Introduction and Project Overview

The North East State Foresters Association (NEFA) is an organization representing the State Foresters of Maine, New Hampshire, New York, and Vermont in partnership with State & Private Forestry, USDA Forest Service.

NEFA’s mission is to keep the region’s forests as forests. This is accomplished through work towards:

- Permanent land conservation; and
- Sustainable forestry.

Threats to forests in the northeast United States from fragmentation, high-grading, invasive plants and insects, climate change and shifts in wood utilization and manufacturing capacity have revealed gaps in the knowledge of, and learning opportunities for, working forest managers – especially in silviculture. Field foresters need updated and accurate information regarding new and emerging forest science to assure their silvicultural decisions are as informed as possible. The successful bidder on this Request for Proposals (RFP) will deliver training programs for the Northeast Silviculture Institute for Foresters (Institute) to provide northeast U.S. foresters with the appropriate knowledge to make sound, science-based decisions for forest ecosystem management, harvests and regeneration. This project will create a training module that can be used in the USDA Forest Service's National Advanced Silviculture Program (NASP) to provide landscape-specific materials for northeast forests – where such a curriculum does not exist at this time. While good silviculture training has been available through state workshops and particularly through the Society of American Foresters (SAF) meetings, these have not been as in-depth and intensive as envisioned by the Institute. The Institute plans to offer a graduate level of instruction.

With a grant from the USDA Forest Service, State & Private Forestry, NEFA is charged with delivering a series of silviculture training modules for public and private foresters in the northeast U.S. in a manner consistent with the NASP. The intent is for the Institute to fulfill the northeast local module
series requirement for NASP. The successful bidder will be tasked with delivering the Institute modules as later described -- five distinct modules to be delivered once in 2017 and again in 2018.

The institute curriculum presented during training modules will also be posted as online resources through the NEFA website. This will make the information available for all foresters in the region, whether they are able to attend the Institute training modules or not.

In addition to the staffing and delivery to be provided by the successful bidder, NEFA contract staff will assist in the delivery of the training modules through:

- marketing and outreach to foresters in the region to urge them to apply to attend one or more training modules;
- accepting and processing registrations;
- acting as registrar at each training module; and
- assisting in other ways mutually agreed upon between the successful bidder and NEFA contract staff.

Note: If more applicant registrations are received than the 50 per module limit, NEFA will determine which applicants are admitted. See below for more explanation.

Public agencies, private for-profit companies, and non-profit companies and institutions are invited to submit bids in response to this Request for Proposals.

**Deadline for proposals:** Proposals must be e-mailed to the address above no later than 5:00 p.m. Easter Standard Time, January 30, 2017.

**Contract awarded:** No later than March 1, 2017.

**Project duration:** Until completion in 2018.

**DEFINITIONS:**

**Curriculum** – Detailed training topics embellished from the curriculum outline in this RFP.

**Forest type** – A collection of tree species as defined by the Society of American Foresters.

**Indirect costs:** Indirect costs are those expenditures or costs that are not readily identifiable with delivery of the specific activities of the contract, but nevertheless are necessary to the general operation of the contractor and the conduct of its activities. The types of expenses usually considered as indirect costs include the cost of operation and maintenance of buildings and grounds, equipment, and secretarial or administrative services.

**Lead Organization** – The organization or entity that will contract with NEFA to deliver the Institute training. It is contemplated that the lead organization will subcontract some or much of the work to deliver the modules through partner organizations or others to cover all the components of each module. The lead organization may be public or private.

**Match** – Cash, In-Kind or other donated services or value in support of the Institute training.
Module – Each two-day training session as described in this RFP.

NASP – National Advanced Silviculture Program of the USDA Forest Service. A certification training program in silviculture designed originally for public foresters. The Northeast Silviculture Institute for Foresters is being designed to fulfill the requirements of a local module for NASP.

Overhead – Costs associated with the Lead Organization and Partner organizations that cover other than the direct costs of delivering the Institute training modules.

Participants – Attendee foresters receiving the training in the modules.

Partner organization – An organization or entity, public or private, subcontracting to the lead organization to deliver a portion or all of the training modules.

**Lead Organization**

NEFA requests that proposals only be submitted if they cover the entire curriculum package later described. It is expected and acceptable for a lead organization to be identified as the bidder and subcontractor organizations identified as partners to the lead organization that will provide training for one or more of the curriculum modules described. The lead organization is expected to assure that if subcontractor organizations are used to deliver one or more training modules, all training modules are designed and delivered in a consistent fashion.

**Limits to training module attendance**

Given the nature of the Institute training modules, there will be a limit to the number of registrants for each training module. No more than 50 individuals will be allowed to attend any specific training module. Of the 50, a break-down of 50% for private foresters; 33% for state employed foresters; and 17% for federally employed foresters will be the target for each training module. NEFA will work with the successful bidder to market and accept training registrations and to assure these allocations are met.

**A. Scope of Services**

For the Northeast Silviculture Institute for Foresters, the successful bidder will deliver the following:

A1. Training team

Identify and secure individual trainers to lead and teach the 5 curriculum modules described in this RFP. The team members can be from the Lead Organization, formal partners and other entities as the expertise required is wide ranging. It is assumed that many trainers will be identified with appropriate expertise for the subject matter and that each module may have different trainers.
Resumes for all individuals delivering the training are required as part of the RFP reply and will be used to evaluate proposals.

A2. Locations and Facilities

The bidder will identify the classroom facilities and field tour locations where the training will take place for each module. Include a description of the classroom or indoor facility space to be used. Securing this space will be the responsibility of the Lead Organization.

Provide a description of the field sites proposed for each training module, the content to be covered in the field portion of the training (under curriculum) and the link to topics covered in the classroom portion of the training.

It is desirable that the successful bidder identify local sources to provide morning coffee and tea, drinking water and lunch and dinner for the participants. NEFA will be responsible for paying for and making food arrangements for the training modules and will likely use the recommended sources provided by the successful bidder.

Bidders should provide suggested options for reasonably priced local overnight accommodations for training participants with contact information.

A3. Curriculum

Using the curriculum outline provided in this RFP, develop a detailed curriculum narrative that fully describes the curriculum to be delivered at each of the 5 training modules and the techniques to be used in the training (lecture, group assignment, field tour, etc.). Identify the individual trainers in the narrative. Identify contact hours planned for each portion of each module consistent with the outline.

A4. Partners and others

List the formal subcontract partner organizations and contact individuals for each partner organization that will be utilized to deliver the training. If other individuals are identified to deliver training, also list those individuals and affiliations.

A5. Use of alternatives to on-site training venues

It is expected that each of the 5 training modules will include both a classroom component and a field component consistent with the training curriculum outline. Also identify other training techniques planned such as group assignments for the evening of Day 1 of each module (if planned), webinars, readings, etc. Bidders will show the link between pre-requisite materials, classroom training, field training and any other training techniques proposed for each module.

A6. Pre-requisites

It is assumed that training participants will be required to complete pre-requisites prior to attending a
training module. These could include readings, webinars, videos etc. Initially identify planned pre-requisites for each training module as part of the proposal.

A7. Audience/training participants

The audience or training participants will be private and public foresters who are practicing foresters operating in the forests of the northeastern U.S. The intent of the Institute is to provide these individuals with substantial material to inform the decisions they make in the public and private forests of the region. Using the expertise that will come with these individuals and the many years of experience they have is highly suggested.

Training modules should be set up to handle up to 50 participants for each of the 5 modules. Though up to 250 participants may attend the modules, some participants may attend more than one module.

Participants will be required to pay $50 to NEFA per module as a registration fee.

A8. Testing

For the small number of foresters choosing to be participants in the Institute who are seeking formal certification under NASP, testing is required. The successful bidder will be expected to coordinate required testing with the Regional Silviculturist of the USDA Forest Service.

A9. Training timeline

It is expected that the full 5 modules of training will be organized and given once during calendar year 2017 and once again in calendar year 2018. Identification of the approximate dates of each training module to be given in each year is required along with location and other information identified above.

A10. Module Evaluation

The lead organization is required to evaluate the module training by providing at least a written evaluation opportunity for attendees. This may be supplemented by an oral request for feedback at the end of the module. Online evaluations may be a part of evaluation techniques.

A11. SAF Continuing Forest Education credits

The Lead Organization must make sure that the SAF and state forester licensing CFEs are secured for each training module prior to the module delivery. NEFA will work with the successful bidder on administering the credit forms and reporting on CFEs.

A12. Video for later re-broadcast

NEFA reserves the right to video-tape module training sessions, including field sessions, for later offerings on-line.
B. Institute module details

The successful bidder will provide the following 5 training modules according to the requirements outlined above and below:

Northeast Silviculture Institute for Foresters curriculum

The training curriculum outline below is intended to serve as the northeast U.S. local module for NASP. In order to meet requirements for certification, candidates must attend a local module. It is the intention of the Institute to provide the NASP local module and also provide an opportunity for advanced silviculture training for private and public foresters who do not intend to seek NASP certification.

It is expected that each module will include, in addition to the description below:
- Recognition that all forest types have transition areas to other forest types;
- Acknowledgement that some attendees may attend only one module while others may attend more than one or all the modules;
- Ample field time as part of training contact time;
- A proposed month for delivery.

Note to bidders: A detailed lecture guide from NASP is attached (Addendum) as a guide to the curriculum. This adds more suggested detail to the curriculum outline below.

NASP New England and Northern New York Overview (2 days) – centrally located (15 hours minimum)

1) Fisheries (2 hours)
2) Hydrology (2 hours)
3) Markets and Utilization (2 hours)
4) Fire Ecology (2 hours)
5) Climate adaptation & mitigation change considerations (1 hour)
   - Weather & Climate in the region
   - Carbon issues
6) Technical writing including prescriptions (1 hour)
7) Presentations Skills (1 hour)
8) Non-Native Invasive Species (1 hour)
9) Pesticide Use including NNIS, site prep, TSI (1 hour)
10) Sale layout and design including logging aesthetics (1 hour)
11) Monitoring & Assessment (1 hour)
12) Landscape issues & considerations
Northern Hardwood Forest Type (2 days maximum\(^1\) – location to be determined)  
(16 hours minimum)

1) Silvics of individual species & Stand Dynamics including land use history, climate change adaptation and restoration  
   (7 hours)
2) Silvicultural Systems and Practices including growth, yield, quality, regeneration and even and uneven-aged stands  
   (4 hours)
3) Economics, utilization & markets  
   (2 hours)
4) Forest Health  
   (1 hour)
   For example:
   a. Diseases
   b. Insects and their control
   c. Natural Disturbances
5) Wildlife Considerations specific to Northern Hardwood forests  
   (1 hour)
6) Soils, Site Quality and Productivity  
   (1 hour)
7) Sample prescriptions
8) Legal, landowner objectives & carbon considerations
9) Field Trip in Northern Hardwood type

Pre-requisites – specification for pre-reading and other pre-work.

Mixed Oak Hickory Forest Type (2 days – location to be determined)  
(16 hours minimum)

1) Silvics of individual species & Stand Dynamics including land use history, climate change adaptation and restoration  
   (7 hours)
2) Silvicultural Systems and Practices including growth, yield, quality, regeneration and even and uneven-aged stands  
   (4 hours)
3) Economics, utilization & markets  
   (2 hours)
4) Forest Health  
   (1 hour)
   For example:
   a. Diseases
   b. Insects and their control
   c. Natural Disturbances/fire
5) Wildlife Considerations specific to Mixed Oak/Hickory  
   (1 hour)
6) Soils, Site Quality and Productivity  
   (1 hour)
7) Sample prescriptions
8) Legal, landowner objectives & carbon considerations
9) Field Trip in Mixed Oak/Hickory Type

Pre-requisites – specification for pre-reading and other pre-work.

Pine, Oak and Hemlock Forest Type (2 days – location to be determined)  
(16 hours minimum)

1) Silvics of individual species & Stand Dynamics including land use history, climate change adaptation and restoration  
   (7 hours)
2) Silvicultural Systems and Practices including growth, yield, quality, regeneration and even and uneven-aged stands  
   (4 hours)
3) Economics, utilization & markets  
   (2 hours)
4) Forest Health  
   (1 hour)

\(^1\) 2 days means that module participants will begin training no earlier than 8 AM on day 1 and end no later than 6 PM on day 2. Training or assigned homework may be contemplated for the evening of day 1.
For example:

a. Diseases
b. Insects and their control
c. Natural Disturbances/fire

5) Wildlife Considerations specific to Pine, Oak & Hemlock (1 hour)
6) Soils, Site Quality and Productivity (1 hour)
7) Sample prescriptions
8) Legal, landowner objectives & carbon considerations
9) Field Trip in Pine, Oak & Hemlock Type

Pre-requisites – specification for pre-reading and other pre-work.

Spruce – Fir Forest Type (2 days – location to be determined) (16 hours minimum)

1) Silvics of individual species & Stand Dynamics including land use history, climate change adaptation and restoration (7 hours)
2) Silvicultural Systems and Practices including growth, yield, quality, regeneration and even and uneven-aged stands (4 hours)
3) Economics, utilization & markets (2 hours)
4) Forest Health (1 hour)
   For example:
   a. Diseases
   b. Insects and their control
   c. Natural Disturbances
5) Wildlife Considerations specific to Spruce-Fir (1 hour)
6) Soils, Site Quality and Productivity (1 hour)
7) Sample prescriptions
8) Legal, landowner objectives & carbon considerations
9) Field Trip in Spruce – Fir Type

Pre-requisites – specification for pre-reading and other pre-work.

Note 1 – Webinars – All contact hours and topics listed are expected to be fulfilled with on-site training techniques. Bidders may contemplate webinars as pre-requisites or to supplement the on-site module training.

Note 2 – Contact hours: where contact hours are identified in the curriculum, this means these topics must have at least that many contact hours – i.e. these are minimums. These hours could be classroom and/or field trip hours. Topics not designated with contact hour requirements must be covered but with no contact hour requirement.
C. Credentials

For each person and/or entity proposed for participation in the Institute training (trainers and others to assist trainers), the bidder will provide the following:

- A narrative describing the entity and the reason it is qualified to deliver the training and/or lead the effort if the entity is proposed as the lead organization;
- Resumes for all individuals proposed to play a role in the project whether they are to deliver training or are acting in an administrative capacity or some other capacity.

D. Proposals

Proposals must be no longer than 10 pages, be sent electronically as PDF files, and contain at least the following:

1. Introduction outlining the reasons why the bidder is the best candidate for the work;

2. 1-page (max) biosketch for any named instructors who are committed to participation in training. Biosketches do not count against the 10-page proposal limit.

3. Information to address both the Scope of Work, Curriculum and Credentials sections of this RFP including past training projects relevant to the work of this project;

4. Cost for the work including: All inclusive cost (not to exceed) for development and delivery of two rounds of the 5 training modules, one in calendar year 2017 and one in calendar year 2018. A payment schedule should be suggested. Breakdown of cost by component is required;

5. Letters of concurrence from partner organizations and trainers proposed for Institute delivery;

6. References: at least 3 references will be provided who can attest to the lead organization and contact person expertise in delivering what the project requires.

E. Budget

The total not-to-exceed budget for delivering the 5 Institute training modules twice (once in 2017 and once in 2018) shall not exceed $100,000.

The successful bidder must account for donated resources that can be used for match in the USDA Forest Service grant provided to NEFA for this project and should estimate those as part of the cost bid.

To further clarify which costs the bidder is responsible for and which NEFA or attendees will cover:
- attendees will pay their own housing;
- attendees will pay registration fee that NEFA will collect and keep to help defray costs;
- NEFA will pay for food;
- NEFA will provide supporting staffing in promotion, registration and on-site admin;
- Bidder will cover the cost of preparing all training materials, paying trainers, & securing training sites (indoor and out);
- Bidder will provide PowerPoints and handouts, pre-requisite citations (where attendees can get materials). These materials will be organized and posted to NEFA website for attendees and others not able to attend;
- Bidder will pay for vans or buses if needed for field tour(s). Bidder may save on these costs by organizing car-pooling of the attendees.

Indirect-costs: Indirect cost recovery is limited to 10% of total direct costs, excluding any pass-through associated with subawards. Subawardees may also request up to 10% indirect cost recovery. Example: Organization A is the lead contractor, and will have direct costs (not including subawards) of $40,000. Organization B and Organization C will be subawardees, and have direct costs of $20,000 each. Organization A may request indirect cost recovery of $4,000, and Organizations B and C may request indirect cost recovery of $2,000 each. The total contract budget would be $88,000.

F. Proposal Evaluation Criteria

Proposals will be evaluated on the basis of the following criteria (not necessarily in order of importance):

1. Credentials of proposed presenter(s) and respondent entity or entities;
2. Module proposed locations relative to module forest type;
3. Field trip component of training;
4. Pre-work requirements for training participants;
5. Contact hours of proposed training relative to required contact hours in RFP;
6. Confirmation that the number of participants served in the module(s) is up to 50;
7. Management structure of the applicant and the plan to assure consistent delivery of modules if more than one delivery entity for modules;
8. Ability to deliver modules in 2017, repeating in 2018;
9. Local housing options for attendees/participants; Facilities to keep delivery cost down (i.e. housing, food services...)
10. Testing coordination plan with USDA Forest Service for NASP;
11. Letter(s) of concurrence from all partners if multiple entities partner to deliver the module training;
12. Identification of lead organization with whom NEFA will contract to carry out the program;
13. Budget for delivery of Institute modules as discussed in RFP including any match or donated services.
Questions about this RFP are welcome and should be directed to NEFA Executive Director Charles Levesque at levesque@inrsllc.com. Answers will be posted on the home page of the NEFA website at www.nefainfo.org. All questions must be submitted no later than January 20, 2017. Answers will be posted no later than January 23, 2017. Proposals are due no later than 5 PM EST via email to levesque@inrsllc.com on January 30, 2017.
Addendum

This addendum is provided as a reference for developing the curricula for the Institute. This detailed lecture guide was prepared for a similar program over a 2 week session rather than a series of two day sessions. It is not mandatory for the Institute but should be a helpful guide to bidders as they design their proposal.

LOCAL SILVICULTURE MODULE

National Advanced Silviculture Program (NASP)

DETAILED LECTURE GUIDE

Two Week Training

INSTRUCTIONAL OBJECTIVES

Provide the silviculturist with the local technical information necessary to evaluate current forest ecosystem conditions and perform analyses for prescription development, utilizing an integrated approach. Information will also be provided emphasizing the importance of implementation and monitoring to assure that prescription objectives are met.

Hours of Instruction: 70

LECTURE TOPICS:

SILVICS AND ECOLOGY (20 HOURS)

Understand the silvics of individual species and the ecology of forest types and plant associations that are significant within the Northeast. Identify important understory vegetation and plant associations. Learn the effects of competition for light, moisture and nutrients on establishment, survival, growth and development of Northeast forest stands and how silvicultural systems affect and are affected by species characteristics. Understand branching and natural pruning habits of various species of importance.

Topic Areas:
- Species site requirements
- Vegetation associations
- Ecological relationship among plants in understory forest communities
- Tree regeneration characteristics
- Shade tolerance
- Successional trends
- Using species characteristics and management objectives to determine silvicultural systems
SILVICULTURAL SYSTEMS AND PRACTICES (16 HOURS)

Understand the various silvicultural systems and methods of application for species within the region. Understand their effects on survival, growth and vegetation development. Know operational limitations and costs of silvicultural practices. Understand the impacts of silvicultural operations on multiple forest values.

Topic Areas:
- Silvicultural objectives
  - Fiber production, water protection, grazing, wildlife, recreation, endangered and threatened species habitat, etc.
- Economic and institutional constraints on silviculture
  - Species value
  - Current grades and anticipated changes
  - Potential for insect and/or disease losses
  - Volume changes
  - Costs
- Intermediate treatments
  - Thinning
    - Methods
    - Evidence of competition
    - Crown position
    - Relationship between residual stand density and subsequent volume growth (volume basal area, spacing guide)
    - Economic yield
    - Growth of individual stems
    - Effect on wood quality
    - Effect on susceptibility to insects, diseases and wind throw
    - Effect on habitat, water, or other forest produce or benefit
    - Trade-off among forest products or benefits
  - Release operations
    - Evaluation of stand condition – crop trees and competition
    - Cost/benefit ratio
    - Objectives of release including non-commodity benefits
    - Recognition and justification of viable alternatives
  - Sanitation and salvage
    - Definitions and uses
    - Estimating yield and returns
    - Determine operability
    - Risk, vigor, tree and crown classification systems
  - Pruning
    - Age and vigor of trees to be pruned
    - Cost and increased value
    - Techniques
    - Use in disease control
- Regeneration treatments
  - Coppice
Clearcut
Seedtree
Shelterwood – uniform and strip
Two aged
Selection
Use of reserves
Regeneration issues for major species
- Drought resistance, growth rates, economics of establishment
- Products, commercial value
- Rotation or cutting cycle
- Habitat values – diversity, food, cover
- Aesthetics
- Susceptibility to damage
- Soil impact related to management intensity
- Understory vegetation development
- Effect on water yield, usage, and timing of delivery
- Erosion, sedimentation and protection of water quality
- Effect on stream temperature
Artificial vs. natural regeneration
- Economics of establishment
- Economics of subsequent management, i.e., need for precommercial thinning, spacing for roads, etc.
- Seed source availability – quality of seed tree
- Availability of desirable nursery stock
- Site conditions – need for preparation
- Potential losses from insects, disease, animals, or site conditions.
Artificial Regeneration
- Cost of establishment
- Seeding
- Seedling stock type choices – container/bare root
- Effect of site and micro-site conditions
- Site preparation required and impacts
  - Prescribed burning
  - Mechanical
  - Chemical

**STAND DYNAMICS (8 hours)**

Have knowledge of how Northeast forests developed. Understand the relationship of historical events, current environment and site influences on stands in the Northeast.

**Topic Areas:**
- Stand development processes
  - Crown development
  - Shade tolerance
  - Inter-species interactions
  - Gaps
- Competition
  - Natural pruning

- Effects of site
  - Species composition
  - Competition
  - Growth

- Effects of disturbance
  - Weather
  - Fire
  - Insects and disease
  - Humans

**PRESCRIPTION WRITING (4 hours)**

Understand the components of a detailed and defensible silvicultural prescription. Be able to identify and incorporate the appropriate mitigation measures. Demonstrate appropriate coordination with other resource specialists. Use clear and concise language, charts and graphs as appropriate.

**Topic Areas:**

- **Site description**
  - Soils, geology, water, landform, aspect, slope, elevation, ecological classification, climate

- **Existing stand description**
  - Location
  - Forest type
  - Species details – composition, stocking, stand structure, age, size
  - Genetic considerations
  - Forest health condition, insects, disease, susceptibility to wind
  - Growth rate, site index
  - Fuel loading
  - Special features, inclusions, disturbance history

- **Desired future condition (stand objectives)**
  - Short term and long term objectives
  - Forest type
  - Stocking/density
  - Species composition
  - Coarse woody debris, fuel loading
  - Snags

- **Implementation directions**
  - Layout
  - Marking
  - Regeneration method/site prep as appropriate
  - Stand protection – animal, fuel reduction, insect, disease
  - Cultural operations – timber stand improvement, wildlife habitat improvement

- **Resource coordination and mitigation measures**
- Threatened, endangered species
- Cultural resources
- Water quality
- Recreation
- Engineering
- Wildlife
- Fisheries
- Soils
- Visuals
- Fuels
- Pest management
- Nonnative invasive species management
- Monitoring and Evaluation
  - Survival / stocking exams
  - Quality control
  - Sale administration
  - Treatment effectiveness

**WILDLIFE RELATIONSHIPS (4 Hours)**

Recognize and quantitatively evaluate habitat capability for indigenous species. Identify important wildlife species with special emphasis on threatened and endangered species (TES) and Regional Forester Sensitive Species (RFSS). Understand the socio-economic values of wildlife.

Topic Areas:
- Identification and management of habitat components related to vegetation for game and non-game species
- Management strategies for wildlife populations including vegetation manipulation, food plots, etc.
- Principles of conservation biology
- Management implications on TES and RFSS

**FOREST PATHOLOGY AND ENTOMOLOGY (4 hours)**

Be able to identify signs, symptoms, biology, and plant hosts of locally significant insect and disease complexes and related damage. Be able to identify management strategies for control of locally significant forest insects and diseases. Understand economic impact of local forest insects and diseases. Become acquainted with stand conditions which are most susceptible to local forest insect pests. Make sound pest management decisions based on an understanding of the interrelationships between pest activity and silvicultural practices.

Topic Areas:
- Identification of forest insects and diseases
- Forest diseases - types of organisms, etiology and damage caused by various organisms.
  - Foliar diseases
  - Stem and cone diseases
  - Rusts
  - Canker
  - Vascular Wilts
  - Blight
  - Nematodes
  - Root diseases
  - Physiological disorders

- Management strategies for prevention and control of local insects and diseases
  - Natural Suppression
  - Applied Suppression
    - Silvicultural
    - Mechanical
    - Biological
    - Regulatory
    - Chemical
  - Ecology of stands
    - Hazard rating
    - Climate factors

- Recognizing indicators of potential pest problems
- Linkage between environmental conditions and pest species development
- Abiotic health issues
  - Meteorological effects
  - Atmospheric pollution
  - Nutritional deficiencies and excesses
- Current status of forest tree insect and disease research on prevention and suppression

**FISHERIES RELATIONSHIPS (2 Hours)**

Recognize and evaluate habitat capability for indigenous fish species in the Northeast. Have an awareness of threatened and endangered species (TES) and socioeconomic factors. Learn basic techniques of fisheries management. Understand the relationship between the forest and stream productivity.

Topic Areas:
- Limnology of rivers and streams
- Techniques of fisheries management
- Effects of land and vegetation management in riparian areas on fish and fish habitat
- Management implications on TES and RFSS
**FIRE ECOLOGY (2 hours)**

Understand the historical role of fire in the ecosystem. Understand the use of prescribed fire to accomplish management objectives. Explore the management of natural fires to accomplish management objectives.

**Topic Areas:**
- Effects of fire on forest ecosystems, such as modifying the successional stage, effects on soil, water, air, flora, fauna, and visual resource
- Fire adapted species and effects of fire exclusion
- Factors controlling effects of fire
- Fire as a management tool (history of fire use, current practices and attitudes)

**INVASIVE PLANTS (2 HOURS)**

Be familiar with policy and direction for invasive plants. Understand the National Strategic Framework which incorporates prevention, early detection, rapid response, control, management, restoration and rehabilitation. Be able to identify local species of concern.

**Topic Areas:**
- Implications on forest health and productivity
- Control strategies (integrated)
- Considerations prior to and during silvicultural treatments
- National policy and direction

**GEOLOGY / SOILS / LANDFORMS (2 hours)**

Become familiar with forest soils as a basic component of the local ecosystem. Recognize and evaluate forest soil properties in relation to management considerations such as location of transportation systems, harvesting, site preparation, prescribed burning, recreation development, species selection, and wildlife habitat. Have a knowledge of appropriate mitigation measures and effective monitoring.

**Topic Areas:**
- Physical and chemical properties of soil and their relationship to tree growth, site productivity and forest management
  - Species suitability
  - Site modification – fertilization, drainage, site preparation
  - Change in site productivity over time
  - Soil erosion and control
  - Mass failure
- Mitigation measures
  - Soil profile alterations
  - Harvest treatments
  - Cultural treatments
- Monitoring and evaluation
Forest soil properties that influence management activities

SITE QUALITY AND PRODUCTIVITY (2 HOURS)

Understand the factors that contribute to site quality. Be able to measure site quality and productivity.

Topic Areas:
- Factors that determine site quality
  - site quality estimates
    - tree measurements
    - indicator plants
    - ecological types
    - stocking and growth
- Estimating changes in site potential over time

HYDROLOGY (2 hours)

Gain knowledge of forest hydrology in the Northeast. Understand hydrological properties that influence management activities such as location of transportation systems, harvesting, site preparation, recreation development. Recognize how tree species, and stand composition impact hydrology. Gain knowledge of appropriate mitigation and monitoring.

Topic Areas:
- Hydrological development and productivity
- Hydrological properties that influence management activities
  - Effects of composition and stand structure on hydrology
    - Run off quality, quantity and regimen
- Effects of silvicultural systems on water flows
- Mitigation measures
- Monitoring and evaluation

MARKETS AND UTILIZATION (2 hours)

Understand current and future utilization trends. Understand basic economic comparison standards such as discounting and present net value in order to compare costs of treatment alternatives.

Topic Areas:
- New wood products
- Supply and demand trends
- Utilization standards (size and species)
- Economic analysis
<table>
<thead>
<tr>
<th>TOPIC AREA</th>
<th>HOURS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Silvics &amp; Ecology</td>
<td>20</td>
</tr>
<tr>
<td>Silvicultural Systems and Practices</td>
<td>16</td>
</tr>
<tr>
<td>Stand Dynamics</td>
<td>8</td>
</tr>
<tr>
<td>Forest Pathology &amp; Entomology including pesticides</td>
<td>4</td>
</tr>
<tr>
<td>Wildlife Relationships</td>
<td>4</td>
</tr>
<tr>
<td>Prescription Writing and Presentation Skills</td>
<td>4</td>
</tr>
<tr>
<td>Fisheries Relationships</td>
<td>2</td>
</tr>
<tr>
<td>Fire Ecology</td>
<td>2</td>
</tr>
<tr>
<td>Invasive Plants including pesticide use</td>
<td>2</td>
</tr>
<tr>
<td>Geology/Soils/Landforms</td>
<td>2</td>
</tr>
<tr>
<td>Site Quality/Productivity</td>
<td>2</td>
</tr>
<tr>
<td>Hydrology</td>
<td>2</td>
</tr>
<tr>
<td>Markets and Utilization</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td><strong>70</strong></td>
</tr>
</tbody>
</table>