Controlling Invasive Species

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Part I: Overview of Workplace

Neal Smith Wildlife Refuge was established in 1990 by the US Fish and Wildlife Service to protect the native prairie and oak savanna ecosystems that once covered 85% of Iowa. Housed on the refuge's 5,600 acres are a variety of native plant and animal species including bison, elk and monarch butterflies. In addition to restoring native habitats, the refuge serves the public through environmental education programing and provides a beautiful outdoor space for recreation activities such as hiking and birdwatching.

Part II: Workplace Focus

Neal Smith Wildlife Refuge's future goals include:

1. Protect and restore native habitats. Projection and restoration plans include vegetation surveys, collecting and distributing seed and using prescribed fires to enhance the health of the ecosystem.
2. Protect and maintain biological diversity of native species. Projects include monarch monitoring, housing a population of bison and conducting bird surveys.
3. Engaging the public in recreational and educational activities. Projects include large scale events such as Pedal the Prairie and Concert on the Prairie, as well as, smaller workshops and public engagement projects such as prairie plot adoptions.

"The mission of the Refuge is to actively protect, restore, reconstruct and manage the diverse native ecosystems of tallgrass prairie, oak savanna, and sedge meadow. "

Part III: Introduce the Problem

As part of the refuge's vegetation management team, your job is to help control invasive species on the refuge. Iowa is home to over 30 different invasive plants including Queen Anne's Lace, Wild Parsnip, Canada Thistle and Sericea Lespedeza which are commonly found at the refuge. You will receive a plot of land, maps of the area and a vegetation survey. Your job is to create a plan for managing the invasives while still protecting the biodiversity of the native species and maintaining the health of the ecosystem. There are many methods that can be used to control invasive species. Research the invasive species in your area and find the best method or methods for each species.

Websites:
https://www.fws.gov/refuge/Neal_Smith/about.html
https://www.iowadnr.gov/Conservation/Forestry/Forest-Health/Invasive-Plants

Part IV: Background

Students will need to have a good understanding of the biodiversity of each ecosystem, interactions among organisms throughout the prairie and the effects of resource availability on the organism's/population's survival rates. Students will also need to be able to ask questions, define problems, analyze and interpret data and design solutions. More specifically, students will need to be able to use a field guide to identify organisms, research and evaluate websites for critical material, and design solutions to control invasive species. Because there are many ways to control invasive species, students should have the skills to compare and evaluate differing solutions.

Possible Standards Address: MS LS1-4, MS LS1-5, MS LS1-6, **MS LS2-1**, **MS LS2-2,** MS LS2-3, **MS LS2-4, MS LS2-5**

Part V: Workplace Solution

The method used for controlling the invasive species at the refuge depends on the species and the size of the population. Methods used at the refuge include:

- Hand-Pulling or Digging
- Mowing or Cutting
- Spraying Herbicides
- Prescribed Burning
- Non-Herbicidal Applications (Smothering)

As a member of the vegetation management team, you must research these methods and determine which method or variety of methods will work best for your assigned area. You should also keep in mind the many native species that could potentially be affected by your method and work to minimize the effects on native plant and animal populations.

Part VI: Educational Pathways

The full-time staff for both the biology crew and the visitor services employees have, at minimum, four-year degrees in science or education fields. The interns are earning or have completed a variety of degrees in fields including education, biology, ecology and horticulture.

The other essential part of each person's career pathway was at least one internship or volunteer opportunity. The workplace is very competitive and having solid experiences and good references are critical in finding employment with the US Fish and Wildlife Service personnel.