SECTION 3. Statewide Forest Resource Strategies Program Area Integration

In addition to the Vision Statements, Principles and Action Steps developed during the Roundtable process, the DOF and the CAES, developed a series of visions, missions, critical success factors, and strategies and actions that can be integrated into the Statewide Strategy.

Statewide Forest Resource Strategies Program Area Integration:

Connecticut Department of Environmental Protection - Division of Forestry

1) State Lands Management

a) Vision

i) The Division of Forestry (DoF) manages Connecticut's State Forests, the largest single landholding in the state, to ensure that a viable and productive forest ecosystem provides clean air, water, carbon sequestration and climate moderation while unique, fragile, and threatened habitats are protected. This management model uses an ecological approach to resource sustainability in a functioning biological system with intrinsic ecosystem values to be held in the public trust for future generations**.**

b) Mission

i) It is the mission of the DoF to manage the resources of the State Forests in a professional manger, perpetuating a healthy forest ecosystem of native species and preserving significant habitat values while protecting the forest from fire, theft, exotic plants and insects, disease and illegal/abusive practices. The DoF uses scientific forest management methods to provide a variety of valuable ecosystem services to citizens and industry. This ensures that the State Forests serve as a resource management demonstration model and an example of silvicultural success while providing both traditional and non-traditional forest products to citizens and the forest based economy in a sustainable manner. This will ensure an array of resources, uses and values now and in the future. This mission of the DoF supports the comprehensive plans of the DEP Bureaus of Natural Resources and Outdoor Recreation [Connecticut's Comprehensive Wildlife Strategy (aka Wildlife Action Plan – WAP), Statewide Comprehensive Outdoor Recreation Plan (SCORP) and The Fisheries Habitat Conservation Enhancement Plan (HCEP)].

c) Critical Success Factors

i) Perpetuate a forest ecosystem that graduates native and natural regeneration to the over-story. Create a mosaic of different aged stands coordinated with the habitat needs of native wildlife populations. Designate and protect core old forest land.

ii) Stop the spread of exotic invasive plants and insects into the public forest ecosystem.

iii) Protect all boundaries and roads, especially in watersheds for public, recreational and agricultural water supplies.

iv) Upgrade information management.

v) Support utilization and marketing as a management tool.

vi) Incorporate recreation uses into ecosystem sustainability

vii) Continually improve public information.

viii) Harvesting sustainability.

d) Strategies and Actions

i) Maintaining a sustainable forest ecosystem:

(1) Establish, perpetuate and graduate desirable native regeneration (oak, hickory, sugar maple, white pine, hemlock, yellow birch, white ash, and tulip).

(2) Control over-browsing by deer (supports WAP).

(3) Increase the number of acres of hunted state land to reduce deer and turkey populations (supports SCORP & WAP).

(4) Revisit stands within 5 years of established regeneration with follow up silviculture treatment to ensure regeneration-release-graduation.

(5) Develop a comprehensive trail policy with trail design standards based on user needs to avoid interruption to the regeneration harvest sequence and protect core old forest land (supports SCORP & WAP).

ii) Stop the spread of non-native plants and insects.

(1) Control/eradicate invasive plants within stands and monitor/prevent invasive insect infestations. Monitor potential diseases. Use prescribed burning for ecosystem maintenance/restoration to control/eradicate invasive plants, improve wildlife habitat and prepare stands for regeneration (supports WAP, Fire Management Program, and Forest Health Program).

iii) Mark forest boundaries on a regular cycle to find encroachments, trespass, theft and infrastructure damage (supports SCORP).

(1) Purchase interior land parcels, inform public of open forest roads, post or gate DEP owned roads closed, and close illegal trails (supports SCORP).

iv) Upgrade Information Management – create an integrated system of field data collection, compilation, storage and dissemination to include GIS maps in house and online for management planning.

(1) Create DEP biological database and GIS map system. Collect, store and distribute field data in partnership with other DEP Divisions with portions available online (LEAN – Jan 2010).

(2) Explore a management system based on eco-regions with common landscapes and forest communities (southeast, northeast, central, northwest and southwest). Preserve and protect old forestland sites, watersheds (supports Watershed Forestry & WAP).

v) Utilization and Marketing

(1) Convey to the public and policy makers the economic importance and social value of Connecticut's forest industry. This includes the value of traditional products such as timber and firewood and non-traditional, non-timber products and ecosystem services such as boughs, biomass, maple taps, hiking, camping, clean fresh water streams, healthy wildlife populations, carbon sequestration and climate moderation. State forests provide a reliable, renewable and sustainable variety of products to the State certified professional forest products industry and

citizens. For over 100 years, state forests have contributed to economic conditions with jobs, equipment and fuel sales and business opportunities in rural areas (supports SCORP, WAP, Forest Utilization and Marketing, FPA Mission).

(2) Prepare a biomass harvesting strategy that addresses early intervention in younger stands, graduation of advanced regeneration, nutritive replenishment and sustainability.

vi) Cultivate alliances with user groups for cooperative trail management agreements, Institute paid recreational passes for horses and wheeled vehicles (supports SCORP).

vii) Provide conservation education and demonstration

(1) Partner with the Private & Municipal Land Program (P&ML) landowner groups, conservation organizations and other DEP Divisions to establish Conservation/Demonstration harvest schedules and tours. Motivate landowners to learn the importance and apply principles of sustainable forest management to their land using partners like the University of Connecticut, Connecticut College, The Nature Conservancy and The Connecticut Forest and Park Association (supports WAP, Forest Stewardship Program, Conservation Education).

(2) Assist with Envirothon and No Child Left Inside.

(3) Promote research and projects that allow better quantification of ecosystem services. For policy makers, landowners, land mangers and the public to fully embrace ecosystem services they need a greater understanding of how these benefits matter at the local level.

(4) Disperse information to the public regarding the benefits of forest management integrated with improved wildlife habitat management, clean water and well planned recreation using municipal involvement in management planning review, response to citizen concerns, clearly marked boundaries and informational signs at harvest sites.

(5) Post harvest schedules online with maps.

viii) The Yale University Sustainability Study, commissioned by DEP, was completed in 2008. The study indicates that DEP Forestry is currently harvesting approximately 30% of the available timber. The challenge is to meet the sustainable harvest goal of 9 million board feet of timber per year that the Yale Study references. This gap in sustainability reveals that only a portion of the ecosystem is being managed. The current State Lands Program is currently only 50% staffed. Four state forest units comprising about 60,000 acres are without forester coverage. This strains the remaining field staff and one supervisor to cover the unmanned areas for minimal management that will never approach a sustainable level without additional personnel. This will result in diminished ecosystem services, reduced economic importance and social value, increased invasive spread, and a degraded forest ecosystem in rural regions that will not be able to benefit equally with other areas of the state.

2) Forest Protection Unit

a) Background

Connecticut Statues require that the DEP maintain personnel and equipment to be able to respond to requests for assistance in the suppression of wildfire. Consequently, DEP Forestry staff and Parks and Recreation staff all have fire suppression as part of their job duties. Division of Forestry fire staff maintains wildland fire equipment and provides training to DEP staff to meet the intent of the law.

Connecticut is a charter member of the Northeast Forest Fire Compact (NE Compact) that was formed after the disastrous fires in Maine in 1947. This is a mutual compact between the New England states, New York, the National Forest System in New England and four Canadian provinces. This is the oldest and most active fire compact in the country. Fire staff work on committees, train and coordinate all activities for compatibility.

The DEP has an agreement in place to move federally qualified firefighters and equipment to respond to fires anywhere in the U.S. Fire crews made up of twenty highly trained persons have responded to fires all over the country and individuals meeting very high training standards with specialized experience have responded as well. These "national mobilizations" form the background of a very skilled workforce that makes the fire staff the best in Connecticut. The National Wildfire Coordinating Group (NWCG) is the body that develops standards for training, equipment and experience for national response.

Connecticut fire staff annually train DEP employees in wildland fire suppression and tactics. In addition free training is provided to any fire department. Annually over 1000 local firefighters are trained. There is a close working relationship with local fire departments.

Five years ago the Connecticut Rural Fire Council was formed to provide an improved conduit to the DEP fire staff and the local fire chiefs. The Council is made up of representatives from county chief's organizations and reviews DEP programs and identifies rural fire issues.

Wildland Urban Interface (WUI) is where the "wildlands" and people coexist. When people move into former wooded areas there are increased wildland fire issues that emergency responders must deal with. Although other areas of the country have very expansive WUI problems, Connecticut has its own set of concerns facing the fire departments and Emergency Responders. Nationally there are several programs that deal

with WUI to help provide information, relevance and continuity to interested parties. Firewise is one such program that has gained national recognition.

b) **Vision**

i) Connecticut is a wealthy state that thrives on the home rule concept. Volunteer, paid and combination fire departments are independent yet are struggling to maintain membership, training requirements and high service to the public that they serve. The Division of Forestry has the skills necessary to meet the statutory requirements to assist fire departments with fire suppression through highly trained personnel and ready equipment. Fire departments depend on the Division of Forestry for the highest quality wildfire training, suppression assistance, knowledge of the Incident Management System (ICS), and the National Incident Management System (NIMS). The Division of Forestry has thorough knowledge of the rural fire needs and wildland urban interface concerns. A well coordinated communications system and partnership between the state and the fire departments can help to achieve a safe wildfire working environment, an efficient suppression effort, reduce the number of acres burned and protect the lives of Connecticut's citizens and reduce property damage.

c) **Mission**

i) Maintain NWCG safety standards for Connecticut wildland fire fighters.

ii) Maintain/improve annual wildland fire training for Connecticut wildland firefighters.

iii) Maintain/improve all equipment. Add equipment to improve efficiency and service.

iv) Maintain an active Connecticut Rural Fire Council.

v) Strive to get active Northeastern Compact Commissioner's appointed by the Governor's office.

vi) Continue with strong Northeastern Compact support and return to active participation at all levels.

vii) Maintain/improve wildland fire training to Fire Departments (FDs)

viii) Improve Wildland fire statistics.

ix) Continue with support of National Mobilization.

x) Improve capability of Wildland Fire Investigation.

xi) Improve in-state Incident Management Team (IMT) experience and capability.

xii) Improve our relationships/build coalition with partners and potential partners.

xiii) Improve our Prescribed fire program

*xiv)*Improve public/DEP knowledge of the fire program.

xv) Improve efforts to meet the Rural Fire Issues identified by the Connecticut Rural Fire Council.

*xvi)*Improve ability to get precipitation data for fire weather predictions.

d) **Critical Success Factors**

i) Maintain funding from USDA Forest Service (USDA FS) for operational needs.

ii) Continue to receive the highest quality training for staff

iii) Get DEP buy in for program. Develop stronger relationships with DEP Law Enforcement & Air Bureau.

iv) Maintain an active Rural Fire Council.

v) Strengthen our involvement with Non-Governmental Agencies (NGOs) to foster close working relationships.

vi) Strengthen our relationship with Department of Homeland Security and Emergency Management (DHS & EM) to assist with ICS/NIMS, IMT development.

vii) Look to change the Connecticut Environmental Policy Act (CEPA) requirements to allow for larger prescribed burns on State Forests.

viii) Refill vacated fire position as Rural Fire Coordinator.

ix) Update State Fire Standard Operating Procedures (SOP).

e) **Strategies & Actions**

i) Maintain NWCG safety standards for Connecticut wildland fire fighters. Upgrade as necessary.

ii) Maintain/improve annual wildland fire training for Connecticut wildland fire fighters.

(1) Continue to create new training materials for in-state firefighters and bring appropriate NWCG training classes.

(2) Improve flexibility of personnel through training/experience.

(3) Strive to have 1 NWCG Engine Boss by 2010, 3 by 2011.

(4) Utilize NE Compact to provide training assistance as needed.

(5) Provide training assistance to Northeastern Compact as needed/requested.

(6) Utilize Federal grant funds through the Northeastern Compact for training as necessary.

(7) Provide Leadership classes as appropriate.

iii) Maintain/improve all equipment. Maintain to NWCG specifications as much as possible and where appropriate.

(1) Make/upgrade equipment to achieve maximum flexibility.

(2) Maintain minimum NWCG standards for all engines.

(a) Strive to have 3 Type 6 engines available for National assignments by 2011.

(3) Replace laptops as needed with appropriate software.

(4) Replaced assigned vehicles as needed.

(5) Utilize Federal grant funds through NE Compact for equipment as necessary.

iv) Maintain an active Connecticut Rural Fire Council

v) Strive to get active Northeastern Compact Commissioner's appointed by Governor's office.

(1) Improve dialogue with Commissioners

(2) Gain active support

vi) Maintain/improve wildland fire training to FDs

(1) Improve numbers of Fire Fighter 1(FF1) Wildland Firefighter classes

(a) Open discussion with Fire Academy on DEP being lead.

(b) Identify ”other” wildland fire training cadre

(c) Develop training curriculum/monitor.

(2) Continue with Fire Academy Recruit training.

vii) Improve Wildland fire statistics to be more accurate, increase number of FDs participation

(1) Better info from all-cause/size-work with dispatch areas.

(2) Develop better reporting program to support national needs (Texas).

(3) Get better handle on loss of structures and structures threatened due to wildland fire.

viii) Continue with support of National Mobilization

(1) Provide minimum of two crews

(a) Upgrade all crews to Initial Attack (IA)

(2) Provide 12-15 different overhead positions.

ix) Improve capability of Wildland Fire Investigation

x) Improve in-state IMT experience and capability

(1) Partner with DEP Law Enforcement for search & rescue.

(2) Build broader capabilities for all wildland fire positions.

xi) Maintain and improve the Federal Excess Property Program (FEPP)

(1) Encourage FDs to get access to Federal purchasing contracts.

(2) Maintain current FEPP equipment and inventory

(a) Evaluate the current Fire Fighter Program.

f) **Hazard Mitigation**

i) Develop workable plans to meet issues identified by the Connecticut Rural Fire Council Survey – (rural water supply, access issues, house numbering).

ii) Address issue of Rural Fire needs and WUI

iii) Review Community Wildfire Protection Plans for their applicability and relevance to Rural Fire Issues

iv) Review Firewise for relevance to Rural Fire Issues

v) Review areas of State property where fuel reduction could be a concern and develop plans to mitigate situation.

vi) Prescribed Fire

(1) Strengthen our involvement with NGOs to foster close working relationships.

(2) Prescribed burning can be a common link – Audubon, The Nature Conservancy.

(3) Strengthen our relationship within DEP with air compliance (prescribed burning issues)

(4) Look to change the CEPA requirements to allow for larger prescribed burns on State forests.

(5) Increase the number of qualified burn bosses and safety officers.

(6) Look to improve large grassland habitats through burning coordinated with DEP Division of Wildlife.

(7) Review prescribed fire policy and be sure there is enough flexibility to allow for assisting FDs, provide training and develop relationships with NGOs

vii) Improve public knowledge and understanding of fire program

(1) Notify chief elected officials of funding awards

(a) Media notification

(2) Improved website.

viii) Continued prevention and education activities

(1) Maintain strong Smokey Bear message

(2) Continue to have strong media ties to deliver prevention message during periods of high fire danger.

ix) Continue to work with DEP's Education programs to provide quality wildfire prevention information.

3) Urban Forestry

a) Vision

i) Urban forestry is seen as an essential contributor to the quality of life throughout Connecticut. Governmental bodies, civic organizations, private property owners and citizens in general all know that each of them has a role in keeping the urban forest thriving and healthy. All of Connecticut's cities and towns have strong urban forestry programs that provide essential benefits to local residents.

ii) Urban forests are managed with recognition of their critical role in the quality of life in Connecticut. The Connecticut Urban Forest Council, Department's Division of Forestry, UConn's Cooperative Extension system, and other organizations continue to inform community decisions makers, private property owners, legislators, concerned citizens and the public at large about the importance of trees, the contributions made by trees and their needs. All individuals and groups work to develop policies designed to promote progressive and appropriate urban forestry programs and practices throughout the state.

b) Mission:

i) Build local capacity by providing leadership and support in the development of community management plans for urban forestry, local ordinances and policies relative to urban forestry, community advocacy and advisory groups and to encourage communities to have professional urban foresters on staff.

ii) Administer the small grant program to municipalities and non-profits.

iii) Establish and maintain creative and productive collaborations with other groups throughout the state.

iv) Support the two most important state laws with regards to urban forestry and quality tree care:

(1) The two laws are the Tree Wardens Law (Connecticut General Statute Section's 23-58, 59 and 65) and the Arborist Law (Connecticut General Statute Section's 23-61). This effort gibes with support for the Tree Wardens Association and Connecticut Tree Protection Association (CTPA).

v) Establish and maintain creative and productive collaborations with other programs within the Department.

vi) Support research and information gathering efforts regarding urban trees throughout the state.

vii) Support publications that assist with information gathering and outreach efforts.

viii) Support local non-profit and volunteer groups throughout the state

ix) Provide basic leadership on issues of importance to urban forestry.

x) Work directly with municipalities to help them bolster local urban forestry efforts.

xi) Provide outreach and support to groups and individuals regarding basic tree care and the importance of trees outside of the forest.

xii) Support urban forestry outreach and education efforts

c) Critical Success Factors

i) Maintain a well trained and knowledgeable program staff that is apprised of current issues and of those techniques, programs or resources available to address those issues.

ii) Continuing the practice of supporting existing collaborations and cultivating new ones.

iii) Continued funding of small grants program to municipalities and non-profits. This is the program's key tool for providing outreach and direction to municipalities and non-profits throughout the state. It is the best way to cement gains, in terms of understanding and partnerships, all the while also getting good work done.

iv) In David J Nowak and Jeffrey T Walton's report entitled Projected Urban Growth (2000 – 2050) and its Estimated Impact on the US Forest Resource, they project that more than half (61%) of the Connecticut's forestland will be subsumed by urban growth between 2000 and 2050. Regardless of the outcome of efforts to retain forests as forests, inevitably there will be increased need for communities to take a proactive approach to urban forestry and therefore an increased demand for our assistance. In order to adequately meet anticipated demands program capacity must increase resulting in more feet on the ground and additional financial support.

v) Continue to coordinate with the Division's service foresters with respect to providing management advice and assistance on municipally owned forest lands.

d) Strategies & Actions

i) Administer the small grant program to municipalities and non-profits: As previously stated this is the urban program's key tool for providing outreach and direction to municipalities and non-profits throughout the state.

ii) Establish and maintain creative and productive collaborations with other groups throughout the state: These groups include the Connecticut Urban Forest Council, CTPA, Tree Wardens Association, UConn Cooperative Extension, UConn Technology Transfer Center, Connecticut Nursery and Landscape Association and other organizations with a stake in urban forestry.

iii) Establish and maintain creative and productive collaborations with other programs within the Department: Urban forestry is a natural fit with the water quality and air quality groups, along with groups working on carbon management, climate change and, basically, all programs within forestry.

iv) Support research and information gathering efforts regarding urban trees throughout the state: These efforts include the Connecticut Agricultural Experiment Station's work on urban tree population studies, the urban tree canopy cover analyses being done for New Haven and Hartford by these cities in conjunction with the US Forest Service, the University of Vermont, UConn CLEAR and the Department, and also the many inventories and analyses going on throughout the state at the local level.

v) Support publications that assist with information gathering and outreach efforts: UConn Cooperative Extension has been in the lead in publishing useful urban forestry information, which has proven its value to the urban forestry programs throughout the state many times over. Other publications, such as those produced by non-profits and by the US Forest Service, are also of high value.

vi) Provide support to local non-profit and volunteer groups throughout the state: Local non-profit and volunteer groups have proven to be invaluable as bulwarks for the advance of urban forestry at the local – especially, the local municipal – level. In larger cities, these groups have tended to be well-established non-profits with paid staff, in smaller cities and in the towns, these are often volunteer groups that may or may not be incorporated 501(c)3 non-profits, and in the smaller towns and villages, these are often individuals who have chosen to champion the cause. Each has different needs, including different financial needs. All require support.

vii) Provide outreach and support to groups and individuals regarding basic tree care and the importance of trees outside of the forest: There is an ongoing need for basic information regarding tree selection, tree planting and tree care. Similarly, there is a need to disseminate information regarding the importance and value of trees for people throughout the state. The urban forestry program can and should take a role in these outreach efforts. This is particularly important with respect to that part of the urban forest that is on private property.

viii) Place special focus on the larger cities and the urban core areas: The older and more densely populated areas of the state tend to present issues and challenges that are unique in the state. These issues and challenges should be recognized and provided support commensurate to their importance to the number of people affected.

ix) Place special focus on those parts of the state undergoing the most population growth and development: The issues raised in the suburbs and those in the more rural parts of the state are often different from those in the urban core, but are nonetheless important to the state urban forestry program.

x) Work directly with municipalities to help them bolster local urban forestry efforts:

xi) Municipalities often 'need a hand' with respect to planning or implementing local urban forestry activities. In addition, programs such as Tree City USA provide opportunities to express public pride and commitment to municipal urban forestry efforts. Efforts in support of these activities help build local awareness and often lead to increased involvement in urban forestry efforts.

xii) Attendance by program staff to critical training and informational meetings is essential. Beyond the technical aspect of such meetings they often provide the opportunity for peer to peer exchange of ideas, experiences and discussions on issues and potential resolutions that are of particular importance. It is also imperative that interested staff from other programs be given the opportunity to cross-train.

4) Private and Municipal Lands

a) Vision:

i) Landowners (private and public) have all the resources (i.e., incentives, tools and guidance) at their disposal to completely understand and make intelligent fully informed decisions regarding the environmentally and fiscally sound management of their forest lands. The policymakers, forest landowners, public and certified forest practitioners understand the many benefits of forests and forestry and cooperatively and aggressively work together to implement policies and programs that help keep forests as forests. A sufficient pool of competent certified professional loggers and foresters exists to meet the needs of forest landowners, municipalities and the industry. In addition, a sufficiently strong local industry and markets exists for traditional and nontraditional forest products, nontimber products and ecosystem services to encourage and enable landowners to maintain their forests as forests.

b) Mission:

i) Forest Land Taxation (Public Act 490, 10 mil) – Provide training and assistance to certified foresters, landowners and municipal assessors on statutes and regulations pertaining to the classification of land as forest land.

ii) Landowner incentive programs - In collaboration with other state and federal agencies, provide guidance and assistance in the design and implementation of programs that provide incentives to landowners including but not limited to cost share programs.

iii) Forest landowner assistance – Provide landowners (private and public) with sufficient, accurate, unbiased and state-of-the-art forestry expertise respecting and balancing landowner goals with fiscally and environmentally sound management practices. Such expertise is provided in one-on-one consultations and site visits and through education and outreach programs.

iv) Keeping forests as forests –Provide outreach, education and assistance to forest landowners, municipalities, policymakers, forest industry and citizens on the benefits and means by which landowners and communities may retain forests as forests.

v) Assistance to other Division programs – One of the missions the service forestry program has traditionally engaged in is assistance in the form of manpower, support, outreach and education and technical expertise to the urban forestry program (e.g., municipal tree worker workshops), the forest protection program (e.g., ALB and forest fires), the state lands management (e.g., boundaries and timber marking), the forest planner (e.g., Forest Legacy) and the forest practices act program (e.g., certification examinations).

vi) Public outreach and education – Provide or assist other programs and organizations in providing schools, organizations, municipalities and citizens with education and training on forests, forestry and the critical issues facing both.

vii) Forest Stewardship – With the guidance and assistance of the Forest Stewardship Committee and in collaboration with our partners and stakeholders, work with foresters and landowners in the preparation and implementation of forest stewardship plans that help landowners achieve their resource objectives in a sustainable manner. In addition, the Division has the responsibility of approving stewardship plans written by private foresters and operating a monitoring program which tracks implementation performance.

viii) Climate change – In collaboration with other programs, Division's and partners support and assist with the design, implementation outreach and education of processes and programs designed to mitigate the impacts of climate change.

ix) Provide leadership through our awareness of forestry related issues as they relate to forestland owners and through our knowledge of forestry and forest practices to a range of audiences, including the landowners themselves, policy makers and forest professionals.

c) Critical Success Factors

i) Maintain a well trained and knowledgeable program staff that is apprised of current forestry issues and of those techniques, programs or resources available to address those issues.

ii) Build and maintain partnerships – The key to future success will be built upon maintaining and cultivating new partnerships that support private forest lands, forest stewardship and sustainable forest management. Key programs and partnerships are the new forest landowner assistance program authorized under the Farm Bill and administered by the Natural Resources Conservation Service and the Biomass Crop Assistance Program administered by the Farm Services Agency.

iii) Support additional research in critical areas such as best management practices, forest landowner dynamics and communications and social impacts on forests and forestry that will lead to improvements in environmental performance and provide greater understanding of the interactions between landowners, society and the environment. The outcomes of such research will help direct the Division as it focuses limited

resources on key issues such as fragmentation, regressive harvesting and invasive species control.

iv) There are 25,000 landowners owning ten acres of forests or more leaving each service forester to service more than 8,000 owners each. With these numbers in mind implementation and achievement of the Division's vision, missions and strategies is already very challenging. Compounding this is the fact that all of the staff is currently eligible for retirement. The potential loss of such a significant level of expertise and institutional knowledge in such a short period of time would be a devastating setback to achieving the vision. Short-term success, i.e., maintaining the status quo, will be very dependent upon working with our partners and cross-training and mentoring of staff from other Division programs in order to maintain the continuity and quality of service. Long-term success, i.e., implementing strategy and progression toward achieving the vision, will require a combination of an investment in and use of technology and placing more feet on the ground.

v) Landowner incentives – Recent incentives programs (aka cost sharing) have been short-lived and underfunded resulting in lost confidence and interest of many forestry professionals. Interest and confidence need to be rebuilt through the careful long-term implementation of the new cost share program. Landowner incentives must go beyond traditional cost-sharing programs. Building strong and diverse local markets for traditional and nontraditional forest products, non timber products and ecosystem services provide powerful incentives for landowners to keep their forests as forests. Creation of favorable state and federal taxes laws regarding estates and the sale of products are also critical. As favorable incentives are created, it is essential that disincentives such as liability, timber encroachments and theft and poorly written or inconsistently implemented laws governing forest practices be eliminated.

vi) Renewal of the 10 Mill forest land taxation is on the horizon. The Division needs to provide strong leadership in crafting and advocating for a process that provides landowners the incentives necessary to keep forests as forests.

d) Strategies & Actions

i) Outreach and education:

(1) Landowners (private and municipal) – In collaboration with our partners, provide assistance and guidance in forest management including but not limited to silviculture, invasive species, landowner incentives, forest land taxation and fragmentation. Efforts using traditional means such as one-on-one contacts, workshops, meetings, demonstrations, publications and the internet should continue but identifying and investing in additional effective and efficient means of outreach to traditional and nontraditional landowners is essential to long-term success.

(2) Public – In collaboration with our partners, provide or assist with outreach and education efforts with schools, private and municipal organizations and the public

on understanding the many benefits of forests and forest stewardship. Continue collaboration with and support of the Bureau of Outdoor Recreation on their very successful No Child Left Inside program and expand collaboration with the Department's Air and Waste programs concerning the utilization of biomass. Continue support of other key efforts such as the Envirothon and Project Learning Tree.

ii) Staff training: Attendance by program staff to critical training and informational meetings is essential. Beyond the technical aspect of such meetings they often provide the opportunity for peer to peer exchange of ideas, experiences and discussions on issues and potential resolutions that are of particular importance. It is also imperative that interested staff from other programs be given the opportunity to cross-train.

iii) Research: Research concerning landowners is essential and must continue. Identifying who these landowners are and understanding their attitudes will greatly improve our ability to efficiently and effectively provide services.

iv) Landowner incentives: Rebuild interest and confidence of forestry professionals and landowners in cost sharing programs. Assist other programs in advocating for policy and laws that build strong and diverse local industry and markets. Advocate for favorable state and federal taxes laws regarding estates and the sale of products. As favorable incentives are created, it is essential that the Division be a strong advocate of and actively work toward breaking down and eliminating disincentives such as liability, timber encroachments and theft and poorly written and implemented laws governing forest practices be eliminated.

v) Forest Stewardship: Continue to support and assist landowners and forestry professionals writing and implementing forest stewardship plans.

vi) Partnerships: The Division must continue to collaborate with and support the forest stewardship and forest land conservation related efforts of organizations such as Tree Farm, Coverts, Connecticut Forest and Park, Eastern Connecticut Forest Landowners, Conservation Districts, Connecticut Forestland Council, Nature Conservancy, Trust for the Public Lands the Goodwin Collaborative and other stakeholders.

vii) 10 Mill forest land taxation: In collaboration with our partners and municipalities craft those policies, statutes or regulations that are necessary to enable landowners to keep forests as forests.

viii) Continue working with the Division's state land management program and the Goodwin Conservation Center in demonstrating forest land management and providing conservation education.

4) Forest Practices Act

a) **Vision:**

i) The implementation and enforcement of the certification and conduct regulations authorized by the Forest Practices Act has contributed significantly to the credibility of the profession

and provided a firm footing for improving the public's perception of forestry and timber harvesting. The success of this program was and remains a critical factor in aiding private forest landowners in keeping forests as forests.

ii) The future success of the program will be built on maintaining an environment whereby forest landowners are served by highly competent certified forestry and logging professionals. Understanding landowner's goals, certified forest practitioners use their expertise to guide landowners toward the implementation of safe and environmentally sound forest practices.

b) Mission:

i) Establish, implement and maintain minimum standards for excellence that forest practitioners must demonstrate to achieve and maintain certification while promoting an environment that encourages certified forest practitioners to perform beyond such standards (Connecticut General Statutes Section 23-65h).

ii) Establish, implement and maintain an outreach and education program targeting the forest industry, forest landowners and regulating government agencies on the provisions of the Forest Practices Act and other statutes and regulations that impact forest management and operations.

iii) Collaborate with other Division programs and partners to coordinate and implement a program of outreach and education with the forest industry, forest landowners, public and regulating government agencies on best management practices and matters relating to forest operations and forest management.

iv) Enforce the Forest Practices Act and all subsequent regulations and collaborate and support other local, state and federal agencies with compliance of all other environmental laws (civil and criminal) related to forestry practices.

v) Collaborate with other Division programs and partners to assure that forest landowners have the opportunity to consider, without bias, all available options to manage their lands.

vi) Encourage cooperation and understanding between the forest industry, forest landowners, the public and local and state agencies on issues surrounding forestry and related environmental policies and practices.

vii) Collect, observe, assess and report on the annual forest management and utilization activities of Connecticut's certified forestry professionals.

viii) Review and approve regulations to govern forest practices from those municipalities authorized to implement such regulations (Connecticut General Statutes Section 23-65k).

c) Critical Success Factors

i) Maintain a knowledgeable and experienced program staff at current levels – while the primary charge of the program requires regulatory skills, significant knowledge and experience in non-regulatory subjects such as utilization and marketing is often required to work with the industry and service forestry skills is often employed while working with landowners.

ii) Building and maintaining partnerships – while the Division stands alone during the conduct of its regulatory function, the key to success is built upon its partnerships and non-regulatory outreach and education of forest landowners, regulating government agencies, the forest industry and the public.

iii) Support additional research in areas such as best management practices and forest landowner dynamics and communications that will help maintain standards and better enable the program to focus its limited resources

iv) Municipalities, forest landowners, the general public and the forest industry have all benefitted from the increased professionalism and goodwill generated through the continuing education component of the Forest Practices Act required of all certified forest practitioners. For continued success, the program must build on this momentum and strive to improve the program by addressing several key issues such as the course cost and availability and course saturation.

v) Continue to seek the advice and guidance of the Forest Practices Advisory Board (Established pursuant to Connecticut General Statutes Section 23-65g) and other stakeholders concerning the Division's programs, regulations and policies regarding forests, forest health, forest practices and certification of technically proficient forest practitioners.

vi) Cross training and mentoring of staff in other Division programs

d) Strategies & Actions

i) Staff training:

(1) Attendance to critical training and information meetings is essential. Beyond the technical aspect of such meetings they often provide the opportunity for peer to peer exchange of ideas, experiences and discussions on issues and potential resolutions that are of particular importance.

ii) Continuing education of certified practitioners:

(1) Working collaboratively with new and established government and nongovernment partners, continue seeking improvements in this very successful continuing education program addressing the need for new and innovative training methods and classes and assuring that a variety of quality educational opportunities are offered at the lowest cost possible, at sufficient intervals while avoiding course saturation.

iii) Landowner assistance, outreach and education:

(1) Working collaboratively with our partners and other Division programs, utilize established, new and innovative means and tools to provide landowners with critical information enabling them to make intelligent decisions concerning the management of their forest lands. Such information will include but not be limited to: Best Management Practices, programs governing the certification and conduct of forest practitioners, forest management and harvesting operations.

iv) Local and state agency assistance, outreach and education:

(1) Working collaboratively with new and established government and nongovernment partners, provide information and training opportunities for regulatory agencies whose responsibilities impact the conduct of forest practices.

(2) Provide technical assistance to municipalities, other agencies and programs with respect to the conduct of a particular forest practice(s).

(3) Review and approve regulations to govern forest practices submitted by those municipalities authorized to implement such regulations (Connecticut General Statutes Section 23-65k)

v) Annual reports:

(1) Collect, evaluate and report Connecticut's forestry activities through the collection of annual reports that are submitted to the Division of Forestry by certified forest practitioners.

vi) Communications:

(1) Utilize established, new and innovative ways to improve understanding and cooperation between forest landowners, the forest industry, the general public and regulating government agencies.

vii) Forest Practitioner Certification:

(1) Working collaboratively with partners, continue to provide comprehensive and current training materials to enable applicants to meet the minimum standards for excellence that forest practitioners must demonstrate to achieve and maintain certification.

(2) Maintain an active and effective program measuring and enforcing practitioner certification, practitioner conduct and best management practice compliance.

5) Utilization and Marketing

a) Vision:

i) Connecticut's forest landowners and industry are able to provide traditional and non-traditional forest products, non-timber products and ecosystem services to the state, nation and world from a sustainable and diverse forest resource. Success creates local jobs and provides landowners with the means to maintain their forests as forests and supports a robust and stable forest products industry.

b) Mission:

i) Encourage the development of sustainable markets for traditional and non-traditional forest products, non-timber products and ecosystem services from the state's rural and urban forests.

ii) Convey to the public and policy makers the economic importance and social value of Connecticut's forest industry and forest products, including the economic importance and social value of traditional and non-traditional forest products, non-timber products and ecosystem services.

iii) Encourage and support existing and future opportunities for third party green certification

iv) Observe, assess and report on the annual forest management and utilization activities of Connecticut's certified forestry professionals.

v) Collect, assess and convey information concerning new and innovative business and market opportunities.

vi) Promote the sustainable use of Connecticut's forest resource in a way that maintains or improves biodiversity.

vii) Encourage and support a strong forest industry and solid markets for Connecticut forest products so as to better enable forest landowners to maintain their forests as forests

viii) Provide outreach and education to the forest industry to improve safety, competitiveness and environmental performance

ix) Promote cooperation and understanding between local and state regulating entities and the forest industry and landowners

c) Critical Success Factors

i) Maintain a well trained and knowledgeable program staff that is apprised of current industry issues and is aware of the techniques, programs or resources available to address those issues.

ii) Supporting existing partnerships and encourage the development of new partnerships.

iii) Collaborate with partners to provide educational opportunities for the forest industry, forest landowners, and government agencies on matters concerning and impacting forestry practices.

iv) Enhance cooperation and communications among the forest industry and local government and state regulatory agencies.

v) Promote research and projects that allow better quantification of ecosystem services. For policy makers, landowners, land managers and the public to fully embrace ecosystem services they need a greater understanding of how these benefits matter at the local level.

vi) Cross training and mentoring of staff in other Division programs.

vii) Expand collaboration with the Department's Air and Waste programs concerning the utilization of biomass.

d) Strategies & Actions

i) Engage the forest industry concerning evolving issues through the Forest Practices Advisory Board and through cooperation and partnerships with professional forestry organizations such as the Connecticut Professional Timber Producers Association, Inc., (TIMPRO) and the Society of American Foresters.

ii) Improve cooperation and communication among the forest industry, forest landowners and local government and state government.

iii) Collect, evaluate and report on Connecticut's forestry activities through the collection of annual reports that are submitted to the Division of Forestry by certified forest practitioners.

iv) Revise and update the "The Forests and the Connecticut Economy". This report, which describes the role of forest products industry in Connecticut's economy, is based on data that is nearly ten years old. The report should be expanded to include non-traditional forest products, non-timber products and especially ecosystem services.

v) Gather and analyze information on the impact of woody biomass harvesting. Utilize the outcome to establish a comprehensive set of best management practices for woody biomass harvesting.

vi) Collect and report data concerning the state's primary and secondary wood processors

vii) Collect, assess and report data pertaining to harvesting, the forest industry, forest landowners, public views and government regulations.

viii) Have staff and, where possible, key partners attend critical training and information meetings such as the Northeast Area Association of State Foresters Forest Utilization Committee. Such meetings provide the opportunity for peer to peer exchange of ideas, experiences and discussions on issues and potential resolutions that are of particular importance.

ix) Continue to provide support to the Master Logger and Tree Farm programs through which Connecticut's forest landowners are able to enter into the green certified wood market.

x) Create and encourage projects which demonstrate the best ways to utilize wood produced from urban forests.

xi) Collaborate with other Division programs and partners to provide continuing education opportunities to improve safety, competitiveness and environmental performance of the forest industry.

xii) Engage and support research and projects which quantify ecosystem services from both the rural and urban forests that will lead to greater understanding by the public and policy makers of the importance and potential value of those benefits.

Statewide Forest Resource Strategies Program Area Integration:

Connecticut Agricultural Experiment Station
Forest Health Program

Vision

The vision of the Cooperative Forest Health Program in Connecticut is to protect the state's timberland, urban forest, and non-commercial forest resources from significant loss of economic, ecological, or aesthetic value due to insects, diseases, other stressors, and unknown causes and provide future generations with healthy, sustainable forests.

Mission Statement

The mission of The Connecticut Agricultural Experiment Station is to develop, advance, and disseminate scientific knowledge, improve agricultural productivity and environmental quality, protect plants, and enhance human health and well-being through research for the benefit of Connecticut residents and the nation. Seeking solutions across a variety of disciplines for the benefit of urban, suburban, and rural communities, Station scientists remain committed to "Putting Science to Work for Society," a motto as relevant today as it was at our founding in 1875.

Since 1993, the Connecticut Agricultural Experiment Station (CAES) has implemented the State's Cooperative Forest Health Program. The Experiment Station is the plant pest regulatory agency for Connecticut. The Forest Health Program provides states with federal funds to detect, monitor, and evaluate forest health conditions on state and private lands. The funding enables states to collect forest health data in a standardized manner so it is compatible with other states for regional reporting. Additional support is provided by McIntire-Stennis forestry funds. The Experiment Station is in a unique position that combines forest research, pest survey, outreach, and regulatory response in one agency.

The Experiment Station, founded in 1875 as the first agricultural experiment station in the country, is chartered by the State's General Assembly as an independent agency governed by a board of control. Station staffers are state employees. They are not part of the Connecticut Department of Agriculture, Connecticut Department of Environmental Protection, or the University of Connecticut, but they work with all three institutions including the Cooperative Extension Service located at UConn. Station scientists make inquiries and conduct experiments regarding plant and their pests, insects, soil and water quality, food safety, and perform analyses for other State agencies. The station's main laboratories are located in New Haven with additional laboratories and farmland in Windsor; its Lockwood Farm is located in Hamden, and its Griswold Research Center is in Griswold and Voluntown.

Critical Success Factors

Connecticut has experienced many forest health problems in the last century. Chestnut blight, Dutch elm disease, gypsy moth, red pine scale, and butternut canker have all affected the structure and composition of Connecticut's forests. For example, chestnut accounted for 25% of Connecticut's growing stock before chestnut blight arrived. Now it forms only an understory shrub layer that is periodically killed back. The Experiment Station is a leader in research to develop blight-resistant Chestnut trees and reintroduce them to Connecticut's forests.

More recently, the hemlock woolly adelgid (HWA), an exotic insect from Asia, first appeared in south central Connecticut in 1985. Since then, the insect has slowly spread northward and now occurs in almost all the State's 169 towns. The adelgid caused branch dieback and tree mortality across the State- often in combination with other insects like elongate hemlock scale (another exotic species) and hemlock looper (a native defoliator). Alternatives for managing the adelgid, particularly in forests, are limited. Suppression of HWA by the Experiment Station working with the USDA Forest Service has been provided by research on systemic insecticides and the release of the adelgid predator Sasajiscymnus tsugae. At the beetle release sites, hemlocks in previously damaged areas have recovered and show healthy crowns. Targeted chemical strategies developed by an Experiment Station scientist working with the USDA FS and others has protected hemlock trees throughout the range impacted by HWA until biological interventions can fully implemented.

Another insect native to Asia poses a significant threat to our forests and the nursery industry in Connecticut. The Asian longhorned beetle, (ALB), Anoplophora glabripennis, was first discovered in Brooklyn, NY in 1996, in other areas around New York City, and then in nearby areas in New Jersey. Other infestations have been found in Chicago, IL; Toronto, Ontario; and most recently, Worcester, MA. The U.S. Department of Agriculture's Animal and Plant Health Inspection Service (USDA-APHIS), working with local and state partners, has quarantined infested areas and is attempting to eradicate the beetle by cutting and chipping infested and nearby host-associated trees. The infestation that has been estimated to be 12-15 years old, and to date, the quarantine area encompasses 74 square miles with over 16,000 infested trees found and a total of just over 25,000 trees removed from an area of about 2 square miles. The risk of this beetle being in or introduced to Connecticut is considered high.

An ALB management program relies on several approaches to eradicate the beetle. These are survey and detection to determine the limits of an infestation; eradication by cutting and chipping infested trees; chemical treatment of non-infested host trees; regulation to curtail movement of infested materials (firewood is a high-risk method of spreading the beetle!); research on the beetle; education and outreach to citizens; and restoration to replace trees with a non-host tree. Public outreach is a very important part of the program as all of the infestations have been detected by a citizen reporting the beetle to the proper authorities or bringing in a specimen for identification.

A second Asian insect, the Emerald Ash Borer (EAB), Agrilus planipennis, also poses a threat to Connecticut's ash trees. This beetle was first detected in southwestern Michigan in 2002 and was

found in Ohio in 2003, northern Indiana in 2004, northern Illinois and Maryland in 2006, western Pennsylvania and West Virginia in 2007, Wisconsin, Missouri and Virginia in summer 2008, and Minnesota, New York, and Kentucky in the spring of 2009. Since its discovery, EAB has killed tens of millions of ash trees in southeastern Michigan alone, with tens of millions more lost in Illinois, Indiana, Kentucky, Minnesota, Missouri, New York, Ohio, Ontario, Pennsylvania, Quebec, Virginia, West Virginia, and Wisconsin. Its appearance in Connecticut is considered likely in the next five years.

The question with all new exotic species is whether they will cause negative impacts like chestnut blight or Hemlock Woolley adelgid. We can only guess what impacts organisms like Asian longhorned beetle, emerald ash borer, Sirex woodwasp, or P. ramorum will cause in Connecticut's forests if they became established, but the potential consequences to the nursery industry, forest products industries, tourism, and environmental quality are huge. At the current time, federal and state quarantine and eradication of ALB and EAB would be the goal of the program if they are detected in the state. The program objective is to identify, manage, and reduce threats to forest and ecosystem health.

Specific Critical Success Factors include:

- Collaboration and communications with state (e.g., Connecticut Department of Environmental Protection; Cooperative Extension Service) and federal agencies (e.g., U.S. Forest Service; USDA/APHIS/Plant Protection and Quarantine), with forestry or forest pest responsibilities.
- Funding and infrastructure support from the State of Connecticut and agencies of the Federal government related to forest health monitoring, research, and response (e.g., U.S. Forest Service, USDA/APHIS/PPQ), particularly for pests of federal regulatory concern (i.e., Federal funding for an ALB eradication program). Infrastructure support includes availability of state vehicles, laboratories, and offices for research, survey, detection, and outreach activities.
- Input and communication with forest and plant health stakeholder groups such as Connecticut's Green Industry Coalition (CGIG), Connecticut Tree Protective Association, Connecticut Forest & Park Association, The Nature Conservancy, and Connecticut's garden clubs.
- Maintain survey and detection programs like the Cooperative Agricultural Pest Survey (CAPS) and National Plant Diagnostic Network (NPDN), and public access for pest reporting and identification. CAES is the lead agency for the CAPS program and a participant in the NPDN. Insect and plant pathogens are routinely identified for the green industry and the public through our insect inquiry and plant disease diagnostic laboratories. Many pests are detected through reports or specimens brought to diagnostic agencies and laboratories.
- Input from existing pest response and mitigation programs through after action reviews for U.S. quarantine pests such as ALB and EAB.

Develop and maintain appropriate regulatory structure, regulations, and response related to plant pests. The Experiment Station Director has Connecticut statutory authority for the regulation of plant pests (CT Statute Sec. 22-84).

Forest Health Program Strategies & Actions for Objectives

Connecticut's Cooperative Forest Health Program will accomplish the second S&PF national themes and objectives to protect forests from harm by identifying, managing, and reducing threats to forest and ecosystem health. The program addresses, in whole or in part, all the following nine elements suggested for a State Strategy for Forest Health. Specific actions for each objective follow. Some activities will fit under more than one objective.

1. Address exotic invasive species and the impact they have on forest resources.

The Experiment Station conducts research to address exotic invasive species and the impact these species have on forest resources. Research on forest health and exotic species are long-term activities, though some specific projects may be short-term (1-5 years) or long-term (+5 years) in duration. Regulatory activities will also address the introduction of exotic species. These will include:

- Conduct HWA surveys to determine HWA suppression or resurgence in northwest Connecticut in response to biological control efforts and abiotic factors such as winter mortality with extended low temperatures. See objective 4.
- Japanese barberry is listed as invasive in 20 states and is associated with enhanced densities of blacklegged ticks and detrimental impacts on Connecticut's native forested ecosystems and forest regeneration. Experiment Station research will continue on the effectiveness and relative costs of treatment combinations to control this plant, which will promote improved forest health throughout the state.
- The Experiment Station will breed chestnuts for orchard and timber trees and plant blight-resistant chestnut hybrids in forest clear-cuts to further progress toward restoration of the American chestnut as a tree in our forests. This is a long-term project.
- Necessary regulations will be drafted and submitted for approval for ALB and EAB (See objective 9 on flexibility of response to emerging situations).

2. Detect, monitor, and evaluate forest pests and forest health conditions.

Monitor forest health at permanent plots – The Experiment Station will detect, identify, and evaluate population trends of pests known to cause serious forest damage using aerial surveys, permanent ground plots (51), and other ground surveys as needed to confirm aerial findings of damage and predict next year's conditions. Conduct ¼ mile roadside surveys near each of the 51 permanent plots. As a part of these surveys, we conduct an annual state-wide aerial survey for gypsy moth defoliation and defoliation caused by other insects, such as the orange-striped oakworm. We also perform gypsy moth egg mass surveys to delineate potential problem areas for the subsequent year. This is supported by the core forest health funding from the US Forest Service and it is a long-term strategy (+5 years).

Conduct Asian longhorned beetle, Emerald ash borer, Phytophthora ramorum and Sirex woodwasp (Sirex noctilio) surveys - The Experiment Station will determine if these pests are present in Connecticut through survey and outreach and identification/diagnostic services to the

public, foresters, and other stakeholders. Surveillance is a long-term strategy depending upon detection/presence of the pests, which have not been found in Connecticut at this time (other than P. ramorum in a nursery, which was eradicated). However, some specific surveys are short term, 1-5 years, depending upon funding support. Detection of ALB, EAB, and P. ramorum will initiate a regulatory response from USDA/APHIS/PPQ and the Experiment Station. Specifically;

- We will conduct visual surveys for ALB at warehouses, industrial areas, town parks, and other similar areas considered to be at high risk based on location or product import history, and examine trees reported by the public as possible ALB infestations. Trained state foresters will also conduct visual survey for ALB.
- We will conduct bio-surveillance for EAB with the native, solitary wasp Cerceris fumipennis (Hymenoptera: Crabronidae). Short-term, 1-5 years.
- We will conduct Phytophthora ramorum surveys in wholesale nursery perimeter sites, a woodland site, and garden center perimeters. These locations complement the CAPS survey in Connecticut. Short-term, 1-5 years.
- We will conduct surveys for Sirex noctilio in western Connecticut as a part of the CAPS surveys. Trapping is conducted from June to September. Short-term, 1-5 years.

Conduct plant pest diagnostics - The Experiment Station will perform diagnostic sample processing and identification of forest pests and pathogens using Station expertise. The Experiment Station is a member of the National Plant Diagnostic Network (NPDN). The diversity of arthropod pests and plant pathogens received for identification is large. The Kenneth A. Welch Insect Inquiry Office in the Department of Entomology served 5,610 people in 2008, and 974 different arthropod species were identified. The hemlock woolly adelgid continued to be a leading pest of concern. The Plant Disease Information Office (PDIO) in the Department of Plant Pathology and Ecology handled 4,895 inquiries in 2008 and identified 153 different plant pathogens. This is an ongoing, long-term strategy (+5 years).

3. Conduct activities to maintain and improve forest health conditions and sustainability.

The Experiment Station's ongoing research is developing innovative methods of pest control and forest management that improve productivity while maintaining forest health. Other studies are examining the potential of prescribed fire to enhance oak regeneration, silviculture methods to increase tree crop production to help produce a sustainable economic return for private forest owners, tree populations in our cities and towns, barberry control impact on forest health, and forest dynamics over an 80-year period (the oldest such study in the United States). For example, carefully timed series of crop tree releases could increase regional forest productivity by 60%. The monitoring of forest dynamics is a very long-term program with assessments conducted every 10 years.

4. Reduce damage through effective peat management, including suppression and/or eradication.

With US Forest Service, McIntire-Stennis, and Hatch fund support, research and suppression activities that will reduce damage or help improve pest management will include:

- Evaluation of Sasajiscymnus tsugae survival and establishment, and assess trends in hemlock health in stands where predators have been released. Long term, +5 years.
- Refine and improve artificial diet formulations for HWA predator Sasajiscymnus tsugae (Coleoptera: Coccinellidae). Short-term, 1-5 years.
- Develop adult and larval diets for other mass-reared HWA predators Laricobius nigrinus (Coleoptera: Derodontidae) and Scymnus sinuanodulus (Coleoptera: Coccinellidae). Short-term, 1-5 years.
- Determine factors that affect the catch of wood-boring beetles in Lindgren funnel traps to improve trap efficacy and performance. Short-term, 1-5 years.
- Determine the identity, seasonal activity period, succession, and hosts of Connecticut Cerambycidae. Short term, 1-5 years.
- Refine chemical control of HWA and evaluate bark applications of systemic insecticides on hemlock and maple. Short-term, 1-5 years.

5. Represent forest entomology and pathology expertise within Connecticut

As a research institution, The Connecticut Agricultural Experiment Station has six Departments and the Valley Laboratory; each is led by a chief scientist who still conducts research and reports to the Station Director. The Forest Health Unit at The Connecticut Agricultural Experiment Station currently consists of the State Entomologist, Deputy State Entomologist, and 3 full-time and one part-time plant inspectors in the Department of Entomology. There are twelve scientists in the Departments of Entomology, Plant Pathology and Ecology, and Forestry and Horticulture who conduct research and survey on forest pests, diseases, or other forestry-related problems. Information gained from surveys and research is delivered to stakeholders by giving talks to civic groups; reports to town, state and federal officials; interviews with the media; scientific publications; and reports to the legislature, Eastern Plant Board, Forest Health Cooperators, and other relevant forestry meetings and workshops. In addition, the Experiment Station is a member of the National Plant Diagnostic Network.

6. Include education efforts where needed, such as the “do not move firewood” campaign to limit the spread of invasive insects.

Experiment Station staff will continue to provide talks and interviews on research and other activities to state foresters, the public, stakeholder organizations, and the public media. In addition, The Experiment Station participated in an ALB survey and outreach program (i.e., the Northeast Forest Pest Survey and Outreach Program supported by USDA/APHIS and US Forest Service) in 2009. The “do not move firewood” campaign was part of this outreach. All ALB infestations to date have been detected and reported by the public. Activities include the transfer information through presentations at annual meetings like the Eastern Plant Board, Forest Health Workshop, Cooperators Meeting, Northeastern Forest Pest Council, and Plant Science Day Open House. We will continue to write articles for the Tree Protective Association Newsletter, Frontiers of Plant Science, and the Connecticut Weekly Agricultural Report. Our annual Forest Health Monitoring workshop (February) fosters closer working relationships and transfers up-to-date information to the State Forester and Division of Forestry staff. This meeting is highly anticipated and has had increasing attendance every year.

7. Involve lead agencies for Cooperative Forest Health.

The Experiment Station is the lead agency for Cooperative Forest Health and a partner to the State Forester and the Division of Forestry, Connecticut Department of Environmental Protection (DEP) in the Statewide Forest Resource Strategy.

8. Collaborate regionally and nationally; collect forest health data compatible with other states.

The Connecticut Agricultural Experiment Station maintains excellent communication and working relationships with the State Forester and other foresters in the DEP, USDA Forest Service, USDA APHIS, and forestry and plant health officials in the region.

The Forest Health Monitoring (FHM) Off-Plot Program supplements plot data with landscape level data on forest stressors. The program promotes survey standardization among states, enhanced surveys of specific health problems, and regional forest health mapping and reporting to promote healthy sustainable forests. Long-term, +5 years. Specific activities in Connecticut supported by the Forest Health Monitoring Off-Plot Program are:

Survey about 1.8 million acres of forested land using national aerial survey standards. Maps will be either 1:100,000 or 1:50,000 scale. All areas with defoliation, discoloration, dieback and decline, breakage, and mortality above thresholds will be delineated. In addition, all other areas that are detected will be mapped and, where possible, identified by damaging agent. Damage will be verified by ground surveys. No fly (survey) areas will be indicated. Hard copy and digital aerial survey maps and insect and disease narratives will be provided to the NA Durham, NH Field Office by December 15th of each year. A representative of the State's Forest Health Program will attend the National Forest Health Monitoring working group meeting to report Off-Plot survey results. Canopy damage will be photographed during aerial surveys.

9. Include flexibility to respond to emerging situations that threaten forest health.

The Experiment Station will continue to monitor and respond to emerging situations in a timely manner. For example, pursuant to Section 4-170 of the Connecticut General Statutes, new regulations were proposed to quarantine the Asian longhorned beetle and Emerald ash borer in Connecticut. A public hearing was held and there is strong public support for the regulations. Although at this time, neither pest is known to be present in Connecticut, the beetle infests adjacent states. We needed to be prepared if we find an infestation of either insect species in Connecticut. At the time of this writing, the proposed regulations have received legal sufficiency review and have been submitted to the Legislative Regulations Review Committee of the Connecticut General Assembly.

Prioritized Implementation Schedule

Many of the strategies planned for the Forest Health Program have been implemented or are part of ongoing survey, research, and outreach activities.