

Torpedograss Herbicide Study:

Imazapyr Only vs. Imazapyr/Glyphosate mix

Background: During FY 18/19, the Florida Fish and Wildlife Conservation Commission (FWC)'s Aquatic Habitat Restoration and Enhancement Subsection (AHRE) used a new technique in herbicide application on Lake Okeechobee's northwest marsh. Biologists contracted a "boom-truck" herbicide applicator which is commonly used in agriculture. The machine was a 3-wheeled boomed sprayer machine with 50-foot booms that apply herbicide out of both sides of the machine.

Two polygons were treated, one with imazapyr (64 oz/acre) and the other with a mix of imazapyr (16 oz/acre) and glyphosate (96 oz/acre). Both treatments used 32 oz/acre methylated seed oil (MSO), a commonly-used adjuvant for herbicide application. Both herbicides are registered with and approved by the U.S. Environmental Protection Agency for use in aquatic environments. A total of 1,140 acres were treated in Spring 2019. The purpose of sampling was to determine which chemical or mix proved most effective at controlling the torpedo grass and allowing for the promotion of native moist soil annual plants. One year post treatment, the torpedograss treatment was monitored.

Methods:

Fifty-nine (59) random sampling points were selected within the polygons and t-posts with PVC posts on top were placed at each point. One year post treatment, at each monitoring point, a ½ meter x 1 meter PVC quadrat was dropped over the pole marker, with the pole marker being in the exact center of the quadrat. The percentage of live torpedo grass present within the quadrat was recorded. Percentages were recorded as 0%, 0-5%, 5-25%, 25-50%, 50-75%, 75-95% and 100%. Other species were recorded if present. After all data was collected, an areal percentage of live torpedo grass was calculated. Each percentage range was given a category score (see Table 1). The torpedograss category score average for each herbicide mixture was determined (the higher the score, the less effective the control). Other species present were noted as present or absent and summarized by mixture type to determine plant communities for each mixture. Further monitoring events may occur in subsequent years to determine efficacy of spot treatments each year.

Table 1. Torpedograss categories with percent coverage ranges

Torpedograss Category Score	%
0	0%
1	0-5%
2	5-25%
3	25-50%
4	50-75%
5	75-95%
6	95-100%
7	100%

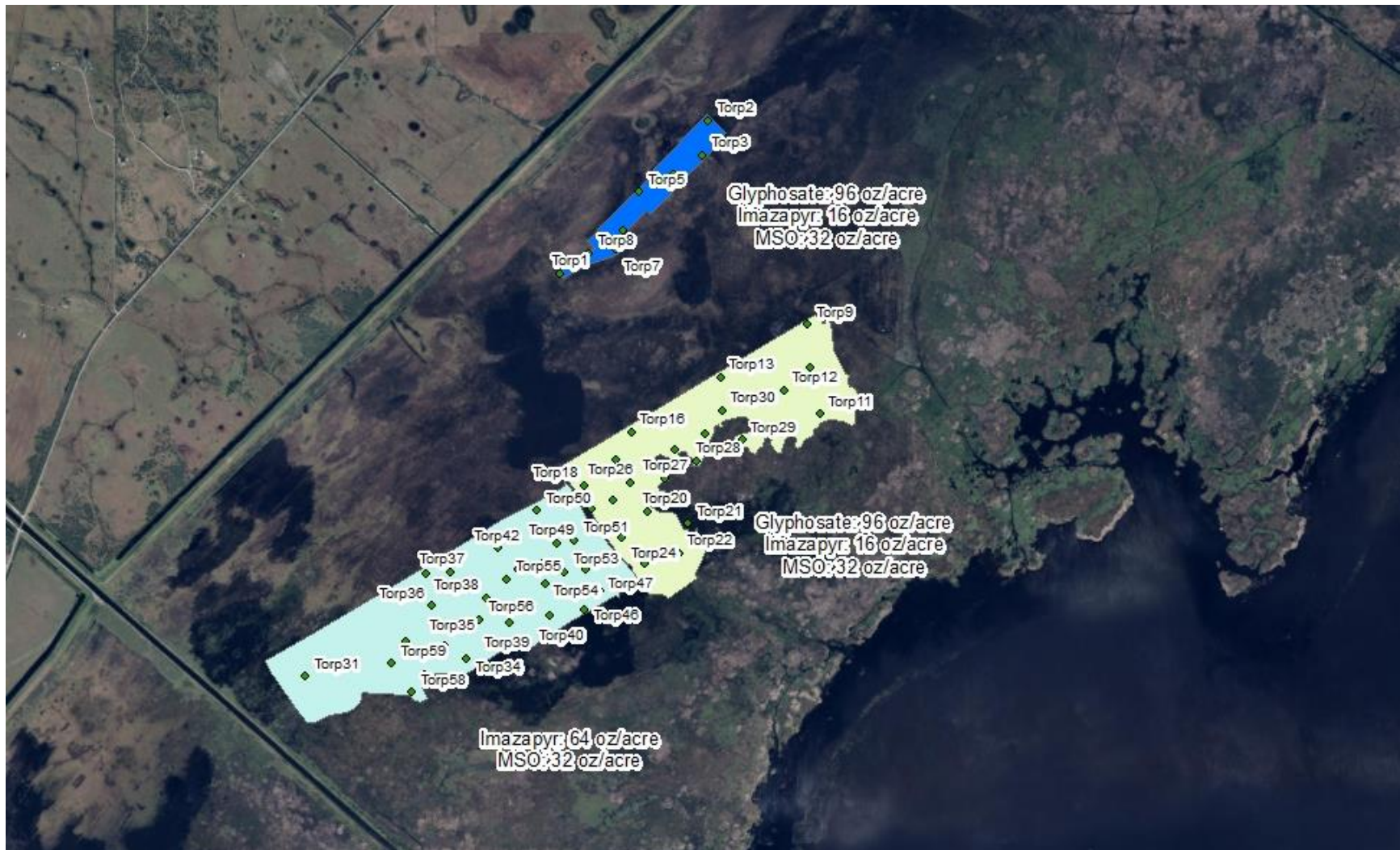


Figure 1. 2019 torpedograss treatment area within the northwest marsh of Lake Okeechobee. Monitoring points and herbicide mixtures are included on the map.

Results:

Torpedograss coverage prior to herbicide treatment in Spring 2019 was near 100%. One year after herbicide treatment, coverage average was 25-50% throughout the treatment areas (score of 3). Some areas still had near 100% coverage, but other areas had little to no torpedograss present. There was **no difference** in torpedograss coverage between treatment areas. Each mixture had the same coverage of torpedograss controlled or recolonize (Figure 2).

In addition to torpedograss coverage, presence of other plant species found within the quadrat were also recorded (Figure 3). There was some difference between the mixtures when looking at other species, but no statistical analysis was done. For the imazapyr/glyphosate mix, there tended to be more duck potato, more sedge and panicum species, more wildflower species and more smartweed. For imazapyr only, there tended to be more bare/dead areas, more marsh mermaidweed, dog fennel, millet species, paragrass, cupscale and pluchea (camphorweed).

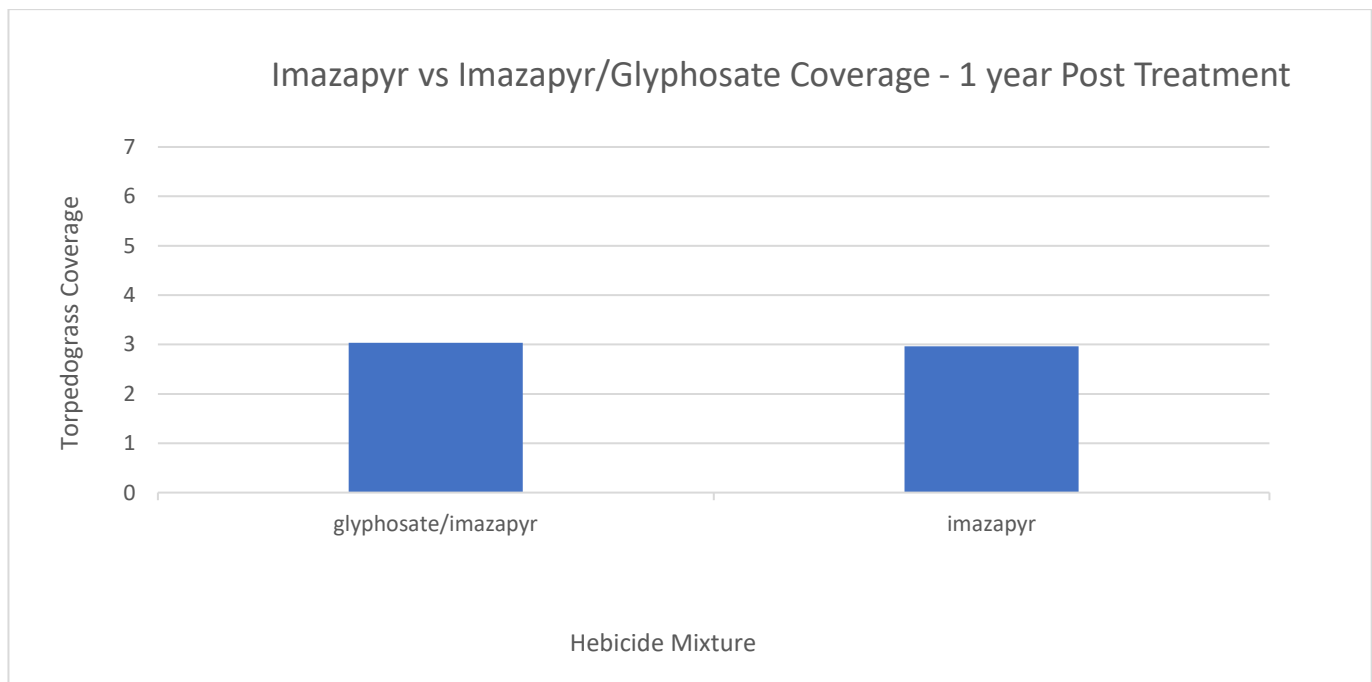


Figure 2. Coverage of torpedograss one year post treatment. Imazapyr vs imazapyr/glyphosate mixture. A score of three (3) means that there was an average of 25-50% of torpedograss throughout the area.

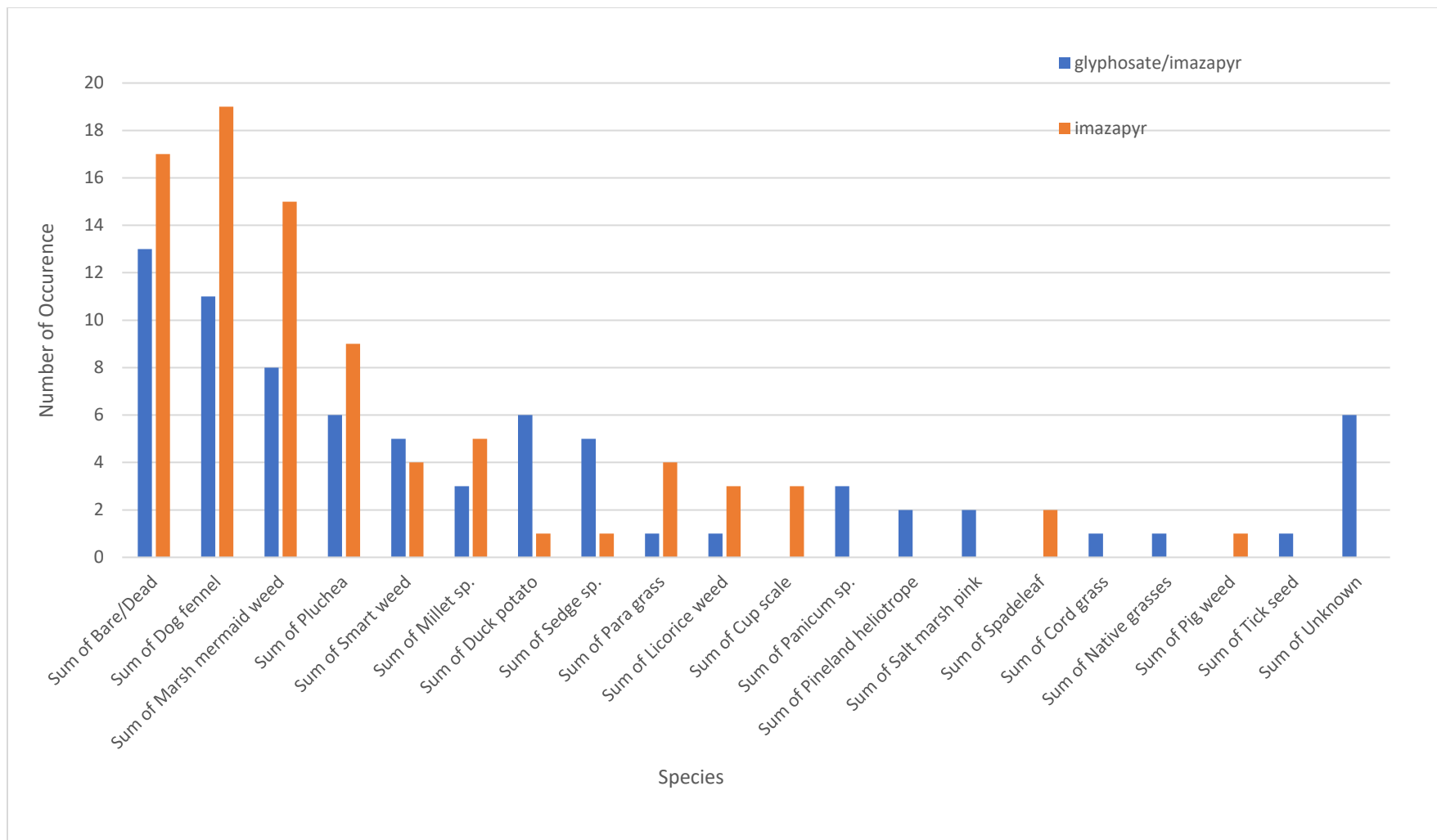


Figure 3. Number of occurrences of species recorded at each transect for glyphosate/imazapyr mixture vs imazapyr only.

Discussion:

The main purpose of these torpedograss treatments was to reduce the amount of torpedograss in Lake Okeechobee and increase coverage of native species within the lake's wetland and wet prairie habitats. Torpedograss often forms dense monocultures where very little wildlife can forage or use. Torpedograss often entirely replaces native plant communities and spreads fast.

There was no difference between using a glyphosate/imazapyr mix or imazapyr only, in eliminating torpedograss. Either can be used to accomplish the same goal, although spot treatments will be needed in both areas, regardless of original treatment type. In Spring 2020, spot treatments were conducted within most of the 2019 treatment areas to further reduce torpedograss. An additional monitoring event will be conducted in Spring 2021 to see if torpedograss coverage continues to decline.

Additionally, other plant species present were recorded to document what returned to an area after treatment. While there were some differences in newly returned species between the treatment methods, it is unknown if those differences are because of the herbicide mixture used, if there were differences in the seedbanks in each area, or perhaps even small differences in elevation allowing one area to be moister than the other. It's also possible that differences in soil moisture throughout the actual treatment period could have impacted soil residual or other unknown items at that time.

During the herbicide treatments, there was increased rainfall for the second half of the treatment resulting in the ground being very wet, with standing water in many areas. This caused some of the imazapyr/glyphosate treatment area to be moved closer to the levee to a higher elevation so that the boom truck did not get stuck. The first half of the treatments had dry ground and were at lower elevations. The imazapyr only treatment was only conducted at this lower elevation. A separate study would be needed to determine if the different treatment methods result in different species returning to an area initially. Monitoring next year will also be helpful to see if the species in these areas remain the same, or begin to transition to other types.