

ED 5630 Forest Resources & Environmental Sciences Teacher Institute

Monday-Saturday, July 12-17, 2004 ~ MTU Ford Forestry Center

AGENDA

MONDAY, July 12: Introduction to Forestry: Tree ID & Forest Measurements

9-10 AM Participants check in

10-11 **Course Overview, Pre-Test & Course Requirements**

Introductions

Participants share brief summary of proposed teaching unit ideas

11 AM **Tree, Shrub & Herbaceous Plant ID & Characteristics** (Dr. Andy Burton)

Topics to be addressed in lecture:

- Characteristics used to identify trees, shrubs and herbaceous plants
- Identification of important overstory and understory species
- Life-history attributes of common forest species: why do certain tree species grow in certain environments or habitats

Noon LUNCH

1-5 PM **Forest Measurements** (Dr. Andy Burton)

Topics to be addressed in field trip:

- Individual tree measurements: diameter, total height, merchantable height, age
- Calculated tree and stand characteristics: volume, biomass, density, use of spreadsheets
- Inventory using fixed area plots: sampling of overstory, saplings, seedlings
- Landscape view: stratified inventory of all the ecosystems within an area

6 PM DINNER

7:30-9:00 **Evening Presentation: *White Pine Logging History in Michigan*** by Wendell Hoover, retired Hartwick Pines interpretive historian

TUESDAY, July 13: Forest Soils & Watershed Management and Forest Ecology

8:00 **Geomorphology, Forest Soils and Vegetation** (Mike Hyslop)

Topics to be addressed in lecture & lab/field trip:

- Soil texture, porosity, permeability, fertility, mineral v. organic, litter layer
- Relate soil types to forest types: conifer, deciduous, wetland

Noon LUNCH

1-5 PM **Forest Ecology** (Dr. Linda Nagel)

Topics to be addressed in lecture & lab/field trip:

- General ecological principles: organism to ecosystem levels, diversity, change, adaptation, succession, etc.
- Forest ecosystem interactions
- Different ecosystem types and how they function differently:

- Northern hardwoods v. Conifers
- Managed v. Not managed
- Stand structure: vertical levels of herbaceous to shrub to tree canopy

5 PM TOUR of MTU Forestry Bldg & Welcome by Dr. Glenn Mroz, Dean of SFRES

6:00 PM Dinner at MTU Forestry Bldg

7:00-8:30 PM Applications of GIS to Forest Management (Noblet G002 & Rm 139) (Mike Hyslop)

WEDNESDAY, July 14: Forest Insects & Disease and Wildlife Ecology

8 AM Forest Health: Insects & Disease (Dr. Andrew Storer)

Topics to be addressed in lecture & lab/field trip:

- Major insects and diseases of Michigan and how they are controlled
- Invasive plant and animal species
- Ecology of important insect species
- Ability to identify forests/trees impacted by these diseases and insects

Noon LUNCH

1-5 PM Wildlife Ecology (Keren Tischler, graduate student)

Topics to be addressed in lecture & lab/field trip:

- Biotic and abiotic factors of wildlife population regulation
- Wildlife habitat relationships & suitability
- Habitat and landscape principles (e.g., fragmentation, corridors, patches)
- Wildlife management and values
- Overview of wildlife species found in Michigan forests

6:00 PM DINNER

7:30-8:30 Tour of Historic Ford Sawmill and Alberta Townsite (Roger Rogge)

THURSDAY, July 15: Forestry & Water Quality and Conservation Biology

8 AM Conservation Biology & Biodiversity (Jim Hammill, Michigan DNR)

Topics to be addressed in lecture & lab/field trip:

- Principles of conservation biology and biodiversity
- Diversity v. ecological stability
- Biodiversity indices – measure biodiversity of native forest v. planted forest
- Affects of habitat changes on various forest species

Noon LUNCH

1-5 PM Forestry, Water Quality, and Watershed Management (Joan Chadde & Byron Sailor)

Topics to be addressed in lecture & lab/field trip:

- Watershed management; point v. non-point source pollution
- Water quality impacts associated with forest management: runoff timing and quantity, sedimentation, erosion, streamside buffers, shading, logging debris in stream

- Forestry Best Management Practices to protect water quality: stream crossings, sediment control, road location
- Conduct a stream health assessment on Menge Creek (bioindicators, physical measurements and streamside habitat assessment)

6 PM DINNER

7:30-9:00 Evening: Panel Discussion on Perspectives in Forest Management

(Panel members: Byron Sailor (DNR); Mark Sherman (Mead-Westvaco); Doug Welker (U.P. Environmental Coalition); Randy Swaty (The Nature Conservancy))

FRIDAY, July 16: Forest Management & Silvicultural Prescriptions (Jim Schmierer & Scott Noble)

8:00 AM Forest Management

Topics to be addressed in lecture & lab/field trip:

- Management options and silvicultural prescriptions based on the landowners' goals.
- Sustainable Forestry Initiative (SFI)
- Forest stewardship for private forest landowners

Noon LUNCH

1-5 PM Institute Capstone: Work Session to Develop a Forest Description & Management Plan
(Jim Schmierer & Scott Noble)

Institute participants work in groups of three to design their own management plan for an assigned plot of forest near the Ford Forestry Center, following an outline of a typical forest plan used in FRES capstone projects or MDNR forest stewardship plans. Plans must contain: digital photos, maps, forest inventory and measurements, diagrams, management prescription and justification, etc.

6 PM DINNER

7:30-8:30 **Canyon Falls Hike** (optional)

8:00-10:00 **Work on Forest Management Plans**

SATURDAY, July 17: Capstone: Developing a Forest Description & Management Plan

8-Noon Forest Management Plan Presentations On-Site: 6 Groups (Jim Schmierer)

Noon-1 pm LUNCH

2-3 PM Teaching unit ideas, course evaluations, post-test & wrap-up discussion

3 PM Institute ends

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COURSE SYLLABUS

Coordinating Instructor

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Western Upper Peninsula Center for Science, Mathematics and Environmental Education

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Course Faculty & Instructors

School of Forest Resources & Environmental Sciences Faculty & Staff:

Dr. Andy Burton

Michael Hyslop

Jim Schmierer

Dr. Linda Nagel

Scott Noble

Dr. Andrew Storer

Keren Tischler (graduate student)

Guest Presenters:

Jim Hammill, Michigan Department of Natural Resources (retired)

Wendell Hoover, Hartwick Pines interpreter

Roger Rogge

Byron Sailor, Michigan Dept. of Natural Resources

Lynwood Stephens, Michigan Forest Foundation TBA

Jeff Mell, Ottawa National Forest (USFS) TBA

Mark Sherman, Mead-Westvaco

Doug Welker, U.P. Environmental Coalition

Randy Swaty, The Nature Conservancy

Course Credit: 3.0 graduate credits through Michigan Tech's Dept. of Education (requires 45 contact hrs)

Course Description: This institute is designed to provide Gr. 4-12 teachers with the basic understanding of forest resources, ecology, and management, as well as current issues in forest management. Throughout the institute, participants will interact with scientists, forest management professionals, and educators through a combination of lecture, lab, technology applications, and field trips. The institute will offer new teaching ideas that participants can incorporate into their classroom teaching, opportunities for real-world, inquiry-based experiences, and time to share best teaching ideas with their peers. This intensive interactive week-long course is designed to provide elementary, middle, and high school teachers with standards-based professional development and time to plan, discuss, create, renew, and reflect on their teaching. Teachers will receive curriculum support materials and references to assist them in the development and implementation of a forestry teaching unit in their classroom that addresses Michigan Content Standards for Science, Mathematics, Social Studies, and Language Arts. Possible careers related to forestry and natural resource management will be discussed by the wide variety of presenters throughout the week.

Course Objectives

At the end of this institute, teachers should be able to:

- a. Guide their students in the development of a forest management plan.
- b. Develop a 5-day, age-appropriate teaching unit for a biology, environmental science, general science, earth science, math, chemistry, natural resources course for grades 6-12 students. (requires both content knowledge and skills)
- c. Conduct real world, inquiry-oriented classroom activities/labs and field investigations related to forestry topics (soils, ecology, game/non-game wildlife, flora, forest management, watersheds, insects & disease, conservation biology, silvicultural prescriptions, forest stewardship, natural resource careers, civic responsibility, GIS applications).
- d. Articulate an understanding of Michigan's forests- community types and their distribution, perspectives on management, human-environment interactions, role in Michigan's economy, current issues and threats to Michigan forests.
- e. Identify curriculum support resources and tools.
- f. Identify sources of professional forest management expertise (USFS, DNR, private companies, consultants, scientists, advocacy organizations, conservation organizations).

Course Requirements:

- **Completion of Pre-Course Readings** - Participants will be provided with selected readings prior to the institute, and are expected to begin formulating ideas for their teaching unit *before* arriving at the institute. Teachers must prepare a **one-page written summary** that lists the target grade(s) and subject for the unit, learning objectives, Michigan Content Standards that could be addressed for science, math and/or social studies, and how the unit would fit into their current curriculum or meet a current teaching/learning need. Participants must be ready to present their written summary to the other participants in the opening session of the institute. (10%) *Readings will be mailed to you.*
- **Attendance and Class Participation** - All participants are expected to attend all sessions and to enter into substantive discussion during sessions, with continuation on into informal discussions with peers. A **field journal** is required during the institute. (25%)
- **Forest Management Plan & Presentation** (15%)
- **5-Day Teaching Unit** – After the Institute, teachers must design a teaching unit that contains at least 5 days of activities appropriate for their teaching level on a topic of interest related to their institute experience, and that meets the guidelines of the Michigan Curriculum Frameworks or national content standards. ***The teaching unit must be submitted to receive credit for the entire course. Due August 31, 2004.*** See attached teaching unit grading rubric. (50%)