Instructing tomorrow's practitioners today: prescribed fire training in university natural resource programs.

Melvin, Mark (1), Kevin McIntyre (1), David Brownlie (2), Frank Cole (3), Michael Wimberly (4).

1) Joseph W. Jones Ecological Research Center, 2) U. S. Fish and Wildlife Service, 3) For Land's Sake, 4) University of Georgia Warnell School of Forest Resources

Abstract

Currently, few opportunities exist for students in university natural resource programs to learn applied aspects of prescribed fire as a management tool. In the southeastern United States, fire is an ecological imperative for many coastal plain ecosystems and future natural resource management professionals need training in the use of prescribed fire as a management tool. The Joseph W. Jones Ecological Research Center, located in southwest Georgia, conducts basic and applied research on coastal plain ecosystems and has conservation as well as education programs as part of its mission. The Center is located at Ichauway, an 11,600 ha property that includes 7200 ha of fire dependent longleaf pine dominated forests. The Center has an active fire management program, burning over 4000 ha annually. As part of its education program, a weeklong "Maymester" prescribed fire class is offered to upper-level undergraduate and graduate students. The course gives hands-on experience with all aspects of planning and implementation of prescribed fire as well as the ecological basis and historical uses of fire as a management tool. Instructors include representatives from the Jones Center, U. S. Fish and Wildlife Service, Georgia Forestry Commission, and the University of Georgia (UGA), and the course carries two semester-hour credits through UGA. Participants have included students in forestry and wildlife management from the UGA Warnell School of Forest Resources as well as conservation biology students from the Institute of Ecology. This course fills an important niche in the natural resource management curriculum, emphasizing both the science and the art of prescribed fire as a management tool.

Introduction

Fire has long been recognized as a dominant ecological process in the Southeastern Coastal Plain (SCP) of the United States. Coastal Plain biotic communities as we know them developed in the last 5000 – 10,000 years (Stout and Marion 1993), concurrent with a climate that became warmer and drier, thus more prone to burning. The paleoecological record indicates that longleaf pine dominated the upland landscape in this region for at least the last 5000 years (Delcourt and Delcourt 1985). The dominance of a fire-adapted ecosystem and the high lightning frequency characteristic of the lower SCP suggest that natural fires were an important factor that shaped the landscape. Native Americans also used fire extensively as a management tool, (Day 1953). European settlers continued the tradition of burning for agriculture, range, and timber management in the area. Whatever the origin, frequent large-scale fires structured

vegetation patterns across the landscape of the SCP over time, resulting in a dominance of the fire-maintained longleaf pine grassland ecosystem. Longleaf pine once covered approximately 22 to 37 million ha across its range, from southeastern Virginia to eastern Texas (Ware et al. 1993).

Longleaf pine savannas are among the most species-rich ecosystems in North America (Walker and Peet 1983, Kirkman, et al. 2001), provide habitat for many species of rare and endangered plants and animals and are also centers of endemism (Walker 1993, Ware et al. 1993). Longleaf pine is also one of the most threatened ecosystems in North America, having been reduced to approximately 2% of the presettlement range (Noss et al. 1995). This ecosystem is a conservation priority, both in terms of further need for formal protection, but also in terms of the need for informed, ecologically-based management and restoration, particularly fire management.

Longleaf pine savannas are not only adapted to frequent, low intensity fires, but are actually dependent on this disturbance regime for their persistence. In the absence of recurrent fire, hardwood species can escape from a suppressed state in the understory into midstory and canopy positions in the forest. This structural change shades out understory grasses and forbs, changing fuel composition and pyrogenicity, thus altering the fire regime and ultimately forest structure and composition. Longleaf pine depends on fire to expose a bare mineral seedbed for successful germination of seeds and fire helps control diseases such as brown needle blight. A suite of other floristic and faunal components of this ecosystem also depend on fire to varying degrees and require management intervention in the form of prescribed fire for their survival.

Few opportunities exist for hands-on fire management training in university natural resource programs of study such as forestry and wildlife biology. Field experiences in general receive less emphasis in university natural resource curricula than they once did (Noss 1996). It is essential that future natural resource management professionals have the opportunity to learn both the ecological basis and the practical application of prescribed fire for the effective conservation management of fire-adapted ecosystems. The prescribed fire course offered as part of the education and outreach program at the Joseph W. Jones Ecological Research seeks to provide such an opportunity.

Objectives

The overall objective for this course is to provide the opportunity for students in forestry, wildlife biology, and ecology programs to gain practical experience and training in the use of prescribed fire. While hands-on experience applying fire to the land is a priority of this course, it is also essential that students have adequate conceptual and academic background to understand the role of fire in a land management context.

Another broad objective is to give students sufficient background in planning a prescribed burn. It is important for students to understand not only what they are doing but why. Therefore, the course emphasizes the ecological basis for the use of fire as a

management tool and teaches the use of an objective-driven approach to fire management.

Through the combination of classroom lectures, field exercises, and hands-on experience executing prescribed fires, the course fills a gap in the UGA natural resource curricula and gives students additional tools for their professional careers.

Course description

The course is held at the Joseph W. Jones Ecological Research Center at Ichauway. The mission of the Jones Center is to serve as a regional center of excellence in ecology and natural resource management that includes integrated research, education, and conservation goals. The Jones Center is located at Ichauway, an 11,600 ha reserve located in southwest Georgia, with an extensive acreage of second-growth longleaf pine and wiregrass. The property is burned on a 1 to 3 year rotation, resulting in relatively low, manageable fuel loads that create ideal conditions in which to conduct prescribed fire training.

The course begins with two days of intense classroom lectures and computer training, as well as field exercises. The primary focus of these first two days is to give students an understanding of the ecological need to burn, basic fire behavior, the mechanics of a written prescription, and operational planning. Topics include fire physics and behavior, fire weather, smoke management, fuel loading, fire history of the SCP, safety, and sociopolitical aspects of fire as a management tool. The field exercise features a survey of the burn unit to be used in the first prescribed fire training exercise, which is typically small (~ 30 ha) in size with low/moderate fuel loading and well-defined control lines. This section of the course ends with an overview of the written prescription for the burn unit, which has been prepared in advance by the instructors. At the close of the second day, students are prepared to execute the first prescribed burn of the course. On the third day, under close supervision, students perform all the tasks necessary for this burn if environmental conditions are within prescription.

The objective for remainder of the course is for the students to more independently plan, prepare a written prescription, and execute a second prescribed burn. The class is divided into teams of 3 to 4 for this exercise. Each team then prepares their own written plan and prescription for the second burn using what they have been taught in the classroom and from field experiences. Students visit the burn unit for an initial survey, which includes management history, fuel evaluation, definition of objectives, and identification of resources needed. Under supervision by a “coach” the teams develop a written prescription for the unit. Each team makes an oral presentation of its prescription which is then open for debate by the class to discuss strengths and weaknesses. The best components from each plan are compiled to formulate the actual written prescription for the second burn. This team-building exercise ensures that the best ideas from each team are used and that each team has input into the plan. If conditions are within prescription the second burn is then executed. A tailgate critique is a useful tool to recapture the day’s events and to answer questions concerning the burn or any contingency plan employed.

The last section of the class is the formal evaluation of a prescribed fire. The students visit an area that was burned approximately two weeks prior to the class to evaluate the effects of the burn. Effects on vegetation are surveyed and quantified, including the degree of crown scorch (if present), woody understory top kill, fuel consumption and an assessment of whether objectives were met. Coupled with this field exercise are presentations on fire effects on soils, woody plants, threatened/endangered species and a discussion on the future of prescribed fire.

Conclusion

The Maymester prescribed fire course taught at the Joseph W. Jones Ecological Research Center gives university-level wildlife, forestry, and conservation biology students the opportunity to gain practical experience in the application of prescribed fire while obtaining course credit. While students will not become proficient in the art of using prescribed fire in a one-week course, they will be grounded in the principles of analysis, prescription, preparation, execution, and evaluation of prescribed burning. Most importantly, this course gives students first hand experience with the use of fire as a management tool. Training tomorrow's practitioners today will help ensure the responsible use of prescribed fire into the future.

Acknowledgements

The authors would like to acknowledge the support of their respective institutions as well as that of the Georgia Forestry Commission, especially Neal Edmondson. Other Jones Center contributors include Jimmy Atkinson, Steve Jack, Kay Kirkman, Jonathan Stober, Lindsay Boring, Bob Mitchell, and Desiree Harrell.

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