Assessing fire effects and regime in a coastal strand ecosystem

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MAIN QUESTIONS OR ISSUES THAT YOU ADDRESSED

Coastal ecosystems face numerous well documented threats that pose significant risk of reduction in the ability of these ecosystems to persevere. Little is known about the specific role of fire in maintaining coastal ecosystems of the region. Since fire plays such an important role in so many southeastern ecosystems, and since the areal extent of coastal strand ecosystems has been much reduced, it is important to resolve the role of fire for management of these threatened communities.

LOCATION AND ECOSYSTEM INVESTIGATED

The Guana Tolomato Matanzas National Estuarine Research Reserve near St. Augustine in northeastern Florida manages a significant, protected example of the coastal strand ecosystem.

KEY FINDINGS OF YOUR RESEARCH

Our observations that saw palmetto cover was reduced and that herbaceous species cover and abundance increased in the burned treatment was supported by the SIMPER analyses and may reflect the different rate of fire recovery mechanisms of these important species. Our results support the use of prescribed fire to sustain the backdune coastal strand ecosystem by inhibiting succession to oak-dominated mesophytic hammock. From our review of the relevant literature, we recommend as a starting point that a fire return interval of between 4 and 20 years be considered by fire managers of the Northeast Florida coastal strand ecosystem.

HOW DID YOU ANSWER THE MAIN QUESTIONS OR INFORM THE ISSUES?

In January 2014, a prescribed fire treatment was applied to both foredune and backdune components of the southern portion (22.5 ha) of the study area, while the adjacent northern sector (32.6 ha) was left unburned, allowing us to compare control vs. fire treatment effects in this ecosystem. Plant species abundance, cover, and tree size data were collected to assess the vegetative response to burning on the foredune and backdune subcommunities. Our vegetative survey methodology was adapted from the Carolina Vegetation Survey (CVS) (Peet et al. 1998, 2012), and used the "module" sampling unit concept. We sampled ten modules in each of our four treatment combinations (burned foredune, unburned foredune, burned backdune and unburned backdune) for a total of 40 modules. Our results were analyzed using Primer 7 NMDS.

HOW MIGHT/WILL IT INFLUENCE FIRE MANAGEMENT DECISIONS OR PRACTICES?

Our goal was to describe the vegetative response to fire in this threatened ecosystem to help inform natural areas managers in their efforts to conserve and protect what remains of these fragmented coastal ecosystems. From our review of the relevant literature, we recommend as a starting point that a fire return interval of between 4 and 20 years be considered by fire managers of the Northeast Florida coastal strand ecosystem. We do caution, however, that in the absence of a firm understanding of an appropriate fire return interval, the risk of destabilizing the dune system with too-frequent or too-intense fires, combined with the effects of other disturbance effects, such as hurricanes, should be considered by fire managers.

WHO IS THE MAIN END-USER OF YOUR RESEARCH?

Coastal ecosystem natural areas managers

CONGRESS SESSION

Fire Ecology and Effects