

FISCAL YEAR 2011 ANNUAL REPORT

OF THE

CAROLINE A. FOX TRUST FUND

AND THE

**CAROLINE A. FOX RESEARCH AND
DEMONSTRATION FOREST**

Hillsborough, New Hampshire



Hillsboro-Deering Middle School Students and Staff at the Fox Tree ID Trail Head

STATE OF NEW HAMPSHIRE
DEPARTMENT OF RESOURCES AND ECONOMIC DEVELOPMENT
DIVISION OF FORESTS AND LANDS
FOREST MANAGEMENT BUREAU
July 2011

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Caroline A. Fox Research and Demonstration Forest
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Facilities

Buildings

Repairs to a section of the barn's north side, south side and re-roofing of the tractor shed (paid for with Capital Improvement funds approved by the legislature) were completed by the Department's Construction & Maintenance crew during the summer of 2010. Repairs to trim boards and around windows on the second floor of the house were completed by Fox Staff in the



fall of 2010. In the spring of 2011 issues with the barn's sill were found during work to replace damaged clapboards on the barn's south side. This section of sill was replaced by Fox staff. A contract for painting the house, barn and tractor shed (using Capital Improvement funds approved by the legislature) was approved in June 2011, with work planned for the summer of 2011. New exit and emergency lighting was installed in the Baldwin Center by the Department's Construction & Maintenance crew in the spring of 2011.

Grounds

Wood was cut and split by seasonal staff, from both Fox and the NH Forest Health Program, to burn in the furnace next winter. Wood came from trees cut by PSNH during power line construction along Concord End Road. During a Forest Management Bureau work day in the fall cord wood was stacked.

Work continued in the Christmas Tree Demonstration plantation adjacent to the Baldwin Center.

In February a one (1) acre area was cleared adjacent to the parking lot at Fox Forest Headquarters for an American Chestnut Seed Orchard.

Trails

During the summer of 2010 seasonal interns cleaned up debris from the winter.

In January 2011 repairs were made to the Monroe Hill tower.

The timber sale off Gould Pond Road (P1-535) was completed in February 2011. In the spring final cleanup of debris in the trails was completed and some minor re-routes were flagged. A new foot bridge was installed on the Ridge Trail using hemlock from the timber sale as headers and stringers. As part of the final landing cleanup, crushed rock was added and rocks were placed to delineate the parking area at Bog 4-corners.



During the 2010-11 school year students from Kim Sychterz's Hillsboro-Deering Middle School 7th-8th grade class completed work to rehab the Tree ID Trail first established by Ken Desmarais and Henry Baldwin, and formerly maintained by the Hillsborough Bird & Garden Club. Students repainted signs, built sign backs and developed informational posters for each tree species.

The Black Gum Swamp Guide, developed by the Division's Natural Heritage Bureau with funding from the NH Conservation License Plate Program, was updated and reprinted using Fox Forest funds in the 2010.

Staffing

Inge Seaboyer, who holds a Bachelor of Science in Forestry degree from University of New Hampshire, completed her fourth full year as Program Forester and her 26th year with the Division of Forests and Lands.



Inge Seaboyer
Program Forester
(Spring 2007 - Present)

After two and a half summers as a Fox Forest intern, Chris Richard, a 2010 graduate of the UNH Thompson School of Applied Science – Forest Technology Program, left at the end of July 2010 for a full time position in private forest industry.



Chris Richard
Forest Technician I

Peter Lucas continued as the sole Fox Forest intern for the remainder of the summer. Peter, a 2010 graduate of the four year school at Paul Smith's College in New York, carried on with resource inventory and provided invaluable assistance with timber sale layout. After spending the fall assisting with forest management duties in the Division's North Region, Peter returned to Fox in December. During the winter he assisted with trail maintenance, timber sale administration, resource inventory, stage one of the American Chestnut Foundation seed orchard project and most significantly completed the re-measure of all of the CFI plots on the east side of Fox Forest. In the spring he once again ably assisted with prescription cruising, timber sale layout, trail work and followed up the Seed Orchard clearing with additional brush saw work to control Asian bittersweet. Anticipating a return to the North Region, Peter prepared a manual for use by future Fox Forest interns and field maps for use by this year's new interns before leaving for a new job in the private sector at the end of May.



Peter Lucas
Forest Technician I



Randy Marcotte
Forest Technician I

Recent graduates of the UNH Thompson School of Applied Science – Forest Technology Program, Adam Taschereau and Randy Marcotte came on board on Peter's last day and hit the ground running doing resource inventory, helping to mark timber sales and trail work, including making many replacement signs for the trails at Fox. Adam is continuing his forestry studies in the UNH four year forestry program and Randy plans to enter the UNH Wildlife program in the fall.



Adam Taschereau
Forest Technician I



Paula Simpkins
Forest Technician I

Paula Simpkins continued to provide occasional coverage for evening programs at the Baldwin Center.

Jim Byers continued his exceptional stewardship of the facilities and grounds as part time Maintenance Mechanic and provided most coverage for the Baldwin Center on nights and weekends.



Harry "Jim" Byers
Maintenance Mechanic
Foreman

Research

Growth and Yield of White Pine

Fox Forest currently maintains many research projects concerning white pine. All the Eastern white pine projects fall under a single major research initiative called the “*Growth and Yield of Eastern White Pine*” project. Grouping the projects under this initiative unifies the direction of the research and enables individual projects to be integrated together.



Low Density White Pine at Bear Brook State Park

Existing projects in this category were measured and monitored as part of the continuing research at Fox Forest. These include study plots at a pre-commercial low density crop tree release study at Bear Brook State Park (P1-512).

Final crop tree release of a white pine plantation off Bog Road was completed as part of a commercial timber sale (P1-535). This continues to build on work done by Ken Desmarais at Mast Yard and Feuer State Forests.

Uneven-aged Management

Fox also has several ongoing projects dealing with uneven-aged silvicultural systems.



Group Selection in Red Oak – Northern Hardwood Stands -A commercial Group Selection/Crop Tree Release cutting (P1-535) was completed in an area dominated by a combination red oak and northern hardwoods off Gould Pond Road in an effort to assess the viability of maintaining red oak on these highly productive hardwood sites. The project builds upon work done by Ken Desmarais in a previous timber sale, which overlaps a portion of the current project.



Single Tree Selection – In the winter/spring of 2011 planning and layout was done for a commercial timber sale off Molly Jackson Road (P1-559). This project is a re-entry into an area harvested by Ken Desmarais in 1987, including a small unit of single tree selection cutting. In June 2011 four (4) permanent 10 BAF points were established in the unit to aid in marking and assessing the results of the single tree selection cutting method in this mixed wood stand.

Group Selection Cutting in White Pine-Red Oak-Red Maple, and Hemlock/Red Oak Stands – This same timber sale (P1-559) re-enters areas partially cut in 1987 which resulted in patches of regeneration - closely resembling group selection cutting. At this entry group selection cutting is the goal. CFI plots within the sale area were re-measured prior to marking and will be useful in tracking changes in the stands.

Early Successional Wildlife Habitat / Aspen Cloning



Initial assessment of vegetative reproduction of aspen in a small clear-cut done off the Oak Lot Road was very promising. This area involved old plantations damaged in both the 1998 and 2008 ice storms and an area of declining aspen clones. Aspen is generally thought to vegetatively reproduce (clone) best when vigorous healthy stems are cut. Aspen cut in this area were older and beginning to decline, however, root sprouting in the first growing season exceeded expectations. A trail side kiosk and interpretive poster were installed.

Forest Management and Invasive Exotic Plants

Concern over the impact of invasive exotic plants on silvicultural operations in the forests of New England has been rapidly growing over the past decade. What was once considered a minor annoyance in New Hampshire, largely limited to the seacoast and Merrimack and Connecticut River Valleys, has come into sharp focus of late. Dense understories of invasive plant species, including Oriental bittersweet and glossy buckthorn, threaten regeneration goals in many stands throughout the state. In forests not yet affected, neighboring populations of these aggressive seed producers raise the specter of additional invasion into our working forest. The very wildlife for which many of these species were originally intended to provide soft mast for act as a vector for seed into the forest. Increasingly, wildlife biologists are concerned that fruit from these plants do not provide the same nutritional value as native species. In areas with small populations eradication may still be a possibility, but such measures are expensive and time consuming – the watch word is “pick your battle”. Increasingly invasive plant communities in our woodlands have reached the stage where an eradication battle can be won. So how do we learn to manage in the face of these invaders?



Pre-harvest Treatment of Glossy Buckthorn - This new research initiative at Fox began by looking at an invasive problem in a planned timber sale area at Casalis State Forest in Peterborough where glossy buckthorn (and other invasive species with seed source on abutting old fields) had invaded the understory. During the summer of 2009, prior to harvesting, sample plots were re-measured to assess the effectiveness of the pre-harvest cut stem herbicide treatment done in conjunction with the Division's Forest Health Program in 2008. Pre-sale treatment is

recommended in some recent best management practices guidelines developed in other states. Early indications are that cut stem treatment of larger caliper stems was very effective. However smaller seedling sized stems remained. These findings are in line with findings from treatment of buckthorn with fire done by Jeff Ward of the Connecticut Agricultural Research Station, and Steve Eisenhaure the UNH Woodlands Manager. In the summer of 2010, one year post harvest, the plots were re-measured to assess the effectiveness of the treatments. Analysis of the data will be done later in 2011.

Post Sale Assessments/ Timed Meander - Sample design to assess the extent of invasive plant invasion into a managed stand is problematic. Studies show that a technique called a "timed meander" which is used for sampling for rare plants has shown promising results in assessing areas for invasive plants. In October of 2010 (when most native species had lost their leaves, but non-natives remained green) Fox staff used a version of this protocol to sample areas at Ballard State Forest in Derry, where shelterwood cuts and release of the resulting regeneration adjacent to a dense invasive (predominantly oriental bittersweet) seed source does not appear to have resulted in spread of the invasive plants. Initial assessment of the sampling seems to indicate that distance from seed source and density of established regeneration (prior to cutting) are both contributing factors to the spread of invasive plants into newly managed areas. Further assessment is needed to determine if we can indeed learn from past practices and apply them elsewhere as we learn to live with this new reality in New England's woodlands.

Post Sale Assessments/Detection Dogs - A similar protocol was planned for use at Fox Forest, for post harvest sampling in operations which occur in relatively close proximity to headquarters and abutting agricultural fields where dense invasive (predominantly oriental bittersweet) seed sources also exist. With invasive plants which are frequently spread by birds, is there a critical distance beyond which low density management and heavy cuts for regeneration are not at risk for invasion? Here, however, a new technique may be used. Nancy Lyons, of New England K-9 Search and Rescue, approached both Fox and the Forest Health Program with the idea of developing a pilot program using detection dogs to find insect pests or invasive plants. One of her dogs is "in training" and this technique will be tried out at Fox in the near future.

Invasive Plant Control around Fox Headquarters – In February of 2011 Phase 1 was begun to control invasive exotic plants in the vicinity of Fox Forest HQ and the future American chestnut seed orchard (see more below). The goal of this work is to eradicate or at least control the invasive exotic plants as a seed source, and so mitigate their impact on both the American



chestnut seed orchard and existing research projects in the vicinity of Fox Forest HQ. Since one of the attributes of invasive plant species is their ability to produce copious amounts of seed, which contributes to their further spread. Controlling bittersweet and other invasive exotic plants in the surrounding area is essential to establishing and maintaining the seed orchard project. It is also appropriate to try to limit the chance of a State owned property (in this case Fox Forest) as a source for invasive exotic plant dispersal when possible. Additionally, ongoing assessment of this project will serve as an example to judge the

validity of taking on extensive eradication/control of invasive plants in areas of similar dense invasions on NH State lands. Phase 1 consisted of mowing the Oriental bittersweet (and other invasive exotic plants) in conjunction with clearing for the seed orchard. Phase 2 – herbicide treatment of re-sprouts will take place in the summer of 2011. A series of three mowings (or brush saw treatments) and herbicide treatment of re-sprouts will follow these initial treatments.

Continuous Forest Inventory

Continuous forest inventory plots (CFI) were established at Fox Research Forest in 1952. Re-measurement took place in 1955, 1960, 1965, 1975, 1984 and 2001. As one of the longest standing CFI projects in the state, the information gleaned from the plots is of interest not only



for establishing management direction and cutting levels at Fox, but with researchers at UNH and beyond. The 2001 re-measure was done in conjunction with the UNH Department of Natural Resources and the Environment utilizing an undergraduate student to re-locate and re-measure the plots. However, attempts to affect a current re-measurement in a similar way has proved difficult. The return of Peter Lucas to Fox for the winter of 2010-2011 offered the opportunity for re-measurement of the Fox CFI plots in earnest. Beginning with three plots which fall in the Molly Jackson Road timber sale area, Peter completed the measurement of thirty four plots (some 3000 trees in all) on the east side of the Forest. Prior to his leaving in May, Peter completed data entry for all the eastern plots and readied the data for assessment. The remaining west side plots are currently scheduled to be re-measured during the summer of 2011.

Collaborations



The American Chestnut Foundation – American Chestnut Seed Orchard

This project involves working with The American Chestnut Foundation to establish a seed orchard to plant their B3F2 nuts (the 6th backcross, produced at breeding orchards including the one at Sheiling State Forest in Peterborough, NH). This will be one of several seed orchards which will eventually produce blight-resistant chestnuts to be tested through woodland out-plantings. Phase 1 of the project, clearing a one acre area off the parking lot near Fox HQ, took place in February 2011. During the summer of 2011 the area will be stumped, rocked and smoothed and planted to grass, which will be maintained until the orchard is planted starting in 2016. Test planting may take place as early as 2014.

Forest Health Program-Emerald Ash Borer



Emerald Ash Borer (EAB) continues to spread in the Midwest and pose a potential threat to New Hampshire's ash resource. Firewood continues to be the main method of spread. In 2010-11, prism traps for EAB were placed at locations at Fox and in the southwestern portion of the state as part of a larger cooperative effort with the New Hampshire Department of Agriculture and the USDA Animal & Plant Health Inspection Service (APHIS). The traps are designed to attract and capture adult beetles. Samples from prism traps for EAB were identified by Forest Health program staff in the Fox Forest lab. As of yet, EAB has not been found in any of the surveys.

Forest Health Program –Camp firewood Investigation

The rearing barrels in the Fox Forest barn continue to be used to monitor firewood suspected of being moved from locations with invasive pests. This included wood the State of Vermont confiscated at its campgrounds, and the State of Maine confiscated at firewood roadblocks in 2010. The wood was placed in rearing barrels in 2010, and later insects will be fumigated and sorted to determine what pests have already been accidentally moved by camp firewood into the region.



Forest Health Program/USFS – Walnut Pest Investigation

The rearing barrels were expanded in the spring of 2011 to also accommodate a project to rear insects which might be transporting disease to butternut and black walnut.

Forest Health/NH Department of Agriculture – Bark Beetles

Both the Forest Health program and John Weaver of the NH Department of Agriculture again put out traps for bark beetles at Fox in the spring of 2011.

Forest Health Program-Lepidoptera Collection

As part of the ongoing effort to create insect reference collections, the Forest Health program has continued to do light trapping at Fox and other locations, with Ray Boivin identifying and mounting samples in the Fox lab.

Forest Health/NH Department of Agriculture/APHIS – Acer mono Sentinel Trees



Asian long-horned beetle (ALB), while on our doorstep in Worcester MA, has yet to be discovered in New Hampshire. Should it arrive in NH, early detection is crucial to curtailing its impact. However, finding beetles at the early stage of an infestation is difficult. In the summer of 2010 an *Acer mono* (painted maple) sentinel tree was planted at Fox Forest as part of a larger project to use these trees as an early detection device while informing the public about the threat if ALB arrives. Work by Dr. Michael



Smith, a USDA insect behaviorist, showed that this species of maple is very attractive to ALB and therefore a good choice for sentinel or trap trees. More attractive to the beetle than Norway maple, it may be the most preferred host for ALB in the US. This survey technique uses susceptible host trees, in this case *Acer mono* trees, to help attract ALB beetles in locations which can be easily monitored. Additional *Acer mono* were planted in 2011 as part of a study in NH, VT and NY to test the “growing ability” of the tree species in the northeast.

Outreach/Education

Forestry Field Day

On October 23rd Fox Forest held its annual forestry field day. Inge Seaboyer was joined by Dr. Pamela Hunt, Avian Conservation Biologist for New Hampshire Audubon, for a morning program focused on early successional and shrubland wildlife habitat. A demonstration by the



Brown
Brontosaurus (to
maintain a block
of shrubland
habitat near the
parking lot)
brought out a
small but
enthusiastic group.

Cottrell – Baldwin Lecture Series

The eighth annual Cottrell – Baldwin lecture series was again held in the Baldwin Center at Fox Forest. This program is co-sponsored by the Society for the Protection of New Hampshire Forests. This year's three part series "*The Enduring History and Legacy of The Weeks Act Law of 1911*" celebrated the 100th anniversary of the Weeks Act, the law that created the eastern national forests. The first lecture, by Forest Historian, Dave Govatski, drew a large crowd for "*The Weeks Act and Creation of the White Mountain National Forest*". For the second lecture Marcia Schmidt-Blaine of the Plymouth State University History Department spoke to another good crowd, focusing on two prominent early activists who led the campaign to pass a national reform and policy to purchase and protect the forests of the Appalachian region, with "*Early Activism: The Legacy of Joseph B. Walker and Philip W. Ayers*". The series wrapped up with Rebecca Weeks Sherrill More, great-granddaughter of John Wingate Weeks, and "*The Weeks Act of 1911: Leadership, Community & Collaboration*" focusing how John Wingate Weeks' New Hampshire roots influenced his commitment to public service and his ability to facilitate the successful passage of the Weeks Act of 1911. One hundred and fifty people attended over the course of the three lectures.



Sustainable Forestry Walks

In September and again in February Hillsboro-Deering Middle School classes met with Inge Seaboyer at the Gould Pond Road timber sale area for a walk and discussion of sustainable forest management. The February walk happened just as the timber sale was wrapping up, and the students had the opportunity to see a “forwarder” up close.

Annual Potluck Dinner

The Friends of Fox 23rd Annual X-Country/Snowshoe Outing and Potluck Dinner was held in February. It included a hike with Inge Seaboyer to Monroe Hill Tower to see the reopened view. In the evening a good crowd enjoyed the variety of foods and a special travelogue by Priscilla Simm on her recent hill walking trip to Ireland.



Interpretive Posters



Kiosks and interpretive posters were installed at Mud Pond Bog, the Black Gum Swamp, and an Early Successional Wildlife Habitat Demonstration on the Oak Lot Road. A new kiosk was installed at the trail head at the junction of Whitney and Mud Pond Bog Road.

Meetings

Several organizations use the Baldwin Center at Fox Forest for meetings and workshops. This year the following organizations used the Baldwin Center:

Hillsborough Bird and Garden Club
Monadnock Herb Society
New Hampshire Fish and Game Department
Northeast Forest Pest Advisory Council
NH Timberland Owners Association
NH Timber Harvesting Council
Hillsborough Historical Society
Hillsborough Chamber of Commerce
Hillsborough Conservation Commission
John Stark Regional HS 9th Grade Science Class
Trailwrights New Hampshire
WAG
The American Chestnut Foundation

FOX FOREST BUDGET
010-035-52000000
July 1, 2010 to June 30, 2011

FY 2011
Budget

Class 20 - Current Expenses	\$10,000.00
Class 23 - Heat, Electricity & Water	\$6,052.00
Class 30 - Equipment	\$3,000.00
Class 50 - Personnel, Temporary	\$37,021.00
Class 54 - Trust Fund Expenditures	\$10,000.00
Class 60 - Benefits	\$2,832.00
Class 70 - In-State Travel	\$1,600.00
Class 80 - Out-of-State Travel	<u>\$500.00</u>
	<u>\$71,005.00</u>

FY 2011 Expenditures

Class 20 - Current Expenses	\$6,048.32
Class 23 - Heat, Electricity & Water	\$5,653.22
Class 30 - Equipment	\$661.39
Class 50 - Personnel, Temporary	\$35,625.97
Class 54 - Trust Fund Expenditures	\$4,851.92
Class 60 - Benefits	\$2,725.41
Class 70 - In-State Travel	\$462.51
Class 80 - Out-of-State Travel	<u>\$0.00</u>
	\$56,028.74
Transfer to General Fund for wages	\$16,500.00
	<u>\$72,528.74</u>
Total Expense	<u>\$72,528.74</u>