2019 Herbaceous Weeds Annual Report

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Overview

Management Type	Worker Hours	Herbicide (gal)	Area (acre)	Average hours/acre	Average gal/acre
Boom Sprayed	85.44	2437.5	668	0.128	3.645
Mowed	43.7	0	245	0.178	0
Spot Treated	850.25	294.65	1820	0.447	0.074
Re-swept	121.5	20.25	272	0.467	0.162
Grand Total	**1100.89**	**2752.4**	**3005**	**N/A**	**N/A**

The above overview table is a general summary of weed management performed by Nachusa's 2019 restoration crew. For clarification, a 'spot treatment' is an initial sweep of a planting, targeting one or more specific invasive species.

A 're-sweep' is a second or third sweep of a previously spot-treated planting. Plantings are generally re-swept after invasive species are found while performing other restoration tasks in that planting. Weed cruises are also done periodically to check already swept plantings for weeds. A 'weed cruise' consists of driving around a planting and scanning for missed weeds or late season weed growth. If enough weeds are spotted during a weed cruise, the planting will be re-swept. Some re-sweeps were completed using hand tools to remove entire invasive plants, particularly those that were mature enough to produce viable seed. Roughly 14 percent of the initial spot treated plantings were later re-swept.

In the case of very large patches of dense invasive growth, these areas are mowed and/or boom sprayed using a tractor, which equates to many gallons of herbicide applied in a short amount of time. This affects the data much differently than a slower, walking sweep of a large planting with a comparatively smaller volume of herbicide applied.

Overall, 3005 acres were managed for weeds. Resources consumed were 2752.4 gallons of herbicide and 1100.89 worker hours. It is important to note that time spent weed cruising and pulling the occasional one or two weeds spotted from the truck was not recorded. However, if a larger weed patch required more than just a couple crew members and 5 or so minutes to remove, the location and time spent was recorded.

Management Units

Management Unit	Worker Hours	Herbicide (gal)	Area (acres)
Williams	124	52.5	311
Holland Prairie	100.2	151.25	343
Clear Creek Knolls	88.4	264	254
Hook Larson	65.55	289.7	116
Meiners Wetland	68	42	112
Schafer Knob	63.03	45	54
Bushclover Rise	51	30	53
Oak Island	38.75	7	81
Rolling Thunder	37.25	22.5	51
Senger	36.6	35	52

The above table represents the top 10 most highly managed units in terms of restoration worker hours. The 2019 restoration crew also spent time and resources managing several other units, but in much smaller quantities. The quantity of weeds found in a management unit varies and can be affected by many factors. A single management unit may contain multiple separate plantings that vary in size, age, composition, and historical use. In general, larger units take more time to manage and smaller units less time, but the amount of herbicide applied does not coincide with planting size. For example, invasive species in remnant areas are usually removed using hand tools rather than spraying herbicide, which in turn takes more time to treat.

It is worth noting that this year, the east section of the Williams unit was managed for weeds differently than any of the other units. When that area was initially swept, the crew was joined by 30 students from Loyola University on a field trip. The big group formed a long line and pointed out weeds for the crew to spray. The same area was re-swept by driving two UTVs through the vegetation in place of walking, due to extreme heat and time constraints.

Herbaceous Weed Species

Herbaceous Weed Species	Worker Hours	Herbicide (gal)	Area (acres)	Average hours/acre
Melilotus officinalis (YSC)	461.85	804.45	1397	0.33
Melilotus albus (WSC)	167.85	162	387	0.433
Lotus corniculatus (BFT)	147	317.50	251	0.585
Phalaris arundicacea (RCG)	123.04	783.50	259	0.475
Hieracium piloselloides (King Devil)	51.25	13.60	125	0.41
Trifolium pretense (Red Clover)	44	23	75	0.586
Pastinaca sativa (Wild Parsnip)	21	160	66	0.318
Coronilla varia (Crown Vetch)	8.1	100	6	1.35

The above table is a summary of the top eight invasive species managed in the 2019 season. After a planting is swept, the data recorded includes time spent, amount of acreage covered, gallons of herbicide applied, and species treated. Multiple species are often treated in a single sweep, however, the most abundant invasive species encountered in that particular sweep is recorded as the primary weed species treated during that sweep.

Yellow sweet clover (*Melilotus officinalis*), white sweet clover (*Melilotus albus*), bird's foot trefoil (*Lotus corniculatus*), and reed canary grass (*Phalaris arundicacea*) consumed most of the crew's time and herbicide compared to the rest of Nachusa's invasive weeds.

The 2019 crew began their weed season in April, targeting reed canary grass on creek banks and the edges of other wet spots. In mid-May, the primary weed species shifted to yellow sweet clover, followed by white sweet clover and bird's foot trefoil in June until the end of weed season in August.

Comparison of 2017 and 2019 Data

Year	Worker Hours	Acres Treated	Herbicide Gallons
2017	948	1666	2952
2019	1100	3005	2752

Management by Weed Crew

Year	Worker Hours	Acres Treated	Herbicide Gallons
2017	938	1269	508
2019	971	2092	315

Management by Tractor

Year	Worker Hours	Acres Treated	Herbicide Gallons	Acres Mowed
2017	10	397	2444	30
2019	129	913	2437	245

The above tables demonstrate that although the number of acres treated between 2017 and 2019 nearly doubled, the total number of worker hours only increased by 16 percent, and the amount of herbicide applied decreased by 200 gallons.

Important Notes

Per the 2017 weed report summary, the data from that season may be somewhat incomplete regarding hours used for mowing. That is likely why the worker hours for management by tractor is so much lower than in 2019. There is also no differentiation between applying herbicide with the boom sprayer and the boom-less hand sprayer for management by tractor. The boom sprayer data shows multiple examples of applying 200+ gallons in less than two hours, whereas most of the boom-less sprayer examples are of 20-40 gallons applied in two hours.

Map of Weed Management in Hook Larson Unit

Spot Treated	
Re-Swept	
Boom Sprayed	
Mowed	

Hook Larson Weed Management Overview

This section was included to provide an example of how weed management is represented within a management unit. In the Hook Larson unit, white sweet clover and yellow sweet clover were the primary weed species targeted and treated, followed by reed canary grass, Asian bush clover, and wild parsnip.

The 116 acres of Hook Larson that were managed for weeds in 2019 required 65.55 worker hours and 289.7 gallons of herbicide. The mowed areas took 6 hours, the boom sprayed areas took 9.05 worker hours, crew sweeping consumed 44.5 worker hours, and re-sweeping took another 6 hours.

Lessons Learned/Recommendations for Next Season

- The report is only accurate if the data has been input into collector correctly. During analysis, several weed management polygons were found to have missing or inaccurate data.
- Recommend implementing a spot in collector for identifying who input each polygon so that the crew leader can refer back to that person if the information in a polygon needs to be clarified.
- Recommend adding drop down selections in Collector for spading and boom-less spraying.

- While walking transects during an initial sweep of a planting, the technician on the outer edge marks their line with flagging tape. On long transects it was sometimes easy to get off track and end up with too wide or too narrow of a sweep. Recommend teaching new weed sweepers techniques of using landmarks in front of and behind them or a compass to walk a straight line.
- Recommend adding a "remnant" layer in collector to reference while weed sweeping to prevent applying herbicide to the remnants.

Photos

Photo A. Tyler Pellegrini and Amanda Contreras spraying RCG sprouts along Wade Creek

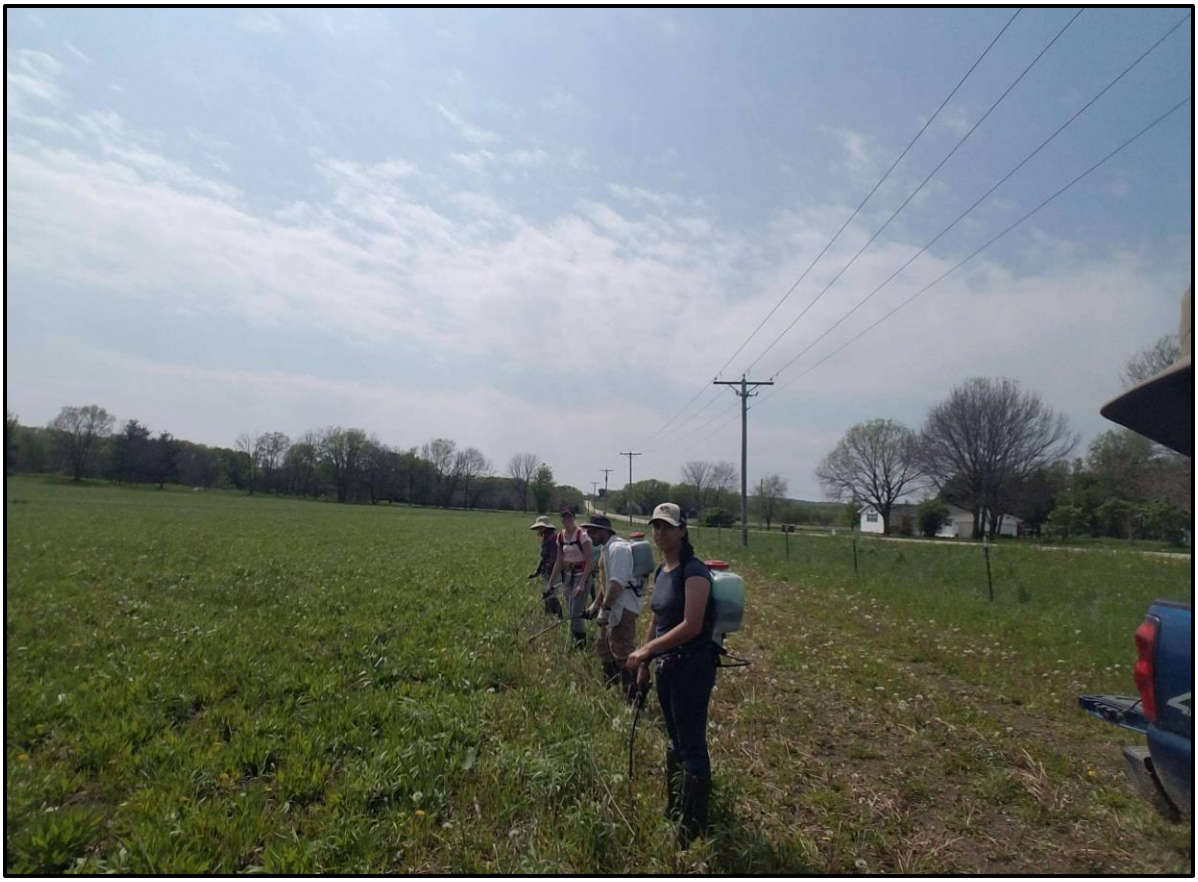

Photo B. The crew is lined up to begin their weed sweep

Photo C. The crew poses next to their wild parsnip haul at Green River State Wildlife Area

Photo D. Nathaniel Weickert and crew are lined up in search of white and yellow sweet clover