

Kellogg and Russ Forest projects.

2002 Project sand highlights

MacCreedy Reserve a new property in Jackson Michigan, 407 acres. Initiated a red pine management area 60 acres in size. Demonstrates 6 management options for red pine plantations.

Post wind storm – comparing beetle populations of *Tomiscus pinaderda* in damaged, and non-damaged red pine stands and damaged scotch pine stands.

Purdue researchers – work in black walnut plantation. Reviewed data information and then collected cuttings of the best sources for grafting.

Village of Augusta – MSU class visited several times to give recommendations on storm damage recovery and inventory all the street trees. Extension program on plant selection.

University of Chicago gypsy moth egg mass over wintering study.

Marcellus Outcome School leased 10 acre sugar maple stand to be used for sugar maple production and tours.

Creek research – effects of ozone levels on algal communities through manipulation of air in environmental chambers.

2001 Projects and highlights

Wind storm total of 56 acres of the forest blown down. Extensive salvage and clean up.

Ruffed Grouse habitat management area planted 4,000 hardwood seedlings in clear cut. Additional 20 acres of mature hardwoods wind blown – leveled.

Eagle Scout projects. Two additional Eagle Scout projects making a total of seven projects.

Asian Longhorn beetle, bait logs and forest harvest openings created to monitor and trap native longhorn beetles that would be similar to the Asian beetle.

B & B of true fir species from the true fir planting (42 species) -Moved to MSU Horticulture, MSU Tree Research Center, N.W. Station in Traverse city, Clarksville Horticulture station. Project Green introduction of fir species as potential Christmas trees and ornamentals - assessing pH tolerance, drought resistance, insect and disease resistance, and transplantability.

Notre Dame – study of Artic and Near Artic insects at Russ Forest.

Southern Illinois University – Beetle collection for SIU project.

2000 Projects and highlights

Asian Longhorn beetle research – Injection of multiple tree species to access movement throughout the trees for possible use of insecticide injection to treat infested trees.

Arc View maps constructed for Kellogg and Russ Forests – GPS orientated.

Forest Genetic work in 1963 plantation red pine. Collection of tree buds to access genetic difference in tree sources.

National Walnut Council tour of Kellogg Forest walnut plantations.

Notre Dame Researchers testing LDNPV gypsy moth virus collected from various geographic locations testing possibility spread of the virus.

1999- NEW PROJECTS / STUDENT PROJECTS

New Project: Dr. Doug Landis, MSU Entomology, release of insects *Galeerucella californiensis*, and *G.pusilla* to control purple loosestrife on May 13.

New Project: Kirsten Fondren, MSU Entomology graduate assistant, working on balsam twig aphid. Dr. McCullough GREEN initiative project. Moving active aphids to frasier firs at GA property.

New Project: European larch study John Gerlach, MSU Forestry graduate student. "A comparison of site factor-stand productivity relationships for European larch and red pine in the Great Lakes." Several sites at Kellogg. Collection of branch samples and litter drop.

New Project: USFS Therese Poland. Bark beetle collection (black locust, sawyer, two line chestnut, bronze birch, others). Sound resonance study for Asian long horned beetle.

New Project: Dr. Sherri Morris, MSU Crop & Soil Sciences with Dr. Elder Paul, is doing an inventory of forest biomass on six 10 acre tracts, 10 plots each. This will be part of a report on the carbon capacities in the soils of various land uses (forestry & agriculture). RUSS

Update: **Ruffed Grouse Management Habitat**. Flush count at the Ruffed Grouse Habitat Management site conducted 10-20-99: 11 grouse, 3 woodcock, a coyote, and a 4 point buck. Yearly measurement of planted oak shelter test. Ruffed Grouse marking the next 5 year four acre (3.2acres) clear cut totaling 53,000 bdf sent out for bids. \$16,500

Update: **Joe Zeleznik** soil data collection. Part of Ph.D titled: Assessment of Effects of Prescribed Burning on Fine Roots of Mature Red Pine.

Update: **Amy (Christensen) Kennedy** graduate student working with Dr. Deb McCullough of MSU's Entomology Department. Working with two bark beetles (*Ips pini* and *Tomicus piniperda*), focusing on red pine stands where active cutting has taken place within the last 6-12 months in red pine. Using trapping methods, Amy will examine survival rates, predation rates, and gallery formation for the *Tomicus* and each generation of *Ips* among other components of bark beetle biology. *Tomiscus piniderda* research report required stand statistics for 7 plantations (5 sample plots for each) Average DBH, BA, TPA and site index determined.

Update: **Nate Seigert, MSU Entomology student**. Evaluation of *Tomicus piniperda*, Host Preference, Distribution, and Potential Impact in Michigan Pine Stands. 170 bait logs 170 of multiple species.

Update: **Leah Bauer, USFS Insect Pathologist, Noah Koller, USFS Pathologist, Debbie Miller, USFS Research Technician, Jeff Andresen, MSU Weather, Deb McCullough, MSU Entomology, and Carl Ramm, MSU Forestry**. Factors that affect survival of eggs and young larvae of the gypsy moth. Study is in the third year.

Update: **Shimatani Kenichiro, MSU Forestry graduate student**, working on his Ph.D. will calculate species diversity indexes from species frequencies data and estimate genetic diversity at the community level and that of oak species population. He will be using Compartment B at the Russ Forest. Collecting red oak buds using high ranger and shot gun.

Update: Dr. Kobe setting up a pilot study to examine differences in species-specific tree growth forest productivity, and forest dynamics across the gradient of growing season length. Lukenn's property in Onekema Mi.

Projects /project updates /Plantings 1998-1991 .

1998 - NEW PROJECTS / STUDENT PROJECTS

MSU Department of Botany and Plant Pathology student Kristi Sherfinski working in Austrian Pine. Measuring transpiration rates, studying effects of Austrian pine in the hydrology of interdunal ponds at Saugatuck Dunes State Park.

Shimatani Kenichiro, MSU Forestry graduate student, working on his Ph.D. will calculate species diversity indexes from species frequencies data and estimate genetic diversity at the community level and that of oak species population. He will be using Compartment B at the Russ Forest.

Dr. Kobe is setting up a pilot study to examine differences in species-specific tree growth forest productivity, and forest dynamics across the gradient of growing season length. Lukens property.

Update: Assisted Joe Zeleznik with high ranger to collect 100 red pine branch samples. Part of Ph.D. titled: Assessment of Effects of Prescribed Burning on Fine Roots of Mature Red Pine.

Update: Leah Bauer, USFS Insect Pathologist, Noah Koller, USFS Pathologist, Debbie Miller, USFS Research Technician, Jeff Andresen, MSU Weather, Deb McCullough, MSU Entomology, and Carl Ramm, MSU Forestry. Factors that affect survival of eggs and young larvae of the gypsy moth. Study is in the second year.

1997 - NEW PROJECTS / STUDENT PROJECTS

Nate Seigert, MSU Entomology student. Evaluation of *Tomicus piniperda*, Host Preference, Distribution, and Potential Impact in Michigan Pine Stands. He will try to determine if *Tomicus* will prefer Scotch pine to Red or Jack Pine. Stands of pine throughout Lower Michigan will be surveyed to estimate the amount of slash suitable for beetle brood material and the frequency and extent of shoot damage of *Tomicus* versus other pests.

Don Uzarski, MSU Fisheries & Wildlife. Using hyporheic community metabolism chambers that will be filled with stream sediments and buried in the streambed and allowed to incubate for four weeks. After incubation, velocity will be determined by spiking the upstream sampling compartment of the chamber housing calculating the time required for conductivity to peak in the downstream compartments. Duration: 5 weeks.

Jeremy Wojdak, MSU Fisheries & Wildlife will examine the potential effects of habitat complexity and disturbance intensity on recolonization of macroinvertebrates. He plans to manipulate substrate in a set of field experiments in the Augusta Creek flowing through the Kellogg Forest. Duration: 5 weeks.

Noah Koller, MSU Entomology. Factors that affect survival of eggs and young larvae of the gypsy moth. Will determine how cold temperatures have to be to kill eggs and how much mortality there is by a certain date, decreasing the likelihood of spraying. Compartment 10 oak tree with multiple egg masses and weather data collection equipment is being used to conduct testing.

Dr. Gerry Adams conducted part of a mushroom class at Kellogg Forest. Five types of mushrooms inoculated on site as demonstration. August 31 – November 2.

Supplied grand fir for fire testing, safety testing lab in Monroe, MI. RUSS

UPDATE: Ruffed Grouse Management Habitat. Interpretative trail was completed; brochures, signage, and directional signs along main roads all installed. People from MSU, KBS, KBS Volunteers, and the Ruffed Grouse Society were on hand April 30 to officially open the trail to the public. Jenni Basmaji, the student who designed the signage and brochures with Dean Poston, Dr. Keathley and Dr. Gaylen Byker of the RGS National Board of Directors cut the ribbon to officially open the trail. Flush count at the Ruffed Grouse Habitat Management site on 10-20-97; nine birds flushed. Scotch pine was cut as prescribed in the management plan. Yearly measurement of planted oak shelter test was conducted.

1996 - NEW PROJECTS / STUDENT PROJECTS

Sarah Lefler, an MSU Forestry student of Dr. McDonough, began designing materials for turning the two volunteer-guided trails into self-guided tours.

Amy Christensen is a graduate student working with Dr. Deb McCullough of MSU's Entomology Department. She will be working with two bark beetles (*Ips pini* and *Tomicus piniperda*), focusing on red pine stands where active cutting has taken place within the last 6-12 months in red pine. Using trapping methods, Amy will examine survival rates, predation rates, and gallery formation for the *Tomicus* and each generation of *Ips* among other components of bark beetle biology.

Geoff Williams, Masters/Ph.D. student in MSU Department of Botany and Plant Pathology will be comparing the pollination drop mechanisms in *Picea engelmanni* and *Picea pungens*. He is hoping that this will lead to a better understanding of the inter- and intra-specific-hybridization incompatibility in the *Picea* genus.

1995 – NEW PROJECTS / STUDENT PROJECTS

Working with US Department of Agriculture-APHIS (Animal Plant Health Inspection Service) putting out bait logs in plantings at C Avenue and at Lux Arbor. Jim Curtis met with personnel with the USDA Plant Protection and Quarantine, Niles, MI lab to collect sample logs that will be used in a predator beetle study. Goal and objective will determine the existence of any native parasites to the pine shoot beetle. Supplying bait logs for lab work; cut USFS *Tomicus* log samples for use at Kellogg Forest and throughout the state.

USDA Bruce Birr initiated a repeat of the spruce budworm test in the C29 balsam fir.

The Forestry Department has endorsed a 16-acre crop tree management project that was established at RUSS Forest. Plan was written, inventory data was collected, and Michigan Forest Association members met on site August 26 to select the crop trees. An MFA, Friends of Russ Forest workday on September 23 conducted the field application of the management. A 3-county tour on October 14, the Soil Conservation District used the area for a tour to the 40 persons attending a conference. By November competing growth has been cut in two plots, trees were girdled in two other plots, measured and painted crop trees on twelve plots totaling eight acres.

Dr. Doug Lantagne's "Investigating the Effect of Tree Shelters and Shade on the Growth and Development of Planted Northern Red Oak Stands" Planted oak seedlings and initiated treatments: control, tree shelters, and shade shelters. After first growing season, 64 whole tree samples were collected and data recorded: ht growth, # flushes, buds, leaf surface area, etc. Second part of study involves the release of nine year old planted oak in Compartment 10: control, ground radius release/aerial radius release.

Scotch Pine grafted seed orchard: 22 acres, site prepped, planted, following mowing, spraying and weed control. Survival data recorded. RUSS

KBS graduate Carl Kloock is studying nocturnal spiders in conifer stands. The periodic censuses are non-destructive and he will collect several species of spiders to perform taxonomic identification and signals sent to prey spiders.

UPDATE: Gypsy Moth Research: In June biological control portion of test was initiated releasing wasps and soil fungus. Graduate student Lyle Buss conducted this part of project.

1994 - NEW PROJECTS/STUDENT PROJECTS

Natural wood preservative study by Dr. Pascal Kamden . Wood varieties include northern red oak, northern red maple, hard maple, American beech, southern yellow pine, eastern hemlock, black locust, and osage orange treated with chemical and wood extract preservatives.

Sap Stain test. Principal Investigator Pascal Kamden. Harvested logs and delivered to campus for testing.

In cooperation with the Kalamazoo County SCD and the Rose Lake Plant Materials Center, a new 5-year plantation of shrub willow was established to determine from native collections those plants that show the desired characteristics for shoreline and streambank stabilization projects. Principal Investigator for this project is George Heffner. Planted May 20.

Caging studies on Scotch Pine variety test involved the European sawfly, pine needle scale, and Zimmerman moth. Natural attack rates were observed in addition to the caging studies. MSU Entomology graduate student Eileen Eliason established plots on selected varieties here at Kellogg and in Greenville to assess varietal resistance.

MSU Forestry student Joe Zeleznik is working on his Ph.D. in red pine with minirhizotron tubes monitoring the effects of a controlled burn on the fine rooting of mature red pine.

MSU Forestry student John Hamel evaluated the effects of a prescribed burn on the hardwood understory of a mature red pine plantation. The study site is located in a red and white pine planted in 1938 with the understory in red maple and eastern white pine.

MSU Forestry student Katherine Zajac worked on the long-term effects of earlier burns in C7 on the understory, overstory and forest floor vegetation. Data from this survey will be analyzed and compared to earlier data taken prior to the original burn of 1988.

WMU Biology student Doug Powless of Paw Paw is an undergraduate student working in *the Alliaria petiolata*, Wild Garlic Mustard. He is studying the depth and spread of the seed bank from random core samples of the bank; flower tops will also be collected for controlled tests of the seeds' viability. Results will be used for a letter grade and published if possible. RUSS.

MSU Forestry grad student David Neumann is studying the activity of carabid beetles in a controlled burn site of 60+ year old pines. The 2-year study will investigate changes in beetle activity, diversity, and abundance.

KBS grad student Brian Black is doing research on the wildflower, Blue-eyed Mary at the Russ Forest. Initiated management demonstration of 64 acres of white pine at the Kellogg Forest. Management plan focuses on the demonstration of six different management goals.

Developed a general management plan for all the conifers located at LAR.

1993 - SUMMARY OF NEW PROJECTS

USDA Forest Service began a research project on the pine shoot beetle (*Tomicus piniperda*) that will assess the potential impact this new insect will have on the conifer resource of North America. The study involves a wide range of investigation of the beetle. Our involvement has included trapping with Lindgren traps and bait logs. Providing conifer species samples from seven pine species along with fir, spruces, and larches. Collecting log samples during different time periods throughout the winter and monitor drying of the logs in open clearcuts and shaded sites. Spraying of stumps and logs to control the insect, cutting whole tree samples to monitor the insect attack and chipping infested logs to assess the effect on the beetle in the logs. Principal investigators USFS Dr. Robert Haack and Rob Lawrence. Data and samples were taken at both Kellogg and Russ Forests.

Ruffed Grouse management project on 60 acres at Goodwin/Angell property was initiated this year. This project is a cooperative effort between the MSU departments of Forestry and Fisheries & Wildlife, as well as support from the Ruffed Grouse Society. The goal of this project is to demonstrate the feasibility of managing southern Michigan woodlands for improved ruffed grouse habitat and for sawtimber production. The project will involve both active management of the area and an educational component in the form of a self-guided trail system. Parts of the management plan initiated to date include: establishment of 55 inventory plots, flush counts, film documentation of the area, erection of a project signs and a parking area and establishment of an interpretive trail. Principal investigators are Rick Campa, Doug Lantagne, and Carl Ramm.

Gypsy Moth project. McIntire-Stennis Cooperative Forestry Research Program. Title: Evaluation of Natural Control for Gypsy Moth in Southern Michigan. For the last three years, we have been trapping gypsy moth at Kellogg Forest and populations are increasing. This project focuses on the monitoring of gypsy moth at Kellogg Forest and at Lux Arbor Reserve as a comparison of three systems of estimating insect populations. A second phase is the comparison of several types of biological population control. Work done to date includes the establishment and monitoring of trapping sites, establishment of 49 inventory plots in the hardwoods, egg mass sampling plots within each plot (4 - 1/40 acre and 100 tree concentric plots). Nine sites for biological control. Principal investigators are Carl Ramm and Deb McCullough.

Chipboard stress study. Supplied samples from thirteen hardwood species, 16" minimum diameter. Samples came from both Kellogg and Russ. Studying the differences when the various species are utilized as a chipboard form. Principal investigator is Dr. Otto Suchslund.

Provided samples of four tree species to the MSU Civil Engineering Department. The pulp is being used for testing as a concrete addition. Principal Investigator is Jong-Pil Won, a graduate research assistant.

Selective harvested black locust logs for shipment to a processing lab in Springfield, OH. Principal investigator is Pascal Kamden.

University of Michigan set up six plots for the Michigan Impact Monitoring System (MIMS). In addition to the plots at Kellogg and Russ Forests, the 300 sites Michigan-wide will monitor the long-term effects of gypsy moth on forest growth.

1992 - SUMMARY OF NEW PROJECTS

Artificial stream research by Jenny Molloy and graduate student Bill Sobczak. Experiments included examining microbial colonization rates of various autumn-shed leaf species. The ten-foot long by four-inch vinyl channels diverting the creek flow provide a controlled environment to study small-scale processes that take place in Augusta Creek.

Extracts from Northern White-Cedar plantation distilled into cedar leaf oil. The thjones have been important as a pharmaceutical product for years but Dr. Phu Nguyen is exploring the oil's antifungal properties.

1991 - SUMMARY OF NEW PROJECTS

Established a hardwood demonstration test, interplanting Black Walnut and Red Oak with white pine, white pine plus fertilization, autumn olive, and a control plot. Boundary trees have Tuley tubes and all trees received weed control.

New deck near the pond has been constructed of black locust and will demonstrate the species' natural resistance to rot. Coordinated with Black Locust genetic plantation consisting of 400 sources.

White oak logs were harvested at Kellogg and Russ Forest to be used in the construction of wine barrels. Research that will test the effect white oak wood coming from various geographical origins has on the taste of wine.

Assisted Ron Baker in the development of a plan for 70-acre Burt property in Chelsea Michigan.

