

The North American Envirothon 2016 Scenario - Invasive Species: A Challenge to the Environment, Economy and Society

The KEY to having a successful project and making a winning oral presentation on this topic is to READ and RE-READ the INSTRUCTIONS SEVERAL TIMES and REVIEW both the SCENARIO and RUBRIC carefully and thoroughly.

IMPORTANT: ALL SCHOOL IDENTIFICATION (names, logos, initials) MUST BE OMITTED FROM ALL VISUAL MATERIAL USED FOR THE ORAL PRESENTATION TO AVOID IDENTIFYING THE PRESENTING TEAM, SCHOOL OR TOWN. ANY TEAM IN VIOLATION OF THIS RULE WILL BE DISQUALIFIED FROM THE ORAL PRESENTATION AND THE TEAM WILL RECEIVE A ZERO FOR THE ORAL PRESENTATION SEGMENT OF THEIR FINAL SCORE.

Please see the web page of CT Envirothon for additional Guidelines and Regulations .

Introduction

Invasive species pose a serious threat to the stability of many North American ecosystems. Invasive species have been known to disrupt food webs, damage or destroy habitat, cause economic loss, pose health risks and contribute to the decline of at-risk indigenous species.

*An invasive species is defined as a species (1) that is non-native (or alien) to the ecosystem under consideration **and** (2) whose introduction causes or is likely to cause economic or environmental harm or harm to human health. (According to the Presidential Executive Order 13112 – February 1999)*

Note: Different groups may use the term “invasive” differently. CT Envirothon will use the executive order described above for all organisms except plants. For plants, the State of Connecticut’s and the State of Connecticut’s Invasive Plant Council’s definition will be used:

Invasive species are non-native species that have become naturalized and cause harm. This tends to happen in places where there are few natural controls on a species population growth and ability to spread.

For further clarification of this definition go to

http://www.cga.ct.gov/current/pub/chap_446ihtm#sec22a-381b

The Current Issue

Your project will begin with a site investigation and selection of one species (a **single** invasive species you choose as the focus of your project). This species may be an invasive animal (including insects), plant, or microbe. It may be a species found on the site, or one chosen because of concerns about it spreading to the site in the future. Choose a site that is convenient for your team to study; do not be concerned about the size of your study site. The oral presentation will be a description of your project.

Each team's project must address **all four** of the key topics:

- I. Introduction and Spread of Invasive Species in the Study Site
- II. Impact(s) of the Invasive Species in the Study Site
- III. Prevention and Detection of the Invasive Species in the Study Site
- IV. Response to and Control of the Invasive Species in the Study Site.

The rubric used to evaluate your project addresses the specific components of these four key topics. Each team should attempt to cover everything listed in the rubric. (Many items may be addressed by a single sentence.) The rubric is found on the CT Envirothon web site (ctenvirothon.org).

Steps to Success for completing the four key topics:

I. Introduction and Spread of Invasive Species in the Study Site:

1. Define clearly the **GOALS** of the project
2. Description of site (DO NOT IDENTIFY YOUR LOCATION!) includes a MAP of the site and a
 - (a) description of your invasive species, including its scientific name, physical characteristics, host (if appropriate), origin and means of introduction to the US
 - (b) description of the habitat at your site (for example: mature deciduous forest, young forest, conifer forest, grassland, wildflower meadow, wet meadow, old field, shrubland, freshwater marsh, swamp, pond, river, rocky shoreline, estuary, coastal marsh, orchard, agricultural field, etc.)
3. Clarify whether your selected species is currently known, or not yet known, at the site. Identify what your primary focus will be (e.g., detect and prevent its introduction to the site; manage it on site; control its spread from the site, etc.)
4. **Site Assessment:** describe how you completed the site assessment by explaining how you determined if there is an invasive species already on the site or if there is the potential for an invasive species to become established at the site.

II. Impact(s) of the Invasive Species in the Study Site

Some impacts of invasive species are quickly evident, while the full impact of other species may take years to develop. Impacts that involve either interactions among multiple species or impacts that are easily seen only after a population of invaders has built up a large population may initially go unnoticed. When considering impacts, you may also wish to consider risk factors that affect the likelihood of spread and of successful establishment in new locations.

Factors that can be used to assess risk of invasion include:

1. distance/proximity to the study site from a site already containing the invasive species
2. landscape corridors/patterns that allow for or promote the spread of the invader
3. natural or human disturbances that may assist spread of the invader
4. environmental characteristics (site conditions or the presence of other species) that assist or promote the establishment of an invasive species (for example: many invasive plants favor bare soil; the presence of ash trees create a habitat for the Emerald Ash Borer)

Factors 1, 2 and 3 would pose a greater risk for dispersal of the species, and factor 4 would assist with allowing the invader to become established with or without involvement of a natural or human disturbance. The impact of any or all of these factors would contribute to the **probability** of invasion.

III. Prevention and Detection of the Invasive Species in the Study Site

An invasive species management cycle has four components: prevention, detection, response and control.

To **prevent** a species from being introduced it is important to fully understand the numerous pathways by which it may be introduced to your study site.

Once an invasive species has already entered a new environment, the next part of the cycle is **detection**. It is important to quickly detect the species to ensure that there is a rapid response to prevent its further spread and establishment. There are standard monitoring techniques that help with detection of a new species in an environment. In addition, educating the public on the invasive species can

provide valuable data for research into detecting the spread or establishment of an invasive species into a new area.

IV. Response and Control of the Invasive Species in the Study Site:

Management of the species already at the study site should be focused on methods of control, how those methods could be implemented, costs of implementing the control and who should be involved in the management plan. Management plans for species not yet present on the site may be more heavily weighted toward prevention and detection, and include having a rapid response plan in place.

1. The management plan options for your site differ depending on (1) whether your selected species is already present at the site or (2) if your concern is that the site is likely to be invaded by your selected species in the future. If your site already has your selected invasive species present, the focus of your project would be to control and contain the species, or if possible/feasible move towards eradication of the species at the site. If eradication is not an end goal for the site this should be mentioned. If your site doesn't currently have an infestation of your selected species, the focus of your project would be description of continued surveillance of the property and steps to be taken for a rapid response action to the discovery of the invasive species on the property.
2. When you think about managing invasive species, consider the impacts that your management activities may have on the ecosystem (including impacts to native species, soil and water resources, etc.). You may want to consider the Best Management Plan (BMP) or the Integrated Pest Management (IPM) approach.

Best Management Practices (BMPs) and Integrated Pest Management (IPM) are management practices that take into consideration the entire biological system in which they operate by analysis of the species present and the environmental and geologic features which function to influence those species. These management plans strive to achieve their goals with the *least* disruption of the environment.

Best Management Practices (BMPs), are a structured management tool used to meet a specific objective, usually to prevent the pollution of an environment. They can even be a component of landscape-level strategies to conserve biodiversity. For invasive species they describe ways to manage land or activities to manage or reduce a population or prevent the introduction or spread of an invasive species. These practices protect your family's health, but also help protect the other land uses such as recreation, animal habitat, fisheries, and agriculture. Best management practices are usually simple and low tech, and benefit everybody.

Integrated Pest Management (IPM), is a process you can use to solve pest problems while minimizing risks to people and the environment. IPM can be used to manage all kinds of pests anywhere—in urban, agricultural, and wildland or natural areas. Integrated pest management (IPM) is an ecosystem-based strategy that focuses on long-term prevention of pests or their damage through a combination of techniques such as biological control, habitat manipulation, modification of cultural practices, and use of resistant varieties. Pesticides are used only after monitoring indicates they are needed according to established guidelines, and treatments are made with the goal of removing only the target organism. Pest control materials are selected and applied in a manner that minimizes risks to human health, beneficial and non-target organisms, and the environment.

3. In considering the resources needed to manage the invasive species at the study site, you may wish to consider the items listed below.

Think about things such as:

- Over what area will your management activities be concentrated (possibly not the entire site)
- How intense an effort is needed (e.g., eradication vs. less intense effort)
- What are the resources needed to carry out your plan: materials, equipment, labor, volunteers, outreach materials.
(Note that these resources will differ for different types of control techniques [e.g., mechanical and physical vs. chemical vs. biological control] and this may influence which technique you choose)
- How will you dispose of the invasives that are being removed
- How will the site be maintained (e.g., timing and Intensity of follow-up surveys in order for the efforts to be considered successful)
- With whom might you partner on equipment/materials/labor (e.g., citizens, town commissions, non-profit organizations, land owners, state/federal agencies)

4. When describing an outreach project to educate or engage the public in managing the invasive species in your study area, **be creative!** Outreach projects can include the use of social media, websites, brochures, signs, commercials and trainings to engage the public. Think about what method(s) work best for you and your management plan, and discuss what materials you would use and how you would implement it.

Information for this background was provided, in part, from the North American Envirothon – Ontario *Final Study Guide*. Please see the CT Envirothon web site's Current Issue Study Guide for a complete description and suggestions for preparing your team's oral presentation.

REMEMBER: All team members must wear the official Connecticut Envirothon T-shirt for the oral presentation. No articles of clothing with the team, school or town identification (hats, jackets, etc.) will be permitted during the oral presentations.