FULL TITLE OF PROCEEDINGS ABSTRACTED IN THIS ISSUE

Abstracts of the Society of Wetland Scientists 22nd Annual Conference: Urban Wetlands—Protecting and Enhancing the Resource. Held May 27 to June 1, 2001 in Chicago, Illinois. For availability of abstracts, contact Michael V. Miller, Illinois State Geological Survey, Champaign, IL 61820, 217/333-7093, Fax: 217/265-8214, miller@isgs.uiuc.edu.

Abstracts of the 15th Annual Meeting of the Society for Conservation Biology. Held July 29-August 1 2001 in Hilo, Hawaii. Abstracts are available at http://conbio.net/scb/activities/meetings/2001/abstracts.cfm.

63rd Midwest Fish and Wildlife Conference: Transitions in the Conservation Landscape. Held December 9-12, 2001 in Des Moines, Iowa. Abstracts are available at www.state.ia.us/midwest2001.

Proceedings of the Native Plant Propagation and Restoration Strategies Conference. Held December 12-13, 2001 in Eugene, Oregon. Edited by D.L. Haase and R. Rose. Nursery Technology Cooperative and Western Forestry and Conservation Association. The proceedings are available for $25, postpaid. Contact Richard Zabel, 503/226-4562, richard@westernforestry.org for information.

SER/ESA 2002 indicates notes that were obtained from presenters at the 14th Annual International Conference of the Society for Ecological Restoration and 87th Annual Meeting of the Ecological Society of America held August 4-9, 2002 in Tucson, Arizona.

GRASSLANDS

1

Forest Type Influences Response of Vegetation and Soil Chemistry to Edge Clearing in Dry Glades (Kentucky)

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Small, herbaceous plant communities known locally as "glades" or "prairie openings" exist within the woodlands of central Kentucky. These communities are underlain by alkaline soils that support rare plant assemblages, including some state-threatened species. Although it is unclear what processes maintained and expanded the glades historically, current management practices typically involve mechanical removal of woody plants growing around the perimeter of a glade. To test the effectiveness of this technique, we studied the results of mechanically expanding portions of three remnant glades at the Bernheim Arboretum and Research Forest near Bardstown. Here, we report on initial plant and soil changes two growing seasons after clearing trees of two distinct forest-edge overstory types: 1) eastern red cedar (*Juniperus virginiana*) and 2) eastern redbud-Carolina buckthorn (*Cercis canadensis-Rhamnus caroliniana*) mixed hardwood.

The 0.25- to 0.75-acre (0.1- to 0.3-ha) glades are dominated by the grasses little bluestem (*Schizachyrium scoparium*) and poverty dropseed (*Sporobolus vaginiflorus*). Common forbs include small skullcap (*Scuttelaria parvula*), hoary pucoon (*Lithospermum canescens*), and prairie tea (*Croton monanthogynus*). The shale and dolomite underlying the glades form silt loam soils with a higher pH (8.0 to 8.5) and lower plant available nitrogen (N) and phosphorus (P) than the adjacent forest (Rhoades and others 2002). In fact, soil pH is more than 1 pH unit higher and extractable P is 50-percent lower in glades compared to the surrounding forest.

Prior to the edge-clearing treatment, we delineated ten 0.25-acre segments of forest edge (five per overstory type) at the glades, and randomly assigned overstory removal and uncut control treatments to halves of each edge section. In winter 2001, a field crew from the Arboretum used chainsaws to fell trees in the cut-treatment sections, and removed the downed boles, tops, and branches. This action expanded the glade openings by approximately 66 feet (20 m) in radius. We then established five 2-m x 2-m vegetation and soil monitoring plots in each treatment area.

Two growing seasons after clearing, we measured the response of forbs and graminoids to cutting. Common native grasses and forbs increased dramatically following removal of hardwood and cedar overstory, and plant cover and biomass is now comparable to the remnant glade openings. We observed that grass response was greater following hardwood clearing, especially little bluestem, poverty dropseed, poverty oatgrass (*Danthonia spicata*) and witchgrass (*Panicum capillare*). Forbs—especially wingstem (*Verbesina alternifolia*), prostrate ticktrefoil (*Desmodium rotundifolium*), and giant ironweed (*Vernonia altissima*)—responded more favorably to cedar clearing. Prior to clearing, edge forest supported equal or lower cover and biomass of graminoids and forbs than forest areas.

Presently, herbaceous biomass and forb cover in both cleared-edge types equals or exceeds that of the glade remnants. However, the newly cleared hardwood and cedar edge areas have yet to regain the overall species richness or rare species occurrence of the original glade openings.

During the 2001 and 2002 growing seasons, we periodically assessed the effects of cutting and edge species on soil nitrogen availability. We found that initial soil conditions and the effects of forest-edge removal differed between the hardwood and cedar communities. Extractable P and potassium (K), and total N and carbon (C) differed significantly between uncut hardwood and cedar edges (Table 1). The effect of cutting differed between edge types (vegetation x cutting interaction was $p < 0.05$ for all but magnesium]. In hardwood edge sites, cutting lowered soil pH, extractable P, K, and calcium and total soil N and C. In contrast, cutting had no significant effect on cedar-edge soils.

Table 1. Mineral soil properties in hardwood and cedar edge forest (0-10 cm depth) two growing seasons after clearing. Within columns, similar letters indicate that treatment means are equal based on Tukey's means separation test ($\alpha = 0.05$).

	pH mg/kg	P mg/g	K	Ca	Mg	Total N	Total C
Hardwood							
Uncut	7.9a	4.3a	197.3a	4,179.2a	1,063.7a	3.8a	60.3a
Cut	7.5b	2.9c	159.4b	3,310.5b	926.5 a	2.5b	39.7c
Cedar							
Uncut	7.8ab	3.2bc	154.8b	3,851.8ab	917.8a	2.6b	43.9bc
Cut	7.7ab	4.2ab	166.5ab	3,935.a	905.4a	3.4ab	57.7ab

Similarly, initial levels of plant available soil N and soil N dynamics differed between the uncut edge types, as did the responses following clearing. Soil nitrate and net nitrification in uncut hardwood was slightly higher than in uncut cedar ($p = 0.01$ and $p = 0.18$, respectively). Cutting increased field nitrification rates under both edge types (two-way ANOVA, $p = 0.052$). Cedar edge responded more than hardwood edge (4.3- and 1.5-fold, respectively). The effect of cutting disappeared when we incubated hardwood soils under optimal moisture and uniform temperature in a laboratory, while it was consistent for both field and laboratory incubation types in cedar soils. This suggests that the response of soils in cut hardwood edge plots may have resulted from altered abiotic conditions rather than a change in substrate quality.

At this point, cleared-edge soils remain more nutrient-rich and less alkaline than glade openings. As forest litter decomposes we expect nutrient levels to begin or continue to decline in cleared hardwood and cedar edges. In an earlier study (Rhoades and others 2002), we noted a significant and abrupt change in soil properties between the openings and the surrounding forest. This suggested that the original location and extent of glade openings might closely follow boundaries between distinct parent material types. Since both original soil conditions and response to clearing differed beneath the two forest-edge types, we expect the development of herbaceous communities within cleared hardwood and cedar edges will also differ. While soil chemistry and nutrient levels may determine the species composition within glade expansion zones, we do not know if or when soil conditions will approach those of the original glade openings.

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Reference

Rhoades, C.C., S.P. Miller and M.M. Shea. 2002. Soil properties and nutrient dynamics of prairie-like forest openings and surrounding forests in Kentucky's Knobs Region. Unpublished manuscript, University of Kentucky, Lexington.

SER/ESA 2002

2

Role of Seedbanks in the Restoration of Tallgrass Prairie (Manitoba)

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Most restored tallgrass prairies in Manitoba are constructed habitats. Although restoration of existing but degraded natural habitat has great potential for success (McDonald 2000), little information about restoring degraded tallgrass prairie exists for our region. Since 1999, we have investigated the effects of various treatments—including fertilization, disturbance, and seeding—on a 4-acre (1.6-ha), post-agricultural site (Sveinson 2003) within the Manitoba Tall Grass Prairie Preserve in southeastern Manitoba. In this note, we highlight one part of this study in which we examined the potential use of glyphosate herbicide as a tool for releasing the native seedbank of degraded sites.

Prior to treatment, our study site was dominated by non-native grass species, including redtop (*Agrostis stolonifera*), timothy (*Phleum pratensis*), Canada bluegrass (*Poa compressa*), and smooth brome (*Bromus inermis*). Native species were less common and included big bluestem (*Andropogon gerardii*), granular sedge (*Carex granularis*) and stiff goldenrod (*Solidago rigida*). We established four 48-m x 32-m herbicide treatment plots in this four-times replicated experiment and an equivalent number of untreated control plots. Originally, we were interested in