FNR 4010 / FNR 5016

Ecology and Restoration of the Longleaf Pine Ecosystem

Spring, 2026
Online Asynchronous, 3 Credits

Instructor: Dr. Carissa Wonkka

Office number 4919, 5988 Hwy. 90, Bldg. 4900

Telephone: (850)983-7129

Email: c.wonkka@ufl.edu

Available by phone, email, Teams session (by appointment) or, in person on Tuesdays 1-3 CT

Teaching Assistant: Nkem Nwosu

Jay Research Center Annex

Email: Nkem.nwosu@ufl.edu

Available by cell phone, email, zoom session (by appointment) or, in person on Thursdays 2-4 CT

Course Description

History, structure, function, and ecological and economic importance of longleaf pine ecosystems; regeneration ecology, stand developmental dynamics and management, restoration techniques, and socioeconomic and political and policy aspects of restoration.

Course Learning Objectives

By the end of this course, students should be able to:

1. **Summarize** the key concepts and factors that define the ecological and economic significance of longleaf pine ecosystems.
2. **Explain** the drivers of longleaf pine decline and the barriers to its restoration.
3. **Describe** theoretical and technical knowledge from ecology, soils, and other biophysical sciences that underpin ecological restoration.
4. **Apply** techniques for ecological restoration, evaluation, and monitoring to develop appropriate management protocols.
5. **Discuss** the socio-economic, policy, and political dimensions influencing ecological restoration.

Course Logistics

Students will access all lectures, assignments, readings and supporting materials through the course Canvas site as they become available.

Students should check canvas regularly to keep up with weekly assignments.

Course Prerequisites

None; Ecology course recommended

Textbooks, Learning Materials, and Supply Fees

Recommended: Jose, S., Jokela, E.J. and Miller, D.L. 2006. The Longleaf Pine Ecosystem: Ecology, Silviculture and Restoration. Springer Science, New York.

Reading list provided in weekly schedule

Instructor Interaction Plan

Preferred method of communication: email or through canvas

Required Technology & How to Obtain the Technology

A computer or mobile device with high-speed internet connection.
Latest version of web browser. Canvas supports only the two most recent versions of any given browser.

Technical Support

UF Computing Help Desk & Ticket Number: All technical issues require a UF Helpdesk Ticket Number.
The UF Helpdesk is available 24 hours a day, 7 days a week. https://helpdesk.ufl.edu/ | 352-392-4357

Weekly Course Schedule

Week	Lecture Topics	Speakers	Readings	Due Next Monday
1	Course Introduction Longleaf Introduction	Carissa Wonkka Debbie Miller	LL Ch. 1, 2	Class Introductions
2	Principles of Restoration Ecology	Megan Brown Debbie Miller	The SER International Primer on Ecological Restoration	Lecture Summary #1 with Questions Quiz 1
3	Introduction to Soils Unifying Characteristics and Variation in the Longleaf Ecosystem	Ashlynn Smith Debbie Miller	Brady & Weil, Ch. 3, pp. 86-87	Abstract #1 Quiz 2 Discussion Thread of potential project /paper
4	Longleaf Pine Landscapes Landscape & Communities: Disturbance	Debbie Miller	LL Ch. 3 **Graduate students only: Mugnani et al., 2019**	Lecture Summary #2 with Questions Quiz 3 **Graduate students: Journal Article Summary #1**
5	Regeneration Ecology	John Tracy	LL Ch. 4, 5, 7 Mitchell et al., 2006	Lecture Summary #3 with Questions Quiz 4
6	Restoration of Long Unburned Longleaf Pine Ecosystems	Kevin Heirs Scott Sager	LL Ch. 9 **Graduate students**	Lecture Summary #4 with Questions

	Regeneration Systems: Natural vs. Planting Planting Basics: Timing, Types of Seedlings, Care of Seedlings		**only: Varner et al., 2016**	Quiz 5 **Graduate students: Journal Article Summary #2**
7	Mechanical Basics Mowing/Mulching, Chopping, Discing, Scalping, Raking, Bedding Chemical Basics & Delivery Systems: Growth and Yield Modeling	Scott Sager Kimberly Bohn	LL Ch. 8 Shaw & Long, 2007	Abstract #2 Quiz 6
8 **No lecture; Midterm Exam Open March 2-7th**				
9	Restoring the Understory	Johanna Freeman	LL Ch. 10 PowerPoint by Denhof **Graduate students only:** Wiggers et al., 2013	Lecture Summary #5 with Questions Quiz 7 **Graduate students: Journal Article Summary #3**
10 **Spring Break**				
11	Vertebrate Fauna of Longleaf Pine Associated Communities RCW Ecology, Status, and Management Updated Status of RCWs on Eglin AFB Gopher Tortoise Biology and Management on Eglin AFB Reticulated Flatwoods	Debbie Miller Kristina Witter Kathy Gault	LL Ch. 6, 11 See Discussion Thread Assignment #1	Discussion #1 Quiz 8

	Salamander Biology and Management on Eglin AFB			
12	Invasive Plants of LLP Ecosystems Cogongrass in Longleaf Pine	Ashlynn Smith Longleaf Alliance - Ed ODaniels	Williams & Jackson, 2007 Ewel & Putz, 2004 Hall & Hastings, 2007	Lecture Summary #6 with Questions Quiz 9
13	Case study: Deer Lake State Park	Ashlynn Smith Jeff Talbert	LL Ch. 12 PowerPoint by Gordon Ralph & Poole pp. 222242	Discussion #2 **Graduate students: Interview with Restoration Professional Due April 15th.**
14	Economics Of Longleaf Ecosystem Role of Public-Private Partnerships	Tyler Carney Vernon Compton	LL Ch. 13 LL Ch. 14 Compton et al., 2007	Lecture Summary #7 with Questions **Due April 22nd** Quiz 10 **Due April 22nd** **Term Paper OR PowerPoint Due April 22nd** Discussion #3 begin continue **through April 22nd**
15	No new lectures Complete Role of Public-Private Partnerships		**Complete Discussion #3 responses by Wed. April 22nd**	Discussion #3 Continue **Due Wed. April 22nd**
16 **Final Exam: Open April 27 – May 1**				

Course Reading List

Brady, N.C. and Weil, R.R. 2008. The Nature and Properties of Soils. 14th Edition, Prentice Hall, Upper Saddle River, NJ. pp. 86-87.

Compton, V., Brown, J.B., Hicks, M. and Penniman, P. 2007. Role of PublicPrivate Partnership in Restoration: A Case Study. In: Jose, S., Jokela, E.J., Miller, D.L. (eds) The Longleaf Pine Ecosystem. Springer Series on Environmental Management. Springer, New York, NY. https://doi.org/10.1007/978-0-387-30687-2_14.

Darracq, A.K., Boone, W.W., McCleery, R.A. 2016. Burn regime matters: A review of the effects of prescribed fire on vertebrates in the longleaf pine ecosystem. *Forest Ecology and Management*, 378, 214-221.
http://dx.doi.org/10.1016/j.foreco.2016.07.039

Dwyer, N., Glass, S., McCollom, J., and Marois, K. 2010. Groundcover restoration implementation guidebook: Restoring native groundcover for FWC restoration practitioners. Florida Fish and Wildlife Conservation Commission, Division of Habitat and Species Conservation, Terrestrial Habitat Conservation and Restoration Section, Tallahassee, FL.

Ewel, J.J. and Putz, F.E. 2004. A Place for Alien Species in Ecosystem Restoration. *Frontiers in Ecology and the Environment*, 2(7), 354-360. https://doi.org/10.2307/3868360

Hall, R.J. and Hastings, A. 2007. Minimizing invader impacts: Striking the right balance between removal and restoration. *Journal of Theoretical Biology*, 249, 437-444.
https://doi.org/10.1016/j.jtbi.2007.09.003

Hiers et al. 2014. Ecological Value of Retaining Pyrophytic Oaks in Longleaf Pine Ecosystems. *The Journal of Wildlife Management*, 78(3):383-393. https://doi.org/10.1002/jwmg.676.

Jensen J.B., Bailey, M.A., Blankenship, E.L., and Camp, C.D. 2003. The

Relationship between Breeding by the Gopher Frog, Rana capito (Amphibia: Ranidae) and Rainfall. *The American Midland Naturalist*, *150*(1), 185-190.

Jones, K.C., Hill, P., Gorman, T.A., and Haas, C.A. 2012. Climbing Behavior of Flatwoods Salamanders (*Ambystoma bishopi/A. cingulatum*). *Southeastern Naturalist*, 11(3):537-542.
http://dx.doi.org/10.1656/058.011.0317

Mitchell, R.J., Hiers, J.K., O'Brien, J.J., Jack, S.B., and Engstrom R.T. 2005. Silviculture that sustains: The nexus between silviculture, frequent prescribed fire, and conservation of biodiversity in longleaf pine forests of the southeastern United States. *Can. J. For. Res. 36:* 2724-2736.
https://doi.org/10.1139/X06-100.

Mugnani, M.P., Robertson, K.M., Miller D.L., and Platt, W.J. 2019. Longleaf Pine Patch Dynamics Influence Ground-Layer Vegetation in Old-Growth Pine Savanna. *Forests*, *10*, 389.
https://doi.org/10.3390/f10050389.

Pfaff, S., Gonter, M.A., Maura, C. 2002. Florida Native Seed Production Manual.

USDA NRCS, Brooksville, FL 34601

Ralph, S.C. and Poole G.C. 2003. Putting Monitoring First: Designing

Accountable Ecosystem Restoration and Management Plans. Report in D.R.

Montgomery, S. Bolton and D.B. Booth, editors. Restoration of Puget Sound rivers. University of Washington Press, Seattle.

Shaw, J.D. and Long, J.N. 2006. A Density Management Diagram for Longleaf Pine Stands with Application to Red-Cockaded Woodpecker Habitat. *South J. Appl. For.* 31(1).

Society for Ecological Restoration International Science & Policy Working Group. 2004. *The SER International Primer on Ecological Restoration.* www.ser.org & Tucson: Society for Ecological Restoration International.

Trusty, J.L. & Ober, H.K. 2009. Ground restoration in forests of the Southeastern United States. CFEOR Research Report 2009-01. University of Florida, Gainesville, FL. 115 pp.

Varner, J.M., Kreye, J.K., Hiers, J.K., and O'Brien, J.J. 2016. Recent advances in understanding duff consumption and post-fire longleaf pine mortality. Proceedings of the 18th biennial southern silvicultural research conference. EGen. Tech. Rep. SRS-212. Asheville, NC: U.S. Department of Agriculture.

Wiggers, M.S., Kirkman, L.K., Boyd, R.S., Hiers, J.K. 2013. Fine-scale variation in surface fire environment and legume germination in the longleaf pine ecosystem. *Forest Ecology and Management, 310*, 54-63. https://doi.org/10.1016/j.foreco.2013.07.030.

Williams, J.W. and Jackson, S.T. 2007. Novel climates, no-analog communities, and ecological surprises. Front Ecol Environ, 5(9), 475-482. https://doi.org/10.1890/070037.

Assignment Descriptions

Weekly assignments:

Lecture Summaries with Student Questions:

Lecture summary assignments are a one-page summary of the selected lectures. Page format should be single spaced, one-inch margins, and 12-point font. The text should be written in paragraph form with complete sentences. Please provide your name only with no other additional header. The summary must include **(1)** objective of the lecture **(2)** major discussion points **(3)** overall message **(4)** your thoughts on the topic **(5)** any suggestions for improvement of the lecture format or content. Each of the five components listed above should be identified in the text, i.e., "the overall message of the lecture was…" Students that do not follow the format instructions will lose 2 points.

Student Questions: Write two questions based on the lecture content to be evaluated for use as test questions.

Journal Article Summaries: FOR 5159 Graduate Students only

Journal article summary assignments are a one-page summary of the selected refereed articles. Page format should be single spaced with one-inch margins and 12-point font. The text should be written in paragraph form with complete sentences. Please provide your name only with no other additional header. The summary must include **(1)** objective of the article **(2)** major discussion points **(3)** overall message **(4)** your thoughts on the topic **(5)** suggestion of an additional study that would further the information provided in the article reviewed. Each of the five components listed above should be identified in the text, i.e., "the overall message of the article was…". Students that do not follow the format instructions will lose 2 points.

Weekly Quizzes:

Weekly quizzes consist of two quiz questions based on the corresponding module content (i.e., lectures, required readings). These quizzes are designed to help you understand the style of questions and type of information that will be included on tests. THESE QUESTIONS WILL NOT BE THE ONLY QUESTIONS ON TESTS.

Discussion Thread:

Discussion thread assignments require students to post one original comment and two replies to fellow students. The original comment post is due by the following Monday, and the reply to posts should occur throughout that week with final comments due Friday, except for Discussion #3 when the final post is due Wednesday, April 24. Each post (original comment and replies to fellow students) should be at least 4 to 5 sentences, and the commentary must be substantial (i.e., "I agree" is not enough). At least one post should include a reference from a journal article, book (other than the discussion prompt reading(s) and the recommended textbook), or reliable website (i.e., USDA, NRCS, etc.) or provide information from personal experience (research/job related). Post early and often. Points will be deducted for posts submitted too late in the week for peer response.

Interview a Restoration Professional: FOR 5159 Graduate Students only

Identify a restoration professional (Ecologist, Forester, Wildlife biologist, etc.); call them and obtain permission for the interview. Come up with a set of questions and send the questions to the individual in advance. There is no specific number of questions or format required (you have creative freedom). On the day of the interview either meet this individual in person or call over the phone. Ask the questions and write down the responses. Make sure to send the draft report to the professional so that he or she is comfortable with your interpretations of the answers. Once you receive the approval from the restoration professional, submit the report.

Abstracts of Scientific Articles:

Abstract assignments require students to select a full-length article from a scientific journal (see the list of journals below) that deals with any topic that reinforces or expands upon material covered in this course. Prepare a summary (Abstracts are generally 250 words or less) that includes:

1. Gives a complete reference to include the author(s), year, article title, name of journal, volume, and page numbers. Use the format found in the example below (4 points; wrong citation format will not receive any points).

2. Describes the topic studied and methods used (2 points).
3. Gives the findings that resulted from the research (2 points).
4. Describes what you found most interesting about the article (1 point).
5. Describes the relevance of the article to topics covered in this course (1 point).

Do not use articles provided throughout this course.

Example Citation Format:
Jenkins, M.A., Jose, S., and White, P.S. 2007. Impacts of an exotic fungal disease forest community composition and structure and the resulting effects on foliar calcium cycling. *Ecological Applications* 17:869-881

List of journals:

Ecology
Ecological Applications
Ecological Engineering
Ecological Restoration
Journal of Ecology
Journal of Applied Ecology
Wetlands
Journal of forestry
Journal of Wildlife Management
Forest Ecology and Management
Plant Ecology
Restoration Ecology
Oecologia
Others acceptable with prior approval

Term Paper or Narrated PowerPoint:
Graduate students (FOR 5159) must choose the term paper option.

Undergraduate students may choose the term paper OR narrated PowerPoint.

Term Paper:
In consultation with the instructor, each student will choose a topic for a synthesis paper. The synthesis paper should follow the format given below or the review article format of any major ecology journal. This assignment is a review of the literature. It should not cover material already provided in lectures except as introductory material. The topic could be related to longleaf, but it can be about restoration of another ecosystem. This should not be a rehash of what we have already covered but a deeper insight into a topic of interest.

Format for term paper:

1. Introduction (including a rationale and need for the synthesis) 2. Objectives of your paper

3. Synthesis of the topic (this may contain various sub-sections)
4. Discussion
5. Conclusion
6. Literature Cited
7. Relevant Tables

8. Relevant Figures

SUGGESTED LENGTH: 10-page text (sections 1-5) + Literature Cited + Tables and Figures. Page format should be double spaced with one-inch margins, and 10- or 12-point font. A minimum of 10 relevant *journal articles* should be used in preparing your term paper.

Narrated PowerPoint:
In consultation with the instructor, each student will choose a topic and prepare a 10-minute narrated PowerPoint presentation. This PowerPoint will be posted in CANVAS for the next class to use and should not cover material already provided in lectures. A minimum of 5 relevant *journal articles and 5 other relevant* references should be used in preparing your PowerPoint. A Literature Cited section must be provided to document the references used in preparation of the PowerPoint.

Tests:
The mid-term exam will cover the first half of the course and the final exam will cover the second half of the course. Final exam is not cumulative. Students will have multiple choice, true/false, short answer questions, and essay questions. Exams must be taken within the allotted time, which is short. You cannot use notes or other materials and if you try, you will find you are not able to complete the test in the allotted time. Further instructions will be given in the beginning of each exam.

Grading Policy
Course grading is consistent with UF grading policies.

Course Grading Structure
[Required, methods by which students will be evaluated and their grade determined.]

Assessment Type[1]	Undergraduate students (FNR 4010) Points	Graduate students (FNR 5016) Points
Lecture summaries with student questions	70 (7 total, 10 points each)	40 (4 total, 10 points each)
Journal article summaries	none	30 (3 total, 10 points each)
Weekly quizzes	20 (10 total, 2 points each)	20 (10 total, 2 points each)
Discussion threads	40 (4 total, 10 points each)	40 (4 total, 10 points each)
Interview with a restoration professional	none	25

[1]Late work will be penalized 5% per day
[2]Term paper required for FNR 5016
[3]Make-up tests will be given only if the student has been excused prior to the scheduled date of the test and should be taken within seven days of the original test date.

Grading Scale

Grade	Percentage
A	94-100
A-	90-93
B+	87-89
B	84-86
B-	80-83
C+	77-79
C	74-76
C-	70-73
D+	67-69
D	64-66
D-	60-63
E	<60

Academic Policies and Resources

Academic policies for this course are consistent with university policies. See https://syllabus.ufl.edu/syllabus-policy/uf-syllabus-policy-links/

Campus Health and Wellness Resources

Visit https://one.uf.edu/whole-gator/topics for resources that are designed to help you thrive physically, mentally, and emotionally at UF.

Please contact UMatterWeCare for additional and immediate support.

Software Use

All faculty, staff and students of the university are required and expected to obey the laws and legal agreements governing software use. Failure to do so can lead to monetary damages and/or criminal penalties for the individual violator. Because such violations are also against university policies and rules, disciplinary action will be taken as appropriate.

Privacy and Accessibility Policies

[required for online courses, list all technology used]

- Instructure (Canvas)
  - Instructure Privacy Policy
  - Instructure Accessibility

- Zoom
    - Zoom Privacy Policy
    - Zoom Accessibility

Additional information

You are expected to be honest in all academic work, consistent with the academic integrity policy as outlined in the Code of Student Conduct and any additional syllabus language. All work is to be appropriately cited when it is borrowed, directly or indirectly, from another source. Unauthorized and/or unacknowledged collaboration on any work, or the presentation of someone else's work, is plagiarism. Content generated by an Artificial Intelligence third-party service or site (AI-generated content) without proper attribution or authorization is another form of plagiarism. If you are unsure about whether something may be plagiarism or another form of academic dishonesty, please reach out to me to discuss it as soon as possible.