



Virginia Master Naturalist Program Basic Training Lesson Plan for Online Instruction: Urban and Developed Systems Ecology & Management

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Introduction

Urban and Developed Systems Ecology and Management is one of the required curriculum topics for the Virginia Master Naturalist basic training course. This topic can be covered in a variety of ways: having trainees read the recommended readings and watch the videos provided on [our curriculum page](#), having an in-person classroom or field session on the topic, having a synchronous online class, or through a combination of these approaches.

This lesson plan describes how to use a flipped-classroom approach to teach this topic in order to maximize interaction and hands-on learning while also covering the learning objectives.

Objectives

The learning objectives for Urban and Developed Systems Ecology and Management within VMN basic training were developed in collaboration with urban foresters, natural resource managers, and educators in Virginia. These learning objectives do not all need to be covered in a lecture. They may be covered through a combination of pre- or post-class readings and assignments, small group activities in class, field sessions, and presentations.

Upon completion of the Virginia Master Naturalist basic training course, participants will be able to:

- Understand the definition of urbanization in a broad sense (i.e., the conversion of rural and undeveloped lands into built, developed environments.)
- Understand that Virginia is becoming increasingly urbanized and that natural resource

issues associated with land use changes are important in all counties and communities.

- Identify specific ways that land use changes associated with increases in the built environment typically affect soils, hydrology, water quality, flora, fauna, habitat fragmentation, and climate.
- Identify specific practices that can mitigate the effects of these land use changes to improve ecosystem function in developed areas, with a focus on activities that are within the sphere of influence of a VMN volunteer or individual property owner.
- Identify resources and programs of state agencies and local organizations that can provide education and assistance with these practices.
- Describe the benefits that habitats in urban and developed areas, such as urban forests, provide in terms of ecosystem services.
- Describe the impacts of invasive species and locate information about how to manage them.
- Describe the benefits of choosing native plants for landscaping when sustainable and appropriate and be able to use local native plant listings to find species recommendations for landscaping projects.
- Find the community's Comprehensive Plan and be aware of the natural resource and environment components in the plan.
- Identify opportunities to participate in local decision making that influence natural systems (such as local planning commissions, zoning, etc.)
- Assist with non-formal education relating to this topic (e.g., talking to the public at a booth.)

- Assist with stewardship relating to this topic (e.g., habitat rehabilitation and restoration projects.)

Materials Needed

If this topic is to be presented in a classroom or synchronous online session, presenters will need access to the following technology and resources:

- Online meeting software such as Zoom, with a breakout rooms feature for small group discussions enabled (if online)
- Flip chart, chalkboard, or other means of recording group discussion (if in person)
- VMN Urban and Developed Systems Presentation videos, Parts 1, 2, and 3
- VMN Urban and Developed Systems Presentation handout
- VMN Developed Systems Scenarios Lesson Plan, with copies of the scenarios distributed to the trainees

Time

- Pre-class preparation time for the trainees: 1 hour
- Synchronous class time: 1 hour

Presenter Instructions

Pre-class

One or two weeks before the synchronous class, communicate with the attendees about the pre-class preparation and ensure that they have all the pre-class materials described below.

- Ask the trainees to prepare for class by watching the three presentation videos posted on the [VMN Urban and Developed Systems page](#). These are the three videos titled VMN Urban and Developed Systems Presentation – Part 1, Part 2, and Part 3. The total running time of the videos is 30 minutes.
- Provide trainees with a link to or a digital copy of the VMN Urban and Developed Systems Presentation Handout, also found on the [VMN Urban and Developed Systems page](#). They can

keep this as reference material with their other course notes.

- Provide trainees with a link to or a digital copy of the VMN Urban and Developed Systems Scenarios Lesson Plan, also found on the [VMN Urban and Developed Systems page](#). They do not need to read this before class, but they will want to have access to it during class. They may choose to print it out or just view it on-screen.

In class

Begin by asking the trainees to reflect on the pre-class materials. Some possible questions to spark discussion include:

- What did you learn that you didn't know before?
- Was there anything in the presentations that surprised you?
- Was there anything in the presentations that you have questions about?

This reflection should take ten to fifteen minutes, depending on how many questions they have.

Next, review the material in a succinct and interactive way. Ask the trainees to list how urbanization typically impacts soils. Then ask them what practices and strategies can help to mitigate those impacts. Repeat this process with hydrology, flora, and fauna. For a visual in the online environment, you can share your screen and type their answers into a table in a document. In an in-person environment, use a flip chart, whiteboard, or chalkboard. This review should take approximately fifteen minutes.

Next, transition to the Scenarios activity. It is described in the Scenarios Lesson Plan. Divide the trainees into groups of approximately four individuals and assign each group to one of the scenarios. Make sure each group knows which scenario to discuss and that at least most people have a copy of the scenarios to look at before you send them to breakout rooms. Give the groups ten to fifteen minutes to discuss their scenarios. Bring the groups back together and have each group describe the scenario and some of the strategies that they felt would fit the situation and the goals of the landowners while also helping to mitigate the impacts of urbanization.

If time allows, use the Investigating Online Tools for Urban Forestry Lesson Plan to show the trainees the [National Tree Benefit Calculator](#) and/or the [i-Tree design tool](#).

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To wrap up, ask the trainees to share what volunteer projects they might like to do related to Urban and Developed Systems. Other chapter members in attendance may be able to share some pertinent approved activities for the chapter. Show the trainees the VMN Urban and Developed Systems page where they can find additional readings and resources. Ask them to complete the evaluation for this topic and either pass out the paper evaluation or provide them with the link to the online version. Please send the paper evaluations or a summary of the results to the VMN State Program Office.

Post-class

With one to three days after the class, send a follow-up communication with any additional resources, answers to questions that you were not able to address during the class, and the link to the online evaluation.

Additional Resources

[VMN Urban and Developed Systems page](#), which contains links to the presentation videos, presentation handout, scenarios activity, and other resources.

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