STUDENT MASTER

Stewardship and NERRS

Did you know the National Estuarine Research Reserve System (NERRS) was created to help protect estuaries along the coasts of the United States and Puerto Rico? The mission of these Reserves is to help protect coastal wetlands by doing such things as removing non-native plants from public lands, monitoring water quality, restoring oyster beds, and preserving these environments for everyone to enjoy.

Like the students you read about in Exercise 1: *Student Stewards*, the Reserves serve as stewards for the estuaries and nearby wetlands. In this case, stewardship translates to everyone associated with each NERR working together to preserve the estuary environments for everyone to use and enjoy, now and in future generations.

Using the information below and from your online research, choose a NERRS stewardship project. Write down how individuals worked on the project and how they 'Scored One for the Estuaries'.

These stewardship projects fall into four general categories:

1. Change to Coastal Habitats

Coastal habitats are the parts of the coastal estuaries where plants and animals are living. These habitats can be negatively affected by changes in land use, pollution, erosion, and sea-level changes due to climate change. Restoration efforts within the Reserves allow people to explore the science behind restoration. Efforts include dam removal projects, restoration of sea grass along channels, beach grass on dunes, and widening of openings to allow more salt water flow into marshes.

> **Example:** The Grand Bay Reserve serves as a "NERR" perfect restoration example. Recently, the stewardship coordinator designed a project to prevent the shoreline adjacent to their boat launch from eroding. Black Needlerush marsh was planted/restored with the help of local elementary students and is protected with a manmade "log "of shredded coconut hulls. This log keeps the waves from eroding away the new marsh and will eventually decompose and disappear after the root systems of the plants have had a chance to develop. Today the restored marsh is successfully growing and helping protect the shoreline from erosion. The runoff from the parking lot has been minimized, and the Reserve's visitors and staff have a useful boat launch and fishing dock.

2. Invasive Species

Invasive species are species not native to an ecosystem although not all non-native species are invasive. An invasive species can either be animals, plants or other organisms. Invasive species are bad for the native ecosystem because they often "out compete" the native species, in effect starving or displacing the native plants or animals. Invasive species may constitute the largest single threat to coastal ecosystems. All four coasts — East, West, Gulf, and Great Lakes — as well as many waterways in the interior of this country have been severely affected by invasive aquatic species.

> **Example:** At North Inlet-Winyah Bay NERR in South Carolina, local stewards continue to work hard monitoring and controlling the spread of beach vitex. This woody shrub, native to Pacific Rim countries, became a problem on Carolina beaches in the mid 1980's when it was imported for beach stabilization. Beach vitex makes a dense mat of vegetation over dunes posing a direct threat to animals, like sea turtles, that depend upon the dunes in their natural state. Volunteers that monitor sea turtle nesting have documented turtles returning to the sea without laying their eggs when they have encounter beach vitex covered dunes. Luckily the hard work of volunteers within the NERR and along the whole coast of Carolinas has resulted in a location, treatment and replanting of roughly 250 beach vitex sites.

3. Water Quality

Water quality directly affects the quality of coastal habitats. Water quality in estuaries, for example, affects spawning and nursery habitats for fisheries, as well as influencing biodiversity. Human communities that live along the coasts and that rely on estuaries for recreation and livelihoods are also affected by water quality. Water quality is a fundamental indicator of the negative impacts from coastal watersheds and is used to measure the health of estuary ecosystems. The quality and quantity of ground water is also important.

> **Example:** At Elkhorn Slough NERR in California, staff and volunteers collect monthly data from 24 recording stations (data loggers) within the watershed and associated waterways. Data gathered includes water temperature, salinity, dissolved oxygen, pH, turbidity, nitrate, ammonium, and dissolved inorganic phosphate. The data gathered reveals extremely high nutrient enrichment in the estuary, indicative of non-point source pollution.

4. Climate Change

Climate change and the associated impacts are being increasingly felt in coastal areas. A changing climate will have significant impacts on estuaries by likely causing local extinction of some species, dramatic changes in habitats, and changes in how nutrients cycle through the ecosystem. While climate change impacts vary regionally, coastal communities and estuaries are clearly on the front lines of climate change.

> **Example:** The Climate Stewards Program at Padilla Bay NERR in Washington, trains staff and volunteers to work with their local communities to educate their neighbors about climate change and show how simple changes in our lives can make huge differences. The volunteers first participate in a training program that provides them with a background in the science of climate change and its impacts, discussions on wise choices to live more sustainably, and how to communicate accurately and confidently about climate change. After completing the training program volunteers develop and engage in climate education projects within their community to teach ways that we individually and collectively can reduce our carbon footprint.

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Q1. What issue did the stewardship project you picked address?

Q2. How did the NERR staff and volunteers work together to address the issue?

Q3. What might be some next steps the NERR staff and volunteers could do to further help the estuary?