

Plan for a demo plot of new restoration techniques in NATL's pineland

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Executive summary

On 30 April 2012, seven persons experienced in the restoration of longleaf pine ecosystems met to view the present state of longleaf restoration at NATL and to plan how to use the restoration of a 1.2-acre "demo plot" in NATL's southwest corner to best academic advantage. This plot is nearly devoid of mature longleaf pines, making burning difficult and offering minimal longleaf seed drops. On the brighter side, the group found that many species typical of longleaf ecosystems were still present—leading to the conclusion that general herbiciding followed by direct seeding should be avoided. Recommended procedures included (1) improving botanical knowledge of this and other portions of NATL's 13 acres of longleaf pine (2) frequent burning of those areas within the plot that will carry a fire, (3) increasing burn coverage by mowing and spot herbiciding the margins of these burnable areas. Progress in restoring the 1.2 acres is expected to be slow. During the initial years, treatments should be kept simple and applied uniformly with the goal of keeping the target tract and an adjacent tract of similar area suitable for academic projects that demonstrate, or test with replication, techniques that might be useful to those attempting to restore longleaf communities of 20 acres or less.

Introduction

At least 30 of the 60 acres of UF's Natural Area Teaching Laboratory (NATL) were once part of an extensive, upland, longleaf-pine ecosystem. Efforts to restore 13 acres that were among the least degraded began in 1995 with the 4.4 acres of Blocks A and B (see attached map). The first controlled burn of these blocks was in 1996. They have been burned 10 times since then, with gratifying results. Attempts to burn the 7.7 acres of Blocks C and D, begun in 1999, have had poor success, especially in Block D. Coverage of burns in Block C eventually exceeded 50% in three successive years, whereas no burn attempted in Block D ever reached 50% coverage.

With this record of failed burns, it seemed time to reconsider the management plan for Block D. Thus Peter Frederick and Tom Walker invited seven experienced restorers of longleaf pineland to convene onsite on 30 Apr 2012 to consider what should be done. The stated purpose of the visit was to consider using direct seeding to restore longleaf-suited ground cover in the 1.2 acres (0.5 ha) at the western extreme of the block. Thus all those invited had some experience in that strategy of restoration.

Those participating in the visit were:

- Anne Barkdoll—Florida Parks and Recreation, Gainesville
- Linda Duever—Conway Conservation, Micanopy

- Nancy Dwyer—Half Moon WMA, FFWCC, Lake Panasoffkee
- Peter Frederick—UF Dept. Wildlife Ecology and Conservation
- Johanna Freeman—FFWCC, Lake City
- Chris Matson—FFWCC, Frostproof
- Stefanie Nagid—City of Gainesville Nature Operations Division
- Kent Williges—FFWCC, Micanopy
- Tom Walker—UF NATL

The rest of this document is ordered by listing topics that were discussed regarding the restoration of Block D and its 1.2-acre “demo plot.” The numbering system makes it easy to refer to particular parts of the plan. The participants noted that many of the techniques suggested for Block D could be used to speed restoration in Blocks C and E as well.

1) General Assessment of current condition.

- a) It was agreed that the demo area had never been a longleaf pine flatwoods nor a typical sandhill longleaf pine community. Its pre-Columbian state was likely closer to hammock than most upland longleaf communities as indicated by the presence of overstory southern red oaks and mockernut hickories. In the FNAI classification scheme, it would be tentatively classified as “upland mixed woodland,” a transitional habitat between pinelands and hammock composed of mostly pyrogenic plants and maintained by fire. Future botanical work may clarify some of the uncertainty about the demo area’s former status.
- b) The original community of Block D is degraded but largely recognizable, and many components of the overstory and ground cover communities are intact. In the early stages of restoration overstory laurel and water oaks were removed, opening up the tract to light. This resulted in a ground cover over-dominated by muscadine grape and catbrier, but many key indicator herbs and forbs are still present. Seedling and sapling laurel and live oaks are much too common in the understory and ground cover. Presence of bracken fern suggests little to no soil disturbance in the history of the site.
- c) General approach to restoration: There is enough desirable rare, typical, and indicator groundcover that this area should not be subjected to general herbiciding. The approach should be to strongly discourage over-dominant species and those that do not belong, and encourage those that do. The should be done carefully, using fire, mowing, and spot herbiciding, moving things in a strategic, long term fashion. In general, work should be from spots that have intact ground cover towards those that do not, and from pyrogenic microhabitats outwards. The demo plot seems an excellent site to test or demonstrate techniques suited to the restoration of small tracts of longleaf pine.

2) Detailed plant lists for Block D and other restoration tracts

- a) Much of the ground cover in Block D is hidden under a layer of vines, but valuable plants and micro communities should be identified and mapped as soon as possible. This will be best achieved by enlisting the help of one or more competent botanists. Because no controlled burn of Block D is scheduled until this winter, its legacy forbs and grasses will remain largely inaccessible to identification at least until late winter 2013. If good botanical help is found before then, it can initially concentrate on identifying the grasses and forbs of the blocks that are further along in restoration (Blocks A, B, and C) and of Block E, the one-acre tract that has had much of the oak overstory removed but has yet to be burned.
- b) As botanical knowledge of NATL's longleaf pine tracts improves, the academic uses of the demo plot and the management and restoration of the rest of Block D should be adjusted accordingly.

3) Mowing

- a) Bush-hog mowing has the benefits of being available from UF PPD at no charge to NATL and of making acres at a time burnable by temporarily creating dead, dry plant material. Drawbacks are that it is not selective and may introduce unwanted plants. Until brush is more under control in Block D, selectivity there should be of no concern. As for introducing unwanted plants, PPD mowers should be safer than those brought in from off campus. On this basis, and in hopes of getting the first-ever generally successful controlled burn of Block D in January or February 2013, it is planned to have PPD bushhog the demo plot along with the rest of Block D in mid to late December 2012.
- b) After one or more burns of Block D achieve a coverage of 50%, the areas of the demo plot in which heavy machinery is allowed should be restricted as much as feasible to avoid bringing in unwanted seeds from distant sources.
- c) NATL owns a Kee 24" mower with 20"-dia rear wheels, dual swivel front wheels and a 6.5 hp motor. This self-propelled mower is used mainly to mow nature trails, but it will mow light brush easily and, with a strong and skilled operator, heavy brush. This mower might be adequate to increase the size of pyrogenic-spots or to start ones in new places. An alternative would be to use a small riding mower if one becomes available. A substitute for small-scale, targeted mowing would be to use a special form of herbiciding (see 5b).

4) Burning

- a) The most recent (partial) burn of Block D was March 2005. The only reason the understory is now relatively low is because it was bush-hogged by PPD in 2008 and 2009 and by the School of Forestry in December 2010.

- b) Every year as much of the demo plot as will carry a fire should be burned. This may consist only of roughly circular areas under mature pine trees. Such areas could be called "tree-spots."
- c) As circumstances and academic goals permit, these tree spots in the demo plot might be complemented by creating "demo-spots". A demo-spot would simulate an area of higher flammability typical of areas beneath mature pines but rather than pine needles, the burnable materials would result from hand-mowing or hand-herbicideing vegetation that is already within the demo-spot. This would provide dry fuel, making an unburnable area temporarily burnable. Initially mowing/herbicideing of demo-spots should probably occur shortly before a winter or early spring general burn. When burned, the fires would be expected to carry little beyond the treated areas.
- d) As pyrogenic areas increase in area and in number, burning them might be shifted to the growing season, but in the early stages of establishment burning them at any time of year would be preferable to skipping a year.
- e) In all burns, duff ignition under legacy pines should be carefully controlled and water applied immediately after the surface layer of needles has burned off.
- f) The urgency of frequent burning should taper off once it appears that a fire tolerant ground cover is gaining the upper hand.
- g) The eventual goal for all burning in NATL's longleaf pineland should be in keeping with the improved botanical knowledge envisioned as essential in developing the demo plot.

5) Herbicideing

- a) The modes of herbicideing previously used in NATL's pineland are:
 - o herbicide restricted to the target individual (e.g. imazapyr applied to the soil within 12" of the target individual, triclopyr in oil applied to stumps, girdles, and stems)
 - o herbicide sprayed on the target individual, but drifting or forcibly ejected onto other individuals of the target species or of other species (e.g. triclopyr on laurel oak root sprout)
 - o herbicide sprayed on an area (e.g., imazapyr on large area of cogongrass)
- b) Restricting the application to a target individual is important when individuals of other, desirable species are likely to be herbicideed. Spotting of foliage or stems is made possible with a method developed by Chris Matson in which a sponge is affixed to the wand of a knapsack sprayer containing 25% triclopyr in oil. The sponge is kept wet with herbicide by occasional strokes of the pump and is used to spot parts of the target plant with the lethal mixture.
- c) Because the botanists in the group found evidence that desirable ground cover plants from the former longleaf ecosystem still existed in the demo plot, all or most herbicideing

there should be restricted to target individuals. (Most of these desirable plants are thought to be able to survive mowing and burning.)

6) Restoring/enhancing desired species that have not survived

- a) *Trees*: southern red oaks and mockernut hickories are obvious survivors from the earlier ecosystem, but when wild cherry was mentioned as a possibility it was suggested that saving a seed tree or so would be sufficient to find out. Unless longleaf pines begin to recruit from natural seed drop within 5 years, longleaf seeds from elsewhere in NATL could be planted in pots, pampered for the first year and then planted and pampered some more. .
- b) *Understory trees and shrubs*: none identified as needing introduction or encouragement in the near future.
- c) *Ground cover*: A seed mix from a nearby, similar, longleaf community should be sought and, when found, used to seed appropriate areas of open ground as they become available during the restoration.

7) Timeline

- a) This plan does not attempt to see beyond 10 years.
- b) Resources to establish a demo plot seem adequate for success if the goal is to make the best use of the area as a place to try out and to demonstrate restoration methods that are likely to be of use in restoring longleaf pine communities on areas of 20 acres or less.
- c) Initially this plan should be kept as simple as possible by not adding alternative treatments unless they are part of an academic project that replicates a comparison of treatments or are conceived as increasing the utility of the demo plot in hosting such projects (see next item)
- d) At an appropriate stage in the execution of this plan, demo-spots (see 4c) of a single size and of a number and arrangement that will maximize the quality of future or already planned academic projects should be established.
- e) As pyrogenic tree-spots are mapped and pyrogenic demo-spots are successfully started the desirability of having "micro burns" in the summer growing season increases—but general burns in early to mid spring must be continued. Such an increase in complexity of NATL's program of controlled burns may be difficult but so long as the Ordway-Swisher TNC burn team (or its equivalent) remains available for such burns, it should be doable.

NATL-west Grid Map

50-Meter Grid

Locations in NATL can be specified by reference to a grid system based on north-south gridlines (A-O) and east-west gridlines (1-12). Gridlines are at 50-m intervals. Each gridline intersection ("grid point") is identified by its two gridlines (e.g., E5). Each 50x50-m block formed by the gridlines is identified by the grid point in its northwest corner (e.g., block G9 is north of Gasline Trail and west of the Surge Area).

Using the grid

To use the grid, you must know where you are in the grid. To approximate your location, refer to the map on which the grid is displayed. To determine your location more exactly, find one or more of the grid stakes that mark the intersections of grid lines. Each grid stake is white plastic and has a green band at top with the letter and number of its two grid lines (e.g., E4). For those using GPS devices, the geodetic coordinates of all grid stakes are in the spreadsheet at <http://natl.ifas.ufl.edu/GPSgriddots.xls>.

Successional Plots

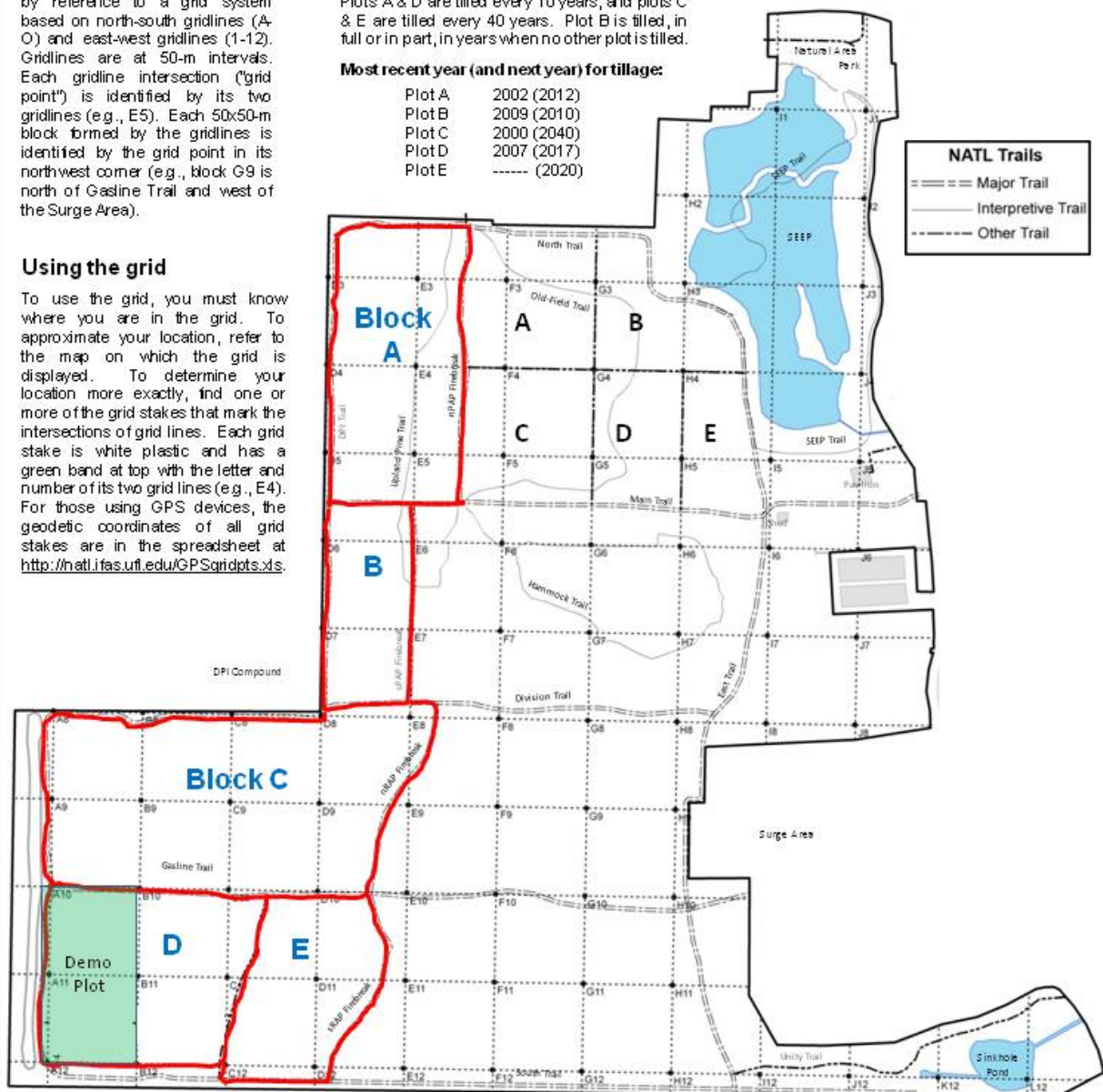
Large letters identify the 5 successional plots. Plots A & D are tilled every 10 years, and plots C & E are tilled every 40 years. Plot B is tilled, in full or in part, in years when no other plot is tilled.

Most recent year (and next year) for tillage:

Plot A	2002 (2012)
Plot B	2009 (2010)
Plot C	2000 (2040)
Plot D	2007 (2017)
Plot E	----- (2020)

Public and Restricted Areas

All parts of NATL-west north of Division Trail are open to the public from dawn to dusk. The area south of division trail and all of NATL-east is limited to academic uses as explained at <http://natl.ifas.ufl.edu/rules>.



Grid surveyed by
 UF Student Geomatics Assoc.
 Map created by
 Robert Guggenheim - May 2010

