

**Time Frame**  
5 Class periods

## OVERVIEW

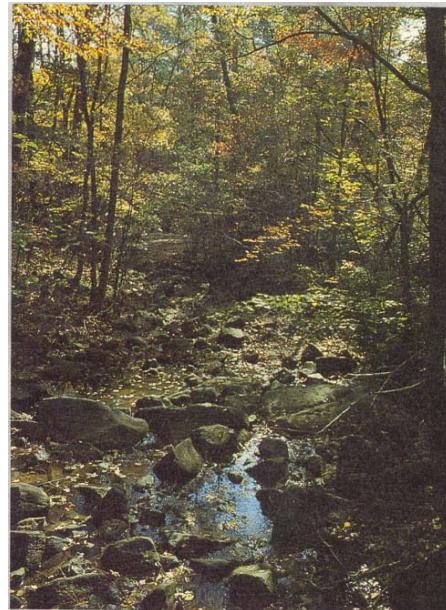
### Key Words

Silviculture  
Urban Development  
Urban Forest  
Stakeholders

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**From Forest to Farm to Urban Forest** has students examine what happens when the post-war urban development boom crowds out the forest. Students will examine the land use history of Duke Forest from 1930 on, and the variety of stakeholder opinions on the future of the forest. Students will also reflect on how science and technology have changed people's perception of the natural world.



One of the creeks running through the Korstian Division of Duke Forest. Duke Forest pamphlet, 1990.

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## OBJECTIVES

### National Standards for History

- The student will explain the impact of suburbanization on the lives of postwar Americans.  
(Era 9: Postwar United States)

### National Council for Social Studies Standards

- The student will show through specific example how science and technology have changed people's perceptions of the social and natural world, such as in their relationship to the lands, animal life, family life, and economic needs, wants and security.  
(Standard VIII, Science, Technology & Society)

## LESSON PLAN

### Advance Preparation

Make one copy per student of all of the student pages (except Student Pages 9-10). Copy the Map Analysis Tool (**Student Page 10**) onto a transparency, one per student. Print a color copy of the 2006 Map of Durham (**Student Page 9**), one per student. Obtain 2 pieces of tracing paper and a green, black and yellow colored pencil for each student.

**Day 1:** Set the stage for this activity by leading a group discussion answering the following questions:

1. Has anyone ever seen an area of woodlands cut down for development? How does this make you feel?
2. If you were a landowner, how would you feel if other people had an opinion about what you do with your land?
3. Who should decide if trees are to be cut on a piece of land--the owners, the abutters, the local government, or a combination of these?

Hand out the Essay (**Student Pages 1-4**) to give students a general overview of Duke Forest and the development of the region. Have students complete Worksheet 1 and Worksheet 2. (**Student Pages 12-17**)

**Day 2:** Students will analyze 2 maps of the region for a birds-eye view of the landscape over time. Handout 1931 Map (**Student Page 8**), 2006 Map (**Student Page 9 - this map must be in COLOR**), and the Map Analysis Tool (**Student Page 10**) and have students complete Worksheet 3 (**Student Page 7**).

**Day 3:** Students will analyze the historical record --an annual report and a newspaper article--to compare and contrast the day-to-day activities of a forest manager past and present. Hand out the Annual Report and 1994 Newspaper and have students complete Worksheet 4. (**Student Pages 11-14**)

**Day 4:** The final part of the lesson will give students an opportunity to analyze the variety of points of view contained in public opinion. Hand out the 1987 Newspaper and Worksheet 5. (**Student Pages 15-19**)

**Day 5:** Choose the assessment that best suits your learning objectives.

- The Application and Integration Exercise has been designed to allow students to integrate the content into broader contexts. (**Teacher Page 5**)
- The Test has been designed to measure how well students master the History objectives. (**Student Page 20**)
- The Reflective Exercise has been designed to measure how well students master the Social Studies objectives. (**Student Page 21**)

Use teacher Answer Key (**Teacher Pages 6-9**) to grade assessments.

## CLASS EXTENSIONS

- Using census data, determine the population change in your local community from the 1930's to the present. Compare and contrast a map of your community today with a map from the 1930's. Have students conduct an oral history of someone in their local community on the subject of local land-use change. Compare these changes with those on the Duke Forest.
- Create sketch maps of your community comparing forest / green space to urbanized land at two different time periods. Have students research the answers to the following questions: 1.) Who owns the forest / green space in your town today? 2.) How much is likely to remain 'green' in perpetuity? 3.) Compare property values of houses abutting green space to housing abutting urbanized land.

## TEAM TEACHING POSSIBILITIES

**Technology:** Worksheet 5 asks students to summarize the viewpoints of the various people involved in the debate concerning the potential development of Duke Forest during the 1980s. Since the exercise encourages students to look at different perspectives, a technology teacher could design a basic WebQuest that would allow students the opportunity to critically analyze the complexities surrounding the issue. For more information about WebQuests visit Kathy Schrock's site, <http://school.discovery.com/schrockguide/webquest/webquest.html>.

**English:** Assign students the task of writing an editorial that expresses an opinion about the potential development of Duke Forest (or nearby urban forest) or a letter to the editor about the possible development of a nearby forest. Encourage students to use facts they learned from the activity to substantiate their point of view.

**Math:** Since Worksheet 3 incorporates math skills this exercise could be introduced in a social studies class and completed in a math class.

**Science:** have students explore the scientific studies that have transpired in Duke Forest (or a local forest) in order to get a better idea of how forests can help lead to advancements in science. Use the following website to learn more about research projects in Duke Forest, <http://www.env.duke.edu/forest/projects.html>.

## LINKS

**Forest History Society**--Bibliographic resources on forestry, conservation and environmental history. <http://www.foresthistor.org>

**Duke Forest**--The Nicholas School of the Environment at Duke University hosts this web site. The Forest has been managed for research and teaching purposes since the early 1930s. The focus on forestry education and research includes a broad range of studies in the ecological and environmental sciences. <http://www.env.duke.edu/forest/>

**Duke Homestead**--The North Carolina Division of Archives and History compiled the history of the Duke Family estate.

<http://www.ah.dcr.state.nc.us/sections/hs/duke.htm>

## REFERENCES

Jayne, Benjamin A. *History of Duke Forest*. Durham, N.C.: Duke University School of Forestry.

Korstian, Clarence F. *Clarence F. Korstian: Forty Years of Forestry*. Oral History Interview by Elwood R. Maunder. New Haven, Conn.: Forest History Society, 1969.

Korstian, Clarence F. and William Maughan. *The Duke Forest: A Demonstration and Research Laboratory*. Durham N.C.: Duke University, 1935. Forestry Bulletin No. 1

MacCleery, Douglas. *American Forests, A History of Resiliency and Recovery*. Durham, NC: Forest History Society, 1992.

Miller, Robert W. *Urban Forestry: Planning and Managing Urban Greenspaces*. Upper Saddle River, New Jersey: Prentice Hall, 1997.

## ASSESSMENT 1: APPLICATION AND INTEGRATION (TEACHER INSTRUCTIONS)

Stage a role-play of a Duke University Board of Trustees Meeting.  
The topic to be discussed is whether to sell a scenic 750-acre parcel of Duke forest adjacent to a shopping mall.

**Cast students in each of the following roles:**

Nick Tennyson  
Eugene McDonald  
Philip Stewart  
George Dutrow  
James L. van Zee as the ULI report spokesperson  
Barry M. Jacobs  
A. Paul Norby  
Save Duke Forest spokesperson

**Cast the rest as the Board of Trustees at Duke University.**

The motivation of the Board of Trustees should be as follows:  
Duke University is a private institution, obligated to no one, whose primary purpose is to further itself as a world class research university.

**Resolve the question.**

## TEACHER'S ANSWER KEY

### Worksheet 1: Keywords

#### Silviculture

1. He wanted to use research to advance timber growing and use the forest itself as an outdoor teaching lab for silviculture students.
2. The science of growing timber.

#### Urban Development

1. Due to a thriving research and technology park located in the triangle between Durham, Raleigh and Chapel Hill, the Durham has experienced rapid population growth and urban development.
2. Building human structures--roads, houses, and business districts--on the landscape.

#### Urban Forest

1. Meanwhile, the large patches of urban forest throughout the city and county provide area residents with many benefits.
2. Trees and/or forests in an urban setting.

#### Stakeholders

1. With over 300,000 people visiting the forest each year, Duke University has a large population of stake-holders who are very passionate about the benefits of this urban forest to their community
2. People who use or devote time or money to something.

### Worksheet 2: Essay Analysis

1. How many centuries have people been managing the forest in the region now called Durham, North Carolina? **More than 5. Native Americans used it for "hundreds of years" and Durham residents since 1700's.**
2. What was the impact of the tobacco plant on this region?  
**Entrepreneurial farmers cleared acres and acres of forest to be able to turn the tobacco plant into cash for the next forty years.**
3. What was the legacy of Mr. Duke's tobacco fortune on the region?  
**In 1924, James B. Duke, son of Washington Duke, invested a substantial amount of the family's fortune to expand the Methodist-owned Trinity College into a new university. He would honor his father by renaming it Duke University.**
4. What was Mr. Duke's purpose for purchasing the land that was to become Duke Forest?  
**Ample land and good access to roads and water were cornerstones of J.B. Duke's successful tobacco factories. He recommended the same thing for the new University.**
5. What was Mr. Korstian's goal for Duke Forest?  
**He wanted to take the best of what he'd seen at the School's of Forestry at both Harvard and Yale to create a self-supporting demonstration research forest that would model scientific forestry practices, use research to advance timber growing and be an outdoor teaching lab for silviculture students.**

6. How does the Nicholas School of the Environment use Duke Forest today?  
**The research carried out in the forest is about how to grow big trees and how to understand big ecosystems.**
7. Who else uses Duke Forest today and for what purpose?  
**With over 300,000 people visiting the forest each year, Duke University has a large population of stakeholders who are very passionate about the benefits of this urban forest to their community.**

#### Worksheet 3: Map Analysis

1. How many quadrants are open or green spaces 1931?  
**33 squares**
2. How many quadrants are open or green spaces in 2006?  
**7 squares**
3. By what percentage did the amount of open or green space decrease in the 75-year time period?  
 **$33 - 7 = 26$   $26/33 = 78\%$ . The amount of open space declined 78% from 1931 to 2006.**
4. If the rate of decline in the amount of green or open space stays the same for the next 75 years, how many quadrants will be open or green space in 2081?  
 **$.78 \times 7 = 5.46$ ,  $7 - 5.46 = 1.54$  squares. If the rate stays the same for the next 75 years, then there will only 1.54 squares of open space remaining.**
5. What, in your opinion, was the value of Duke Forest to Durham residents in 1931?  
**Not much because it was hard to tell any difference between Duke Forest and the surrounding landscape.**
6. What was the value of Duke Forest to Durham residents in 2006?  
**Significant recreational area. It stands out from the rest of the landscape as a rare green space.**
7. What do you think the value of Duke Forest will be in the future?

#### Worksheet 4: Forest Management: Then and Now

1. How many people visited Duke Forest in 1932-1934 for recreation?  
**Over 4000 people.**
2. What research was conducted in the forest in 1932-1934?  
**A study was initiated to determine the soil-leaf moisture relationships between five different forest types in the Duke Forest.**
3. What were the primary management activities carried out by Korstian in 1932- 1934?  
**Planting 92 acres planted of trees. Detecting and suppressing fires. Servicing the picnic areas.**

4. How many people visited Duke Forest in 1994 for recreation?  
**27,000 people.**
5. What research was conducted in the forest in 1994?  
**A super-site for a radar experiment by the Space Shuttle Endeavor and measuring the effects of carbon dioxide on a stand of trees and the earth and foliage beneath.**
6. What were the primary management activities carried out by Edeburn in 1994?  
**Prescribed burning or cutting to sustain a certain age or stand of trees. Maintaining the 22 miles of roads and fire trails and managing public access. Containing outbreaks of forest pests.**
7. What problems do you think the recreational users of Duke Forest create for Duke University?  
**Trash, bicycle ruts, soil compaction, dogs chasing wildlife, disturbing research sites.**
8. What benefits do you think the recreational users of Duke Forest offer Duke University?  
**Goodwill in the eyes of the students and the community. Safety in numbers—students working in the forest are safer with more visitors around. Increased users will report any serious problems to the University.**

#### Worksheet 5: Public Opinion Analysis

Summarize the view of each of the following characters to each of the following questions:

**Real estate agent:** Willing to make money handling the real estate transactions but would be sorry to see the forest go.

**Duke University Senior Vice President:** Feels the surrounding development may be harming the forest for research purposes. Wants to know just exactly what the land is worth on the open market. Wonders if selling the land could benefit other important Duke projects. Wants to make sure the community knows just who owns the forest.

**Faculty Chair and Romance Language Professor:** Doesn't believe the University should decide policy based upon the report. Sees the report as a tool for future decision-making.

**Dean of School of Forestry:** Believes the outdoor research laboratory is the best in the nation, and doesn't want to lose any of the forest.

**Consultant's Report:** Finds it hard to justify locking up the forest solely for the School of Forestry when the value of the land in dollars has tripled.

**County Planner:** Wants the University to be considerate of the quality of life the Forest brings the county. Doesn't want the land developed. Has already made plans and spent money based upon the belief the land would be a forest.

**City Planner:** Doesn't believe the area needs more strip malls. Believes Duke wants to keep it as a forest.

Teacher Page

## Assessment I: Test

1. What was the state of the landscape surrounding Duke Forest in 1931? **Abandoned agricultural land.**
2. What is the state of the landscape surrounding Duke Forest today? **Highly urbanized.**
3. What were the forest management activities in 1931? **Trees were planted as an important learning lab for the forestry students.**
4. What are the forest management activities in 1994? **The Forest is managed for experiments in silviculture and ecosystem processes.**
5. What are the benefits to the community of Duke Forest today?  
**It is an urban forest that makes scenic roads, shaded sidewalks and nature available to hikers, bikers, joggers, dog-walkers and nature lovers.**
6. What was the impact of rapid growth and suburbanization on the lives of postwar Durham residents? **Forested land became more valuable to them.**