Distribution and Management of Invasive Species in Florida Dry Prairie

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ABSTRACT

Communication and dissemination of information on effective methods of controlling exotic species in Florida dry prairie are essential because invasive species threaten even the most remote prairies. I interviewed land managers regarding distribution, control, and monitoring of invasive species in dry prairies. We developed a web page to assemble information on the two species [cogongrass (*Imperata cylindrica*) and fire ants (*Solenopsis invicta*)] that might pose the greatest threat. Additionally, I used Myakka River State Park as a case study to document the efforts and results of attempts to control cogongrass, the species deemed most challenging by land managers. In interviews the animal specified consistently as contributing the most impact was the feral pig. Managers rated fire ants from no effect to probable significant impact, but cited lack of data to determine severity. Cogongrass (*Imperata cylindrica*) was consistently rated as the most significant invasive plant in dry prairie, although a variety of other invasive plants occur in the prairie landscape (including hammocks, wetlands, cypress swamps, and ruderal areas). Most interviewees report that the spread of cogongrass in detected sites is under control; however, eradication is rare. Commonly, GPS points are used to record known sites and their treatment history. However, lack of manpower to enter data and a system to connect field personnel with data often hinders effective treatment, as does the lack of continuity in management. Control of exotics in dry prairie will depend upon developing better control methods, having staff dedicated to invasive species control, and employing effective monitoring systems.

REPORT

I queried resource managers of dry prairie about invasive species in the areas they manage. Each listed feral hogs as the most problematic invasive animal and said that they had intensive trapping or hunting programs that consistently removed hogs.

I asked about imported fire ants, as we have observed significant impact of fire ants on prairie animals in routine small mammal inventory trapping and herp arrays. Fire ant impacts were rated as either insignificant or unknown.

I searched the web to find research that looked at the effects of imported fire ants on prairies or prairie fauna in this country. Though there is not much that relates specifically to Florida dry prairie, I was impressed by the amount of literature that emphasizes impact of fire ants on related natural communities and their animals. A link to references cited is posted at http://www.MyakkaRiver.org/resource.html. I concluded that studies of the impact of imported fire ants on Florida dry prairies are very much needed and believe land managers should seriously consider initiating some type of control programs.

When I asked about invasive plants, the response was again unanimous. Though there were various invasive plants in river floodplains and prairie hammocks within the dry prairie landscape, only one plant was considered a major threat to prairie habitat—cogongrass. Therefore I present an account of our experience over fifteen years with detection, monitoring, and treatment of cogongrass at Myakka River State Park in Sarasota, Florida.

The first cogongrass site was discovered in the park around 1988. We treated it with 2% Roundup (a glyphosate-based alternative). It came back. We discovered another half dozen or so sites and continued to treat and retreat with Roundup. We now have over 200 sites ranging from 2' × 2' to over an acre.

The most surprising revelation gained from the past few months of reviewing our cogongrass treatment histories and talking to dry prairie land managers is the discovery that we cannot eliminate cogongrass sites. Land managers told me they treat, document, and monitor cogongrass sites, keep them from expanding, but seldom eliminate them. We have eliminated only a few sites at Myakka over all these years. Last fall I discovered regrowth at sites that had been cogongrass free for up to three years.

One of the most difficult challenges in managing this weed is detection. Accurate assessments of the extent of cogongrass invasion in dry prairies do not exist. Even with the aggressive monitoring system we have in place at Myakka River, I cannot go out into the field during spring bloom without discovering new sites. We have found the best time of year to detect it is in the spring when it blooms. We ride in the back of pickup trucks, up and down all the roads and trails in the park in late March and early April. We can detect even tiny patches of four or five plants, a couple hundred yards away. We find tractors useful in detecting cogongrass as we can travel cross-country and see the bright lime-green patches several hundred yards away. At first I was concerned about the impact the tractors had on the land until I realized how insignificant tractor tires are in comparison with the threat of undetected cogongrass.

Selecting the herbicide mix has also been a challenge. We started with 2% Roundup. We changed to 1% after reading that smaller amounts of herbicides take longer to kill the above-ground growth and allow the plant to absorb more into the roots. It was a reasonable hypothesis but it didn't work. We tried 3% Roundup.

Land of Fire and Water: The Florida Dry Prairie Ecosystem. Proceedings of the Florida Dry Prairie Conference. Reed F. Noss, editor. 2006.

That was an improvement, but the grass still came back, over and over. We added Arsenal to the mix. We were hopeful that we had finally found the answer. There was less regrowth, but still it continues to come back. Now we add Quest, a kind of water conditioner that is supposed to facilitate absorption of the herbicide into the roots. We keep detailed records of treatment of each site to be able to evaluate effectiveness of new treatment methods.

Another important step in managing cogongrass is documentation and monitoring. Through trial and error we developed a system that is accessible to the entire staff. New locations of cogongrass are located and GPS coordinates are taken and recorded; the perimeter of the patch is flagged with pink and black striped marking tape; a wooden stake is pounded into the ground, and a 5-ft, 1 ½-inch, schedule 80 PVC pipe that has been spray-painted red at the top is placed over the stake. This allows easy temporary removal of the PVC when we burn. The site is measured. A 4 × 6 yellow card (yellow signifies cogongrass) is filled out for the site and placed in the card file. Each site gets a new number; the higher numbers indicate most recently discovered sites. Each time a ranger or volunteer treats grass at the site, information on date, treatment method, size, and who treated it is recorded. This system permits everyone who is involved in managing cogongrass to be an equal participant. Each month, and sometimes several times a month, I update a spreadsheet that lists the sites by zone, print out the sheets, and leave them on a clipboard by the cogongrass card file so rangers or volunteers can take them into the field.

Manpower and transportation are additional challenges in the cogongrass war. We have a large volunteer program, but transportation to remote areas where cogongrass is located is difficult with limited vehicles. I wrote a grant request for two ATV's to be used by park volunteers to monitor and treat cogongrass. That has helped quite a bit. But still it is not enough. We are always short of manpower and transportation. Volunteers are plentiful in the winter but scarce during the summer and fall when cogongrass monitoring and treatment is most intense.

We don't limit our control methods to herbicides. We also mow, burn, pick seeds, dig up rhizomes, and continue to search for new cures such as the biological control being developed for cogongrass. We have learned a lot but often have as many questions as the number of problems we solve. One of the people I interviewed for the presentation lamented that there is lots of information on cogongrass, but it is so difficult to find. Therefore, we have developed a webpage of cogongrass resources. It includes both links to web pages and lists of research (http://www.MyakkaRiver.org/resource.html). There is also a link to the Research and Restoration Partners Projects grant report that was submitted to Charlotte harbor National Estuary Program summarizing the Control of Invasive Grasses in the Myakka River Watershed by Park Volunteers.

Listed below are some cogongrass observations made by park staff over the last few years.

OBSERVATIONS

Cogongrass site #3 had no growth for three years, then reappeared about 100 ft from original site. Cogongrass site #1 had no growth for 18 months then reappeared about 75 ft from original site.

Seeds are consumed by fire when burned, so burning is an alternative to picking and bagging seeds.

Areas usually burned in dormant season seem to have greater infestation of cogongrass than those traditionally burned with growing season fires. Burned areas make open seedbeds for wind-dispersed seeds.

Cogongrass sites seem to be concentrated along edges of communities, where palmetto and shrubs are higher than other parts of the zone, rather than in clearings (fire lines, marsh edges, and improved pasture).

Cogongrass growing in the shade looks very different from what grows in sunny areas. The blades are wider and deeper green in color.

Cogongrass growing in flooded or muddy areas can be pulled up with rhizomes intact, though the one long, feeder root that goes deeper into the ground may break off.

Small seedlings sprayed repeatedly come back in full force immediately. We learned to wait until the grass is at least knee-high to spray with herbicide so the leaves can absorb enough herbicide to affect the rhizomes.

The best time to detect new sites is in late March and early April when the bright white flower plumes and seed heads are easy to spot from a distance. We have discovered many sites 500 ft or more off roads and trails from the back of a pickup truck or in a tractor in spring.

A tractor is good for monitoring cogongrass in prairie. You can detect it quite a distance from the height of the cab, and can carry herbicide and tools for marking and monitoring.

We have found that manual systems of recording and monitoring sites work better than sophisticated computerized systems. People are too busy to enter the data into a computer; therefore it is not available to all field staff at all times.

Schedule 80, white PVC pipe, 5-ft high, with top 4" spray-painted bright red over a wooden stake has been most effective for marking sites. The PVC can be easily removed from the stake when the zone is burned, and, unlike rebar, the wooden stakes do not puncture tractor tires.

One way to identify cogongrass is that it usually grows just a couple of inches taller than the palmetto, even in 5-ft-high palmetto.

Mowing is used when the palmetto and shrubs are too thick and too tall to spray the grass. Sometimes shrub height may exceed five feet. Cogongrass grows back faster than native vegetation and can be treated when it is about 18 in tall. We also mow sites when there are layers of dead cogongrass that prevent treatment of green growth underneath.

Burning was advantageous in palmetto/shrub growth too thick or too high to treat with herbicide effectively. Of course it was important to treat the area with herbicide as soon as the grass was knee-high.

We found that grass treated in December was effective, but there was little effect on grass treated in late January and February.

Seed from cogongrass along road shoulders and adjoining private lands also threatens park lands. We have found that highway departments in both Sarasota and Manatee counties are willing to treat cogongrass growing along road shoulders. We have also begun contacting park neighbors to make them aware of the problem, and in two cases, to treat their patches of cogongrass.