

Connecticut Envirothon 2015

Current Issue Problem: Urban and Community Forestry

For complete coverage of the current issue: <http://ctenvirothon.org/competition/currentissue.asp>

Urban and Community Forestry

Urban and community forests are an essential component of our cities and towns. These forests, which consist of trees in our parks, along our streets, in our yards and parking lots – anywhere trees and people get together – provide a host of benefits that contribute to making our cities and towns what they are. The trees of our urban forests clean the air, produce oxygen, reduce the heat of hot summer days, block the cold winter winds, help direct water into the soil, reduce storm water runoff, provide health benefits in several different ways – the list just goes on. Without trees, we would not experience the same quality of life that we do now, and would be less well-off for it.

The Challenges

However, to keep the urban forest together as a functional whole – healthy, sustainable and as a real asset to our communities – these forests and the individual trees within this forest need to be managed. We need to be aware of whether individual trees are healthy and safe, what insects or diseases might be threatening these trees, and when individual trees might need to be removed and replaced with new trees. We also need to be aware of the impacts that other decisions we make – such as the construction of new buildings or the use of materials such as road salt – have on these trees. These are among the challenges of urban forestry.

The Assignment:

Your school's Board of Education has come to your Envirothon team for help. They've asked you to develop an Urban Forest Management Plan for a piece of property that is currently being used by the community for a variety of activities. The main goal of the management plan is to maintain a healthy urban forest that provides a range of benefits for the public while also allowing for other uses of the property.

Listed below are the required elements of the project. For a more detailed explanation of each step and guided brainstorming questions, see the **STEPS FOR SUCCESS**.

Required Elements:

1. Choose a parcel of land in your town to use as the project site.
2. Prepare an urban forest management plan.
 - a. Complete an inventory of 10-15 trees
 - b. Discuss the benefits of the trees present
 - c. Discuss any changes you want to make – planting new trees, maintenance, etc.
 - d. Discuss how the site's topographic features and the dominant soil types may influence the management plan
3. Develop specific management goals for your site – choose three of the six listed goals and discuss how you propose to manage your site to meet those goals. The six goals are a) Wildlife habitat, b) Biodiversity, c) Water Quality, d) Air Quality, e) Forest Health, and f) Community Benefits.

STEPS FOR SUCCESS:

1. **Locate a parcel of land** of at least one acre in your town to use as the project site. Choose your school campus or a wooded section in a town park.¹ Use [i-Tree Canopy](#) to determine the percentage of canopy cover, as well as area covered by lawn, gardens, water, buildings, and impervious surfaces, like a parking lot. See the attachment *Instructions for using i-Tree Canopy* for a step-by-step guide. Also, identify areas, if any, as potential tree planting sites.

Using the results from step 1, create an attractive table using **Microsoft Excel** showing the ecosystem benefits that currently exist on your site.

2. **Prepare an Urban Forest Management Plan:**

- A. **Inventory & Analysis:** In order to develop a plan and make recommendations, each team must conduct an urban tree inventory and analysis. Start by scheduling a field visit to your site. Take a quick walk around before you conduct the inventory. What do you like about the property? Not like? Quickly jot down some initial thoughts on what you consider to be the key features as well as the major current uses. As you work through your site, consider other issues such as i) wildlife habitat, ii) biodiversity, iii) water quality, iv) air quality, v) forest health, and vi) and community uses (recreational use, social benefits, and educational opportunities). Then, choose a minimum of **10-15** trees that best represent the different types of trees on the property.² Use the attached ***Inventory Template Excel sheet*** to collect the data. (See directions below). The data you collect from the inventory will be used to create the Urban Forest Management Plan.

At this point, stop and think about what you would recommend for this property. Are the trees healthy? Could more trees be planted? Should more trees be planted? If so, what type of trees, and where? What are the other uses for this property? Do the trees interfere with these other uses? If so, what might you change?

Determine the items you wish to focus on in the Management Plan you will be creating. At this point, do you need to take additional field data? For example, if you have decided that you might like to plant trees, are the areas you would like to plant, compatible with the trees that you would like to plant. If you see a conflict in the way the property is being used (for instance, a parking lot too close to a stream), what changes might you propose?

¹ No not use the actual name of your school or park. Create a fictitious name, such as Anytown or something else, for the presentation.

² Depending upon your site, you may record only one species, like red maple. Simply record a general sample of the sizes, species, and condition of trees on your site. The results from this sample size will not be statistically significant, but merely represent a snapshot of the work involved in conducting a tree inventory.

- B. **Back in the Classroom:** Using your inventory, create a chart in **Microsoft Excel** showing the species composition of your urban forest. Include descriptions of the overall diversity in terms of species, size, health, and benefits of the trees (use i-Tree Design), based on your data and observations.

Use Google Earth to create a map of the property (it might be better without the image). Identify areas in which you would like to plant new trees. Check out the [Native Plant Database](#) to help you choose the best plant for the site. Note other features that you observed in the field, such as important wildlife habitat or important water features, and include them on the map. Be sure all buildings, parking lots, sidewalks, paths and wooded areas are on the map as well.

- C. **Topographic Map:** Identify the project site on a topographic map. Find your site by visiting the [University of Connecticut's topographic map directory](#) and type in the address. Click on the quadrangle to download the topographic map that best matches your site. What information does the topographic map provide?
- D. **Soils Map:** Determine the different soil types on the property. What is the dominant soil type? What are the characteristics of this soil type? Do you think this soil type would limit your management goals in any way? How many acres is your property?

*Directions: go to USDA Natural Resources Conservation Services Web Soil Survey site: <http://websoilsurvey.sc.egov.usda.gov/App/HomePage.htm>. Click on the big green WSS button; go to the column on the left under the heading **Quick Navigation** and click on **Address**. Type in your address and choose the best match in the pop-up window. Click on the Area of Interest (AOI) by polygon button to create a polygon around the property. Drag the mouse for the first boundary line, click once to stop, and then continue this method until you've captured your property. Click twice to close the polygon. Wait for the program to create a light blue border around your property. You are now ready to create a soils report. Go to the tab labeled **Shopping Cart** (free) and create a soils report for your forest.*

3. **Specific Management Goals:** Now that the basic inventory is complete, choose **three** of the following **six** topics as the main goals for your property.

- a. **Wildlife habitat** - What kind of wildlife is present on the site? What about quality of habitat? Mention two ways you could enhance the wildlife habitat on the property. How could you improve the experience for the recreational user? To begin, review the ***Schoolyard Habitat How-to Guide*** from the National Wildlife Federation in your attachments folder.
- b. **Biodiversity**— In order to promote biodiversity, no more than 10% of one kind of tree species should be present on your property. If more than 10% of one kind of tree exists, what changes could you make in a planting strategy to build a more diversified population? Why is this important?
- c. **Water Quality** - Identify any water features, such as a pond, stream, wetland, or watercourse. Use the topographic map to determine the direction of stream flow. Are the water features protected by a vegetative buffer such as native, understory shrubs? Vegetative cover can control soil erosion and protect water quality. Or does lawn grow to the edge of the water feature?

What path does stormwater take on the property? Use **i-Tree Design** to estimate the percentage of lawn or forest to that of impervious surfaces, like a parking lot or sidewalk. Stormwater runoff is a significant source of pollution. Come up with a few simple ways to modify the design of your urban forest site to reduce the storm water runoff. Using vegetation, soils, and landscape elements to manage storm water is referred to as green infrastructure. See the US Environmental Protection Agency's website for some ideas: [What is green infrastructure?](#)

- d. **Air Quality** – Use **i-Tree Canopy** to determine how the existing urban forest affects the air quality in your community. Using **i-Tree Design**, determine the benefits of the new trees you are recommending for planting. Do you think there is a direct correlation between forest health and community health? Provide a few examples to support your claim.
- e. **Forest Health** – A forest community is a dynamic system consisting of biotic and abiotic interactions. A healthy forest can sustain itself in the advent of intermittent attacks from pests and diseases. Go back to your forest inventory. How many trees did you label as being in fair or poor health? What do you think could be causing the stress? Did you notice any non-native plant species during the inventory? Japanese barberry, winged euonymus, Oriental bittersweet, and multiflora rose are four of the most common invasive plants found in suburban and fragmented forests. Learn more about how invasive plants affect wild bird populations: http://www.nrs.fs.fed.us/disturbance/invasive_species/nonnative_plants_birds/
Is the white ash tree (*Fraxinus americana*) part of your species mix? Name the invasive pest decimating this tree and causing serious management concerns. Refer to the ***Connecticut***

Forest Health Highlights and Hartford's Urban Forest-the Challenge to help you identify the health concerns in your forest. Is there one that stands out? List three steps your team could take towards solving this problem.

f. **Community Benefits** - Imagine that the panel of judges consists of members of the community – council members, elected officials, average citizens. How will you manage the different needs and pressures such as economics, safety, recreation, and environmental health? Include the economic, social, recreational, and environmental benefits of your urban forest in your presentation. Use **i-Tree Canopy** to determine the ecosystem services. Research the costs associated with basic tree care and maintenance. Find a local arborist (see references) who could provide some cost data on your priority trees. How could the answers from the ecosystem services inquiry help your team secure more funding to get the job done? Which individuals, citizen groups, government agencies should be involved in finalizing your plan? How would you educate the public about the benefits your urban forest provides to the community?

Attachments

A Guide: Developing a street and park tree management plan
Inventory template Excel spreadsheet (ignore the trees/mile column)
Inventory template instructions
Urban tree inventory example
Hartford's Urban Forest
CT Forest Health Highlights
Schoolyard wildlife habitat how-to guide
Instructions for i_Tree Canopy and design
Instructions for i_Tree Design

References

CT Department of Energy and Environmental Protection: [Connecticut Urban Forestry Program](#)

[USDA Forest Service Urban and Community Forestry Web Page](#)

[USDA Forest Service Northeast Center for Urban & Community Forestry Web Site](#)

[Connecticut Urban Forest Council](#)

[What is Green Infrastructure?](#)

The International Society of Arborists (ISA) provides a list of certified arborist by state: <http://www.isa-arbor.com/findanarborist/arboristsearch.aspx>.

[Hartford's Urban Forest](#)

Nowak, David J. and John F. Dwyer. *Understanding the Benefits and Costs of Urban Forest Ecosystems*. USDA Forest Service, Northeastern Research Station. Netherlands: Springer. 2007

Tools and References for Urban and Community Forestry Current Issue Scenario

Goal Identification	Biodiversity	Air Quality	Water Quality	Forest Health	Wildlife	Community	Tool	Description	Output generated	Where to find it
✓		✓					iTree Canopy		Percent cover of tree canopy and other cover types, calculations of air pollution reductions.	http://www.itreetools.org/canopy
✓	✓		✓				iTree Design			http://www.itreetools.org/design.php
	✓			✓	✓		Arbor Day Tree Finder	Suggests appropriate tree species to plant based on site conditions and goals.	List of tree species.	http://arborday.org/shopping/trees/treewizard/intro.cfm
						✓	UConn MAGIC Topo map directory	Electronic copies of topographic maps throughout the state.		http://magic.lib.uconn.edu/topographic_maps.html
✓	✓						Forest Inventory Spreadsheet			
					✓		CT DEEP Wildlife Webpage	Fact sheets regarding habitat suitability for native wildlife.	Habitat requirements for wildlife across Connecticut.	http://www.ct.gov/deep/cwp/view.asp?a=2723&q=325718&deepNav_GID=1655
						✓	American Trails Resources and Library	Outdoor recreation information is provided, including benefits, planning, impacts, and management.	Information regarding recreation opportunities.	http://www.americantrails.org/resources/index.html
					✓	✓	Schoolyard Habitats How-To Guide			http://www.nwf.org/pdf/Eco-schools/SchoolyardHabitatsHowToGuide_Part2.pdf
✓							How to recognize hazardous defects in trees			http://na.fs.fed.us/spfo/pubs/howtos/ht_haz/ht_haz.pdf
				✓			CT Forest Health Highlights 2013			http://fhm.fs.fed.us/fhh/fhh_13/CT_FHH_2013.pdf
	✓			✓	✓		Native Plant Database.			http://www.wildflower.org/plants/
			✓				What is Green Infrastructure?			http://water.epa.gov/infrastructure/green_infrastructure/gi_what.cfm