

## 2016 Massachusetts Envirothon Current Issue Problem

# Managing Invasive Species

**Background** (For more extensive background see <http://massenvirothon.org/2016-current-issue/> )

The geographic spread of species has been an essential feature of biological evolution and the development of ecological communities over time. In the past century, however, the magnitude and speed of the change – in terms of numbers of species, swiftness of spread, and geographic extent – have increased dramatically. Human activity is responsible, and the ecological disruption has been significant. We have entered the Anthropocene Era.

Species invasions have been identified as a widespread environmental problem by scientists and resource managers. No place, particularly in an urbanized state like Massachusetts, is unaffected. Invaders include plants, animals, pathogens.

Species invasions are a natural consequence of 20<sup>th</sup> century civilization. Global trade has introduced species to new locations where they encounter favorable conditions and no natural enemies. Landscape changes like sprawling development can provide disturbed and edge conditions where introduced species can proliferate. Burning fossil fuels creates a carbon dioxide rich atmosphere and warmer temperatures, accelerating climate change and favoring different species.

Invasions can have a variety of effects. Some may cause economic damage, some harm human health, some impair ecological processes. Some have a combination of these effects. Some have very little easily perceptible effect, and some lead to catastrophic change. Some invasions proceed slowly, some rapidly.

Governments and environmental organizations, scientists, and many citizen volunteers, have mobilized to address these problems in recent decades.

The Mass Envirothon 2016 Current Issue challenges your team to investigate species changes and management interventions that are taking place in your community. Your team will do field research, develop recommendations, and present your findings to a panel of judges at the Envirothon competition in May.

## The Problem

Your municipal conservation commission has heard that you are doing research on ecosystem relationships and invasive species in your community. They would like to hear more about what you have found. What past and present species changes have you identified? Are these changes important in the context of accelerating global change? Why? Do any of these pose significant problems? Are important ecosystem services at risk? Will human health or livelihood be affected? Are there problems and solutions that the public should be educated about? Have management strategies been employed? What efforts have been successful? What future developments do you expect? In particular, they would like to hear whether you have recommendations for management that will prevent or reduce problems.

Your team's research has provided you with good background on ecosystem change and invasive species management, particularly as it relates to your community. Your task is to answer this question:

**What is the most noteworthy change in species and ecological community relationships affecting or potentially affecting your community? What – if anything – should be done?**

Draw on your research and provide:

- An overview of changes in ecological communities and species relationships in your community in the past century, including efforts to manage the changes.
- Your judgment regarding what is the most noteworthy change affecting or potentially affecting your community, and why it is significant.
- Your recommendation for what, if anything, should be done to address this change in your community.

## **In your presentation you should:**

### **Provide an overview of ecological changes in your community**

- Introduce your local landscape, particularly its ecological communities and the ecosystem services they provide, and how and why they have changed over the last century.
- What changes are problematic? Why? Pay particular attention to the impact of human use of forest, wildlife, soil, and water resources over time.
- How have human activities contributed to the overall problem of species invasions in your community? What examples of specific cases can you provide?
- How has your community worked to address the problem of species invasions? Introduce the people and organizations that are concerned about these issues. What are their goals and plans? How have they collaborated and involved the public? What efforts are ongoing? What successes and lessons can you point to?

### **Present your judgment on the most noteworthy change**

- What is the most noteworthy change in species and ecological community relationships affecting or potentially affecting your community?
- Identify the species and ecological communities that are most involved in this change
- Why does this change matter to us? Does it affect ecosystem services? biodiversity? human health? the local economy?
- What is the best outcome of management efforts that you can reasonably expect? What is likely to happen if nothing is done?

### **Make your recommendation**

- What – if anything – should be done in this situation? What is your goal, and why?
- What management strategies are available? What resources – expertise, people power, techniques – are available? Which are likely to be most effective?
- Are there geographic locations that should get more attention than others? What will be the scale of your impact – neighborhood, municipality, watershed, or beyond?
- What strategies should be used? How much effort should be brought to bear? Will this build on positive efforts already underway?
- Who should be involved? Can youth have a positive impact?
- Who would disagree with your recommendation? What might they recommend instead? In what ways is their assessment correct? How would you respond?

## **Some tips for your presentation**

### **How it works:**

- The Current Issue Presentation score is 25% of your team's total Envirothon score.
- Five (and only five) members of your team will make your presentation to a panel of five to eight judges. Your coach and other team members will be able to observe but not participate. The judges' job is to listen, ask good questions, assess your work, and give you feedback on your research, your proposal, and your presentation.
- You have 15 minutes for your presentation, followed by a 10 minute period when the judges can ask questions.
- Five of the judges will give your team a number score. The average of these will be your score for the competition.
- All the judges are asked to give you helpful comments. Copies of the score and review sheets are sent to your coach.

### **You have encountered some amazing stories of species adaptations and human undertakings. Share them!**

**Show the judges how you know what you know, and how you came to your conclusions.** Tell them about where you visited, who you talked to, what documents you researched, what activities you participated in.

**Use visual aids and examples.** Photographs, charts and graphs, samples, and quotes can help you make your points and distinguish your presentation from others. **Your Envirothon map** can help you to introduce your community.

**Practice your presentation.** Practice makes it easier for you to be poised and at ease in your presentation, including being able to make good eye contact and speak naturally with the judges.

**Be Prepared!** You will be presenting in a tent, outdoors. The day of the Envirothon is often surprisingly windy and cold, and sometimes wet. Mount your visual aids on sturdy boards in case of wind.