco Bay region and from the outer California coast.

**NARRATOR:** The arrival of Europeans marked an era of unprecedented change in the landscape as well. Upon first seeing San Francisco Bay in 1769, the Portolá Expedition noted grasses as high as a horse's bridal. The coastal prairies and foothill grasslands stayed green long after the winter rains ceased. Native perennial bunch grasses, such as blue wild rye, purple needle grass, and California oat grass, covered the hillsides and prairie. But the native grasses were soon at a disadvantage.

**STEVE EDWARDS:** The landscape has changed dramatically and has really been what we call a type conversion from native plants to exotic plants, mostly coming from the Mediterranean. And these are mostly exotic annual grasses. That means grasses that live out their whole life span with the rainy season and turn brown and die in the summer.

**NARRATOR:** Lodged in cattle's hooves, scattered in their droppings, spread intentionally by the friars, carried in on ships, were the seeds of European annuals—fescues, wild oats and rye, and a host of weeds—producing larger seeds in 10 times the quantity.

**DAVID AMME:** The first grass that really swept through California was oat grass, and this is a good example. This is oat grass. It has a seed that is 35 to 40 times larger than the native seed. That was the first sweep across. Then, after that, other exotic grasses would come through one after another. It was like a parade of grasses.

**EDWARDS:** The transition happened very quickly. You wouldn't have seen it happening in a year. You might have seen significant change in your lifetime.

**NARRATOR:** The speed of the transformation was facilitated by the new animals the colonists brought with them.

**ANDREW GALVAN:** You bring in a cow. You bring in thousands of them. You bring in horse, pig, goat, sheep. They eat all of the native vegetation. They destroy the seasonal environment. The seeds don't come back. The livestock that the Europeans brought in totally wiped out the native balance.