

# Integrated Resources Management

## FOR 490

Mondays 12:45 – 4:45pm

313 Bray Hall

Instructor:

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(or by appointment)

Teaching Assistants:

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### Introduction

The goal of this course is to have students prove their competency in eight broad subject and skill areas prior to graduation. Students will show evidence of each of the eight areas through the development of a comprehensive forest management plan of a section of Heiberg Forest in Tully, New York. Your grade will be influenced by the degree to which you and your team demonstrate knowledge of the concepts and skills outlined below.

1. Understanding Forests and Natural Resources
  - a. Know the general relationships between flora and fauna including the biological and physical requirements of different plant and animal species.
  - b. Know how to identify plant species. That is, know the process by which a plant species, particularly trees, can be correctly identified.
2. Manipulating Forests and Natural Resources
  - a. Describe alternative ways to change or maintain forest and stand structure.
  - b. Prescribe, justify, and implement forest and stand level treatments in accord with owner objectives.
3. Measuring Forests and Natural Resources
  - a. Be able to correctly identify the number of major species of flora in a given area.
  - b. Plan, conduct, and analyze forest inventories including biological, physical, and social. Be able to describe and apply different statistical sampling methods.
  - c. Project stand and forest development.
4. Managing Forests and Natural Resources
  - a. Evaluate tradeoffs among biological sustainability, economic feasibility, and social acceptability. Be able to describe and apply different economic and related decision techniques including investment analyses, to evaluate alternative stand and forest management practices.
  - b. Specify and implement management practices appropriate to owner objectives.
5. Interpreting Forest and Natural Resources Policy
  - a. Explain how forest policy at the national, state, and local levels affect forest management.

6. Communicating
  - a. Explain forest development, manipulation, and management to different audiences in both written and oral form.
  - b. Describe technical forestry terms to many different audiences.
  - c. Use consistent and accurate terminology.
  
7. Ethics
  - a. Take responsibility for the work of the team and your actions.
  - b. Act in an honest and credible manner.
  - c. Exhibit tolerance for different viewpoints and opinions of others that may not agree with yours.
  - d. Understand values and value systems used by people to reach decisions and to take actions.
  
8. Leading
  - a. Recognize the union between leading and following.
  - b. Function effectively as a member of a team.
  - c. Demonstrate effective teamwork.
  
9. Problem Solving
  - a. Identify short and long-term objectives.
  - b. Describe current and future situations.
  - c. Distinguish between causality and correlation. Distinguish between symptoms and signs.
  - d. Develop alternative solutions.
  - e. Evaluate and choose among alternatives.
  - f. Monitor progress, continuous improvement.

Acquisition and demonstration of knowledge can occur at up to six different levels depending on how one classifies knowledge. The outline presented below is drawn from Bloom's Taxonomy of Cognitive Levels. The activities listed for each level are measurable and capable of evaluation.

<u>Cognitive Levels</u>	<u>Activities</u>
1. Knowledge	remember facts, terms, concepts, definitions
2. Comprehension	explain, predict, interpret, infer, summarize, give examples
3. Application	apply, solve problems, modify, demonstrate
4. Analysis	breakdown material into component parts, describe inter-relationships
5. Synthesis	produce something new or original from component parts
6. Evaluation	make a judgment based on set of criteria, appraise, judge

The Department of Forest and Natural Resources Management expects students to demonstrate abilities in the eight areas up to levels three and four – application and analysis.

### Physical Fitness for Field Work:

Each student will be required to participate in field activities under potentially difficult conditions due to terrain and winter weather. Please contact me immediately if you have health issues that may limit your ability to perform in the field.

### Field Work:

All students must take the college van/suburban to class sessions at Heiberg Forest. Students must wear hardhats, boots and warm clothing.

### Student Code of Conduct:

You have all signed an agreement to abide by the College's Code of Conduct. As young professionals, I expect you to act respectfully to me and your classmates.

## **Heiberg Forest Management Plan**

Each group will be assigned a section of the Heiberg Forest to complete a management plan. Each section will average approximately 200 acres in size. The development of the management plan will integrate many of the aforementioned eight concepts and skills. The management plan must include the following:

1. Introduction: Goals and Objectives (based on landowner criteria)
2. Background: historical, biological and cultural setting
  - a. Provide context for plan with description of land use history, both social and biophysical across entire compartment (i.e. agricultural and forestry practices)
  - b. Deeded ownership (based on ESF archives)
    - i. Note: When writing the report, assume that ESF is no longer the owner
  - c. Special issues that make this compartment unique
  - d. Land use and harvesting regulations or any other restrictions/regulations placed on management activities
3. Methods:
  - a. Describe inventory methods used to collect data (forest inventory plots, wildlife transects, recreation survey, water samples, etc.). Use International Scale, FC-78.
  - b. You must provide statistical proof that your forest inventory is within an acceptable allowable error (in this case the estimated average basal area of each forest stand must be within 20% of mean at the 95<sup>th</sup> percentile).
4. Describe Current Conditions (provide tables to summarize data)
  - a. Forest Stands (species mix down to 1-inch DBH) (minimum acreage for stand is 1 acre)
    - i. Breakdown by species, basal area, stems/ac, relative density, volume (bdft, cords), acceptable growing stock, unacceptable growing stock
    - ii. Economic assessment of stumpage value (timber valuation)
    - iii. Note: you must submit all your inventory data files with plan as a separate appendices
  - b. Recreation trails and facilities
    - i. Hiking activity
    - ii. Hunting activity
    - iii. ATV and snow mobile use

- c. Existing roads, skid trails
  - d. Soil and Water Resources (ponds and streams)
    - i. Define watershed at various spatial scales
    - ii. Physical soil limitations for operability
    - iii. Physical soil limitations for plant growth and development
  - e. Wildlife
    - i. Species known to exist on property
  - f. Natural and manmade disturbances
    - i. Pest and pathogen problems
    - ii. Windthrow
    - iii. Erosion
5. Property maps must be generated using GPS/GIS technology describing:
- a. Roads, trails, streams, water bodies, fences, buildings, other landmarks
  - b. Forest cover types
  - c. Soil types
  - d. Land use classification (when appropriate)
6. Recommendations for the parcel will be based on the landowner objectives of three hypothetical owners. Land is assessed at \$300/acre and the tax rate is \$8/acre/year. For further inquiries about landowner objectives, or other information pertaining to the property, please see instructor.
- a. Landowner #1: Nonindustrial private forestland owner
    - i. Full-time resident of property (not absentee landowner) with long-term outlook.
    - ii. Primary reason for owning land is recreation (including hunting)
    - iii. Landowner has a passive attitude towards forest management
    - iv. No knowledge of forestry but wants what is best for the woodlot
    - v. Considering timber harvest because they were told it was good for the woodlot, plus could use the money to pay property taxes
    - vi. Use firewood as secondary form of heat.
    - vii. The landowner is seeking a recommendation on whether to enroll in the NYS Forest Tax Law (480A). What will this require?
  - b. Landowner #2: Forest products company
    - i. The company manages their forestlands to ensure the production of forest products for this and future generations while also providing a diversity of wildlife, clean air and water, soil conservation and recreational opportunities.
    - ii. The lands are strategic for supplying wood fiber to the mill and creating cash flow.
    - iii. The mill saws dimensional lumber and kiln dries it. Sawdust and chips from the sawmill heat the kilns. They only buy sawlogs, market the veneer and low grade logs to other markets.
    - iv. Given the economy and poor markets, the company is not excited about cutting valuable stumpage.
    - v. The company will not invest additional funds in plantations.
    - vi. The company uses both hardwood (not aspen) and softwood species.

- vii. The company is seeking a recommendation on whether to become third party certified under the Sustainable Forestry Initiative. What will this require?
- c. Landowner #3: Nature Conservancy
    - i. The Nature Conservancy's mission is to preserve the plants, animals and natural communities that represent the diversity of life on earth by protecting the lands and waters they need to survive.
    - ii. The Nature Conservancy's vision is to conserve a set of places that, if managed appropriately, will ensure the long-term survival of all their native life and natural communities—not just those that are threatened.
    - iii. They work with resource-based industries to alter their business practices to have less environmental impact.
    - iv. They will not allow hunting.
    - v. They are seeking a recommendation on whether to become third party certified under the Forest Stewardship Council. What will this require?
7. Your group will generate management recommendations for each owner scenario. Components should include the following:
- a. Silvicultural prescriptions
    - i. Provide tables with pre- and post-harvest data by species
    - ii. Discuss management of non-commercial species
    - iii. Provide harvest schedule for next 20 years
  - b. Provide a 20-year NPV analysis (discount rate of 4%)
    - i. Make adjustments for growth and proposed removals
  - c. Forest Operations
    - i. Provide detail on harvest system
    - ii. Provide map of harvest system (landings, roads, skid trails)
  - d. Recreation development
  - e. Soil and Water conservation
  - f. Wildlife management
    - i. Specify species
  - g. Economic justification
    - i. Not looking for detailed cost-benefit analysis, but recommendations must be economically viable.
  - h. Other pertinent information associated with Landowner descriptions (i.e. certification programs)
8. How much did it cost to generate this management plan? Using a summary of your group's personal log books, provide an estimate of how much this plan cost the client. Use a rate of \$25/hour.

Your Course Grade will be Based on the Following Criteria:

Attendance	10% (Individual)
Personal Logs*	10% (Individual)
Draft – Management Plan	10% (Group)
Final – Management Plan	30% (Group)
Class Presentation/Field Interpretation	15% (Group) (bonus pts for early group)
Class Presentation/Field Interpretation	15% (Individual)
Peer Evaluation	10% (Individual)

\* Weekly Personal Logs will itemize the time spent on the following activities:

- Field work
- Data Management (input and analysis; generating maps)
- Writing Management Plan
- Planning Meetings
- Travel

The weekly log will be itemized to the nearest quarter hour. It is critical that you are accurate and honest with the log.

### **Class Presentation/Field Interpretation**

- Each group will give an oral presentation of their management plan to the class at the Heiberg classroom.
- The classroom presentation will be followed by a field tour of your compartment.
- Your group has from 1:15 to 4:00 to conduct both activities. Please monitor your time.
- The class and field presentations should be conducted in a highly professional manner.
- Please see the instructor if you have any questions.
  
- Group presentation grades include the following criteria:
  - Knowledge of subject matter
  - Organization of subject matter
  - Presentation
  - Creativity
  - Flow from individual to individual
  - Ability to answer questions
  
- Individual presentation grades include the following criteria:
  - Eye contact
  - Demeanor
  - Articulation and clarity
  - Accuracy
  - Professionalism
  - Polish
  
- The audience has the responsibility to be polite and courteous, listen intently, and ask good questions to the “group of the day”.
- If the audience is not asking enough questions for either the classroom presentation or the field tour, we will randomly select individuals to ask questions.

**Integrated Resources Management (FOR 490)**  
**Course Schedule**

<u>Date</u>	<u>Topic</u>
January 24	Introduction
January 31	Heiberg Forest (field work)*
February 7	Heiberg Forest (field work)
February 14	Heiberg Forest (field work)
February 21	Heiberg Forest (field work)
February 28	Heiberg Forest (field work)
March 7	Heiberg Forest (field work)
March 14	No Class – Spring Break
March 21	Heiberg Forest (field work)
March 28	Heiberg Forest (field work)
April 4	Heiberg Forest (plan field tour)
April 11	Workshop 1 – Heiberg Forest (Early Bird Incentive of 5 pts)
April 18	Workshop 2 – Heiberg Forest
April 25	Workshop 3 – Heiberg Forest
May 2	Final Plan Due

**\*Field Trips: All students must take school transportation. Hard hats are required. Watches to monitor time are required. Please dress appropriately. Snowshoes are highly recommended. Field work must be conducted in groups of two or more persons (no solo work).**

**Deliverables:**

**Draft 1 – Written Management Plan due by noon on April 4, 2011 (minus 10 pts for each day late)**

**Final Draft – Final Written Management Plan due by noon: May 2, 2011 (minus 10 pts for each day late)**