**Subject area/course**: Science/Environmental Science

**Grade level/band**: 9-11

**Task source**: Stanford Center for Assessment, Learning, and Equity (SCALE); author: Susan Schultz

**Silent Invaders: Invasive Species and Their Impacts**

**STUDENT INSTRUCTIONS**

1. **Task context:**

An invasive species is “…a species that is 1) non-native (or alien) to the ecosystem under consideration, and2) whose introduction causes or is likely to cause economic or environmental harm or harm to human health” (NISC, 2001). Human activity has introduced these species to ecosystems around the globe. These organisms attempt to fill the niche of native organisms that are already present. There is a limited amount of resources in any environment. Adding new species means that species already present now have more competition for food and shelter. If an invasive species does well, it usually means a preexisting species begins to decrease in numbers through intense competition for ecosystem resources.

**Your Task**

A non-profit environmental company, *Invasion Free*, hired your team to investigate an invasive species that has been introduced to your state. *Invasion Free* wants to learn about the characteristics and distribution of different types of invasive species in your state. Your team will select one specific invasive species to investigate. The team will need to select an invasive species to research and learn everything you can about the characteristics of the species and its interaction with native organisms and ecosystems. You will create a “wanted poster” of your invasive species to educate others about what it looks like, where it is located, and how it entered your state. Then you will identify the potential impacts (i.e., environmental, health, social, and/or economic) of the invasive species. Once you understand the impact you will be able to identify and evaluate options for removing or reducing the impacts of your invasive species. Using all of this information, your team will construct an argument to justify which option or combination of options you think will remove or reduce the impacts of your invasive species. To fully develop your argument, you must justify why your option or options are the “best” for removing the invasive species, providing multiple credible sources of evidence to support your claim. You must also explain and refute any alternative option using evidence, and identify the limitations of your own argument. Using your argument, you will develop a plan to effectively remove and/or minimize the impact of this species. Finally, as a team you will prepare a presentation to share your argument and plan to the *Invasion Free* panel. At the end of the project, each member of the team will prepare an individual research paper (see details below) to share what you learned about your invasive species.

1. **Final product**:

For this task you will need to work collaboratively with a team of students to:

* Select an invasive species within your state.
* Research everything you can about the characteristics of the species and its interaction with native organisms and ecosystems and make a “wanted poster” for your invasive species.
* Identify the potential impacts (i.e., environmental, health, social, and/or economic) of the invasive species.
* Identify and evaluate options for removing or reducing the impacts of your invasive species.
* Construct an argument to justify which option or combination of options you think will remove or reduce the impacts of your invasive species. To fully develop your argument, you must justify why your option or options are the “best” for removing the invasive species providing multiple credible sources of evidence to support your claim. You must also explain and refute any alternative option using evidence, and identify the limitations of your own argument.
* Develop a plan to effectively remove and/or minimize the impact of this species.
* Prepare a presentation to share your argument and plan to the *Invasion Free* panel.

Individually you will:

* Write a research paper sharing what you have learned about a specific invasive species, the potential impacts, possible options for controlling the impacts, your argument with evidence for the most effective option or options, the limitations of your argument, and your plan for removing or reducing the invasive species.

**ADDITIONAL INFORMAtion**

1. **Knowledge and skills you will need to demonstrate on this task:**
2. **On this task, you will show that you know these things:**
* How to identify different types of invasive species found in your state-their distribution and their potential impacts on the environment, health, and economy of your state
* How to describe the history of a specific invasive species within your state and the impacts (i.e., economic, environmental, health, and/or social) associated with the invasive species
1. **On this task, you will show that you are able to do these things:**
* Conduct research and synthesize information from a number of credible sources
* Make a visual (“wanted poster”) to share important information about your invasive species
* Identify feasible options and evaluate each option using evidence
* Discuss the possible problems, limitations, and/or further investigation you would need to consider
* Construct an argument to justify which option or combination of options you think will remove or reduce the impacts of your invasive species. To fully develop your argument, you must justify why your option or options are the “best” for removing the invasive species providing multiple credible sources of evidence to support your claim.  You must also explain and refute any alternative option using evidence, and identify the limitations of your own argument.
* Develop a plan and justify your recommendations for minimizing the impacts of your invasive species with arguments and evidence from your research
* Provide constructive feedback to your peers on their draft arguments and plans and take into consideration feedback they provide you
* Prepare a research paper that details your research findings, supports your argument with evidence, and offers recommendations to remove or reduce the impacts of your invasive species
* Correctly cite your sources within the text and provide a reference or bibliography page
* Communicate your argument and recommendations to the Invasive Free panel clearly, creatively, and effectively using evidence to support your claims in a way that will engage the audience
1. **Materials needed:**

When conducting research you will need access to the Internet. You will also need access to presentation software or poster-making materials for your oral presentation.

1. **Time requirements:**

Your teacher will provide the due dates for completing each portion of the task.

|  |  |  |
| --- | --- | --- |
| **Due Date** | **What You Need To Do** | **Product** |
|  | Learn about invasive species within your state | Construct Argument and Plan |
|  | Select and research a specific invasive species and make a “wanted poster” of your invasive species |
|  | Identify possible options to control or remove your invasive species  |
|  | Generate a list of criteria based on your research and evaluate each option |
|  | Construct an argument using evidence to identify the most effective option or options to reduce/remove the invasive species  |
|  | Evaluate your argument by considering other options (counterclaims) and discuss the limitations of your argument |
|  | Develop a plan to remove or minimize the invasive species |
|  | Get peer and teacher feedback on draft argument and plan |
|  | Finalize your argument and plan |
|  | Group Presentation: Present your argument and plan to the *Invasion Free* panel | Oral Presentation |
|  | Research Paper | Individual Paper |

1. **Scoring:**

Your work will be scored using the SCALE Scientific Literacy Rubric and the SCALE Effective Communication Oral Presentation Rubric (see both rubrics before beginning the project). You should make sure you are familiar with the language that describes the expectations for proficient performance.