Developing Treatments for Ecosystem Restoration: Fire and Fire Surrogate Study in the Southern Coastal Plain

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INTRODUCTION

Many U.S. forests, especially those that historically burned at short-intervals, are too dense and/or have excessive quantities of fuels. Widespread treatments are needed to restore ecological integrity and reduce the high risk of uncharacteristically severe and destructive wildfires in these forests. Among possible treatments, however, the appropriate balance among cutting, mechanical fuel treatments, and prescribed fire is often unclear. To fill this knowledge gap, long-term, interdisciplinary research has been initiated to quantify the consequences and tradeoffs of alternative fire and fire surrogate treatments. The objective is to develop realistic management options that can be used to treat fuels and restore ecosystems. Myakka River State Park is one of 13 nationwide research sites. It is representative of the flatwoods forest type, which historically burned quite frequently, every 2 to 5 years. It also represents a widespread forest type that is in need of and will likely benefit from, fire or fire surrogate treatments, that we currently have the ability to apply over a significant area at a reasonable cost.

BURNING

CHOPPING

MOWING

METHODS

1. Installed treatment units that consist of a core area of 12.25 ha and a surrounding 20m buffer giving a total size of 15.2 ha.
2. Within each treatment unit there are 36 grid points on a 50m by 50m spacing.
3. The exact configuration varies for the different treatment units to fit site conditions, but a typical layout consists of a 6 by 6 arrangement.
4. Randomly assigned 2 units to receive prescribed burn only (photo), 2 to be burned and then roller drum chopped (photo) and 1 unit to be burned and then mowed (photo).
5. Selected area with native tree cover and understory vegetation on the Myakka River State Park.
6. Entire area was prescribed burned on July 13, 2000.
7. Measured cover of wiregrass and palmetto on 10 line transects in each treatment unit in October 2000.
8. Applied chopping and mowing treatments in February and March 2001
9. Remeasured wiregrass and saw palmetto cover in October 2001.

LOCATION

TREATMENTS

1. Untreated control
2. Prescribed fire as needed
3. Mechanical roller drum chopping of the ground cover
4. Prescribed fire followed by roller drum chopping of the ground cover with reburns as needed
5. Prescribed fire followed by mowing of the ground cover with reburns as needed

RESULTS OF TREATMENTS

Fire was quite hot and scorched most of the trees resulting in some mortality.

All vegetation was consumed and cover of both wiregrass and palmetto reduced to zero

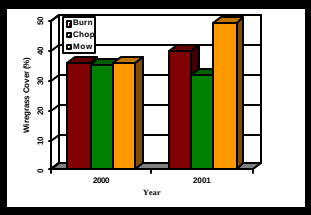
By the end of the growing season, vegetation had recovered

RESULTS

Chopping and mowing treatments could not be applied to the entire area because of the trees (photo). The equipment used for the actual treatments performed well but the tractor was not rugged enough for use in the woods. A ground guide was required to locate lightered stumps to reduce tire punctures. In addition, because of the stumps the mower had to be elevated about 30 cm above the soil surface.

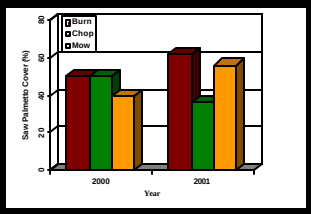
Chop Treatment October 2001

Mow Treatment October 2001



All treatment areas had equal wiregrass cover at the end of the growing season following the prescribed burn. Although it appears mowing may have favored the expansion of wiregrass while chopping caused a slight decline, these differences were not significant.

There was slightly less saw palmetto on the mowed area after the fire but prior to the mechanical treatment. This was a site difference, and the mow area was slightly lower and a little wetter than the other treatment units. Saw palmetto increased in cover on both the burn and mow plots the second year. The chopped areas, however had significantly less palmetto than the other treatments and actually declined compared to the previous year.



CONCLUSIONS

Some thinning of the overstory would be required to apply mechanical treatments to flatwoods sites with heavy tree cover. Equipment designed for wood operations like skidders seem more appropriate for pulling drum choppers or mowers through forested areas. Although mowing may reduce the height of saw palmetto, it does little to reduce cover because it is difficult to mow close to the soil surface. Roller drum chopping, however, with a small chopper can reduce the cover of saw palmetto without significant damage to desirable species like wiregrass. Although some recovery is expected, this should be a long lasting effect because chopping kills a number of the palmetto buds by severing them from the prostrate stem.

Acknowledgements

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