

# Conservation in Action:

## *Parker River National Wildlife Refuge*

### *Lesson Plan*

#### **Purpose**

To introduce students to the work of Rachel Carson and the resource management activities of Parker River National Wildlife Refuge.

#### **Grade Level**

Middle and High School

#### **Subject Areas**

History, English/Literature, Science

#### **Massachusetts Frameworks**

##### **Science and Technology Frameworks**

Grades 6-8

Life Science Standard 12, 13, 14, 17

Grades 9 or 10

Life Science Standard 6.2, 6.3, 6.4

##### **Language Arts Frameworks**

General Standards 8: Understanding a text

General Standards 9: Making connections

General Standards 13: Non-fiction

#### **Materials**

Required:

- Copies of *Conservation in Action, Parker River: A National Wildlife Refuge* by Rachel Carson
- Rachel Carson Fact Sheet

Recommended:

Copies of books written by Rachel Carson (*Silent Spring, Under the Sea Wind, The Sea Around Us, The Edge of the Sea*).

#### **Duration**

Required: 1-3 class periods for reading and research

Recommended: Field trip to Parker River National Wildlife Refuge or an in-class visit by refuge staff

#### **Learning Objectives**

Students will (1) identify Rachel Carson as an important figure in the conservation world, (2) describe her major accomplishments in the field of conservation, (3) identify the main purposes and describe the history of the Parker River National Wildlife Refuge, and (4) explain the differences between the management goals of Parker River National Wildlife Refuge in 1947 and 2007.

#### **Method**

##### **I. Discussion**

Teachers will lead a discussion about the environment and wildlife conservation. Sample discussion questions include:

- How do you define environmental protection?
- How important is environmental protection to you?
- What experiences have you had in the outdoors? Hiking? Camping? Canoeing? Beachcombing?
- How would you describe the state of our environment? Is it well protected from pollution? Not protected enough? Too protected?
- Do you believe that protection of wildlife and wildlife habitat is important? Why or why not?
- Which animal and plant species need the most protection? Which ecosystems need the most protection?
- Are wild animals and plants too protected? Why or why not?

##### **II. Rachel Carson**

Students will read and research background information about Rachel Carson, a heroine in the environmental conservation movement, and will answer the following questions:

- In a short paragraph, describe who Rachel Carson was. Include where she spent her childhood, her educational background and her career.
- List some of her life achievements.
- What is Rachel Carson's most famous work? What was it about?
- Who inspired her life-long love of nature?
- Why is Rachel Carson an important figure in the conservation world? What has she done to set the stage for the future of conservation?
- What does this quote below mean to you? How does this quote relate to wildlife conservation?  
"The more clearly we can focus our attention on the wonders and realities of the universe about us, the less taste we shall have for destruction." – Rachel Carson 1954

##### **III. Conservation in Action: Parker River**

A. Students will read pamphlet entitled *Conservation in Action, Parker River: A National Wildlife Refuge* written by Rachel Carson and answer the following questions (note: some answers will need to be furnished by refuge staff as part of a field trip, in-class visit, or through direct phone or email contact):

- When was Parker River National Wildlife Refuge established?
- In the 1940s, the decline of waterfowl populations was a major conservation concern. Does this hold true today? Which species are of greatest concern at Parker River today?
- Define a “flyway.”
- Dr. Charles Townsend said in 1905, that Parker River is “in one of the greatest highways of bird migration.” Does this statement continue to hold true today?
- *Ammophila* is part of the Latin scientific name for beach grass. What does the word “*ammophila*” mean?
- Which plants are the first to grow on the beach and help build the dunes? Why is this important?
- What is bird banding? Why is it important? Does it occur on the refuge today?
- What kinds of birds migrate through Parker River today?
- What are the primary habitats that make up Plum Island?
- Rachel Carson wrote, “The conservation program at Parker River National Wildlife Refuge was designated to restore and if possible increase the black duck population. The refuge has many other uses and many values, but these are secondary to its principal purpose.” Has the refuge maintained this mission statement? What is the principal purpose of the refuge today?
- How has the refuge’s management techniques changed over time? What were some of the refuge’s original management projects? What are the current management projects?
- Rachel Carson listed the most abundant refuge plants in 1947 as wild rose, sumac, beach plum, and bayberry. What are the most abundant plants on the refuge today?
- List the reasons given for the population decline of the black duck prior to 1947.
- Does the refuge still harvest rye as a source of food for migrating geese?
- Rachel Carson explained that staff in 1947 were “building up potential nesting sites in the marshes by creating artificial ‘islands’ which will rise above the level of the highest tides.” Do any such islands exist on the refuge today? Why or why not?
- What evidence does she use to support that refuges are important to waterfowl hunters? Does hunting occur on the refuge today?
- Are the refuge clam flats still managed by individual towns?
- Does the refuge still have a “laboratory” for shell-fish study?
- Does the refuge manager still issue permits for cutting salt marsh hay? Why or why not?
- List the recreational opportunities available on the refuge at the time of Rachel Carson writing. Compare them with recreational opportunities available at the refuge today. What are the similarities/differences?
- Compare the refuge map provided in “conservation in action” with the map provided by the refuge today. List specific changes.
- Using specific examples of plant and animal interactions given in the text, construct a refuge food web.

B. Through a class field trip to Parker River National Wildlife Refuge, an in-class visit from refuge staff, or through internet research, students will learn the main purposes of a national wildlife refuge, and more specifically, the Parker River National Wildlife Refuge. Questions to consider include:

- What is a national wildlife refuge?
- National wildlife refuges are managed by which federal agency?
- Which department does this agency fall under?
- What are the main functions of national wildlife refuges?

- Name three different refuges that can be found in Massachusetts; list where they are located and what their main functions are.
- Where is the Parker River National Wildlife Refuge? What is its main purpose?

**Supplemental Lessons from the Project Wild and Project Wild Aquatic Activity Curriculums:**

- 1) *Enviro-Ethics* from Project Wild
- 2) *What's in the Water?* from Project Wild Aquatic
- 3) *Can Do!* from Project Wild
- 4) *Living Research: Aquatic Heroes and Heroines* from Project Wild Aquatic
- 5) *Hazardous Links, Possible Solutions* from Project Wild