



2013 Annual Report



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Forest Management

Forestry-related technical information and assistance is provided to Georgia's private forest landowners by the Forest Management Department to enhance their woodlands for economic, social, and environmental benefits. This system is delivered to private landowners through professional foresters, some of which are assigned counties and deal directly with the public. Other foresters help implement and deliver regional and/or statewide programs including: water quality, forest stewardship and legacy, urban and wildland-urban interface, forest health, cost share programs, and forest inventory and analysis. By statute, the GFC is authorized to take action pertaining to the nurture and culture of Georgia's forests, to monitor and suppress forest insect and disease outbreaks, and by authority granted by the Georgia Environmental Protection Division, the GFC is the authority to monitor and investigate water quality issues pertaining to any type of silvicultural activities.

The GFC also manages several state forests for multiple objectives including traditional forest products, clean water, wildlife habitat, and recreational opportunities. Assistance is also given to other state agencies with the management of forest lands they own and these include: Georgia Department of Natural Resources, Georgia Department of Transportation, University of Georgia, and Georgia Department of Corrections. Assistance to these other agencies vary from developing management plans to meet the owning – agency's objectives to conducting a variety of silvicultural treatments (timber sales, site preparation, tree planting, prescribed burning, and planning and implementing road improvements). More information on state forests can be found at GaTrees.org.

GFC foresters and technicians handled almost 9,500 field visits with landowners involving 767,847 acres. Over half of these visits were cost share visits (5,230), with the remainder involving technical advice to landowners in forest health, water quality, forest stewardship and invasive plants. Georgia's forests

remain overall healthy and 91% are privately owned. The services GFC foresters provide along with private consultants and industry foresters are vital to keep our resource healthy and productive.

COST SHARE INCENTIVE PROGRAMS

Cost share incentive programs play an important role in assisting Georgia landowners with properly managing their forests. GFC partners with the Farm Service Agency (FSA), Natural Resources Conservation Service (NRCS), U. S. Forest Service (USFS), U. S. Fish & Wildlife Service (USFWS) and the Georgia Department of Natural Resources (DNR) to deliver these programs. GFC takes the lead role on some programs and serves as the technical agency responsible for determining specifications necessary for landowners to install a range of forestry practices. GFC efforts have resulted in a total of \$7.5 million going to landowners to help fund completed practices. See *Table 1* for a breakdown of the dollars by incentive program.

The following is an overview of GFC accomplishments within each incentive program:

Conservation Reserve Program (CRP)

CRP was primarily created to provide soil erosion protection and crop base reduction but was expanded to improve wildlife habitat. GFC provided assistance on 1953 CRP cases covering 73,369 acres. As a result of this work, approximately \$876,000 went to GA landowners to help fund forest management practices. Also, these participants will receive rental payments for a total \$1.22 million annually for the next 10-15 years depending on the contract length. The total dollar impact for the year is \$2.1 million.

Emergency Forest Restoration Program (EFRP)

Recent tornadoes resulted in the funding of EFRP. GFC foresters assisted FSA with the planning and oversight of contracts to restore damaged/destroyed forests. GFC provided oversight to 64 forest restoration

contracts covering 2,942 acres. As a result of these services landowners received approximately \$665,000 in cost share payments.

Environmental Quality Incentives Program (EQIP)

The Georgia Forestry Commission assists the NRCS in implementing the EQIP forestry practices. Assistance was provided on initial prescription plans for 584 practices covering 163,667 acres. The performance of 443 practices was also certified covering 31,204 acres. As a result of these services landowners received approximately \$1.66 million in cost share payments.

Wildlife Habitat Incentives Program (WHIP)

The Georgia Forestry Commission assists the NRCS in implementing the WHIP forestry practices. Assistance was provided on initial prescription plans for 217 practices covering 86,885 acres. There were 368 practice performance inspections completed covering 33,452 acres. As a result of these services landowners received approximately \$1.8 million in cost share payments.

Southern Pine Beetle Prevention & Restoration Program (SPBPR)

In cooperation with the USFS, GFC offers cost share to help minimize the impacts of the southern pine beetle. The grant is primarily utilized for direct cost-share payments to landowners to implement several prevention practices to treat high risk stands and for several restoration practices. Landowners deal directly with their county GFC forester for all phases of the program (application, needs determination, practice supervision, performance check, final reporting and payment requests) and payments are made directly from the GFC Administration Department in Macon.

Assistance was provided on initial prescription plans for 262 practices covering 23,897 acres. There were 777 practice performance certifications completed covering 67,422 acres. As a result of these services landowners received approximately \$1.06 million in cost share payments.

Invasive Species Plant Control Program (ISPC)

The USFS has provided federal grants in this program area to help control invasive plants in Georgia. These grants were primarily utilized for direct cost-share payments to Georgia landowners to help control privet, Japanese climbing fern, tallow tree, multiflora rose and olive spp.

Assistance was provided on seven initial prescription plans covering 138 acres. GFC personnel went on to

certify the performance of 71 plans covering 3,973 acres. As a result of these services landowners received approximately \$106,860 in cost share payments.

Partners for Fish & Wildlife Program

The GFC assists the USFWS with the technical side of this program. The focus of the program is the restoration of longleaf pine ecosystems, riparian/stream habitat & endangered species habitat.

Assistance was provided on seven initial prescription plans covering 295 acres. GFC personnel went on to certify the performance of four plans covering 200 acres. As a result of these services landowners received approximately \$45,000 in cost share payments.

Table 1: Cost shares to GA landowners related to GFC services

Program	2013
CRP	\$ 2,119,112
EFRP	\$ 664,979
EQIP	\$ 1,658,482
WHIP	\$ 1,832,594
SPB	\$ 1,059,952
Invasive Plant	\$ 106,860
Partners	\$ 45,000
Totals	\$ 7,486,979

WATER QUALITY PROGRAM

Fiscal year 2013, beginning July 1, 2012, saw the GFC Forest Water Quality Program finishing up two major projects and beginning another. An updated, more user friendly version of GFC’s Georgia County Timber Harvest notification database was made available through GFC’s public website. The new website attempts to actually give searchers access to the wording of the current county timber harvest ordinances they may be searching for, and is more readily updatable as ordinances change. Another project the Water Quality team has been working on is an online Logger Continuing Education effort. Over the course of the last two fiscal years, we’ve been cooperating with Southeastern Wood Producers Association (SWPA) and Georgia Environmental Protection Division (Georgia EPD) to create four online learning modules that would be available as an alternative to “live” BMP presentations by GFC Water Quality foresters. Over the course of

this fiscal year, the goal of four modules was met, with the creation of “Temporary Stream Crossings”, “Stream Classification”, “Pre-Harvest Planning”, and “Forest Roads”. Two versions of each module have actually been put online. An accredited version of each is available through SWPA’s website that is set up to monitor the online classes, conduct tests, and issue the education certification at course end. There is an administrative fee associated with these accredited versions. Another version of each module is available on GFC’s website free of charge, all of which run as informational segments, reaching not only loggers and foresters in the forestry business, but also groups such as landowners and other advocacy groups that may have a keen interest in learning how water is protected during forestry activities. For the fiscal year since the modules went live on GFC’s website, there have been 844 total hits to the modules. Since the accredited modules did not go live on SWPA’s website until May 2013, there have not been any certifications issued so far, but, as the renewal deadline approaches, more activity is anticipated.

The new project undertaken is the 2013 Statewide Forestry BMP Implementation Survey. This project was kicked off with a training session for district and state level Water Quality personnel to distribute information and coordinate the gathering of candidate field sites to include in the survey. Once sites have been selected according to a stratified random sampling method, the sites are field verified that they are eligible for inclusion in the survey and permission is obtained from the landowner for GFC entry to each site. State level GFC Forest Water Quality Specialists will carry out the actual field assessments and further survey related work once site selection is completed. It is expected that actual field assessments will begin in January and progress through the end of summer 2013. A 2013 BMP Survey Report can be expected near the end of calendar 2013 or very early 2014.

Besides these larger projects, the Water Quality team remains busy with its three core duties, which are BMP development and education, forestry water quality complaint resolution, and BMP monitoring. Fiscal year 2013 BMP education efforts total very near historical annual averages. For the fiscal year, a total of 80 presentations were provided to a total of 2,439 participants. This included six introductory Master Timber Harvester forestry BMP presentations for 196 participants, along with 22 Continuing Logger Education presentations for 894 participants. Other

audiences for GFC Water Quality related talks included Southeast Wood Producer Association chapter meetings, Forest Industry sponsored meetings, government agency presentations, and NGO presentations. In addition to this, GFC Water Quality personnel presented 21 BMP training related talks to GFC employees, primarily for Firebreak BMP training, but also for internal Water Quality Program training. A total of 18 BMP field demonstrations were provided for 344 participants, primarily for Landowner field days and for internal GFC firebreak BMP demonstrations. Besides the education efforts, GFC worked very closely with Georgia EPD to develop BMP Addendums for Forestry Fire Fighting Dip Sites and for Forest Pesticide applications. Coordination with Georgia EPD was needed to develop BMP wording to help Landowners and Practitioners comply with applicable environmental law, and also to obtain EPD interpretations of these laws that minimize, to the extent possible, regulatory infringement on the practice normal forestry.

In the area of Forestry Water Quality Complaint resolution, GFC personnel handled 51 new complaints during the fiscal year, requiring 118 separate site visits to problem sites. Multiple site visits are required so that recommended stabilization work can be inspected and verified, and if needed, additional rehabilitative work can be further recommended. GFC monitors BMP implementation at each site visit in carrying out forestry complaint resolution. For FY2013, BMP Implementation for complaint cases rose by about 17.5 percentage points as a result of GFC involvement, and all areas with potential for sediment delivery to streams (32 such areas seen at initial inspection) were all completely stabilized. These figures are very typical, statistically, of GFC’s involvement in forestry complaints from year to year. In addition to Water Quality complaints, GFC foresters responded to 180 BMP Advice visits, where specific BMP issues are assessed and recommendations made to avoid the potential of a water quality complaint later on.

In the responsibility area of BMP monitoring, the Statewide BMP survey is ongoing. Overall Statewide BMP Implementation seen at our most recently completed BMP Survey in 2011 stands at about 95 percent. Another area of BMP monitoring activity that GFC receives intermittent funding for is the monitoring of BMPs in TMDL watersheds. GFC carried out a total of 122 BMP Assurance inspections this fiscal year in TMDL watersheds and, as seen in

GFC's complaint resolution, a positive influence in terms of BMP Implementation can be seen as a result of GFC's involvement in targeted forestry activities. Active timber harvesting sites are discovered aerially through monthly devoted flights in the areas of TMDL watersheds, and then the located sites are first verified as to whether or not they are actually within a TMDL watershed according to GFC's GIS database. Sites verified to be in TMDL watersheds are then ground checked, with the landowner's permission, with GFC foresters meeting on-site with the timber buyer, logger, landowner, and anyone else associated with the timber harvest activity. Additional visits to sites are made to follow the activities to final closeout, with GFC foresters making recommendations for any needed BMP remediation along the way. Many times, the timber harvesting activities have already closed out by the time GFC foresters get there. In such cases a BMP exam is carried out anyway, and if no significant BMP problems are found, no further action is taken. GFC foresters carried out 31 of these BMP exams in TMDL watersheds after harvest closeout for fiscal year 2013 with an average BMP implementation of 98.8 percent. An additional 48 exams were categorized as initial BMP exams, where additional follow-up visits would be needed to check on recommended remedial BMP work. These 48 exams averaged 85.6 percent BMP implementation with 11 areas found where active sedimentation to streams was occurring. GFC foresters carried out 28 final exams in the TMDL watersheds, averaging 94.7 percent BMP implementation, and leaving no active sedimentation problems. The remaining 15 BMP inspections, out of the 122 total TMDL inspections, were categorized as interim exams where GFC foresters visited sites with ongoing harvesting activities, or ongoing work to bring the sites into BMP compliance.

Besides these core areas of accomplishment, GFC Water Quality program initiated conversation with Georgia EPD that helped GFC to become part of a statewide nutrient criteria technical advisory group. Georgia has just begun the process of formally developing pollution criteria for Nitrogen, Phosphorus, and Potassium nutrients in all of Georgia's watersheds. This process is needed due to litigation that occurred against USEPA in Florida and other areas, so EPA is working with each state in the region to develop these criteria. GFC will likely partner with Georgia EPD to carry out a number studies to help determine nutrient levels naturally occurring in managed forest watersheds.

GFC participated in and hosted the Southern Group of State Foresters in June, with the Water Quality program participating in the Water Resources Committee meeting. The GFC Water Quality team partnered with Plum Creek Timber Company to put together a field tour during the Water Resources meeting. Along with Water Quality counterparts from state forestry agencies from four other states, we were able to include multiple representatives from the USEPA and US Army Corps of Engineers, Savannah District in our tour. The sites visited on Plum Creek property were all wetland related, making the tour very timely and relevant, since the purpose of the tour was to initiate conversation between federal agency regulatory personnel and state forestry agency water quality experts concerning BMP compliant forestry in the subject areas.

URBAN AND COMMUNITY FORESTRY

Georgia Forestry Commission, through a partnership with the USDA Forest Service, provides assistance to communities with planting, protection and maintenance of community trees and forests. In FY13, Georgia had 139 Tree City USA communities, 13 Tree Campus USA schools and one Tree Line USA utility.

Funds from the Urban & Community Forestry Assistance program were directed in FY13 to continue to strategically reach communities and help them acquire storm mitigation plans, management plans, tree ordinances, arborist assistance and new local tree groups, the GFC used the federal funding to contract with the Georgia Urban Forest Council and three circuit-rider arborists to make personal visits and assist communities to develop community forestry programs and workshops that will be effective and efficient in managing their forest resources. In addition, 21 trees were planted at one elementary school playground using the GFC's "Making the Shade" grant.

To celebrate Arbor Day, SCFP in conjunction with GFC's Communications department sponsored Tim Womick's "Trail of Trees" educational programs. Eight elementary schools hosted nine programs in which over 1,500 students and adults were informed about the benefits of trees. In addition, one of the programs was broadcast in a live webinar event which included a taped welcome from Governor Deal. The webinar was recorded and made available to additional schools on GFC's website.

The SCFP also continued to provide technical advice through the Ask the Arborist (ATA) project to communicate more effectively with homeowners across the state and to provide citizens with timely, unbiased information from a GFC-certified arborist. The project, which is web-based, had more than 175 contacts in the fourth year.

GFC received funding to help create and expand the American Grove, www.AmericanGrove.org a social networking website that reaches consumers with tree benefits messages and encourages them to take action and plant trees. The American Grove has more than 3,400 members nationwide.

With Redesign funding, a Green Infrastructure (GI) Management System Guidebook to identify, link and collectively manage diverse ecosystems along coastal Georgia was developed in partnership with the Coastal Regional Commission. In FY13 an outreach project was developed to bring GI resources to coastal planners, developers and elected officials. After many communities in the state experienced significant damage due to an ice storm in February 2014, SCFP assisted GEMA with preliminary debris estimations by traveling throughout the affected counties meeting with EMA directors and doing visual assessments of debris piles. In early March, SCFP deployed the Urban Forest Strike Team to assist the City of Waynesboro. Six foresters did on the ground assessments of the damage, collected GPS coordinates of damaged trees and provided a prioritized database and map to the city. The city was able to use this information to hire a contractor to remove the remaining hazards and in turn, the city was able to apply for public assistance from GEMA and FEMA. Starting in March, SCFP was also tasked with representing the state during meetings between FEMA and storm damaged communities that were applying for federal aid. SCFP assisted in debris estimation and advised communities on final disposal of the debris including burning and EPD regulations.

FOREST INVENTORY AND ANALYSIS

The Forest Inventory and Analysis Program in Georgia collected data on 1065 plots from October 1, 2012 through September 30, 2013. Of these plots, 46 were new install NFS Intensification Plots on rugged National Forest land that included a Downed Woody Material (DWM) survey on each subplot (all of these plots had to be newly installed, which adds time). Also of the total, 24 of the plots were DWM Plots which had

normal P2 variables collected with Downed Woody Material variables added. Of the total 1065 plots, 114 were P2 Plus, which adds a veg. profile, DWM and extra crown variables to the normal P2 variables and they can only be done during "leaf on" season. The number of plots on which P2 Plus variables were collected doubled this year from 1/16 of our plots to 1/8.

The average score for all of Georgia's plots that were checked by the USFS QA Foresters in FY13 came out to an outstanding 97.74%. Georgia's QA score average is consistently among the highest in the south. We had one new cruiser added June 3, 2013 to our team and he is expected to take the certification exam in November 2013. Nine of our cruisers have 4+ years of experience, which certainly helps our average score.

Data collection of Cycle 10, Subcycle 3 (Inventory Year 2012) was completed mid-October 2012. All 1131 plots in Inventory Year 2011 were completed and transmitted. New plot materials were available for us to begin the next Subcycle immediately.

Georgia began data collection of Cycle 10, Subcycle 4 (Inventory Year 2013) in mid-October 2012. As of September 30, 2013 we had completed 1026 of the 1149 plots in the Inventory Year 2013 plot list. All plots should be completed by the end of October 2013. The last Felled Tree Study transmit report, received in August 2013, showed 17 plots completed, but my crews have completed many of these in September and October 2013.

We continue to work with six - two person crews of full time Foresters with Forestry Degrees. The added NFS Intensification Plots and DWM Plots in and around our National Forests have added about 1 month of work to each subcycle in which we have collected them. We continue to make steady progress in our data collection efforts and fulfilling our part in the agreement. The USFS implemented version 6.0 of the FIA Data Collection Manual in the fall of 2012. The transition was smooth and the added variables (crown cover percent and individual tree damages) were not as time consuming as first thought and were accepted by the FIA Foresters without much pushback.

Most of our FIA Foresters have over four years of experience. Experienced crews are more productive than a new crew and are badly needed to complete

our yearly work on time. We hired 1 new FIA Forester in June 2013 to fill a position vacated in December 2012. We lost another forester in June 2013 and are working to get it filled this fall.

Two FIA Coordinators' meetings were held in FY13: A fall conference call on October 22, 2012, another conference call on September 6, 2013 and an in person meeting in Little Rock, Arkansas the week of March 25, 2013. A fall conference call continues to work better than having two face to face meetings each year. This saves a good amount of time and travel expense and still allows us to stay informed as to how the program is changing and voice concerns.

P2 Plus Training took place in Macon on May 8, 2013 with a combination of webinar and field exercises with the USFS QA Foresters. We also had a one day PDR Webinar in October 2012 to familiarize us with the new model Allegro PDR that we use to collect FIA data.

One FIA vehicles was replaced this year. We also maintained our current vehicles, GPS units, measurement tools/supplies, and digital hypsometers for all the FIA crews. We maintained, and replaced as necessary, laptops for the FIA Foresters and Coordinator this year. All Georgia Forestry Commission vehicles are still pushed past 150,000 miles before replacement is considered. Expensive repairs on vehicles with over 120,000 miles continue to eat into the operating funds.

The Georgia's Forests, 2009 publication, which should have been released in 2011 is still in progress and hopefully reaching the final stages of writing and ready to enter the proofing/printing stage. We continue to debate the usefulness of such a lengthy document that contains 4-5 year old data in it by the time it is published. The FIA web tools and yearly fact sheets remain very useful for querying the most recent data.

FOREST STEWARDSHIP PROGRAM

The Stewardship Program completed its 23rd year of program delivery. This past year the program continued to evolve through some significant changes. First and foremost, the development of a stewardship plan writer incentive was launched and the response was overwhelmingly positive. Second, several discussions at the state and national level have been ongoing to better reflect the need to show

stewardship accomplishments beyond plans and acres. Currently the cumulative enrollment is 2,779 landowners covering 822,810 acres in Georgia. The cornerstone of the Forest Stewardship Program is the Forest Stewardship Plan developed for each landowner in the program. These plans evaluate the landowner's timber, wildlife, soil, water, scenic, and recreational resources – making specific recommendations on how these resources can be best managed. A total of 274 plans covering 82,099 acres were written in FY13.

Through its Certified Steward designation program, FSP also recognizes landowners who demonstrated commitment to forest stewardship by doing an outstanding job of management on their property. 54 new Certified Stewards were recognized in FY13 covering 39,042 acres.

Forest Stewardship Program Accomplishments - 2013:

- Provided assistance to the Georgia Envirothon and Regional FFA Field Days.
- Strengthened a partnership with the National Wild Turkey Federation (NWTf) by developing several Stewardship Field days, a seed/habitat program, and the hiring of a part time biologist to assist landowners in developing management plans.
- Created over 440 acres of habitat improvement on Georgia forest land through the seed/habitat program, which cost-shared over 16,000 pounds of seed.
- Developed a web based page for Stewardship that provides plan writers with good recommendations on prescriptions for various stands.
- Developed several fact sheets that can be included in plans as an addendum.
- Hosted two landowner seminars in Statesboro and Athens.

FOREST HEALTH

The Forest Health Management Group provides statewide leadership and guidance to consulting firms, industry, natural resource managers, landowners, and Georgia Forestry Commission (GFC) foresters on a wide range of forest health related issues. This information and technology transfer enables a diverse group to increase awareness of forest health issues in Georgia and contribute additional resources in the fight against forest pests. Our forest health staff is increased by each person trained and our team grows by communicating information. Our goal is to

train more than our personnel and staff inside the GFC, as we strive to create cooperative partnerships meeting the needs of the landowners and forestry professionals throughout the state of Georgia.

Georgia Forestry Commission foresters incorporated insect, disease, or invasive species advice into 586 management cases involving 26,777 acres for the year. Each Stewardship and Tree Farm plan written in the State of Georgia incorporates advice to landowners concerning forest health issues, and insect and disease advice is incorporated in each plan; 240 plans were presented to landowners with a total acreage of 73,528 acres.

Statewide, forest health training was provided to foresters, resource managers, loggers, public works departments (state and county), nurserymen, regulatory agencies, and landowners on 131 occasions with 39,171 attendees being reached. This training included field days, exhibits, demonstration plots, field training, hands-on education, and classroom presentations. These sessions involve most of the program areas listed in this report.

Our forest health staff conducted four radio interviews with Georgia Public Radio (GPR), and National Public Radio (NPR), ten television interviews were also conducted in the Albany and Atlanta areas in 2013. Our goal is to share our Forest Health Management message, which is "Protecting the health of our forest is a top priority of the Georgia Forestry Commission and the people of Georgia."

SPECIAL NOTES OF INTEREST

Emerald Ash Borer

Emerald ash borer (EAB) was discovered in DeKalb and Fulton Counties, Georgia, in July 2013 as part of the national detection survey funded by the USDA-Animal and Plant Health Inspection Service (APHIS). More than 400 traps were established throughout the state by Georgia Forestry Commission, Georgia Department of Agriculture, University of Georgia, Athens, and private contractors. These traps targeted areas with increased risk of introduction, such as campgrounds and cargo centers, and traps were placed in stands with a high component of ash (*Fraxinus* spp.). Only two traps out of the 400 returned positive for emerald ash borer. Georgia has been part of a nationwide trapping program to detect the presence of this forest pest since 2005.

The discovery of EAB in Georgia prompted the release of a Frequently Asked Questions brochure (<http://gatrees.org/forest-management/forest-health/alerts-and-updates/FAQ-EAB-GA.pdf>), an emerald ash borer update for Georgia (<http://gatrees.org/forest-management/forest-health/alerts-and-updates/EAB-GAUpdate.pdf>) and regulated areas have been proposed for DeKalb and Fulton counties. These are the first steps in Georgia's efforts to alert residents about the severity of this new pest and to prevent potentially infested ash material from spreading outside this area.

Both the Georgia Forestry Commission and Department of Agriculture are concerned about this pest spreading unchecked. Quarantine regulations have been drafted to prevent potentially infested ash material from spreading by human-assistance outside the proposed quarantine area. Both agencies will work with forest landowners, loggers, firewood producers, nurseries, municipalities and others to insure that commerce can still occur while safeguards are in place to prevent emerald ash borer movement.

Tremex Woodwasp

In 2012, a new first introduction of Tremex woodwasp (*Tremex fuscicornis*) was identified during warehouse trapping in Elberton, GA. This new pest to Georgia was submitted to Dr. Rick Hoebeke, Collection Manager, Museum of Natural History, and University of Georgia, who initially identified a male and female Tremex woodwasp (*Tremex fuscicornis*).

Beech, poplar, elm, maple, willow, and oak are reported as hosts for this woodwasp and in north Georgia this list covers many of the primary species in the forest. For this reason, the Georgia Forestry Commission is taking this introduction very seriously and in 2013 a series of ten early detection traps were established in the Elberton area to detect populations of Tremex woodwasp that may have become established from the 2012 introduction. Two suspect Tremex samples were collected late in the summer and presented to Dr. Hoebeke for identification. The two specimens were *Tremex columba* L., the "pigeon horntail" and *Urocercus cressoni* Norton, the "black and red horntail."

In an effort to increase awareness of nonnative insects, a four-page color brochure has been developed to provide a visual representation of the pests targeted in our early detection surveys. The warehouse contacts have posted these brochures around the warehouse sites and protocols for insect sample collection are provided on the front page.

In 2014, early detection traps will be established near these warehouse sites to detect populations of Tremex woodwasp.

Pine Health Issues

Significant pine health issues in natural pine stands and pine plantations have been observed in various areas in Georgia in recent years. Much of the mortality can be attributed to the causes documented in this report including: prolonged drought, Heterobasidion root disease, southern pine engraver beetles (*Ips* species), and the southern pine beetle (*Dendroctonus frontalis*). However, the factors associated with thin crowns, declining growth rates, and mortality in some mature loblolly stands and younger loblolly pine plantations, especially in southwestern Georgia and central Alabama, are unclear and have been brought to the attention of Georgia Forestry Commission foresters, among others. Many predisposing factors, biological organisms, and cultural practices may be involved in pine health problems and the role that each may play is a topic of considerable discussion and controversy.

The Georgia Forestry Commission's forest health staff is conducting field visits documenting mortality of pine trees that are showing signs of pine health issues. In the spring of 2014 an aerial survey will be conducted in two counties to document cases of pine mortality. Field evaluations will then be performed to determine the cause of mortality. The GFC has offered to facilitate the location of these mortality sites, and to act as liaison between research scientists and local landowners. The objectives of this project are to determine the extent and causes of declining pine growth and pine mortality in southwest and central Georgia.

Rhizoctonia Seedling Blight

Rhizoctonia seedling blight of longleaf pine was first observed in Georgia in 2010 causing mortality in longleaf seedlings. This mortality was associated with prolific seeding of partridge pea, which created excessive shading of the forest floor, restricted available sunlight, and possibly created a microclimate conducive to the success of the unwanted fungus.

In 2013, Rhizoctonia seedling blight has decreased, and many landowners eliminated the use of partridge pea in warm season grass mixes. However, some landowners still report mortality due to the prolific seeding of partridge pea. Mowing infested fields is the standard control method followed by landowners, and the elimination of partridge pea from the seed mix is the best solution to the problem.

Personnel Changes

In 2013, the forest health staff changed personnel with Mark Raines retiring after 32 years of service, and Jeremy Hughes being promoted to Geographic Information Systems (GIS) specialist at the Macon Headquarters.

Lynne Womack was hired as the Forest Health Specialist for North Georgia and Chris Barnes assumed the duties of Forest Health Specialist in East Georgia.

Southern Pine Beetle Pheromone Trapping / Pine Beetle Aerial Survey

The GFC participates annually in the southern pine beetle (SPB) trapping program, which enables foresters to predict seasonal SPB population levels. This insect has the potential to cause more forest destruction in the southeastern states than all other forest pests combined, so anticipating potential damage is important. Insect traps are deployed in early spring by GFC foresters and are checked weekly for at least four weeks. A model developed by Dr. Ronald Billings (Texas Forest Service) is used to predict population levels. The model is based on the number of southern pine beetles captured and the number of clerid beetles, a SPB predator, caught in the traps. The history of the trapping program over the past 20 years indicates this model is more than 75 percent accurate.

In the spring southern pine beetle prediction survey, conducted as a cooperative effort between U.S.D.A. Forest Service, Department of Defense (Fort Stewart), and Georgia Forestry Commission, a total of 37 traps were placed statewide. All prediction traps in Georgia indicated low SPB populations/activity for 2013, except two north Georgia traps with moderate activity. One trap on Department of Defense land in Bryan County showed high SPB activity and salvage work is being conducted on active beetle spots in the area.

Based on the trapping data alone, GFC did not expect to see significant SPB activity in the state this year, and these predictions proved accurate with the low SPB numbers revealed during the aerial survey. In 2013, GFC Foresters flew a 30% statewide survey to detect the presence of southern pine beetle activity. This amounts to approximately 7,000 miles flown with visual observations of 10,500,000 acres. During the early detection flights in August and September, little to no mortality was observed across most of the state. This lack of activity could have been attributed to increased rainfall across the state. Two areas of the state have seen significant beetle activity since this summer: Bryan and Appling counties. The

spots in Appling County are located on The Nature Conservancy's Moody Forest Natural Area and work is being conducted to remove the beetle infested areas. Department of Defense lands in Bryan County have had high activity this year, following a few small spots in 2012. Approximately 37 spots have been detected there, ranging in size from 0.5 to 30 acres. Department of Defense is working to remove all beetle infested areas.

Southern Pine Beetle Prevention and Restoration

The US Forest Service has provided federal grants in this program area for 10 consecutive years in the amounts of \$500,000, \$800,000, \$1,000,000, \$1,950,000, \$1,500,000, \$1,200,000, \$1,150,000, \$1,150,000, \$325,000 and \$245,000 for the years 2003 - 2013, respectively. These grants were primarily utilized for direct cost share payments to Georgia landowners to implement several prevention practices to treat high risk stands and restoration practices. Of these grants totaling \$10.97 million, \$6.53 million has been obligated towards direct landowner payments under cost share practices treating over 200,000 acres.

SPB 2013 - SPB cost share funds for 2013 were obligated towards southern pine beetle prevention practices exclusively. Landowner interest was great, and the funds were allocated in a period of weeks. The framework of the 2013 program was the same as that of the 2012 program.

Program Overview - Landowners deal directly with their county GFC forester for all phases of the program (application, needs determination, practice supervision, performance check, final reporting and request for payment) and payments are made directly from the GFC Administration Department in Macon. This streamlined process has been favorably accepted and is working well to streamline the process that landowners face with many federal cost share programs. During federal fiscal year 2013, GFC foresters serviced 757 contracts covering 94,678 acres.

All types of information regarding this cost share program (application, overview of the program, fact sheets on each practice) are also posted on the Georgia Forestry Commission's public web site: <http://www.gatrees.org/forest-management/forest-health/pine-bark-beetles/spb-cost-share-program/index.cfm> or by calling 1-800-GA TREES.

Heterobasidion Root Disease

The common name annosum root disease has been updated. It was brought to the attention of the forest health staff that The Northeastern pathologists have adopted a new scientific name, *Heterobasidion irregulare*, with the common name of Heterobasidion root disease. With USDA Forest Service and the University of Georgia updating the name, it was time to replace annosum root disease with Heterobasidion root disease.

Widespread mortality caused by Heterobasidion root disease in recently thinned pine plantations (slash and loblolly) was reported in 2005, and the disease continues to cause ongoing damage with new sites being reported in 2013. Although the incidence of Heterobasidion root disease has declined, we continue to get calls to investigate infected stands. The region with the highest incidence and most severe mortality is a zone approximately 75 mile wide from Augusta to Columbus (corresponding to the sandhill and upper coastal plain regions). Ongoing educational outreach programs and one-on-one field visits with professional land managers have resulted in most foresters being able to diagnose this condition.

Georgia Forestry Commission field foresters perform the majority of field inspections, and the forest health staff responded to support the field foresters as needed. Forest industry, consultants, and GFC foresters have performed field visits throughout the state and Heterobasidion root disease and pine bark beetles were the primary concern in many of these inspections.

Georgia Forestry Commission field foresters recommend treatment of freshly-cut stumps in thinned stands with dry granular borax powder, such as Sporax® or water-soluble borate powder, such as Cellu-Treat® (disodium octaborate tetrahydrate). Consultants have observed that these treatments have been successful in thinned pine plantations with a high risk of Heterobasidion root disease. The general recommendation is to apply these treatments to stump surfaces with a spray applicator, to the point of runoff. Sporax® and Cellu-Treat® need to be applied within twenty-four hours of harvest.

The Heterobasidion Root Disease brochure can be found at <http://gatrees.org/forest-management/forest-health/annosum-root-disease/HRDBrochure.pdf>.

Hemlock Woolly Adelgid

A survey for the hemlock woolly adelgid (HWA) was conducted in 2013 for the eleventh consecutive year. One temporary employee worked on this survey, concentrating on the western part of the Blue Ridge and the Cumberland Plateau in the northwest corner of the state. The hemlock woolly adelgid has now spread throughout the entire natural range of hemlock in Georgia. Surveys this year focused on tree condition and level of infestation in order to facilitate the supply of foliage to rearing labs and identify predator release opportunities. Many of the eastern stands are experiencing rapid decline and mortality. The counties with HWA include Rabun, Towns, Union, White, Habersham, Stephens, Lumpkin, Dawson, Fannin, Gilmer, Pickens Murray, Dade, and Walker.

Georgia Forestry Commission provided assistance to the predator beetle rearing labs at Clemson University, University of Georgia, University of North Georgia and Young Harris College. Activities include scouting for and collecting foliage for rearing, scouting and preparing beetle release locations and releasing predators. GFC played a critical role in the logistics of delivering foliage to the labs and getting predators to the forest as the location of these activities moves greater distances from the labs. The Georgia Forestry Commission scouted for suitable foliage collection sites and delivered infested foliage as needed from November through early May.

In 2013, GFC assisted in scouting and flagging predator release areas on the Chattahoochee National Forest, two Georgia State Parks, two Georgia Wildlife Management Areas and one land trust property. Twenty-two potential release areas were scouted. The GFC conducted 33 predator releases on 15 of the scouted sites, representing all four ownerships. Both *Laricobius nigrinus* and *Sasajiscymnus tsugae* were released at all fifteen sites. The first predator release in the Cumberland Plateau in Georgia was conducted on Lula Lake Land Trust property near Cloudland Canyon State Park.

Georgia Forestry Commission continued to serve in an advisory capacity working with the Georgia Department of Natural Resources (DNR) to help survey and protect hemlocks on state lands. Work this year focused on developing plans for chemical treatment and predator releases on the Rich Mountain Wildlife Management Area-Cartecay Tract, Fort Mountain State Park, Cloudland Canyon State Park and adjacent Lula Lake Land Trust properties.

Partnerships continue with non-profit groups with trained volunteers to chemically treat thousands of trees according to developed plans.

The GFC assisted numerous cities, communities, homeowner associations and individuals regarding HWA. Kioritz soil injectors are available at GFC offices in Habersham, Union, Lumpkin, Gilmer, Fannin, Murray, and Pickens counties. One injector was also placed in Rabun County at the UGA Cooperative Extension Office. Most counties reported frequent use of the tool with some counties having a waiting list. An injector will be available for use in Northwest Georgia in 2013. At least ten presentations were made to the public on HWA. The Georgia Forestry Commission continued to work with UGA researchers and others to gather the most up to date information on HWA. GFC public website postings were added and updated in an effort to relay this information. <http://www.gatrees.org/forest-management/forest-health/hemlock-woolly-adelgid/>.

Thousand Canker Disease

The Georgia Forest Health Staff is concerned about the rapid spread of the walnut twig borer and the associated thousand cankers disease from its recent introduction near Knoxville, Tennessee. In 2013, the pheromone trapping for walnut twig borer was expanded from ten to twelve locations, focusing more closely on the counties sharing boundaries with Tennessee and North Carolina. The sites are either pure black walnut plantations or bottomland forests with a large component of black walnut. Five sites were in the Chattahoochee National Forest, two on state property, two on Tennessee Valley Authority land, and three on private property. The survey began in mid-August and lasted through five, two week periods. Samples were collected every two weeks and sent to Dr. Rick Hoebeke, Collection Manager, Museum of Natural History, University of Georgia, for identification. The results from all sampling periods came back negative for the walnut twig beetle (*Pityophthorus juglandis*).

In 2013, we also began windshield surveys for thousand canker disease on various routes connecting the trapping sites. Routes totaled 371 miles as of 30 September with approximately 2,500 black walnut trees observed along the routes. Trees showing twig die-back were inspected more carefully. No suspected thousand canker disease was found on these routes.

Sudden Oak Death Syndrome

The sudden oak death early detection program continued with ten watersheds chosen in north Georgia to monitor for the presence of the pathogen *Phytophthora ramorum*, which is responsible for substantial west coast tree mortality. Sampling targeted watersheds that include Georgia's past positive nursery sites and watersheds with abundant new residential development in the metro Atlanta area. It is believed that many of the plants from these nurseries were sold and planted locally and could be causing further undetected *P. ramorum* infections in the landscape. In 2013, special focus was placed on watersheds adjacent to the new positive watershed detected in Forsyth County in 2012. Four new watersheds west of Atlanta, in an area that has had no early detection sampling to date, were also chosen for sampling.

In addition, stream-baiting continued in two watersheds producing multiple positive samples in the past few years. Both of these watersheds have nurseries that had positive plants and soil in the past. Georgia Forestry Commission continues to sample at five locations in these two positive watersheds.

All stream sampling in 2013 was done using the bottle of baits (BOB) method. Two 900ml samples were taken at each site and baited with a whole rhododendron leaf and ten punched rhododendron leaf pieces per bottle. Samples were incubated before being sent to the lab. All samples from three spring periods in 2013 were negative for *P. ramorum*. Three additional sampling periods will be completed in October and November of 2013.

For the past four years field vegetation surveys have been conducted in a cooperative effort between Georgia Forestry Commission, USDA Forest Service, and Clemson University to detect the presence of sudden oak death symptoms along these two positive streams. To date all samples have returned negative. In 2013, the government shutdown prevented USDA Forest Service from participating in the annual streamside vegetation survey, but GFC personnel performed the survey during the first week in October. Samples have been submitted and results are pending.

Laurel Wilt Disease

Laurel wilt is a disease of plants in the Lauraceae family in the United States caused by the fungus *Raffaelea lauricola* that is vectored by *Xyleborus*

glabratus, the redbay ambrosia beetle (RAB), both of which originated in Asia. Since laurel wilt disease (LWD) was first recognized near Savannah in 2002, it has spread rapidly through the abundant redbay trees (*Persea borbonia*) in the maritime and coastal plain forests of Georgia, north through South Carolina into southeastern North Carolina, and south nearly to the southern tip of the Florida peninsula. The disease has also killed numerous sassafras trees, *Sassafras albidum*, as it spread inland. Other plants in the laurel family known to be susceptible to varying degrees include: camphor (*Cinnamomum camphora*), avocado (*Persea americana*), pondspice (*Litsea aestivalis*), and pondberry (*Lindera melissifolia*).

In 2013, LWD has been confirmed in several distant locations to the west including: one new county in Mississippi in the Pascagoula River drainage, four new counties in the Florida Panhandle, and one new county in Alabama where it is killing sassafras in the absence of redbay. The advance of LWD in Georgia has been documented through contacts with landowners, directed road surveys, and assessments of monitoring plots by Georgia Forestry Commission Forest Health personnel. The presence of LWD in previously uninfected counties has been confirmed by submitting wood samples from symptomatic trees to Steve Fraedrich, USDA Forest Service, Athens, GA, for laboratory culture and identification of the pathogen, *Raffaelea lauricola*. LWD was confirmed in nine new counties in 2012 and one new county through September 2013, five of which were from sassafras trees in areas where redbay is scarce or absent.

As of October 2013, the disease front in Georgia extends about 150 miles to the northwest, 130 miles to the west, and 175 miles to the southwest from where it was originally discovered near Savannah and includes 40 counties, where approximately eight million acres of forest have been subjected to the disease. The rate of spread has varied along the advancing disease front in Georgia from over 17 miles/year in the southern coastal plain, where redbay trees are well distributed, to about nine miles/year to the west in the upper coastal plain where host plants are widely scattered. The rate of spread in Georgia appears to have slowed in areas with sparse host. In 2012 and 2013 much of the disease spread has occurred in sassafras trees, indicating that LWD can infect sassafras in the absence of redbay and may spread beyond previously predicted limits.

An Environmental Monitoring project supported by the USDA Forest Service was initiated in 2009 by the Georgia Forestry Commission to document the spread of laurel wilt in Georgia and further our understanding of the disease process in both redbay and sassafras. Standardized permanent plots were established in redbay and sassafras habitats behind, at, and beyond the advancing disease front to document the LW disease progress, vegetation changes, and survival of host regeneration in southeast Georgia. Sixteen redbay and eight sassafras plots were established in the winter/spring of 2009 and each plot has been reassessed eight times through the summer of 2013.

Redbay trees with symptoms of LWD die rapidly and are colonized by ambrosia beetles within several months. Nearly all redbay trees greater than one inch DBH are killed by LWD within three to four years after the first symptomatic trees are observed in a local area. Disease progression is most rapid in areas with high volumes of redbay, and it is slower in the presence of smaller, more scattered host trees. In most areas, redbay sprouts and regeneration are abundant after the disease runs its course; however the redbay ambrosia beetle and *R. lauricola* remain active at low levels many years after the initial epidemic has passed.

Laurel wilt infects sassafras in a rather haphazard fashion, sometimes killing scattered individual trees; other times killing entire thickets, while other groups of sassafras trees in the area are left unaffected. The largest sassafras trees tend to be killed first and disease spread is sometimes rapid in dense thickets, apparently aided by movement of the fungus through interconnected lateral roots. Most trees in a stand are killed within three years of the initial infection; however some small trees usually remain alive after the disease has run its course, and two sassafras disease episodes appeared to stop spreading with many trees remaining alive. Ambrosia beetle attacks are most evident at the bases of sassafras trees killed by LWD. Redbay ambrosia beetles are capable of spreading laurel wilt disease in sassafras in the absence of redbay and substantial brood can be produced in larger sassafras trees.

Progress reports have been produced detailing the GFC Laurel Wilt Evaluation Monitoring project. The first was completed in 2011, entitled "Evaluation of Laurel Wilt Disease in Georgia: Progression in Redbay and Sassafras – 2008-2010." A poster presentation, "Progression of Laurel Wilt in Georgia,

2009-2011" was prepared for the 2012 Forest Health Monitoring Working Group Meeting and is posted on the National Forest Health Monitoring website. Also, a document summarizing this project with the same title as the poster was published in the 2012 Forest Health Monitoring National Technical Report. The final assessments of the permanent plots established for this project were conducted during the summer of 2013 and a final report is being prepared.

The Georgia Forestry Commission continues to work with the USDA Forest Service, and other partners to document the spread of this destructive nonnative invasive insect and disease. Long distance spread of LWD continues to occur, emphasizing a need for more effective education concentrating on limit movement of host materials harboring RAB.

Additional information on LWD can be found at: <http://gatrees.org/forest-management/forest-health/laurel-wilt-disease/index.cfm>. This Georgia Forestry Commission web page provides a summary of this disease, as well as links to a distribution map, progress reports, a poster presentation.

INVASIVE WEEDS

Cogongrass

Although many invasive plants cause problems within Georgia, the majority of our efforts have focused on cogongrass and Chinese privet. Our "Cogongrass Task Force" continues its mission in Georgia to address the threat this plant poses to our environment. Training has been given to resource professionals throughout the state, and the educational campaign continues to help landowners identify the plant. Once landowners find suspect sites, they notify the Georgia Forestry Commission to verify the identification and if confirmed the GFC will treat the site at no charge to the landowner. All known cogongrass infested sites are being treated by either the Georgia Forestry Commission, or in a few cases the landowners.

The GFC spearheads an effort to bring all concerned groups and agencies under this "Task Force" to detect cogongrass. A total of 23 states, federal and private partners signed an agreement to establish the entire state of Georgia as a Cooperative Weed Management Area for cogongrass in May 2008. These partners were contacted last February to remind them of the flowering and seeding period that makes it particularly recognizable. Literature was mass printed and given to all partners who expressed interest. The combined effort

of this group has had far reaching impacts in educating the public about cogongrass as well as helping to locate all infested sites. All information regarding this nonnative invasive weed has been assembled at this web site: <http://www.cogongrass.org/>

The education efforts of the Georgia Forestry Commission have paid dividends and initial cogongrass reports are being filed from private landowners, industry foresters, and some logging operations. Statewide, forest health training was provided to foresters, resource managers, loggers, public works departments (state and county), nurserymen, regulatory agencies, landowners and at field days on 131 occasions with 39,171 attendees being reached. These sessions involved forest health key topics and cogongrass was included as a fundamental part of these training seminars.

There have been 91 new cogongrass infestation sites reported and treated by the GFC during this fiscal year. Confirmed detections of cogongrass decreased in 2012 for the first time since the GFC began its leadership role in cogongrass detection and eradication. The 2013 detections continue to follow the downward trend set in 2012. The GFC continues to treat all new sites with herbicide, normally imazapyr and glyphosate, at no cost to landowners. This assistance is only possible through an ongoing grant provided by the USDA Forest Service. This nonnative invasive weed has now been found in 55 Georgia counties, involving 768 sites. Harris, Turner and Walton counties each had single cogongrass detections in 2013. In Georgia, 195 acres of cogongrass have been treated with all known sites being sprayed at least once. Most of the infestations in Georgia are between 1/20 - 1/4 acre in size and are not visible from an aerial detection survey. Ground survey and field reconnaissance are the only reliable means of detection. During the post treatment inspection process, approximately 77% of all known sites are being reported as negative for cogongrass. Three consecutive years of negative evaluation is required for a cogongrass site to be deemed as eradicated. There are 139 sites in Georgia that have shown one year of negative post inspection, 123 sites that have shown two years of negative post inspection and 327 sites have been declared eradicated. The chart below displays the status trends over the past three years.

During this fiscal year there were 171 herbicide treatments with 146 post treatment evaluations. This includes new detections treated along with spot treatments being made on prior year sites. Herbicide

treatments have been effective with the majority of all sites now being controlled within two growing seasons based on the current herbicide mixture and rates. These mixes and rates are published in a paper produced by the forest health staff and the USDA Forest Service. These recommendations are posted on the Georgia Forestry Commission's public web site:

Cogongrass Eradication Strategies

<http://www.gatrees.org/forest-management/forest-health/cogongrass/GFCCogongrassEradication-StrategiesrevMarch2010.pdf>.

In an effort to increase public awareness and education, an information newsletter is posted semi-annually on the GFC Homepage and is e-mailed to landowners and partners across the Southeast. This newsletter contains reminders for landowners to be vigilant for new infestations of cogongrass, gives pictures for identification purposes, and provides an update on the current status of cogongrass infestations in Georgia. This newsletter is published on the GFC Homepage:

Cogongrass in Georgia: Spring 2013 Update

<http://gatrees.org/forest-management/forest-health/cogongrass/CogongrassinGAUpdate-NL.pdf>.

A county density map depicts local infestations and more accurately shows the spread of cogongrass in Georgia. This map is published on the GFC Homepage:

County Density Map

<http://gatrees.org/forest-management/forest-health/cogongrass/CogongrassCountyDensityinGA.pdf>.

An additional map was created in 2011 to show the Percentage of inactive cogongrass sites in each Georgia County.

<http://www.gatrees.org/forest-management/forest-health/cogongrass/CogongrassPercentInactiveMap.pdf>.

The cogongrass banner stands created by the forest health staff have been utilized at numerous public events and workshops. In addition, a cogongrass poster created in 2011 was distributed and displayed in state and federal government offices as well as in local community stores.

Dirty Dozen List of Invasive Weeds

The use of the top twelve “Dirty Dozen List” has proven a valuable tool in the fight against invasive weeds in Georgia. This list uses Forest Inventory and Analysis (FIA) data providing a defensible ranking of invasive plants. During the spring of 2012, the FIA inventory was conducted giving the forest health staff an opportunity to contribute input on the nonnative invasive plants surveyed in Georgia. This “Targeted Watch list” included species on the original “Dirty Dozen List,” but it also was developed using the standard Invasive Plant Definition adopted in 2011.

Invasive Species: “Any plant or animal that has normally been introduced and aggressively competes with, and displace, local native communities; normally having no natural enemies to limit reproduction and spread.”

The final “Targeted Watch list” consists of twenty-five nonnative invasive plant species that are proven to meet the definition above; aggressively competing with and displacing native communities. This is not to say that the standard FIA nonnative invasive list was ignored, this input simply provided the FIA foresters a working knowledge of the needs of our Forest Health Program. From the 2012 FIA survey an updated “Dirty Dozen List” was released in 2013.

Across Georgia our efforts have focused on Chinese privet, Japanese climbing fern, Chinese tallowtree, Nonnative olive, and Nonnative rose. This list is subject to change as we encounter new species that are entering Georgia. The use of tools, such as FIA data, gives our Forest Health Team the ability to see trends in occurrence and growth, and the data helps us to predict our greatest enemies in the future. The 2013 “Dirt Dozen List” showed the species composition of nonnative invasives did not change but the magnitude of increase over a two year period was dramatic. For all invasive plants in Georgia there was an average 14% increase across Georgia. Privet increased from 638,000 acres to 726,000 acres (14% increase) and Japanese climbing fern increased from 16,271 acres to 20,563 acres (26% increase).

Cogongrass is considered our greatest threat as an invasive plant and we separate this Federal Noxious Weed out as our number one invasive weed challenge in Georgia.

In 2013, the GFC used the revised “Dirty Dozen” list as a criterion for The Invasive Plant Control Cost Share Program. This cost share program assists

landowners in the control of targeted species listed as major competitors to our native forests. This cost share program has provided assistance to landowners across Georgia and is being extended for a third year in 2013-14.

Invasive Plant Species Control Program

Addressing invasive species occurrence and control is a growing issue. The forest health staff is partnering with the USDA Forest Service, the University of Georgia, and other state, local, and federal agencies to educate the public of the harm nonnative invasive plants can cause in Georgia. Regional and local programs have been conducted during the past year to bring relevant and current topics to the landowners of Georgia and our federal and state partners.

In 2011, the GFC began the Invasive Species Control Cost Share Program assisting landowners in the control of nonnative species, and one hundred landowners were awarded contracts to begin control of Chinese privet and Japanese climbing fern on over 2,100 acres of private lands across Georgia. In 2012, the GFC continued the Invasive Plant Control Cost Share Program assisting landowners with control of targeted invasive species to increase the amount of healthy, productive forests across Georgia by eliminating nonnative, invasive plants. Fifty-two landowners were awarded contracts to control Chinese privet, nonnative olive, Japanese climbing fern, and multiflora rose on 2,250 acres of private lands across Georgia. All 2011/2012 contracts have been completed and a total of 152 Georgia landowners with 4,350 acres of nonnative invasives were served under this initial signup.

This program will hold another signup period in the winter of 2013 with an emphasis placed on funding landowners in a seventeen county area organized under the Coastal Invasive Species Management Area (CISMA). Due to limited funding we should be able to assist approximately 45 landowners in 2013/14. Technical assistance is provided to landowners by GFC foresters for evaluation of sites, and determining the steps landowners should take to expect successful results (brief management plan). The forester will inspect the area at the completion of the practice to determine if the management plan was successfully implemented, and authorize release of cost share funds at that time.

Chinese privet

This is the most widespread and harmful nonnative invasive plant to Georgia's forests. The new Forest Inventory and Analysis survey for 2013 indicates a 14% increase in acreage infested with Chinese privet; in two years there was an increase of 88,232 acres infested with privet.

In 2013 we expect that Chinese privet, Chinese tallowtree and Japanese climbing fern will dominate the requests for assistance under the Invasive Plant Cost Share Program. Chinese privet will lead all requests and should account for 85% of the applications for assistance. This nonnative invasive plant continues to be a major competitor in wetlands and is still the number one invasive plant in Georgia in terms of forested acres infested.

The control of Chinese privet has proven simple using foliar applications of glyphosate (4-7%) applied between October and January; this method is cost efficient and very effective. With herbicide applications being made in the winter months we expect to produce close to a 100% kill by April of the following year. A second application may be required to eliminate the small amount of regeneration, but normally one application is sufficient to achieve control.

The Invasive Plant Cost Share Program provides assist to landowners in controlling this targeted species and results have been documented across all of Georgia.

Trifoliate orange (*Poncirus trifoliata*)

On January 13, 2011 the forest health staff began field trials to determine optimal application timing, techniques, and herbicide rates to control trifoliate orange using commercially available herbicides.

Multiple plots were established using cut stump, basal stem, thin line, and foliar applications at varying rates of triclopyr, glyphosate, and imazapyr to control this thorn infested invasive.

Initial evaluations were made in June 2011 and surprisingly we found that foliar application with low rates of glyphosate, applied during winter months, produced great results. The application of glyphosate (5-8%) with 1.5 ounces of metsulfuron (Escort® XP) in one hundred gallons of mix, applied between October and February has proven to be extremely affective. These rates and application times mimicked the timing and rates used for Chinese privet control.

Field trials were conducted again on three additional plots on February 2, 2012 using backpack mist blowers. This application method appears to be useful with herbicides being dispersed using high volumes of air pressure to atomize the herbicide producing fine droplets giving better coverage, higher efficiency, and greater dispersal in difficult areas. (Caution must be used due to drift of the fine mist). Evaluations were conducted on May 1, 2012. Using field observations, the most promising application was made with low rates of glyphosate in a foliar application. Within three months of application, browning was observed in the cambium layer and dieback was present on smaller limbs.

Field observations, conducted in January 2013, showed the foliar applications of glyphosate in 2011 and 2012 were very affective and achieved good kill. Stems were brittle and brown and appeared to be dead. There was little to no collateral damage to surrounding vegetation and browning was observed in the cambium layer and plants appeared to be dead with no sprouting.

Trifoliate orange treated in 2011 with thin line and basal bark applications of triclopyr also showed very good results. The thin line and basal bark applications were more labor intensive and more herbicide was required due to the size of the stems being treated.

From this field trial, it appears trifoliate orange is easily killed with winter applications of glyphosate and metsulfuron. The best treatment option requires a combination of mechanical and chemical treatments. A forestry mulcher is used to knock down and mulch the invasive plants and the stumps sprout the following year. In fall to winter of the year following the mulching treatment, a foliar application of glyphosate at 5-8% strength with 1.5 ounces of metsulfuron in one hundred gallons of mix is applied to the sprouts. This treatment should be applied as a dormant season application and foliage should be covered completely. Backpack mist blowers work well for this application. As an alternative, the same mulching operation could be used with triclopyr applied as a foliar application at 20% strength with basal bark oil.

Japanese climbing fern

Japanese climbing fern is a perennial climbing fern that can reach lengths of 90 ft. (30 m). Vines are thin, wiry, and green to orange to black and usually die back in the winter. The fronds (leaves of a fern) are opposite, compound, usually triangular in shape,

3-6 in. (8-15 cm) long, 2-3 in. (5-8 cm) wide and finely dissected. Fertile fronds bear sporangia that produce tiny, wind-dispersed spores. Plants are also spread by rhizomes. Japanese climbing fern often invades disturbed areas such as roadsides and ditches, but can also invade natural areas. It generally is scattered throughout the landscape, but can form dense mats that smother understory vegetation, shrubs and trees. Japanese climbing fern is native to eastern Asia and was first introduced into the United States during the 1930's for ornamental purposes.

Six years ago Japanese climbing fern was virtually unknown in Georgia. However, this plant is now perceived as a potential threat to the health of Georgia's forests, with initial estimates showing approximately 16,000 acres of Japanese climbing fern in Georgia. The new Forest Inventory and Analysis survey for 2013 indicates a 26% increase in acreage infested with Japanese climbing fern; in two years there was an increase of 4,292 acres infested with climbing fern.

Increased awareness of this plant has led to a dramatic increase in sightings and identification of this pest. To date Japanese climbing fern has been found as far north as Atlanta and Athens in Georgia.

Recent field trials show good results in the first year control using 5% glyphosate plus one and a half ounces of metsulfuron (Escort® XP) (in one hundred gallons of solution) sprayed in late summer to early fall. First year evaluations show approximately 95% control and very little sprouting in the test area. Sites with dense, multiple layers of Japanese climbing fern often required two treatments of glyphosate in the same growing season to eliminate all layers of fern.

Chinese Tallowtree

Chinese tallowtree is native to China and Japan and was introduced in The United States during the late 1700's. This nonnative invasive can establish in full shade on a wide range of soil types in the coastal region and South Georgia. Chinese tallowtree is becoming a serious forest health problem in bottomlands, old fields, coastal marshes, disturbed and undisturbed sites, and in urban settings.

Each tree has the potential to produce thousands of seeds annually and it is common to find trees in excess of twelve to fourteen inches in diameter in well-established areas. Seeds are dispersed primarily by birds; and flooding in riparian areas can disperse

seeds for miles. These seeds mature in late summer to fall ready to germinate the following spring. Chinese tallowtree has increased by 36% in a two-year period bringing the total infested acres in Georgia to 15,348 acres. This is an increase of 4,034 acre since 2011.

Historically, Chinese tallowtree has been controlled using labor intensive herbicide injection methods or basal stem applications. In the spring of 2010 a new chemical, "Clearcast" (imazamox), was presented by BASF as an aerial or ground herbicide treatment for application directly over hardwoods with the claim that tallowtree and only tallowtree would be killed. In an effort to increase our outreach and education efforts, a partnership was formed with BASF and SePRO to develop this new technology as an eradication option.

In October 2011, twenty one acres of slash pine were aerially treated using three rates of Clearcast to determine if the herbicide can be safely applied over slash pine. In our field trial we applied thirty-two, sixty-four, and seventy-two ounces of Clearcast per acre, aerially, to evaluate the percent kill on Chinese tallowtree and assess any collateral damage to the hardwood and pine.

This field trial was conducted west of Hahira, Georgia in Lowndes County. The study sites were examined seven and twelve months after herbicide application. The Clearcast treatment was very effective at the 64-72oz. /ac rate, while the 32oz. /ac rate had very good initial suppression, but epicormic sprouting occurred on most stems twelve months after herbicide application. There was no collateral damage to water oak, red maple, blackgum, or wax myrtle. There was slight damage to the terminals of sweetgum. Furthermore, there was no visible damage to the slash pine at any of the rates tested.

In November 2012, Ossabaw Island was aerially treated using Clearcast as a collaborative interagency effort to remove invasive pests from environmentally sensitive areas. Our objective was to aerially apply seventy-two ounces of Clearcast per acre to evaluate the percent kill on Chinese tallowtree and to preserve endangered species habitat.

In July 2013, the result of the application was dramatic. Approximately 250 acres of Chinese tallowtree was sprayed and eight months later all trees in the application area were defoliated and the cambium layer of the trees was brown and appeared dead.

In 2012, a collaborative partnership was established with the Jekyll Island Authority to evaluate tallowtree infestations and control techniques.

Two evaluation sites were established near residential communities and written recommendations have been provided to the Jekyll Island Authority on various techniques using chemical control. The hack and squirt and cut stump methods are being demonstrated using Garlon® 4, and landowners on the island are being encouraged to visit the sites to see the results first hand.

The Georgia Forestry Commission maintains a good working relationship with the Jekyll Island Authority and control efforts continue on the island. New infestations of Chinese tallowtree are quickly identified and control measures are used to safely remove this invasive plant. The GFC acts in an advisory and education roll as a cooperative partner in this effort. Our goal is to promote known, safe control techniques and demonstrate herbicides as a viable alternative without collateral damage. Residents are discouraged from planting tallowtrees in their yard and are informed of the invasive potential of this nonnative pest.

Early Detection Rapid Response

In 2013, the Georgia Forestry Commission employed one temporary day labor employee to perform early detection insect trapping around facilities accepting international cargo with solid wood packing material (SWPM).

Twelve sites were selected across the state to establish a total of thirty-six Early Detection Rapid Response (EDRR) traps and Cooperative Agriculture Pest Survey (CAPS) traps. Lindgren funnel traps were deployed in the Athens and Savannah area for the detection of nonnative exotic bark and ambrosia beetles. The traps were inspected on a two week schedule for twelve weeks with trapping ending in July 2013. Specimens collected were cleaned, sorted, labeled and sent to Dr. Rick Hoebeke, Collection Manager, Museum of Natural History, University of Georgia, for sorting and identification.

In 2010, a new United States record for *Xyleborinus artestriatus* was documented when the insect was found in a trap near a warehouse in Port Wentworth, Georgia. In 2011, trapping at this same warehouse resulted in the capture of forty-eight *X. artestriatus*, but none were caught at traps set a few miles from the initial

catch site. In 2012, the forest health staff continued to catch *X. artestriatus* at the original warehouse, but *X. artestriatus* also was captured in four additional warehouses located within 2.5 miles from the initial catch area, which would suggest that this new exotic ambrosia beetle is established in coastal Georgia and is producing breeding populations. To date no damage has been documented on native vegetation in the area, and the preferred native plants have not been determined. For 2013, trap catch information is pending, but it has been confirmed from initial screening that *X. artestriatus* has been caught in traps in the Savannah area. These results will be included in the 2014 report.

In addition, 10 *Sirex* woodwasp traps, 10 *Tremex* woodwasp traps, and 30 emerald ash borer traps were placed in the Elberton and Savannah areas. These traps have yielded no additional nonnative pests to date.

In 2012 a new first introduction of *Tremex* woodwasp (*Tremex fuscicornis*) was identified during warehouse trapping in Elberton, Georgia. This new pest to Georgia was submitted to Dr. Rick Hoebeke, Collection Manager, Museum of Natural History, and University of Georgia, who initially identified a male and female *Tremex* woodwasp (*Tremex fuscicornis*). Beech, poplar, elm, maple, willow, and oak are reported as hosts for this insect and in north Georgia this list covers many of the primary species in the forest. For this reason, the Georgia Forestry Commission is taking this introduction very seriously and in 2013 a series of ten early detection traps were established in the Elberton area to detect populations of *Tremex* woodwasp that may have become established from the 2012 introduction. Two suspect *Tremex* samples were collected late in the summer and presented to Dr. Hoebeke for identification. The two specimens were *Tremex columba* L., the "pigeon horntail" and *Urocercus cressoni* Norton, the "black and red horntail."

In an effort to increase awareness of nonnative insects a four-page color brochure has been developed to provide a visual representation of the pests targeted in our early detection surveys. The warehouse contacts have posted these brochures around the warehouse sites and protocols for insect sample collection are provided on the front page.

In 2014, early detection traps will be established near these warehouse sites to detect populations of *Tremex* woodwasp.

Additional Surveys Supported by Georgia Forestry Commission:

Sirex / Tremex Woodwasp

Huge losses of both loblolly and slash pine have occurred on other continents due the Sirex woodwasp (*Sirex noctilio*), and it remains a pest of high concern that has yet to be detected in Georgia (or the southeastern U.S). The Sirex woodwasp poses a threat to all of Georgia's southern yellow pines and warrants monitoring through our early detection rapid response protocols.

New threats such as Tremex woodwasp (*Tremex fuscicornis*) have been introduced in international cargo with solid wood packing material (SWPM). This pest causes severe damage to healthy trees of importance in agriculture, arboriculture and forestry in Chile, and the host list of potential species closely matches the composition of our North Georgia native hardwood forest. These new pest introductions illustrate that increased global trade carries with it new challenges for our forest health program and emphasizes the importance of our early detection programs.

A series of Lindgren funnel insect traps (baited with ethanol, alpha-pinene/ethanol, and Sirex lures) were deployed at high risk warehouses receiving solid wood packing materials near Savannah and Elberton Georgia. Trapping began in June with twenty traps established (ten Sirex traps and ten additional traps to detect Tremex woodwasp) in the vicinity of warehouse sites; trapping was completed at the end of October. Traps were inspected on a two week interval with suspect catches being hand carried to Rick Hoebeke in Athens. Two suspect Tremex samples were collected late in the summer and were identified as *Tremex columba* L., the "pigeon horntail" and *Urocercus cressoni* Norton, the "black and red horntail." No *Sirex noctilio* have been caught in our traps to date.

Animal Plant Health Inspection Service (APHIS) Funded

Emerald Ash Borer (USDA-Aphis Funded) 11-8213-0651-CA

The emerald ash borer (EAB) has devastated ash trees in the northeast and mid-west and could have the same impact in Georgia. EAB was introduced in Detroit, Michigan in 2002 and has since been detected in 21 states and Canada. Georgia has been

part of a nationwide trapping program to detect the presence of this forest pest since 2005. (Appendix C – Emerald Ash Borer Map)

EAB was discovered in DeKalb and Fulton Counties, Georgia, in July 2013 as part of this national detection survey funded by USDA Animal and Plant Health Inspection Service (APHIS). In 2013, more than 400 traps were established throughout the state by Georgia Forestry Commission, Georgia Department of Agriculture, University of Georgia, Athens, and private contractors. These traps targeted areas with increased risk of introduction, such as campgrounds and cargo centers, and traps were placed in stands with a high component of ash trees (*Fraxinus* spp.). Only two traps out of the 400 returned positive for emerald ash borer.

The discovery of EAB in Georgia prompted the release of a Frequently Asked Questions (FAQ) sheet (<http://gatrees.org/forest-management/forest-health/alerts-and-updates/FAQ-EAB-GA.pdf>), an emerald ash borer update for Georgia (<http://gatrees.org/forest-management/forest-health/alerts-and-updates/EAB-GAUpdate.pdf>), and regulated areas are proposed for DeKalb and Fulton counties. These are the first steps in Georgia's efforts to alert residents about the severity of this new pest and to prevent potentially infested ash material from spreading outside this area. In the winter of 2013 there will be emerald ash borer workshops held to inform landowners and communities about EAB, and information will be updated as new information is released. Information is being maintained on our public website at: <http://gatrees.org/forest-management/forest-health/eab/index.cfm>

Both the Georgia Forestry Commission and Department of Agriculture are concerned about this pest spreading unchecked. Quarantine regulations have been drafted to prevent potentially infested ash material from spreading by human-assistance outside the proposed quarantine area. Both agencies will work with forest landowners, loggers, firewood producers, nurseries, municipalities and others to insure that commerce can still occur while safeguards are in place to prevent emerald ash borer movement. Early detection of this new invasive insect is critical to the protection of the forests of Georgia; with positive catches in metro Atlanta, it will be imperative to trap for emerald ash borer across north Georgia in 2014.

In 2013, EAB traps were deployed across Georgia in an attempt to detect new introductions present in Georgia. Between April and September triangular, purple, sticky traps (baited with a manuka oil lure and a Hexenol lures) were deployed and inspected every two months for suspect EAB. The Georgia Forestry Commission established 145 traps using GFC, UGA Warnell School of Forestry and Natural Resources, and Georgia Department of Agriculture personally. Additionally, Delta-21 Resources, Inc. contracted with APHIS and set the remainder of the 400 traps.

*This includes traps deployed by Georgia Department of Agriculture, and University of Georgia. Does not include the traps set by Delta-21 Resources, Inc

Gypsy Moth Survey 13-8213-0032-CA

The gypsy moth is a serious forest pest capable of causing severe damage to hardwood trees, especially oaks. This damage is inflicted as the gypsy moth larvae defoliate entire stands of trees. In cooperation with the USDA Animal Plant Health Inspection Service (APHIS), the Georgia Forestry Commission deploys traps yearly to detect the presence of gypsy moth. There are no known infestations currently in Georgia, although the threat is always present.

Georgia has had outbreaks in the 1990's in White, Fannin and Rockdale counties. These spots were eradicated by state and federal forestry agencies. It is likely that these infestations were started by individuals moving cargo with egg masses attached to it from infested areas.

The following accomplishments summarize the work done by the Georgia Forestry Commission under Cooperative Agreement 13-8213-0032-CA. A total of 1197 traps were placed in four counties across the state by GFC Rangers, Technicians, and Foresters. There were 728 traps deployed for Port Environment/Waterway surveys, 302 traps deployed for detection, and 167 delimiting traps set. All traps were negative for gypsy moth.

Accomplishments:

- GFC personnel deployed traps across the state in four counties in 2013 with the following counties being trapped: Chatham, Glynn, Catoosa, and Murray counties.
- In 2013 gypsy moth traps were established for three distinct accomplishment goals: Port/Waterway Environment Survey, Detection Trapping, and Delimiting Surveys. A total of

839 traps were placed in Chatham County, 274 traps were established in Glynn County, 60 traps in Murray County and 24 traps in Catoosa County.

- The Port of Savannah is the 4th largest port in the nation and Brunswick is the 6th largest automobile processing port in the nation. With this much overseas cargo, it was determined that these two ports justified Port Environment/Waterways surveys. In Chatham County 688 traps were established from the mouth of the Savannah River, through the waterfront of historic Savannah, and around the Port of Savannah to the Houlihan Bridge north of Savannah. No Positive traps were detected in this portion of the survey. The Port of Brunswick, in Glynn County, specializes in break bulk, agricultural bulk and roll on roll off cargo. There are approximately 1,700 acres on the facility and 40 traps were established around the port. Again, no positive traps were detected.
- The communities around the Port of Savannah and the City of Brunswick were surveyed using detection trapping in 2013. There were 122 traps established in the surrounding neighborhoods and communities adjoining the Port of Savannah and 180 traps were established in the City of Brunswick. No Positive traps were identified in this detection survey.
- In 2012, eight positive gypsy moth catches were made in Chatham, one in Glynn, one in Catoosa, and one in Murray counties. Delimiting trapping was performed around each of the 2012 positive sites and the following traps were established in each county: Chatham - 29 traps, Glynn - 54 traps, Catoosa - 24 traps, Murray - 60 traps. All delimiting trapping was negative.
- A grand total of 1197 traps were deployed in Georgia in 2013.

Exotic Wood Boring and Bark Beetle Survey (USDA-Aphis Funded) 13-8213-0457-CA

A survey for exotic wood boring and bark beetles was conducted for the eighth year. One temporary employee surveyed warehouse sites using the Facility Risk Assessment Scale System (FRASS) developed in 2010 to evaluate and rate facilities for potential risk for exotic pest introductions. Facilities accepting international cargo with solid wood packing material (SWPM) are given a rating based on the type packing material, moisture content, and continent of origin of

the SWPM handled. Facilities scoring 0-5 point's rate a low risk or "cold"; 6-9 points indicate moderate or "warm" risk; and scores above nine points indicates a high or "hot" risk for pests. A facility with cold ratings requires fewer site visits, as they are on the lower risk scale for new introductions, where a high risk site may receive multiple site visits during our survey rotation. (Appendix – D "Facility Risk Assessment Scale (FRASS)").

More than two-hundred total facilities have been identified as potential risks for exotic pest introductions statewide. There were 54 warehouse sites identified using the (FRASS) rating system to conduct inspection and trapping of nonnative bark and ambrosia beetles, and over 130 site visits were made during the year. Thirty-six traps were established and monitored between March 16 and October 31, 2013, and an additional thirty emerald ash borer (EAB), ten Sirex woodwasp and ten Tremex woodwasp traps were established at multiple locations in the Elberton and Savannah area.

In an effort to increase awareness of nonnative insects, a four page color brochure was developed and distributed to participating warehouse partners to provide a visual representation of pests targeted in our annual surveys. This brochure depicts common nonnative insects found in SWPM, and more exotic insects that we expect to see in the near future. These brochures were left with warehouse contacts and posted in break rooms, work areas, lunch areas, and loading docks for the warehouse workers to see.

In 2012 a new first introduction of Tremex woodwasp (*Tremex fuscicornis*) was identified during warehouse trapping in Elberton, Georgia. This new pest has a preferred host list including many native hardwood species in North Georgia; Beech, Poplar, Elm, Maple, Willow, and Oak. In 2013, ten early detection traps were established in the Elberton area to detect populations of Tremex Woodwasp that may have become established from the 2012 introduction. Two suspect Tremex samples were collected late in the summer and presented to Dr. Hoebeke for identification. The two specimens were Tremex columba L., the "pigeon horntail" and Urocerus cressoni Norton, the "black and red horntail". No new Tremex fuscicornis was detected.

In 2014, detection traps will continue near these warehouse sites to detect populations of Tremex woodwasp.



Forest Protection

WILDFIRE ACTIVITY

Fiscal Year 2013 was a moderate year in both number of wildfires and acres burned. Georgia lost more than 19,717 acres to wildfire in FY13, bringing the 5-year average of acreage burned annually to 41,649 acres. Georgia Forestry Commission firefighters responded to 4,153 wildfires for an average of 4.74 acres burned per wildfire. Our fire numbers for 2013 were approximately 25% lower than the five-year average and the acreage total was more than 50% less than the five-year average. Overall, debris burning was the number one cause of wildfires and accounted for 1,767 fires, with arson following as the second leading cause with 427 fires. The Flint District in Southwest Georgia had the highest acreage burned with approximately 4,922 acres lost to 886 fires. The Coosa District in North Georgia ranked second highest with approximately 3,588 acres lost to 596 fires. The Ogeechee District had the third highest acreage burned, with approximately 3,300 acres lost to 999 fires.

COUNTY AND DISTRICT OFFICE OPERATIONS

During 2013, Forest Rangers serviced 3,143 requests for firebreak harrowing for a total of 18,717 miles. There were 3,081 landowner requests for firebreak plowing for a total of 13,465 miles.

Online permits allow homeowners to receive permits via the internet for burning small piles of Hand Piled Natural Vegetation. The Georgia Forestry Commission highly promotes the use of the internet to obtain permits, however; those without internet access may receive a permit for hand piled vegetation by calling 1-877-652-2876. During FY13, 789,343 burn permits were issued in Georgia. Of that total, 170,526 permits were issued online and 522,829 permits were issued by the automated permit service. There were 1,629,928 acres prescribed burned in Georgia for 2013. This includes 310,286 acres of agriculture; 1,136,067 silviculture and 183,575 landclearing acres prescribed burned respectively.

WILDFIRE PREVENTION

Though the precipitation this year did lower the number of human caused wildfires, state and district level outreach has continued with diligence. Wildfire Prevention has continued to be a key component of Georgia's Fire Program.

Through the Career Development Initiative each of our six districts had the opportunity to nominate personnel within their district who shared a great vision in Fire Prevention and/or Firewise. Ten District Coordinators were identified: Denise Croker & Shannon Dean, Coosa District; Jenny Lynn Bruner & Chris Dunn, Chattahoochee District; James Mashburn, Oconee District; Shawn Diddie, Ogeechee District; Tony Thomas & Jacob Hughes, Satilla District; and Jason Rex & Chase Shannon, Flint District. Each of these individuals was responsible for prevention efforts and management in their various regions of the state. Their help in this first year has already made huge impact statewide.

The program also provided a National Fire Prevention Team who served in Polk, Haralson, and Rabun Counties. The team lead by Mark Wiles, Fire Prevention Specialist made great strides to educate local homeowners, community leaders, emergency personnel, and media in these counties.

Last year's GOAL Fire Prevention Team was honored with the Robert E. Browning Award for excellence in Fire Prevention. This was an amazing accomplishment for our program and agency.

GFC also provided fire prevention efforts through large events across the state including: the Georgia Mountain Fair, Moultrie Sunbelt Expo, the Buck-a-Rama/Fish-a-Rama, the Turkey-Rama, and the Georgia National Fair in Perry. A new set of three displays was developed in conjunction with our Communications Department that will now be

available to state personnel in order to provide a more consistent, professional image of our agency and its mission.

One of our most visible programs has been the use of the IMG University of Georgia Bulldog Radio Network to broadcast fire prevention messages during the UGA football and basketball games. Response to this program has been very positive from the general public.

COMMUNITY WILDFIRE PROTECTION PLANS (CWPP'S)

The Forest Protection Department received Redesign Grant funding beginning in late 2009 from the USDA Forest Service to promote Community Wildfire Protection Plans statewide. The Georgia Forestry Commission is currently concluding this grant cycle on September 30th, 2013.

A CWPP provides a community or county with a road map to reduce its risk from wildfire. A CWPP designed through collaboration between state and local fire agencies, homeowners, adjacent landowners, and other interested parties such as city councils, utilities, HOAs, and environmental groups. This planning enables counties in Georgia to address their development patterns in the Wildland Urban Interface and determine how they can reduce their own risk.

As of June 30th, 2013 the program has met its goal of completing 100 of Georgia 159 counties. Not only has the program met the goal, but far exceeded its own expectation by completing 132 counties with an additional 11 counties still working toward completion. Beginning this year, the Georgia Emergency Management Agency has completing the CWPP for each county mandatory as part of the counties State Hazard Mitigation Plan which is required by FEMA.

FIREWISE AND FIREWISE COMMUNITIES/USA

The NFPA's Firewise Communities program is intended to serve as a resource for agencies, tribes, organizations, fire departments, communities, and residents across the state of Georgia who are working toward a common goal: reduce the loss of lives, property, and resources to wildland fire by building and maintaining communities in a way that it is compatible with our natural surroundings. Georgia over the past few years has been very successful in the message of Firewise.

In the past two years our program has grown by leaps and bounds. Fourteen new communities were added to our statewide list, with an additional 15 estimated to join by the end of 2013. This year with the help of our National Fire Prevention and Education Team, Northeast Georgia has been catapulting forward in their success for wildland fire planning.

Another noteworthy accomplishment, Hiwassee/Towns County was chosen to one of only nine areas nationwide to be recognized as Fire Adapted Community. With this success and local support, a taskforce has been created to spread this on to bordering areas and beyond. The fact is that wildfires will continue to occur in the wildland urban interface as an ecological phenomenon and communities will continue to be affected. The program vows to assist these communities to reduce their risk.

TYPE II INCIDENT MANAGEMENT TEAM

The GFC Type II Team, established in 2004, continues to be called upon to manage many incidents and has grown with each deployment. FY-13 was a slow year for team activity as fire threats continued to lessen and the team did not have another assignment. A late hurricane (Sandy) produced a hurricane request for New York, New York, however it was cancelled prior to being filled.

GFC team members and other qualified employees provided aid throughout the west as the western fire season was pretty heavy and there were many requests for single resources. No other requests for our team were made in Fiscal Year 2013. A short team was requested to manage the 2013 Southern Group of State Foresters meeting in Savannah.

Our team membership increased to 115 members in 2013. The team is growing, the team is still ambitious to include future plans integrating other agencies into membership and building a Multi-Agency All-Hazards Team for Georgia. Each year the team builds on its experiences and is establishing an excellent reputation for the Georgia Forestry Commission and the state of Georgia.

LAW ENFORCEMENT

The Georgia Forestry Commission Law Enforcement Program continued to make progress in its ability to investigate arson fires and identify those responsible. Through training, experience, equipment acquisitions, and the hard work of our Investigators, the program is moving toward becoming the best forestry investigation program in the country.

The Law Enforcement Program was awarded a USFS Redesign Grant to develop a southern area arson task force. In September 2012, more than 40 forestry investigators from the southern states met in Georgia for a week long training seminar and to begin work on an organizational plan. In January, the plan was presented to the southern Fire Chiefs, with positive feedback received. The final plan was submitted to the SGSF for approval in June 2013. A second training seminar is scheduled for August of 2013 to build on the advanced training for the southern forestry investigators.

In July 2012, GFC was awarded funding from Homeland Security through Firefighter's Assistance Grant. The one year grant funded equipment purchases, training, and media campaigns. Two week-long fire investigation training courses were delivered to GFC fire suppression personnel were funded by the grant, along with the remodel of a FEMA trailer that will be used as a fire investigation command center for major investigations.

GFC was awarded another Firefighter's Assistance Grant in June 2013. This grant was the third such award for GFC Law Enforcement in the past four years, totaling more than \$376,000 for the improvement of the fire investigation program. This grant will be executed in FY13.

From July 1, 2012 through June 30, 2013, GFC Investigators examined 195 fires, 80 of those were determined to have been arson. Those investigations resulted in nine criminal charges being filed against suspects. Investigators were only able to investigate a small portion (less than 20%) of the 427 incendiary fires GFC reported during Fiscal Year 2013.

COMMUNICATIONS

The Georgia Forestry Commission Communications Department is responsible for maintaining a reliable communications infrastructure, consisting of 78 repeater sites, 328 tractor radios, 537 fleet vehicle radios, and 524 portable radios. All of which interact with the 10 control stations strategically positioned across the state that allow the units to communicate with our Response Centers, when suppressing wildfires, conducting burn operations, or responding to various incidents that threaten the domestic tranquility of Georgia's citizens.

We had a very busy year, with the narrow banding mandate deadline of December 31, 2012. We

replaced 80% of our base radios to the new Midland Syntech that met the specifications we needed. We also changed out the remote office units during this time to be compatible with the new base stations. This also prompted a complete new programming format, in which all vehicle and tractor radios had to be reprogrammed, ensuring that each radio had to be physically touched to accomplish this.

The Communications Working Team (CWT) was officially established and three, eight-hour meetings with training and expectations were conducted. CDI guidelines for Communications Technician as a statewide project were recommended and will be developed further in FY2014.

Repeaters were added in Fannin, Gilmer, Floyd, Charlton, and Ware counties. Repeaters were moved in McIntosh and Decatur counties. These changes were made to enhance and extend service due to the approximately 30% reduction of coverage area caused by the narrow banding mandate. There will be a great deal more of this same kind of work ahead.

The proper grounding of county units and repeater sites was found to be greatly needed. Flint District started making preparations, by conducting inspections to estimate materials needed. They will start their grounding project in July 2013, with two teams being led by the CWT Coordinators.

The Communications department looks forward to serving in a larger capacity in the upcoming fiscal year, to help make the entire operation work Faster, Friendlier, and Easier for the Georgia Forestry Commission.

REGIONAL RESPONSE CENTERS

During 2013, the Regional Response Centers issued 19,908 burning permits statewide; accounting for 22.75% of the burning permits issued.

One of the major changes was having the county units direct all fire radio traffic to the Response Centers. This has served two purposes; one, it prevents the unit from having to leave someone in the office to monitor times and radio traffic and second, it allows for better personnel and resource tracking.

Also, we have promoted having the county units forward their phones to their respective Response Center during the day thus allowing field personnel to be more productive. The Response Centers are able

to answer general business calls and forward the calls to the appropriate personnel, as well as, take messages for the county units.

The Response Centers dispatched resources and personnel to approximately 4,000 fires during FY2013.

A structured training regimen has been implemented to better equip the dispatcher with the tools for greater efficiency. This training also includes S-130 and S-190 to provide them with a better understanding of fire behavior and field personnel actions.

STATEWIDE AIR OPERATIONS

The Air Operations unit returned to the Georgia Forestry Commission on July 1, 2012 after being assigned to the Georgia Aviation Authority for the past three years. Despite the difficulties that arise from changing agencies, the Air Operations Unit made great progress this past year. With the goal of becoming a safer, more efficient, and more effective aviation unit many new programs and initiatives were put into place.

Air Operations developed a new flight operations manual that encompasses our mission more effectively and improves safety systems. A new quarterly and annual training program was initiated to continue improving pilot safety. Flight planning protocol's were established, a new system put in place for monitoring flights, and the daily flight log and reporting system were redesigned.

A new aircraft replacement program was initiated to begin phasing out our older airframes and keep us viable and safe for years to come. Savings were found by eliminating paper charts, improving in-flight weather capabilities, and refining the aircraft tracking system.

Despite having a relatively rainy fire season, Air Operations pilots reported 485 wildfires and worked 630 wildfires, reported over 2,500 controlled burns and checked over 24,000 controlled burns. The Air Operations Maintenance Team performed 46 FAA inspections, changed 3 engines, and responded to 50 unscheduled maintenance events.

Air Operations continued to cooperate with the Department of Natural Resources by conducting fixed wing night flights in support of their Law Enforcement Division and saw great success with that program.

Next year's goals include continued safety improvements through attaining additional ratings and licensing for pilots, refining systems and processes, and improving and replacing aging equipment. We will establish ourselves as leaders in Georgia's public safety aviation community by leading training for all agencies, cooperating with other agencies, and exploring opportunities through federal agencies to enhance our program.

GEOGRAPHIC INFORMATION SYSTEM (GIS)

The Geographic Information System or GIS is a section of the Forest Protection Department dedicated to geospatial support and analysis using GIS technology for planning, mitigation, preparedness, incident response, and managing of fire programs. The GIS program focuses on internal and external customers that include GFC personnel using GIS produced maps and analysis to protect the life, property, and natural resources of Georgia by responding to wildfires and implementing prevention programs.

Preparedness, planning, incident response, and mitigation are all important functions of managing wildfire programs. GIS can provide fast, efficient analysis, and data dissemination. This allows the GFC to develop fire plans, enhance situational awareness, develop mitigation strategies, optimize resource placement and allocation, and support incident management with mapping and analysis.

Georgia's Population has grown 2.4% from 2010 to 2012. The growing population also increases the challenge of the urban interface in firefighting. Improved GIS technology could reduce the number of acres burned while allowing for better coordination to aid in protecting life and property within the urban interface.

The Georgia Forestry Commission operated with a GIS department until 2009 when the position was lost due to agency restructuring dictated by budget cuts. Realizing the need and potential of current and new technology the program was revitalized in February of 2013. One GIS employee was assigned to fully support the Forest Protection Department.

Since that time, the GIS Program has hit the ground running. The program has produced 141 maps since program revitalization on February 1, 2013. The GIS Program has mapped GFC assets, such as unit and equipment locations, to assist with closest resource

response coordination. Support is provided for FMAG applications such as identifying and mapping homes, structures, and public infrastructures at risk from active wildfires. The GIS Program analyzed initial response distance from Ranger residences to GFC Forestry Units to identify response times and for analyzing policies on call-back pay. Also, assistance is provided on large fire support for Incident Management operations.

The GIS Program provides firefighters with training of GIS technology for maximizing all types of information and data. Since February, trainings have been conducted reaching 103 people with over 20+ hours committed.

The program is currently working with several long-term projects. GRITS (Georgia Resource and Information Tracking System) is being developed to track acreage permits and incidents across Georgia. The Community Protection Grant Shapefile Project, to meet US Forest Service documentation requirements, is being completed and enhanced. The Community Protection Grant provides funding for hazard reduction prescribed burning within a 10 mile buffer of US Forest Service land. The US Forest Service is now requiring geospatial data for each burn. A smoke management plotter was developed to assist employees who give permits to evaluate the impacts of the smoke plumes on smoke sensitive areas. Sketchmapper tablet pc's training and software improvements for the utilization of aerial mapping. Support for the CWPP (Community Wildfire Protection Plan) Program is continual until each county has a finished plan. GIS also assists with the maintenance needs of the Southern Wildfire Risk Assessment and SouthWrap.

The GFC is represented by the GIS Program for interagency committees and GIS groups. These committees and groups include: Georgia GIS Coordinating Committee (GISCC), Urban and Regional Information Systems Association (URISA), Southern Group of State Foresters GIS Task Force, Southern Wildfire Risk Assessment Steering Committee.

The GIS Program is exploring the potential technology to provide live tracking of resources. This will increase ability for personnel to fire fight in a safer and more effective manner. This technology will help protect life, property, and the natural resources of the state of Georgia.

PRESCRIBED FIRE

Prescribed Fire continues to be the best, most cost efficient forest management tool for wildlife management, protection of the forest from wildfires, restoration of fire dependent forest ecosystems, forest regeneration, and control of certain unwanted plant species. This year, there were a little over 1.1 million forestland acres treated with prescribed fire in Georgia. The Georgia Forestry Commission gave on-the-ground assistance with 158,791 of these acres, while also providing technical advice, weather forecasts, assistance in writing plans, and prescribed fire workshops for landowners across the state. In addition GFC Rangers plowed or harrowed over 32,000 miles of pre-suppression firebreaks so landowners could conduct their prescribed burning.

Training continues in every aspect of Rx fire, and the Rx Fire Certification Program is still very popular. This year the Instructor Cadre had a three day meeting at the Joseph Jones Research Station to update the presentation and lay the course out in a chronological order. This year, three certification courses were held across the state with 112 students attending. To date, there are over 2,800 Certified Burners in Georgia.

The Georgia Prescribed Fire Council held its annual meeting in Tifton this year, with over 150 burn practitioners in attendance. Several topics were presented, with Managing Wildlife Habitat with Fire, Media Relations, Current Air Quality, and Weather Climatology for the upcoming burn year. Visit the Councils website at garxfire.com for more information and this year's annual meeting registration.

FIRE WEATHER FORECASTING

Wildfire behavior is determined by forest fuels, surrounding topography, and weather conditions such as wind and relative humidity. Daily readiness for fire suppression is usually expressed in terms of fire weather and fire danger. Georgia uses a sophisticated National Fire Danger Rating System in which weather data is measured and interpolated into levels of readiness understood by forest rangers and fire cooperators. The fire danger ratings with fire weather forecasting are produced daily by the Forest Protection Meteorologist and are posted on GaTrees.org.

Valuable tools and information for forest managers intending to conduct prescribed burning are available on the fire weather website. These tools include weather maps, rainfall maps, drought maps, lightning maps, point-forecast system, a prescribed fire

climatology system, prescribed weather notification system, and Web-based V-smoke application.

The weather office continued to perform annual maintenance on our 19 weather stations to meet NFDRS standards. In February 2013, Cloud Condition forecast on our 3-day forecast was enhanced based on improved data from NWS. In June 2013, the basis of GFC weather forecast was switched from GFS MOS data to NDFD data.

GFC Fire Weather Website received 65,000 visitors and 355,000 hits per month in FY2013.

RURAL FIRE DEFENSE (RFD) PROGRAM

The RFD is proud to offer continued assistance in this state-wide endeavor. More than 1,869 types of equipment are located in 130 Georgia counties, involving over 990 fire station locations. This GFC leased equipment responded to over 17,663 calls.

Volunteer Fire Assistance funds managed by RFD were dispersed as 50/50 Grants to 22 government entities to purchase wildland PPE, "Pump and Roll" engines, structural fire gear, hoses, nozzles, and other items needed to make fire trucks operational. VFA funds were supplied as grants to the Georgia Fire Academy to provide Basic Volunteer Firefighter, Structural Fire Control, Practical Fire-ground Hydraulics, and Basic Vehicle and Machinery Extrication training for 493 firefighters for a total of 32,538 contact hours. GFC Instructor Cadre conducted basic wildland fire training for 98 students, 38 different agencies for a total of 3,176 contact hours.

The RFD started screening federal excess property through the Federal Firefighter Property Program and has screened over \$1.3 million in fire and rescue equipment.

Four meetings were held with the Rural Fire Defense Advisory Council, a group comprised of Georgia fire officials, cooperators, and insurance representatives. GFC has provided facilitation and logistical support for the council's activities for 21 years.

The Rural Fire Defense Program also consists of two fabrication shops. The shops' goals are to ensure that the residents of Georgia are protected with the best equipment available for the suppression of wildfires, while maintaining cost effectiveness.

RURAL FIRE DEFENSE (RFD) SHOP

The Rural Fire Defense provided three GFC builds, three RFD builds, and seven additional quotes for RFD builds that had a combined total value of \$159,767.94.

RFD Shop built one Fire Knocker, and two Front Mount Pumpers. In addition, the shop built three, Type 6 Wildland Fire Engines with a total value of \$180,000 produced for internal use by GFC county units. Another five work orders for repairs of pumping equipment for internal GFC customers were processed.

FABRICATION SHOP

During the 2012 Fiscal Year, the Georgia Forestry Commission Fabrication Shop supported the state by providing quality customized fire suppression equipment. Construction was completed on the addition to the Fab Shop. The RFD Shop was combined with the Fab Shop.

Over 128 projects were completed for new fire suppression equipment. Five new road tractors were put into service with equipment installed. The Fabrication Shop built three transport beds for new trucks and provided GFC's Rural Fire Defense Department with 18 tanks for their RFD Program. The shop also repaired 37 "V Blades", four new plows, and one new harrow. A total of 79 painting projects were completed, as were 105 other projects.



Communications

Communications staff for fiscal year 2013 consisted of a director, an administrative assistant, a conservation education coordinator and a contracted writer.

Internal communications within the agency continues to improve. GFC Headline News continues to be well-received, and the Ask the Director intranet site continues to get regular questions, feedback and suggestions from employees.

During the year sixteen press releases were produced and hundreds of news articles appeared in print. In addition, various magazine articles appeared in publications as diverse as Georgia Forestry Today, Out of the Woods, and Georgia Trend, among others. Many radio and television appearances were made, with topics ranging from fire prevention and fire activity to Arbor Day.

GFC developed new partnerships with Bass Pro Shops in Atlanta and Macon. GFC professionals set up exhibits in both stores and provided agency literature and other collateral materials to an estimated 15,000 Bass Pro customers. Topics covered included firewood movement, cogongrass and GFC services.

GFC continued to strengthen its presence on Facebook and twitter in fiscal year 2013. All agency press releases were shared on the sites, as were photos of GFC events and professionals.



Forest Products Utilization, Marketing & Development

The Forest Utilization Department provided technical and marketing assistance to the forest products community, provided leadership to expand the value of Georgia's forests by pursuing forestry and bioenergy economic development projects, and provided assistance to forest landowners through the carbon sequestration registry program. These services ensure that Georgia's forest industry remains a leading competitor in the global marketplace while contributing to the state's economic well being. Without healthy markets, owners of Georgia's 24 million acres of commercial forest have few economic incentives to manage their forests. Wise utilization of the state's forest resource base as an economic engine is a high priority. Rural economic development activities relate to quality of life issues as well as creating and sustaining jobs. Environmental concerns of climate change and carbon emissions are addressed through encouragement to participate in forest carbon sequestration projects. These combined efforts are vital to the state's overall effort to maintain a strong economy, healthy forests, and a sustainable environment.

TECHNICAL ASSISTANCE AND FOREST PRODUCT MARKET DEVELOPMENT

The GFC Forest Utilization Department staff responded to 160 individual requests for technical and marketing assistance and pro-actively provided an additional 386 trade leads for Georgia forest product companies. Formal presentations were provided to forty-two groups during meetings, workshops, or conferences with a total audience of 1,834 persons. The topics of these presentations included: expanding wood product markets, the economic impacts of forestry, forest certification, financial returns on forestry investments, and general wood products. The staff participated with the Georgia Sustainable Forestry Initiative committee in developing a video

documentary on the sustainable use of wood. A total of 7,688 literature items were distributed in these various activities.

The Utilization staff contacted representatives of 15 of Georgia's primary forest product manufacturing firms and collected timber drain data and information. This information was added to previously collected data and a new 2013 Georgia Wood-Using Industry and Forest Products Directory was published. In addition, the Department began a project to develop a secondary wood using industry directory. During FY2013 information was collected on 382 firms out of the 1,193 firms that were contacted. This project will be completed in 2014.

The staff developed a variety of additional tools to improve wood product values and production. They included fact sheets and publications on wood product exporters, forest certification systems, and financial returns from reforestation investments. The Department produced two electronic newsletters and contributed to four of the new GFC Enews updates, which were all distributed to customers within the forestry community. Staff also submitted articles to global and regional marketing outlets, such as the SAFER Alliance Commentary and FDM Asia. The marketing staff established and manned exhibits domestic trade shows and conferences including the International Woodworkers Fair, Wood Solutions Fair, Biomass Solutions Conference, Southern Forest Products Expo and others. By utilizing support from external funding, GFC Utilization staff promoted the export of wood products globally at forest product trade events in Japan and Australia. The staff also cooperated with the Hardwood States Export Group and the Georgia International Trade Division by ensuring that Georgia's wood product manufacturers were made aware of appropriate export opportunities.

A new method of providing advice to landowners on the potential economic returns from reforestation was developed by Utilization staff and made available to GFC service foresters. Foresters can now send requests for growth and financial analysis of forest investments to Utilization staff based on site specific attributes. A report is generated and returned to the service forester and landowner to support prudent decisions on the use of forestland.

ECONOMIC DEVELOPMENT OF FORESTRY RELATED PROJECTS

Forest Utilization staff foresters provided assistance to a total of sixty-five potential projects. Eighteen projects involved companies that are considering expanding in Georgia with new traditional wood products facilities. Thirty-nine projects involved that desired to develop facilities to produce energy products from forest biomass. Eight projects were directed to local government organizations who were preparing information for economic development opportunities in their area.

Twenty-five resource reports regarding timber and biomass availability were provided to firms by the Forest Utilization staff as part of their feasibility analyses. In addition, fifty-nine packets of information on potential industrial development sites and other information provided to firms involved with the projects listed above.

The Piedmont Green Energy biomass-to-electricity facility was of particular significance, as it began operation during the year. New wood pellet operations were begun at SEGA Biofuels, Varn Wood Products, LJR Shavings, and JP Smith Lumber Company. Several other announcements of planned new wood markets were made during the year including the General Biofuels pellet mill in Sandersville and two Enova wood pellet mills in central Georgia.

NEW FOREST PRODUCTS AND VALUES

The GFC provided support regarding biomass energy for many activities with particular emphasis being the production of resource reports to industries, which provide information on the inventory of Georgia's forest biomass and its level of sustainability. The staff also participated in international dialogue concerning sustainability standards that are appropriate for

southern biomass and wood pellets being utilized in the European market.

The Georgia Carbon Sequestration Registry program continued operation during the year by providing technical advice to fourteen landowners representing 175,000 acres of forest land.

New efforts were undertaken to educate forest landowners, industry representatives and others on forest certification systems. Several landowner educational programs were conducted and one workshop for forest industry representatives was conducted by GFC staff.



Reforestation

For the Reforestation Department of the Georgia Forestry Commission, FY13 was a productive season for many reasons. And, while above normal rainfall was a welcome change from previous years, it was the efforts of the conscientious staff that brought about the success.

Seedlings sales improved by nearly 20 percent over the previous year. Though tree planting in Georgia remains sluggish, Flint River sales returned to more reasonable levels compared to 2012. The increased nursery revenue was accompanied by brisk seed sales from Arrowhead Seed Orchard. Several private nurseries now rely on the Georgia Forestry Commission for at least a portion of their nursery crop, expanding the impact GFC has on reforestation across the state.

The Reforestation Department successfully landed two federal grants in 2013 that will support forestry interests in Georgia. With one of these grants, the GFC will begin to establish a longleaf pine seed orchard at the Flint River Complex. Acquisition of longleaf pine seeds for tree planting efforts has long been an obstacle to replanting this species and this orchard will help alleviate that problem. A second grant, an understory plant seed production project, has begun at Flint River in the spring of 2013. This program will provide a seed source for many of the important species of ground cover plants that are so vital to the longleaf pine ecosystem.

In FY13 the GFC was able to confirm the superiority of three of the fastest growing coastal loblolly pine families in the Southeast. These families, known as the “Georgia Giants” are available as seedlings in the 2013-14 nursery crop. Fast-growing, disease-resistant, with good form characteristics, these seedlings will grow to commercial size more rapidly than other open-pollinated loblolly pine families. Though these families have been an important resource for the GFC nursery for years, validation of their credentials has been lacking until recently. These trees are only available from the Georgia Forestry Commission.

The Flint River Nursery has been using an array of solar panels to supplement energy demands for a full year now. The photovoltaic system was established with the help of a federal grant and allows the nursery to run its massive irrigation pumps with low-cost, solar energy.

And finally, the GFC has begun a project that will produce control-pollinated seedlings for Georgia’s nursery market. In cooperation with private contractors, 2013 saw the first large scale efforts to produce loblolly seeds with known parentage at Arrowhead Seed Orchard. Using surplus clones as females, pollen from exceptional sources will be applied by hand to create specific crosses. These crosses can emphasize growth, disease resistance, form, or combinations of these characteristics in the same trees. These seedlings can, in some instances, outperform open-pollinated seedlings. They may be available to Georgia landowners in the 2015-16 seedling crop.



Administration

INCOME AND EXPENDITURES			
	FY2011	FY2012	FY2013
FUNDING SOURCE			
FEDERAL FUNDS	9,590,138	6,499,288	7,663,165
FEDERAL STIMULUS	5,908,672	1,620,396	189,073
OTHER FUNDS	9,748,131	10,203,942	7,849,673
STATE GENERAL FUNDS	27,936,105	28,714,926	29,987,021
GOVERNOR'S Emergency Funds		1,084,862	
FEMA-FIRE MANAGEMENT GRANT	1,925,027	1,096,805	1,426,716
PRIOR YEAR INVENTORY			
TOTAL FUNDS	55,108,073	49,220,219	47,115,648
EXPENDITURES BY OBJECT CLASS			
TOTAL PERSONAL SERVICES	30,401,100	33,146,970	31,184,785
TOTAL REGULAR OPERATING EXPENSES	7,009,851	7,878,928	8,009,164
TRAVEL	280,103	208,340	285,651
MOTOR VEHICLE EQUIPMENT PURCHASES	159,031	204,717	579,104
EQUIPMENT PURCHASES	225,662	394,824	713,014
COMPUTER CHARGES	1,460,461	1,328,358	1,569,755
REAL ESTATE RENTALS	22,944	20,563	26,320
TELECOMMUNICATIONS	740,539	579,265	655,289
CAPITAL OUTLAY	238	334,317	0
PER DIEM & FEES	0	0	0
CONTRACTS	14,747,397	5,045,829	3,032,566
WARE COUNTY TAX - RD. MAINT.	60,000	60,000	60,000
WARE COUNTY TAX - S. FOREST			
TOTAL EXPENDITURES	55,107,326	49,202,110	46,115,648
EXPENDITURES BY PROGRAM			
REFORESTATION	1,205,477	1,247,751	1,202,909
PROTECTION	37,477,484	35,991,992	33,414,371
MANAGEMENT	12,998,707	8,318,841	8,007,384
GENERAL ADMINISTRATION AND SUPPORT	3,425,658	3,644,526	3,490,983
BONDS			
EQUIPMENT BONDS	6,207,727	3,363,765	5,551,949
CAPITAL OUTLAY BONDS	1,176,526	1,758,061	1,909,129
NUMBER OF EMPLOYEES	648	676	670

GEORGIA FORESTRY
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