

Project Leader's Report

February - 2003



USDA Forest Service - Southern Research Station - 320 Green Street Athens GA 30602 - <http://www.srs.fs.fed.us/disturbance>



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Outreach Activities:

Five groups with a total of 40 people toured the Brender Forest during the month of February. These groups included The Wilderness Society (retired Forest Service Researcher John Krause taught the group winter on the Hitchiti Trail), an outdoor lab from the Environmental Science School at Mercer University studied dendrology and lichens, the Georgia Forestry Commission held a training session on installation of new weather station components, and tours of current research were given to Savannah River staff and attendees at the Coastal Plain Chapter, Society for Ecological Restoration meeting.

Approximately 50 hunters took part in the small game and raccoon hunts in February on the Brender Experimental Forest; 84 people hiked the Hitchiti Trail and 35 people visited the office for information.

Sandra Rideout taught Dr. David Van Lear's graduate Fire Ecology class in the Clemson Forest Resources Department how to use BEHAVE software to predict wildfire behavior.

Technology Transfer :

- Boyd Edwards conducted a field tour for John Blake and Don Imm from the U. S. Forest Service, Savannah River Site, of research sites including longleaf pine interaction with loblolly pine, and loblolly pine sites converted to hardwood/wildlife plantings with cherrybark and white oak after sanitation salvage for Southern Pine Beetle infestation.
- Unit staff participated in the 12th Biennial Southern Silvicultural Research Conference, held in Biloxi, MS. Ken Outcalt and John Stanturf were on the planning committee, Pat Outcalt and Dmitry Lima created and maintained the conference website, and Lynne Breland assisted Conference Chair Kristina Connor with planning and logistics.
- Tom Waldrop presented a paper at the 12th Biennial Southern Silvicultural Research Conference in Biloxi, MS, entitled "An evaluation of fire and mechanical treatments as methods of fuel reduction in Piedmont forests: Preliminary results of the National Fire and Fire Surrogate Study."
- Mac Callaham presented a paper at the 12th Biennial Southern Silvicultural Research Conference in Biloxi, MS, entitled "Fuel reduction treatment effects on nutrient and energy cycling in Piedmont loblolly pine forests."
- Ross Phillips presented a paper at the 12th Biennial Southern Silvicultural Research Conference in Biloxi, MS, entitled "Effects of fuel reduction techniques on vegetative composition of Piedmont loblolly-shortleaf pine communities: Preliminary results of the National Fire and Fire Surrogate Study."

- Ken Outcalt presented a paper at the 12th Biennial Southern Silvicultural Research Conference in Biloxi, MS, entitled “Growing season prescribed burns in Florida pine flatwoods.” Outcalt also served as a moderator for the Forest Health Session and poster coordinator for the Conference.
- M. Forbes Boyle II, a cooperator, Dept. of Forest Resources, Clemson University, presented a paper at the 12th Biennial Southern Silvicultural Research Conference in Biloxi, MS, entitled “Impact of prescribed fire and thinning on host resistance to the southern pine beetle: Preliminary results of the National Fire and Fire Surrogate Study.”
- Alex Clark presented a paper at the 12th Biennial Southern Silvicultural Research Conference in Biloxi, MS, entitled “Impact of early pruning and thinning on dimension and shop lumber grade yield from loblolly pine Sudden Saw Log study trees.”
- Richard Daniels, a cooperator, Warnell School of Forest Resources, presented a paper at the 12th Biennial Southern Silvicultural Research Conference in Biloxi, MS, entitled “Variation in loblolly pine weighted average tree wood density and moisture content across the South.”
- Victor B. Shelburne, a cooperator, Dept. Forest Resources, Clemson University, presented a paper at the 12th Biennial Southern Silvicultural Research Conference in Biloxi, MS, entitled “Changes to soils and forest floor as a consequence of fuel reduction treatments in Piedmont forest ecosystems.”
- Eran S. Kilpatrick, Dept. of Forest Resources, Clemson University, presented a paper at the 12th Biennial Southern Silvicultural Research Conference in Biloxi, MS, entitled “The effects of prescribed burning and thinning as fuel reduction treatments on herpetofauna and small mammals in the upper Piedmont of South Carolina.”
- Boyd Edwards presented a poster at the 12th Biennial Southern Silvicultural Research Conference in Biloxi, MS, entitled “Role of coarse woody debris manipulation in 50-year old loblolly pine plantations.”
- Mac Callaham presented a poster at the 12th Biennial Southern Silvicultural Research Conference in Biloxi, MS, entitled “Fuel reduction treatment effects on ground-dwelling arthropods in Piedmont loblolly pine forests.”
- John Stanturf was co-author on two posters at the 12th Biennial Southern Silvicultural Research Conference in Biloxi, MS, entitled “Production efficiency and canopy physiology of *Populus deltoides* in response to intensive management” and “Estimating leaf nitrogen status of eastern cottonwood trees with a chlorophyll meter.”
- Helen Mohr, Tom Waldrop and Sandra Rideout co-authored a poster at the 12th Biennial Southern Silvicultural Research Conference in Biloxi, MS, entitled “Effectiveness of fire and fire surrogate treatments for controlling wildfire behavior and mortality in Piedmont forests: A simulation study.”
- Tom Waldrop co-authored three posters at the 12th Biennial Southern Silvicultural Research Conference in Biloxi, MS, entitled “Effects of fire and fire surrogate treatments on bat habitat use in the upper Piedmont of South Carolina”, “*Rhododendron* encroachment threatens health of southern Appalachian cove forests” and “Seasonal avifaunal responses to fuel reduction treatments in the upper Piedmont of South Carolina: Preliminary results of the National Fire and Fire Surrogate Study.”
- Other staff attending the 12th Biennial Southern Silvicultural Research Conference included Edward Andrews, Dexter Bland, Gregg Chapman, Kim Crider, Chuck Flint, Rob Harrison, Jason O’Shell, Eric Neiswanger, and Shane Welch.
- Boyd Edwards and Ken Outcalt attended the annual meeting of the Coastal Plain Chapter, Society for Ecological Restoration held in Athens. The meeting theme was *From the Mountains to the Sea: Restoration in the South*. Outcalt served as poster session host for the meeting. This is the first time the chapter has met outside Florida. Attendance was less than for previous meetings, but 40 participants heard about restoration projects from North Carolina and Louisiana. Outcalt was re-elected to serve another 2-year term as Georgia state representative to the chapter. The efforts of Pat Outcalt in assisting with local arrangements and logistics for this year’s meeting were gratefully acknowledged by the officers of the chapter.

- Ken Outcalt presented a poster co-authored by Dale Wade and Sandra Rideout entitled: “Restoring flatwoods longleaf communities: Results from long-term burning on the Osceola National Forest” at the annual meeting of the Coastal Plains Chapter of the Society for Ecological Restoration International held in Athens. The poster highlighted the effect of repeated burning at different frequencies on the understory vegetation in longleaf pine flatwoods communities.

- The IUFRO conference on restoration of boreal and temperate forests, held last May and sponsored by the unit, was chosen as the highlight of IUFRO Division 1, Silviculture, for the annual IUFRO Report.

- Ralph DiCosty and John Stanturf initiated a cooperative research project with Tim Rials, University of Tennessee and Steve Kelley, National Renewable Energy Laboratory (Golden, CO) on developing advanced spectroscopic methods for studying soil carbon. This two-year project will allow access to advanced instrumentation to explore ways to characterize carbon forms in soil and to begin work on characterization of black carbon residue from fires. Black carbon is one component of the recalcitrant fraction of soil carbon and plays a key role in recovering ecosystem functions following wildfire. The National Fire Plan funds this work.

- Scott Goodrick initiated a cooperative research project with Youssef Hussaini and Phil Cunningham, Florida State University, on fire behavior prediction modeling. Initial goal is to parameterize the detailed fire behavior model developed at the Los Alamos National Lab for southeastern conditions. The National Fire Plan funds this work.

- Scott Goodrick initiated the second phase of a cooperative research project with John O’Brien, Florida State University on predicting fire season severity using climatic indicators. This project extends the pilot developed for Florida to other southern coastal states. The National Fire Plan funds this work.

- John Stanturf met with Jennifer O’Connor, Presidential Intern, Susan Fox, AD Planning and Applications, and Jim Sedell, Director, WFWAR Staff to discuss the potential Forest Service role in restoring bottomland hardwoods in the Lower Mississippi Alluvial Valley. This effort is a follow-up to the Southern Forest Resource Assessment. Ted Leininger, PL 4155 (Stoneville), was unable to attend due to illness. O’Connor and Fox have prepared an article for a journal and recommendations for Station Director Roussopoulos that Stanturf will review.



Luncheon at Biennial Southern Silvicultural Research Conference, Biloxi.



Biennial Southern Silvicultural Research Conference, Biloxi - Scientists conversing during a break.



Attendees discussing restoration reports, Society for Ecological Restoration International - Coastal Plain Chapter.



Poster Session for Society for Ecological Restoration International - Coastal Plain Chapter meeting, Athens. Discussion of restoration efforts.

Meetings / Reports :

• John Stanturf attended the Southern Research Station Management Team meeting in Asheville. There was much discussion of competitive sourcing and the near-term impacts of the IT study and longer-term impacts on the agency. Other messages heard were the need for syntheses of research in packages useful to NFS, such as the hypertext efforts, integrating performance measures and budget allocations, and monitoring tools needed to substantiate accomplishments reporting.

• John Stanturf attended a meeting of the Hardwood Initiative, spearheaded by Dr. Chad Oliver, Yale University. The goal is to develop state of the knowledge reports and eventually update Ag Handbook 181 (Putnam, Furnival, McKnight. 1960. Inventory and Management of Southern Hardwoods.) Stanturf will participate in the effort led by John Adams, LA Tech, to write a section on site relations. He will attend a meeting at Yale in May.

• Members (FS and cooperators) of the team working on the Piedmont Site of the Fire and Fire Surrogate Study held a “mini-symposium” on February 20. The purpose was to discuss progress and present results of individual studies. Studies topics included: herpetofauna,

small mammals, avifauna, entomology, soil chemistry, carbon and nitrogen cycling, insect diversity, vegetative structure, fuel loading, fire behavior, and bat abundance. Individual study results helped explain results of other studies. These commonalities were identified and will be the subject of future analysis.

Funding :

• Joe O’Brien submitted a proposal to the Foreign Agricultural Service to work in the Bahamas. The proposed research is on the ecology and management of Caribbean pine forests in the Bahamian Archipelago. The three-year project would be funded by FAS (\$42,600) with in-kind contributions from local cooperators (\$25,000) and the unit.

• O’Brien traveled to La Selva Biological Station in Costa Rica in January to re-measure his dissertation study trees and meet with Drs. David and Deborah Clark, Steven Oberbauer and Mike Ryan of the Rocky Mountain Research Station to offer technical advice on a new study of Leaf Area Index and Net Primary Productivity at La Selva. This trip was financed by Florida International University (approximately \$2,000).

Visitors :

• Dr. Ralph Boerner of Ohio State University visited Tom Waldrop and Mac Callaham during the week of February 3 to 7. Dr. Boerner is Chair of the OSU Department of Ecology, Evolution, and Organismal Biology and serves as the leader of the Soils Discipline of the National Fire and Fire Surrogate Study. Ralph worked with Mac and Tom on a paper that examines the impacts of fuel reduction treatments on soil microbial activity. They also discussed plans and procedures for analysis of soils data at the national level.



Dr. Ralph Boerner

• Tom Waldrop met with Dr. Bo Song of the Clemson University Department of Forest Resources to discuss opportunities for collaborative research. Dr. Song specializes in GIS applications to examine changes in forest structure after disturbance. They agreed to pursue avenues of funding through the Joint Fire Science Program.

• Dr. Palle Madsen, Senior Researcher, Danish Forest and Landscape Research Institute, will visit Athens in April to work with John Stanturf and Lynne Breland on the forest restoration book that Stanturf and Madsen are editing. Stanturf spent a week in Denmark this month on the project.

GPR Accomplishments:

| Category | FY 2002 Total | FY 2003 To Date |
|--|------------------|--------------------|
| Number of Refereed Journal Publications | 9 | 6 |
| Number of Non-Refereed Publications (include abstracts) | 53 | 12 |
| Number of Publications (refereed + non-refereed) | 62 | 18 |
| Number of Tours | 46 | 33 |
| Number of Short Courses/Training | 8 | 6 |
| Number of Invited Presentations to Scientific Organizations | 6 | 1 |
| Number of Invited Presentations to Lay Organizations | 25 | 31 |
| Volunteer Presentations to Scientific Organizations (non-GPRA) | 28 | 18 |
| Number of Technology Transfer Activities (other than above) | 172 | 75 |
| Outside Funding | \$3,227,500 | \$47,563 |

Personnel News :

- John Stanturf, Palle Madsen (Danish Forest and Landscape Research Institute), and Emile Gardiner (SRS-4155 Stoneville, MS) received Certificates of Appreciation from the Secretariat of the International Union of Forestry Research Organizations for outstanding effort in organizing and holding the IUFRO Conference on Restoration of Boreal and Temperate Forests, held April –May, 2002 in Vejle, Denmark.
- Deb Kennard was recommended by the International Programs (WO) to be a member of a Nature Conservancy fire assessment team that will visit several national parks in Costa Rica and Panama for a week in late April. The WO and TNC will pay for the trip.
- Lynne Breland attended partnership training in Washington, DC, sponsored by the US Fish and Wildlife Service. The training included public affairs, grant writing, and operating a Friends of the Refuge group. She visited the Auditor's Building, collected outreach material, and visited with the National Program Leader for Invasive Species. She had the opportunity to network with Gale Norton, Secretary of the Interior.
- Corey Babb attended a 3-day hands-on training course at Perkin Elmer Instruments in Atlanta, GA for operation of the Optima 2000 DV Inductively Coupled Plasma Optical Emission Spectrometer. The unit owns this instrument, which can determine the total amounts of 72 chemical elements in plant soil and water samples. Highlights of the course included software, hardware, maintenance, and an in-depth discussion of detection limits and interferences.
- John Stanturf was re-appointed to the IUCN Commission on Ecosystem Management. The Commission's goal is to ensure that "ecosystems fulfill ecological functions and processes while sustainably supporting improved livelihoods." Stanturf will work primarily in the key area of ecosystem restoration.
- Sandra Rideout has been invited to appear on a panel on fire at the conference on Enhancing the Southern Appalachian Forest Resource, sponsored by NC State University and to be held in Hendersonville, NC next October.
- John Stanturf was appointed to the North American Forestry Commission Silviculture Task Group.
- Laura Zebehazy, wildlife graduate student under Drew Lanham at Clemson received an award for outstanding graduate student poster at the 12th Biennial Southern Silvicultural Research Conference. Her poster was entitled "Seasonal avifauna responses to fuel reduction treatments in the upper Piedmont of South Carolina: Preliminary results of the National Fire and Fire Surrogate Study" and was co-authored by J. Drew Lanham and T. A. Waldrop.
- Rob Harrison of the Piedmont and Appalachian Team resigned his position as Biological Science Technician. He accepted a permanent position as Wildlife Biologist with the South Carolina Department of Natural Resources. Good luck to Rob.



Tim Giddens received the Director's Award for Excellence In Support Services; here John Stanturf accepts the award for Tim from Director Roussopoulos following the Management Team meeting in Asheville.

Do not worry about your difficulties in Mathematics. I can assure you mine are still greater.

(Albert Einstein)

Research is the process of going up alleys to see if they are blind.

(Marston Bates)

News from around the Region :

- Larry Thompson, Chief of Forest Management at Georgia Forestry Commission has retired after 34 years of service. Terry Price is acting chief until a replacement is selected.

- Dana Cohen will be joining the fire management staff of the Great Smokey Mountains National Park. Presently Dana is the Lead Fire Effects Monitor on the Natchez Trace Parkway. She will assume a new position dedicated to Wildland Urban Interface projects along the Park boundary, working with homeowners, contractors, volunteer fire departments and state and federal fire cooperators. She will supervise getting hazard fuels cut down and disposed of down along the Park boundary and she will disseminate information on how to reduce the risk of wildland fires in these high risk area.

- Two world leading forestry genomics teams from Canada and Sweden have begun a wide-ranging collaboration between their projects. The partnership between the two countries allows researchers from both countries to strengthen their research projects by pooling their sequencing data to develop a more powerful and useful database on poplar. The collaboration is between the University of British Columbia's Forestry Genomics Group, under the direction of Dr. Brian Ellis and three UBC colleagues, and the Swedish Tree Functional Genomics Consortium in Stockholm, under the direction of Dr. Göran Sandberg. The two projects have a total budget of CDN \$ 20 million dollars. The Sweden forestry project is funded in part

by the Wallenberg Foundation and the Swedish Foundation for Strategic Research (SSF) and is being completed at the Umeå Plant Science Centre. The Canadian research on poplar is an element of Canada's large-scale forestry project being carried out at the University of British Columbia. This \$11 million project is funded in part by Genome British Columbia and Genome Canada. Funded primarily by Genome Canada, with other private and public investment, British Columbia is one of five Genome Canada genomics research centers across the country.

- Ronald W. Rousseau has been named the Interim Director of the Institute of Paper Science and Technology at Georgia Tech. Dr. Rousseau will be responsible for designing the new IPST at Georgia Tech. Dr. Rousseau holds the Cecil J. "Pete" Silas Chair and chairs the School of Chemical Engineering at the Georgia Institute of Technology. He received his B.S., M.S., and Ph.D. from Louisiana State University, and was a member of the faculty at North Carolina State University for 17 years before becoming chair of the School of Chemical Engineering in 1987.

- The European Forest Institute, together with Alterra (Wageningen, The Netherlands) launched the Database on Forest Disturbances in Europe, aimed at providing historic information on disturbances. The Webpage has links to other sources of information on natural disturbances. The database can be found at <http://www.efi.fi/projects/dfde>



Fire damage in a Mediterranean ecosystem.

You may deceive all the people part of the time, and part of the people all the time, but not all the people all the time.

(Abraham Lincoln)

Publications :

FY 2003 (*denotes new publication this month)

Escalante Fernandez, R. Monreal Rangel, S., **Stanturf, J.**, Arseneau, C., Nantel, P. 2002. Forest plantations in North America. Report to the North American Forestry Commission. 26 pp.

Glitzenstein, J.S, Streg, D.R., and **Wade, D.D.** 2003. Fire frequency effects on longleaf pine (*Pinus palustris* P. Miller) vegetation in South Carolina and Northeast Florida, USA. *Natural Areas Journal* 23:22-37.

Hanula, J.L., **Wade, D.D.** 2003. Influence of long-term dormant-season burning and fire exclusion on ground-dwelling arthropod populations in longleaf pine flatwoods ecosystems. *Forest Ecology and Management* 175 (1-3): 163-184.

*Lockaby, B.G., B.D. Keeland, **J.A. Stanturf**, M.D. Rice, G. Hodges, R.M. Governo. 2002. Arthropods in decomposing wood of the Atchafalaya River Basin. *Southeastern Naturalist* 1(4): 339-352.

Rideout, S. and Oswald, B.P. 2002. Effects of prescribed burning on vegetation and fuel loading in three east Texas state parks. *Texas J. Science* 54(3): 211-226.

Stanturf J.A. and Madsen P. 2002. Restoration concepts for temperate and boreal forests of North America and Western Europe. In: *Forest Ecosystems: Ecology, Conservation and Sustainable Management* (eds. Jiang Z., Centritto M., Liu S. & Chiatante D.). *Plant Biosystems* 136, 143-158.

Stanturf, J.A., Wade, D.D., Waldrop, T.A., Kennard, D.K., and Achtemeier, G.L. 2002. Fire in Southern Forest Landscapes. P. 607-630 (Chapter 25) In Wear, D.M. and Greis, J.G., editors, *Southern Forest Resource Assessment*. Gen Tech Rep. SRS-53. Asheville, NC: U.S. Department of Agriculture, Forest Service, Southern Research Station.

Moody, J.M. 2002. Fire and alternative fuel treatment effect on soil Nitrogen: A case study of Myakka River State Park. M.Sc. thesis, FL A&M Univ., Tall., FL. 52 p.

Upcoming Events :

2003

Mar 3-7

Functional Assistance Visit; Asheville admin team led by Jay Hundley, to Athens, GA.

Mar 11-13

Meeting of principal investigators for the Joint Fire Science Program; Waldrop, Rideout and Outcalt to attend.

Mar 12-14

Workshop on Forest Fire Modeling and Prediction in the Southeast United States, Tallahassee, FL; Goodrick, Liu, Achtemeier, Waldrop, and Stanturf to attend.

Mar 23-27

Molecular Studies Of Soil Organic Matter 225th ACS International Meeting New Orleans, LA; DiCosty to attend <http://membership.acs.org/g/geoc/>

Apr 7-11

Geospatial 2003, Putting Geospatial Information to Work. Colorado Springs, CO <http://www.fs.fed.us/gstc/fsgeospatial/>

Apr 21-23

Dean's Tour to be held in at the University of Georgia in Athens, Georgia.

Apr 23-25

IUFRO Conference on Decision Support for Multiple Purpose Forestry: A Transdisciplinary Conference on the Development and Application of Decision Support Tools for Forest Management, Vienna, Austria; Kennard to attend and present.

May 11-16

Fifth International Conference on Science and the Management of Protected Areas (SAMPAA V), University of Victoria, Victoria, British Columbia, Canada. The theme will be Making Ecosystem Management Work: Connecting Managers and Researchers. For more information see <http://www.sampaa.org>

May 12-15

2nd Forest Engineering Conference, hosted by SkogForsk (The Forestry Research Institute of Sweden), Växjö, Sweden; Stanturf to present poster. <http://www.skogforsk.se/fec>

***May 22-24**

International Conference on Economics of Sustainable Forest Management, to be held at the University of Toronto, in Toronto, Canada.

Jun 16-20

Fourth Annual North American Forest Ecology Workshop, Oregon State University in Corvallis, OR. Abstracts due Jan 17, 2003. <http://outreach.cof.orst.edu/nafew/>

Jun 22-25

57th Annual Meeting of the Forest Products Society, Doubletree Hotel, Bellevue, WA. Alex Clark will make presentation.

Jun 28-Jul 2

Society for Conservation Biology, Duluth, Minnesota. <http://www.conservationbiology.org/2003>

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|---------------------|--|-------------------------------------|---|
| Jul 20-24 | 10 th North American Forest Soils Conference, Sault Ste. Marie, Ontario, Canada; Stanturf, Callaham to attend and present posters. http://www.fs.fed.us/forestsoilsconference . | Nov 16-20 | Second International Congress On Wildland Fire Ecology And Fire Management, in conjunction with the Fifth Symposium on Fire and Forest Meteorology |
| Aug 11-14 | IUFRO Working Group for Seed Physiology and Technology conference to be held at the Georgia Center, Athens, GA. | Nov 19-22 | Society for Ecological Restoration 15 th International Conference, Austin, TX (note new dates). http://www.ser.org |
| Sep 7-10 | Council on Forest Engineering annual meeting, Bar Harbor, ME; http://www.forest-resources.umaine.edu/nercofe/cofe2003.htm | *Nov 27-30 | IEA Short Rotation Bioenergy (Task 30) meeting, New Zealand and Australia |
| Sep 16-18 | IUFRO Conference on 'Strong Winds and Trees: ecology and management, sponsored by WP 8.08.02 and University of Karlsruhe, Germany; re-scheduled from Aug 17-24 in Zurich; http://www.ifh.uni-Karlsruhe.de/ifh/science/aerodyn/windconf.htm . | 2004 *Jun 27-Jul 2 | First Agroforestry World Congress, Orlando, FL |
| Sep 18 | Agroforestry and Wildlife Field Day, Griffin, GA | Aug | Society for Ecological Restoration 16 th International Conference, Victoria, British Columbia |
| Sep 21-28 | 12 th World Forestry Congress, Quebec City, Canada; http://www.wfc2003.org ; Stanturf to attend. | Sep 3-7 | European Forest Institute (EFI) annual meeting, Bangor, Wales (UK). |
| Sep 28-Oct 2 | The Question Of Conversion of Coniferous Forests meeting, Freiburg, Germany; contact for further information: instww@uni-freiburg.de | Oct 31-Nov 4 | Soil Science Society of America annual meeting, Seattle, WA |
| *Oct 2-3 | Enhancing the Southern Appalachian Forest Resource symposium, Kanuga Confernece Center, Hendersonville, NC http://www.ces.ncsu.edu/nreos/forest/feop/symposium | Nov | Short Rotation Woody Crops Operations Working Group Biennial Meeting, Aiken, SC; dates TBA |
| Oct 4-8 | 3rd International Wildland Fire Conference, sponsored by the North American Forest Commission's Fire Management Working Group, Sydney, Australia. | 2005 Aug 8-13 | IUFRO World Congress, Brisbane, Australia; Stanturf to attend; http://www.iufro2005.com |
| Oct 25-29 | Society American Foresters Annual Meeting, Buffalo, NY | Aug or Sep | Society for Ecological Restoration 17 th International Conference, Zaragoza, Spain |
| Nov 2-6 | Soil Science Society of America annual meeting, Denver, CO | Nov 6-10 | Soil Science Society of America annual meeting, Salt Lake City, UT |

SRS-4104 Project Leader's Report

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