DEPARTMENT OF AGRICULTURE

2020 Noxious Weed Program Annual Report

Plant Protection Division

Prepared March 2021

Noxious Weed List

The Noxious Weed Advisory Committee (NWAC) voted to move non-native phragmites (*Phragmites australis* spp. a*ustralis*) from Restricted to Prohibited Control in December, 2020. The reclassification includes three conditions:

- The Minnesota Department of Agriculture will work with the Minnesota Pollution Control Agency, the University of Minnesota, and the Minnesota Department of Natural Resources to explore options for phasing out non-native *Phragmites australis* ssp. *australis* from wastewater treatment facilities currently using this species as part of their environmentally designed sewage biosolids filtration process.
- Add the species name non-native *Phragmites australis* ssp. *australis* to MINN. STAT. 18.78 Subd. 2 (MDA will submit this technical change to the 2022 legislature).
- Allow an exemption for wastewater treatment facilities adhering to state approved best management practices with the ultimate goal of enacting a phase out of non-native *Phragmites* if alternative wastewater treatment options can be found.

For legal descriptions of each category in the Noxious Weed List and descriptions of each species, please visit www.mda.state.mn.us/noxiousweedlist

New County Finds of Eradicate List Species

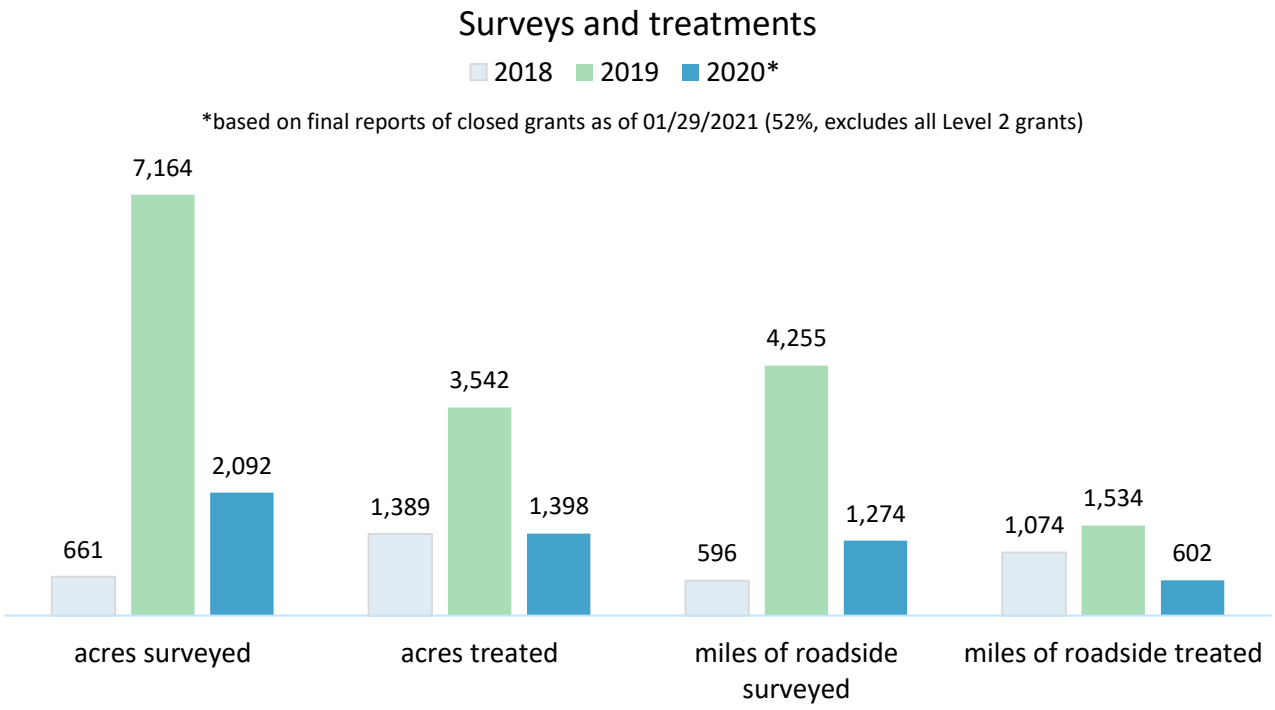
In 2020, the MDA confirmed six Eradicate listed species for the first time in nine counties. The MDA verifies the reports and, when possible, collects samples for the official University of Minnesota herbarium records. The new finds were:

Species	County
Common teasel (*Dipsacus fullonum*)	Dakota
Common teasel (*Dipsacus fullonum*)	Olmsted
Cutleaf teasel (*Dipsacus laciniatus*)	Martin
Dalmatian toadflax (*Linaria dalmatica*)	Cass
Meadow knapweed (*Cenaurea x moncktonii*)	Norman
Palmer amaranth (*Amarannthus palmeri*)	Winona
Poison hemlock (*Conium maculatum*)	Watonwan
Poison hemlock (*Conium maculatum*)	Waseca
Poison hemlock (*Conium maculatum*)	Steele

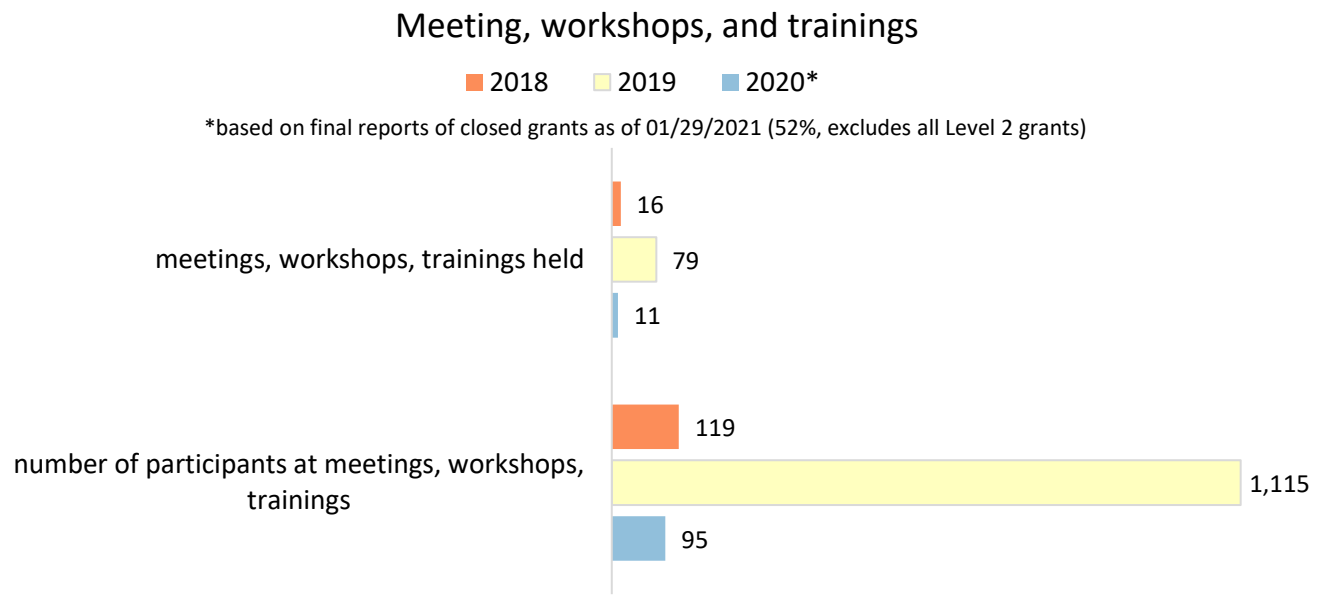
MDA Noxious Weed Grant Highlights

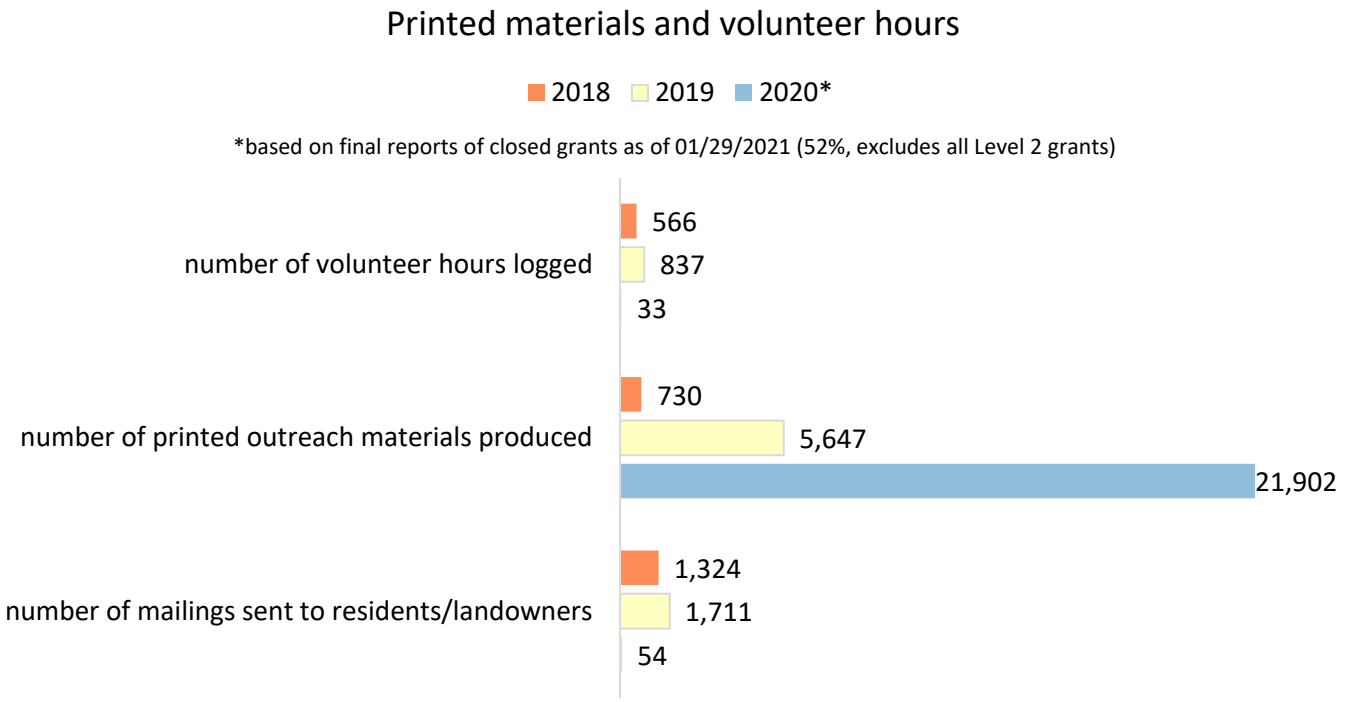
2018 was the first year the MDA received an appropriation to award grants for the Noxious Weed and Invasive Plant Grant fund. From the $300,000 appropriated for Fiscal Year 2018 (FY18), 29 counties or municipalities received awards. From the $300,000 appropriated for Fiscal Year 2019 (FY19), 35 counties or municipalities received awards. In Fiscal Year 2020 (FY20), $550,000 was allocated to the grant program, and the MDA had grants available at two levels. Level 1 grants were capped at $10,000 and Level 2 grants were awarded between $10,000 - $50,000 and intended for collaborative projects. In FY20, the MDA awarded 23 Level 1 grants and 12 Level 2 grants. The following figures are based on the grants that have closed to date (97% of 2018 have closed; 94% of 2019 have closed; 52% of 2020 have closed).

As part of their grant closeout, grantees were asked to provide information about how many acres they surveyed, acres they treated, miles of roadsides surveyed, and miles of roadside treated using grant funds.



Outreach activities ranged from holding workshops or trainings, meetings, printing outreach materials, and sending mailings about noxious weeds to landowners and land managers.





Palmer Amaranth

Palmer amaranth was first found in Minnesota in the fall of 2016. A contaminated seed source was determined to be the initial source for all the infestations discovered at 35 individual locations across Yellow Medicine and Lyon counties. With plants being hard to identify because of their deteriorated state, most plantings received flame torching or prescribed fire to ensure that any seed that was above ground was destroyed. With diligent management plans put in place, and by working closely with each landowner, the MDA was able to prevent Palmer amaranth from establishing and becoming detrimental to farmers and their crops.

From 2017 to 2020, multiple surveys were conducted at documented, and suspect Palmer amaranth infestations and management practices such as hand pulling, flame torching, prescribed fire, and herbicide treatments were quickly implemented to eradicate new and re-occurring populations. While the management practices were implemented, pathways of introduction were being investigated, and enforcement actions were taken when appropriate. Press releases, county meetings, flyers, webpages, and other forms of information were created to get the word out about Palmer amaranth.

For an infested location to be considered eradicated, Palmer amaranth must not be found growing for three consecutive years. Between 2016 and 2018, there were a total of 69 conservation plantings where Palmer amaranth was identified growing as a result of contaminated planting seed. All 69 sites have been deemed eradicated as of 2020 and will be a lower priority for survey in 2021 in order to distribute limited resources to higher risk areas.

Sites discovered in 2018 and 2019 will continue to be surveyed in 2021. There is one planting from 2019 where Palmer amaranth continues to regrow after intense management by the MDA and the landowner. This is most likely because the site had been established for several years prior to being discovered and has developed an extensive seed bank. The MDA continues to work with the University of Minnesota Extension and the landowner to eradicate Palmer at this site and will be implementing a robust management plan for 2021.

In 2020, despite numerous reports, Palmer amaranth was only positively identified in one new county. The MDA was notified by a crop consultant about suspect Palmer amaranth plants in Winona County. These plants were discovered while the consultant was looking over soybean fields in preparation for herbicide treatments. There were a total of four fields owned by the crop consultant's client, and three of those fields had Palmer amaranth plants growing in between the rows of soybean plants. These plants were flagged and visually confirmed to be Palmer amaranth by the MDA. The plants were hand pulled and samples were submitted for genetic confirmation. The source of the plants is currently unknown. It is suspected that contaminated cottonseed may have been fed to dairy cattle, and the manure from these cattle was spread across the field. The MDA is attempting to locate the source of the cottonseed as the landowner does not have any to test.

Palmer amaranth detection and eradication will continue to be a top priority for the MDA Noxious and Invasive Weed Program in 2021.

Elimination of Target Invasive Plant Species Summary

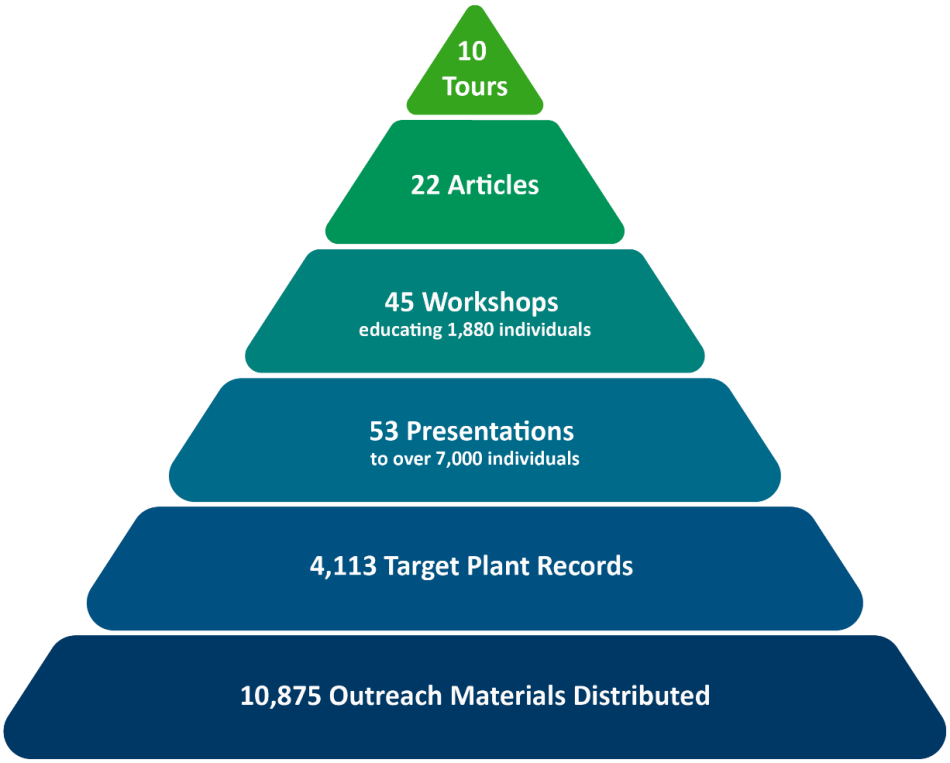
The MDA began the Elimination of Target Invasive Plant Species (ETIPS) project in 2013. The project was awarded through the Environment and Natural Resources Trust Fund (ENTRF) as recommended by the Legislative-Citizens Commission on Minnesota's Resources (LCCMR). The goal of ETIPS was to eliminate highly damaging target invasive plants before they became widespread by:

- training people to identify and report invasive plants
- survey, coordinate control, and monitor target plants
- control target plants
- implement the invasive species management database system

The MDA worked with project partners University of Minnesota Extension (UMN), Conservation Corps Minnesota (CCM), St. Croix River Association, and numerous state and local entities.

Targeted plants that cause severe ecological harm included black swallow-wort, Dalmatian toadflax, cutleaf and common teasels, Grecian foxglove, Japanese hops, brown and meadow knapweeds, Oriental bittersweet, and Palmer amaranth.

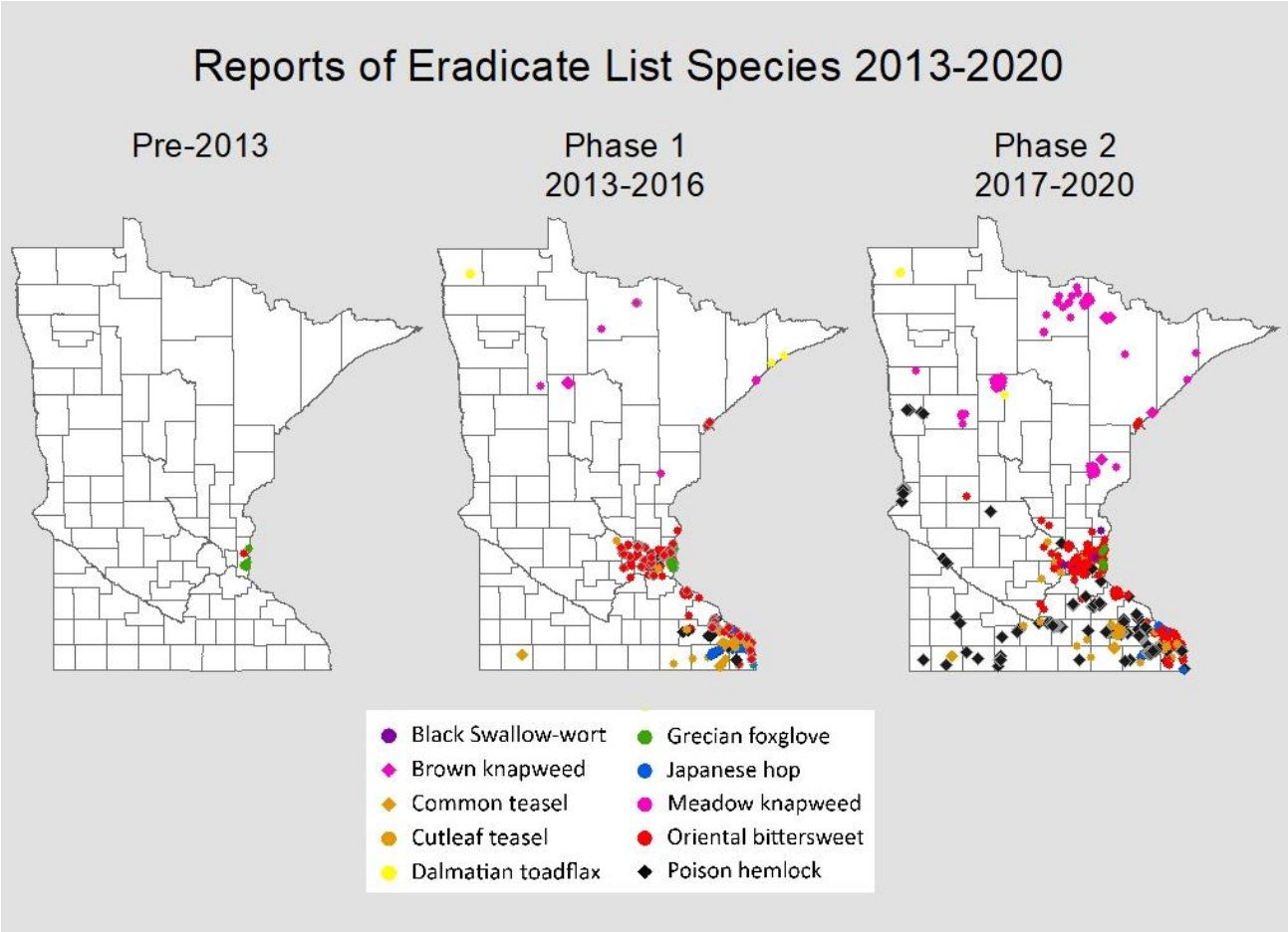
After two successful rounds of funding, the ETIPS project ended on June 30, 2020. Over the seven years the project was active, the MDA and project partners produced numerous outreach materials, conducted surveys and coordinated treatments for thousands of acres of target plant species, developed drone technology for surveying, and implemented an invasive species management database. The UMN led the project education and outreach efforts.



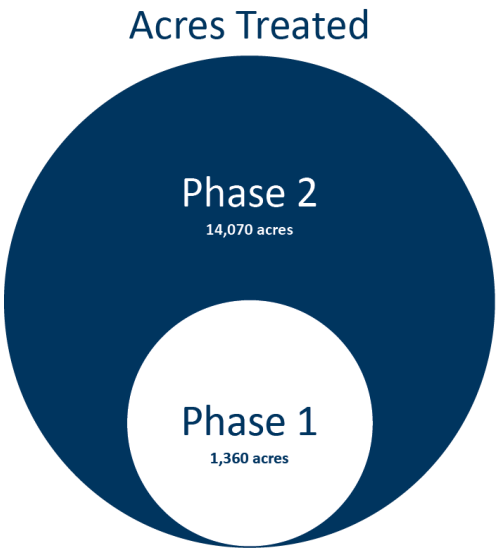
A UMN led team worked on aerial survey for Oriental bittersweet using drones. They tested several drone (fixed wing, quadcopter, and hexacopter) and camera combinations in different lighting and seasonal conditions. The UMN developed software to combine the images to produce maps showing specific bittersweet locations. To view aerial images in a slider view, visit the ETIPS Storymap at the MDA ETIPS website.

The MDA and CCM led invasive plant management. The MDA led survey, invasive plant report follow up, monitoring, and coordinated control with landowners and partners. The CCM led the control effort with 157 unique crew members working on this project.

The image of the maps below depicts the number of reports of Eradicate list species before the project began in 2013, during Phase 1 of the ETIPS project (2013-2016), and during Phase 2 of the project (2017-2020).



The image below shows the differences in acres treated between Phase 1 and Phase 2. Phase 1 focused on mapping and establishing landowner agreements. Phase 2 focused more on eradication.



This project enabled the MDA to find, document, and manage infestations before they spread. The MDA also initiated a response to Palmer amaranth in conservation plantings that was continued by the project Palmer Amaranth Detection and Control. Mitigating these invasive plant threats protected Minnesota forests, grasslands, and riparian areas. To view a compilation of outcomes produced from this project, visit the ETIPS Storymap at the MDA website.

Tactical Invasive Plant Management Plan Summary

The MDA began the Tactical Invasive Plant Management project in July 2017. Like ETIPS, it was funded through the ENRTF as recommended by LCCMR. The goal of the project was to develop a management plan that offers guidance to decision-makers for prioritizing invasive plant management activities.

A Tactical Invasive Management Plan was developed for 14 invasive plant species to improve the coordination and efficacy of management and detection at state and local levels. The aim was to provide information in the form of invasive plant distribution modeling, prioritization maps based upon multiple criteria, identification and management timing guides, and tools for reporting invasive plants and tracking management activities. Prioritizing invasive plant infestations for management are made at all levels of government, but the majority of decisions are made by local officials who are more aware of the invasive plant issues and available resources in their jurisdictions. The tools contained in the plan are integrated and available on the MDA's webpages for the selected species. The plan document is also available on the web and can be downloaded and printed.

Fourteen species were selected for assessment because they are:

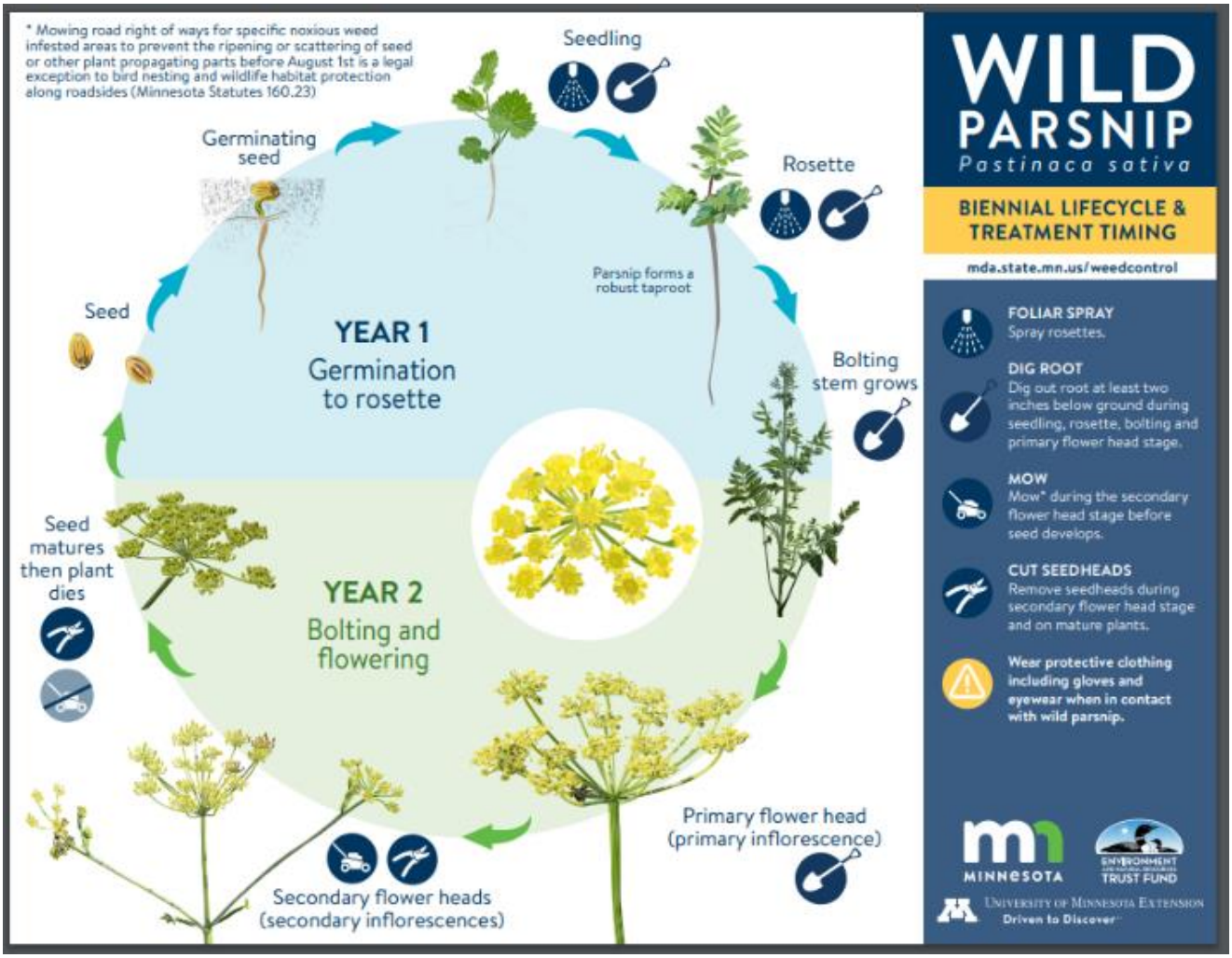
- designated noxious weeds in Minnesota
- not considered early detection within the state, but may be considered early detection at a regional or local level

Training on this plan was provided to land managers. The project team developed an online course and held four virtual workshops. The Tactical Invasive Management Plan online course was delivered to 146 individuals representing federal, state, county, municipal, and tribal natural resource and agricultural agencies. Individuals also represented nonprofits, private companies, and academic institutions. Five videos that were recorded for the online course are also available as a YouTube playlist.

Each of the 14 species selected for the Tactical Plan have the following resources: Storymap, Lifecycle Graphic, Multi-criteria Decision Analysis (MCDA), and Distribution Model. The resources are compiled and available online at the Tactical Plan Hub. Wild parsnip is used as an example for each of the resources in this report.

A StoryMap is an interactive webpage that integrates photos, text, and maps allowing users to explore content. Each StoryMap includes background and identification information, infestation examples, and a collection of the following resources. Click here to view the wild parsnip storymap.

The graphic below shows the lifecycle of the plant and suggested management methods. Brief information is included about plant identification, management execution, and important plant information. These graphics are intended to simplify the often confusing task of determining which management methods to pursue at various times of the year. They also aid in identification and understanding of how the plant grows and reproduces or spreads. Click here to view the wild parsnip lifecycle graphic.



Multi-criteria decision analysis (MCDA) is a decision-making tool. It takes multiple variables into account by analyzing the weighted value of each variable and integrating the criteria into a single outcome or model. Variables here included a variety of environmental, human, and economic factors. The UMN led the development of these MCDA models which suggest management prioritization across the state of Minnesota for each species. Models for different species can be compared to determine which species may be a higher priority for management, and can be used to communicate calculated importance of management to funders and stakeholders. Click here to view the Wild Parsnip Multi-Criteria Decision Analysis Model.

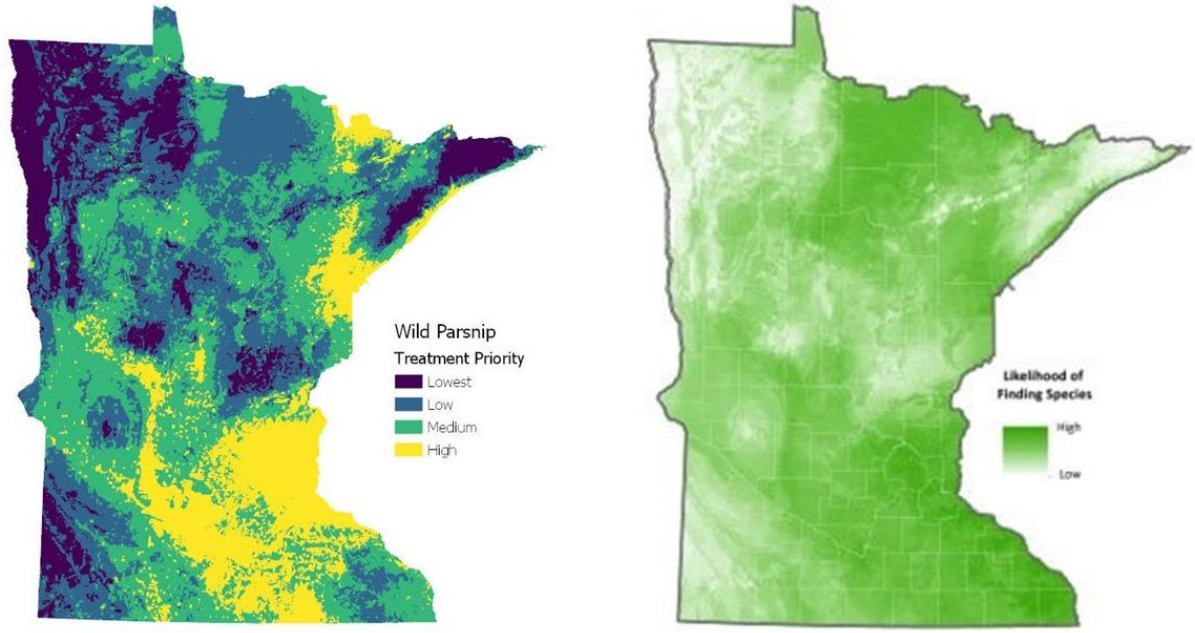


Figure 1. Map on the left shows the MCDA model of treatment priority. Map on the right shows the likelihood of finding the species.

Distribution models show the likelihood of occurrence for a species at any given location within the state of Minnesota. Current distribution is shown by blue pins, modeled distribution is shown through the green shading across the state. Habitat suitability and current distribution were taken into account to produce the model. Click here to view the Wild Parsnip distribution map. To view a compilation of outcomes produced from this project, visit the Tactical Plant Storymap hub at the MDA webpages.

Summary

2020 brought challenges to every aspect of the Noxious Weed Program. From moving to virtual meetings and trainings, to limited fieldwork, and adjusting to working from home, the weed team was busier than ever. With the completion of two large, complex LCCMR projects, the Noxious Weed Program now has more tools and data to support their work. The team also saw an uptick in calls and emails from homeowners looking for help with plant identification and invasive plant management. It's clear more people were spending time doing their part to manage invasive plants in Minnesota.

The Noxious Weed Program would like to thank the Minnesota Legislature, the Legislative-Citizens Commission on Minnesota Resources, the Noxious Weed Advisory Committee, County Agricultural Inspectors, Township and Municipal Weed Inspectors, landowners, and all of our stakeholders for continuous support of our program.