

SUMMARY CURRICULUM VITAE 2007

[Robert J. Mitchell PhD.](#)

Scientist



Dr. Mitchell's interests include the ecophysiological limits to productivity, particularly below ground, and how natural disturbance processes can be incorporated into silviculture to conserve southern pine grasslands. We have pioneered the incorporation of root order and mycorrhizae into a better understanding of how below ground processes regulate carbon and nutrient cycling. With Dr. Jerry Franklin of the University of Washington and Brian Palik of the USFS, he has developed a network of training workshops throughout the country for professional land managers on ecological forestry. Dr. Mitchell has assisted in advisory groups for

conservation management and has participated in regional, national and international forums on how forests can be managed in ways that produce timber wildlife but conserve native diversity.

Education:

PhD in Forestry, University of Missouri, 1984

MS in Forestry, Southern Illinois University, 1980

BS in Forestry, Southern Illinois University, 1979

Professional Experience:

1999-present: Scientist, J. W. Jones Ecological Research Center

Adjunct faculty positions

- Auburn University
- University of Georgia
- University of Florida
- Virginia Polytechnic Institute and State University

1992-1999. Associate Scientist, J. W. Jones Ecological Research Center

1990-1992. Associate Professor (tenured), Auburn University, and School of Forestry

1986-1990. Assistant Professor, Auburn University, School of Forestry

Recent Research Publications: (Past 5 years)

- Hiers JK, JJ O'Brien, RE Will and RJ Mitchell. 2007. [Forest floor depth mediates understory vigor in xeric *Pinus palustris* ecosystems.](#) Ecological Applications 17:806-814. Reproduced with permission of the Ecological Society of America © 2007.
- Kirkman LK, RJ Mitchell, MJ Kaeser, SD Pecot and KL Coffey. 2007. The perpetual forest: using undesirable species to bridge restoration. Journal of Applied Ecology 44:604-614
- Pecot SD, RJ Mitchell, BJ Palik, EB Moser and JK Hiers. 2007. [Competitive responses of seedlings and understory plants in longleaf pine woodlands: separating canopy influences above and below ground.](#) Canadian Journal of Forest Research 37:634-648. Reproduced with permission of the National Research Council Press © 2007.
- Sims SE, JJ Hendricks, RJ Mitchell, KA Kuehn and SD Pecot. 2007. Nitrogen decreases and precipitation increases ectomycorrhizal extramatrical mycelia production in longleaf pine forest. Mycorrhiza 17:299-309.
- Addington RN, LA Donovan, RJ Mitchell, JM Vose, SD Pecot, SB Jack, UG Hacke, JS Sperry and R Oren. 2006. Adjustments in hydraulic architecture of *Pinus palustris* maintain similar stomatal conductance in xeric and mesic habitats. Plant, Cell and Environment 29:535-545.
- Hendricks JJ, RL Hendrick, CA Wilson, RJ Mitchell, SD Pecot and D Guo. 2006. Assessing the patterns and controls of fine root dynamics: an empirical test and methodological review. Journal of Ecology 94:40-57.
- Hendricks JJ, RJ Mitchell, KA Kuehn, SD Pecot and SE Sims. 2006. Measuring external mycelia production of ectomycorrhizal fungi in the field. the soil matrix matters. New Phytologist 171:179-186.
- Kirkman LK and RJ Mitchell. 2006. Conservation management of *Pinus palustris* ecosystems from a landscape perspective. Applied Vegetation Science 9:67-74.
- Mitchell RJ, JK Hiers, JJ O'Brien, SB Jack and RT Engstrom. 2006. [Silviculture that sustains: the nexus between silviculture, frequent prescribed fire, and conservation of biodiversity in longleaf pine forests of the southeastern United States.](#) Canadian Journal of Forest Research 36:2724-2736. Reproduced with permission of the National Research Council Press © 2006.

- Runion GB, MA Davis, SG Pritchard, SA Prior, RJ Mitchell, HA Torbert, HH Rogers and RR Dute. 2006. Effects of elevated atmospheric carbon dioxide on biomass and carbon accumulation in a model regenerating longleaf pine community. *Journal of Environmental Quality* 35:1478-1486. [This document may be obtained from the publisher's website.](#)
- Schulte LA, RJ Mitchell, ML Hunter Jr., JF Franklin, RK McIntyre and BJ Palik. 2006. Evaluating the conceptual tools for forest biodiversity conservation and their implementation in the U.S. *Forest Ecology and Management* 232:1-11.
- Cheng W, F Shenglei, RB Susfalk and RJ Mitchell. 2005. Measuring tree root respiration using ^{13}C natural abundance: rooting medium matters. *New Phytologist* 167:297-307.
- Ford CR, CE Goranson, RJ Mitchell, RE Will, RO Teskey. 2005. Modeling canopy transpiration using times series analysis: A case study illustrating the effect of soil moisture deficit on *Pinus taeda*. *Agricultural and Forest Meteorology* 130:163-175.
- Pecot SD, SB Horsley, MA Battaglia and RJ Mitchell. 2005. [The influence of canopy, sky condition, and solar angle on light quality in a longleaf pine woodland.](#) *Canadian Journal of Forest Research* 35:1356-1366. Reproduced with permission of the National Research Council Press © 2005.
- Addington RN, RJ Mitchell, R Oren and LA Donovan. 2004. Stomatal sensitivity to vapor pressure deficit and its relationship to hydraulic conductance in *Pinus palustris*. *Tree Physiology* 24:561-569.
- Boring LR, CA Wilson, JJ Hendricks and RJ Mitchell. 2004. Season of burn and nutrient losses in a longleaf pine ecosystem. *International Journal of Wildland Fire* 13:443-453.
- Carter DC, JJ Hendricks, RJ Mitchell and SD Pecot. 2004. Fine root carbon allocation and fates in longleaf pine forests. *Forest Science* 50:177-187.
- Ford CR, CE Goranson, RJ Mitchell, RE Will and RO Teskey. 2004. Diurnal and seasonal variability in the radial distribution of sap flow: predicting total stem flow in *Pinus taeda* trees. *Tree Physiology* 24:951-960.
- Ford CR, MA McGuire, RJ Mitchell and RO Teskey. 2004. Assessing variation in the radial profile of sap flux density in *Pinus* species and its effect on daily water use. *Tree Physiology* 24:241-249.
- Guo D, P Mou, RH Jones and RJ Mitchell. 2004. Spatio-temporal patterns of soil available nutrients following experimental disturbance in a pine forest. *Oecologia* 138:613-621.

- Guo DL, RJ Mitchell and JJ Hendricks. 2004. Fine root branch orders respond differentially to carbon source-sink manipulations in a longleaf pine forest. *Oecologia* 140:450-457.
- Hendricks JJ, RJ Mitchell, KM Green, TL Crocker and JG Yarbrough. 2004. Assessing the nitrogen-15 concentration of plant-available soil nitrogen. *Communications in Soil Science and Plant Analysis* 35:1207-1217.
- Kirkman LK, KL Coffey, RJ Mitchell and EB Moser. 2004. Ground cover recovery patterns and life-history traits: implication for restoration obstacles and opportunities in a species-rich savanna. *Journal of Ecology* 92:409-421.
- Battaglia MA, RJ Mitchell, PP Mou and SD Pecot. 2003. Light transmittance estimates in a longleaf pine woodland. *Forest Science* 49:752-762.
- Hiers JK, RJ Mitchell, LR Boring, JJ Hendricks and R Wyatt. 2003. Legumes native to longleaf pine savannas exhibit capacity for high N₂-fixation rates and negligible impacts due to timing of fire. *New Phytologist* 157:327-338.
- Jones RH, RJ Mitchell, GN Stevens and SD Pecot. 2003. Controls of fine root dynamics across a gradient of gap sizes in a pine woodland. *Oecologia* 134:132-143.
- Palik BJ, RJ Mitchell, SD Pecot, M Battaglia and P Mou. 2003. [Spatial distribution of overstory retention influences resources and growth of longleaf pine seedlings.](#) *Ecological Applications* 13:674-686.
- Battaglia MA, P Mou, B Palik and RJ Mitchell. 2002. [The effect of spatially variable overstory on the understory light environment of an open-canopied longleaf pine forest.](#) *Canadian Journal of Forest Research* 32:1984-1991. Reproduced with permission of the National Research Council Press © 2002.
- Bliss KM, RH Jones, RJ Mitchell and PP Mou. 2002. Are competitive interactions influenced by spatial nutrient heterogeneity and root foraging behavior? *New Phytologist* 154:409-417.
- Davis MA, SG Pritchard, RJ Mitchell, SA Prior, HH Rogers and GB Runion. 2002. Elevated atmospheric CO₂ affects structure of a model regenerating longleaf pine community. *Journal of Ecology* 90:130-140.
- Guo D, P Mou, RH Jones and RJ Mitchell. 2002. Temporal changes in spatial patterns of soil moisture following disturbance: an experimental approach. *Journal of Ecology* 90:338-347.
- Mitchell RJ, BJ Palik and ML Hunter Jr. 2002. Natural disturbances as a guide to silviculture. *Forest Ecology and Management* 155:315-317.

- Mulligan MK, LK Kirkman and RJ Mitchell. 2002. *Aristida beyrichiana* (wiregrass) establishment and recruitment: implications for restoration. *Restoration Ecology* 10:68-76.
- Palik BJ, RJ Mitchell and JK Hiers. 2002. Modeling silviculture after natural disturbance to sustain biodiversity in the longleaf pine (*Pinus palustris*) ecosystem: balancing complexity and implementation. *Forest Ecology and Management* 15:347-356.
- Stevens GN, RH Jones and RJ Mitchell. 2002. [Rapid fine root disappearance in a pine woodland: a substantial carbon flux](#). *Canadian Journal of Forest Research* 32:2225-2230. Reproduced with permission of the National Research Council Press © 2002.
- Wilson CA, RJ Mitchell, LR Boring and JJ Hendricks. 2002. Soil nitrogen dynamics in a fire-maintained forest ecosystem: results over a 3-year burn interval. *Soil Biology & Biochemistry* 34:679-689.

Outreach Publications and Reports to Natural Resource Agencies: (Past 5 years)

- Franklin JF, RJ Mitchell and BJ Palik. 2007. Natural disturbance and stand development principles of ecological forestry. USDA For. Serv. Gen Tech Report (in press).
- Mitchell RJ, JK Hiers, RT Engstrom, LK Kirkman, J Hill, RT Sharitz and R Cooper. 2006. Report to the National Council of Science and Sustainable Forestry on Old-Growth Forests and Conservation of biodiversity of the Southeast.
- Schulte LA, RJ Mitchell, ML Hunter Jr., JF Franklin, RK McIntyre and BJ Palik. 2004. Evaluating the conceptual tools for forest biodiversity conservation. Final Report to NCSSF.

Current Jones Center Research:

- Productivity and Biodiversity Patterns: Controls in a Southeastern Coastal Plain Landscape.
- Silviculture that Sustains and Restores Native Biodiversity of Pinelands in the Southeastern Coastal Plain: Legacies, Fire and Recovery Periods.

External Grants and Contracts (past 5 years):

USDA NRI Managed Ecosystems. The Influence of Carbon Sinks and Sources on Root and Mycorrhizal Dynamics. \$440 k. Mitchell, R. J., J. J. Hendricks, K. A. Kuehn, and J. J. O'Brien. 2006-2007.

National Commission on Science for Sustainable Forestry. Old Growth Forest and Conservation in the Southeastern US. \$30 k. Mitchell, R. J. 2006.

National Commission on Science for Sustainable Forestry "Calibrating Conservation Theory with Practice". \$100 k. Mitchell, R. J., R. K. McIntyre, B. J. Palik, M. L. Hunter, Jr., J. F. Franklin. 2003-2004.

Doris Duke Foundation "Lowcountry Forest Conservation Project". Jones Center amount \$117 k. McIntyre K., R. J. Mitchell and S.B. Jack. 2003-2006.

USDA Forest Service/Joint Fire Science Program "Duff Consumption and Southern Pine Mortality Soils Work". \$28 k. Mitchell, R. J. 2002-2004.

National Commission on Science for Sustainable Forestry "Natural disturbances as a guide to restoration". \$100 k. Mitchell, R. J., L. K. Kirkman, L. L. Smith, T. Engstrom, B. J. Palik, J. F. Franklin and M. L. Hunter, Jr. 2002-2003.

Recent Student Advisement:

Jennifer Falkey. Current. Disturbance frequency and changes in plant growth lifeform: ecosystem effects on NPP. M.S., Thesis, Warnell School of Forestry and Natural Resources, University of Georgia, Athens, GA. (Co-advisor with Dr. Ron Hendrick).

Noah A Jansen. 2007. Influence of root branching order on fine root substrate quality and decomposition in a *Pinus palustris* ecosystem. M.S., Thesis, School of Forestry and Conservation, University of Florida. (Co-advisor with Dr. Jose Shibu).

Chelcy R Ford. 2004. Variable distributions of water as a transpiration source: consequences from the tree stem to ecosystem functioning. Ph.D., Warnell School of Forest Resources, University of Georgia, Athens, GA. (Co-advisor with Dr. Bob Teskey).

Robert N Addington. 2001. Water use patterns and stomatal responses to environment in longleaf pine on contrasting sites. M.S., Botany Dept., University of Georgia, Athens GA. (Co-advisor with Dr. Lisa Donovan).

Durwin C Carter. 2001. Carbon-fine root allocation and transfer at ecosystem scales (C-FATES). M.S., Biology Dept., State University of West Georgia, Carrollton, GA. (Co-advisor with Dr. Joe Hendricks).