


MN NWAC Risk Assessment Worksheet (04-2011)	Common Name Wild Parsnip	Latin Name <i>Pastinaca sativa L.</i>
Original Reviewer: Anthony B. Cortilet	Affiliation/Organization: MN Dept. of Agriculture	Original Review: 6/03/2013
Current Reviewer: Roger Becker 	University of Minnesota	Current Review: 8/22/2016

Species Description: <http://www.mda.state.mn.us/plants/pestmanagement/weedcontrol/noxiouslist/wildparsnip.aspx>

- An aggressive, monocarpic perennial plant that germinates from seed, spends the first year or more as a rosette, eventually bolts into a mature plant in the second year or later, flowers, sets seed, and dies.
- Grows 4- 6 feet tall.
- Leaves alternate along the stem, are pinnately compound, and consist of egg-shaped leaflets having saw-toothed edges that are arranged in pairs along the stalk; becoming progressively smaller near the top of the stem.
- Bolted stems are erect, branched, hollow, slightly grooved, and terminate in flat-topped, compound flower umbels. Umbels are generally 2-6 inches wide and contain many small, 5- petaled yellow flowers that bloom from June through late August.
- Reproduces by seed. Seeds are small, broad, oval, slightly ribbed, and are produced in the umbels several weeks after flowering. The plant dies after setting seed.
- Forms a long thick taproot that is similar in appearance and smell to cultivated parsnips.

Risk Assessment 2013 Summary:

NWAC Listing Subcommittee - List as a Specially Regulated Plant rather than Prohibited Control species – Due to it being a grown crop in MN. Special Regulation would be to control all wild populations, excluding approved cultivated varieties.

NWAC Full-group - Vote 12 – 1 in favor of reclassifying from a Prohibited – Control species to a Specially Regulated Plant per Listing Subcommittee’s assessment.

MDA Commissioner - MDA commissioner denied NWAC’s recommendation due to petition letters and other stakeholder input that suggested reclassifying would cause confusion with the requirements under the law and the fact that parsnips are a minor crop in MN. Commissioner ordered that it remain a Prohibited Control Species with an exemption for approved non-wild cultivated varieties.

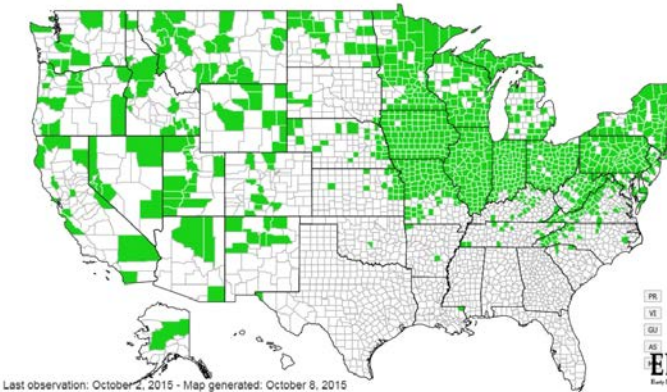
Risk Assessment Current Summary (2016):

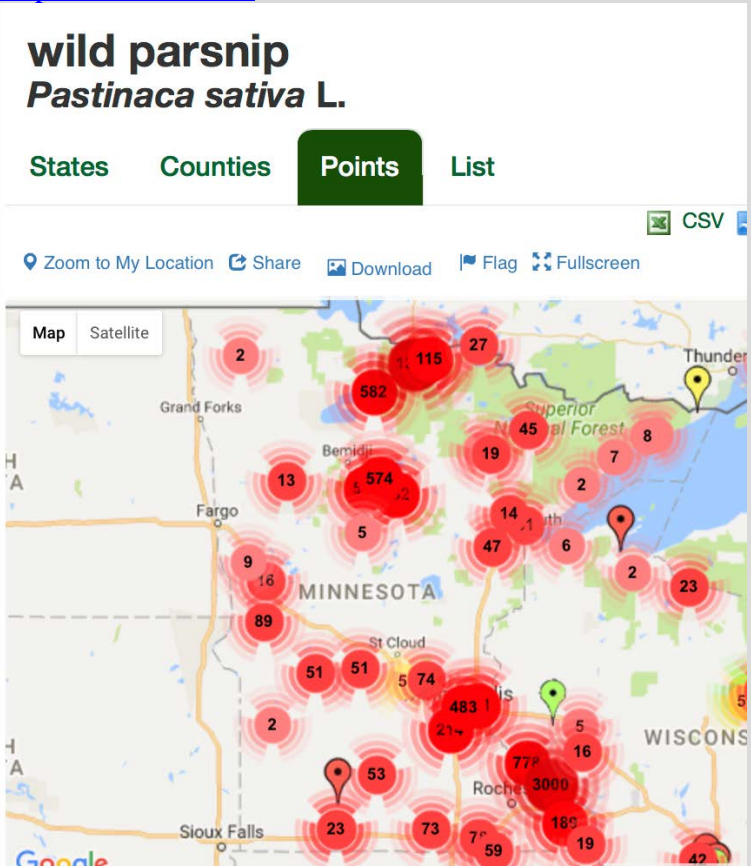
NWAC Listing Subcommittee - Continue as a Prohibited Control Species.

NWAC Full-group - Prohibited Control Species
 MDA Commissioner - Prohibited Control Species

Background: Wild parsnips have been in Minnesota over 100 years, recorded in every corner of the state by 1935. U of M Herbarium records show it was first recorded in Minneapolis in 1878, SE Minnesota near Red Wing in 1885 and Wabasha in 1886, SW Minnesota near Heron Lake in 1902, the far NW corner of the state at St. Vincent, Kittson County in 1900, at the north end of Lake of the Woods near Ft. St. Charles in 1939, and in the far NE Minnesota near Grand Portage in 1935. However, denser stands of wild parsnips have expanding rapidly throughout southeastern Minnesota in the last decade, and more recently, more broadly throughout the state. It is a biennial or a short-lived monocarpic perennial (dies after flowering), spreading by seed. While wild parsnips can invade unmanaged grasslands and is common along field edges, it is particularly common in roadside right-of-ways where it can rapidly spread long distances aided by roadside mowing. In addition to its impacts on ecosystems, its wide distribution throughout the state is of concern as the plant sap of wild parsnips can cause phytophotodermatitis, a blistering of the skin following contact in humans, and when ingested by some animals with light skin coloration.

Box	Question	Answer	Outcome
1	Is the plant species or genotype non-native?	Yes – Native to Eurasia, common in Europe and temperate Asia (between the western Mediterranean and the Caucasus Mountains) (review by Averill and DiTommaso, 2007).	Box 3
2	Does the plant species pose significant human or livestock concerns or has the potential to significantly harm agricultural production?		
	A. Does the plant have toxic qualities that pose a significant risk to livestock, wildlife, or people?		
	B. Does the plant cause significant financial losses associated with decreased yields, reduced quality, or increased production costs?		

Box	Question	Answer	Outcome
3	<p>Is the plant species, or a related species, documented as being a problem elsewhere?</p> <p><i>Pastinaca sativa</i></p> 	<p>Yes. Wild Parsnips is found throughout the US and all the Canadian provinces except the Northwest Territories. Widely naturalized in Australia, New Zealand, China, Japan, southern Africa and southern South America. Recorded introduced to the U.S. in Virginia as a food crop as early as 1609, and widely throughout the colonies. Soon naturalized and reverted to the more toxic wild-type, (review by Averill and DiTommaso, 2007), likely through herbivore selection pressure (Berenbaum et al. 1984). Is problematic for 1.) its ability to invade disturbed habitats and create monocultures and 2.) causes dermatological problems (photoactive burns) associated with human skin and light skinned livestock. It is documented to be a prohibited noxious weed in MN and Ohio and a Restricted Invasive Species in WI. Most US state list it as an invasive species of major concern – mostly for human health.</p> <p>EDDMapS map of wild parsnips by county by state: http://www.eddmaps.org/Species/subject.cfm?sub=6147</p>	Box 6
4	Is the plant species' life history & Growth requirements understood?		
5	Gather and evaluate further information:	(Comments/Notes)	
6	Does the plant species have the capacity to establish and survive in Minnesota?		

Box	Question	Answer	Outcome
	<p>A. Is the plant, or a close relative, currently established in Minnesota?</p>	<p>Yes. EDDMapsS shows the extent of invasion throughout most of Minnesota, reported in 18 counties in 2013 RA, currently in 39 of 87 counties. Heaviest in the eastern Minnesota, especially problematic in Southeastern Minnesota (EDDMapS). https://www.eddmaps.org/distribution/view/map.cfm?Sub=6147</p> 	<p>Box 7</p>
	<p>B. Has the plant become established in areas having a climate and growing conditions similar to those found in Minnesota?</p>		

Box	Question	Answer	Outcome
7	Does the plant species have the potential to reproduce and spread in Minnesota?		
	A. Does the plant reproduce by asexual/vegetative means?	No – Biennial or monocarpic perennial (review by Averill and DiTommaso, 2007, and Cain et al. 2009).	7C
	B. Are the asexual propagules effectively dispersed to new areas?		
	C. Does the plant produce large amounts of viable, cold-hardy seeds?	Yes. Single parsnips plants can produce hundreds of cold-hardy viable seeds with an avg. of 975 seed per plant (Zangerl and Berenbaum 1997) that survive an average of four years (Kennay and Fell 1990).	7F
	D. If this species produces low numbers of viable seeds, does it have a high level of seed/seedling vigor or do the seeds remain viable for an extended period?		
	E. Is this species self-fertile?		
	F. Are sexual propagules – viable seeds – effectively dispersed to new areas?	Yes – wind, water, animals, snow, humans (recreational vehicles, mowers/tractors, foot traffic, etc.). Average dispersal has been measured to be 3 meters with a maximum of 14 meters (Jongejans and Telenius 2001).	7I
	G. Can the species hybridize with native species (or other introduced species) and produce viable seed and fertile offspring in the absence of human intervention?		
	H. If the species is a woody (trees, shrubs, and woody vines) is the juvenile period less than or equal to 5 years for tree species or 3 years for shrubs and vines?		

Box	Question	Answer	Outcome
	I. Do natural controls exist, species native to Minnesota, that are documented to effectively prevent the spread of the plant in question?	No. The Parsnips webworm, <i>Depressaria pastinacella</i> , was unintentionally brought to North America (Berenbaum et al. 1984, 1986; Jogesh et al. 2014; Yates, 2008; and Zangerel 1990). It is established in most of SE MN and has been observed by MDA scientist to have 7 – 10 year cyclic population booms over the past 3 decades (MDA personal communication). It has not been documented to stop the spread of wild parsnips in MN, but has been shown to destroy umbel production in plants, thus lowering average seed production. Parsnips webworms are of concern to producers of cultivated parsnips and have been shown to decimate large acres of cultivated parsnips in New Zealand. There is also evidence in the US. that relationships developing over time between webworms and parsnips populations could be selecting for plants with increased production of the furanocoumarin compounds that cause blistering of mammal skin when exposed to sunlight.	Box 8
8	Does the plant species pose significant human or livestock concerns or has the potential to significantly harm agricultural production, native ecosystems, or managed landscapes?		
	A. Does the plant have toxic qualities, or other detrimental qualities, that pose a significant risk to livestock, wildlife, or people?	Yes – Wild parsnip contains chemical compounds that can cause serious burns, blisters, and lesions on human skin (Canadian Poisonous Plants Information System, 2016) and light-skinned livestock and pets. Many animals will graze wild parsnips, but light-skinned animals can suffer phytophotodermatitis through photosensitization if parsnips comprise a significant portion of forage in their diet (Renz 2016).	Box 9

Box	Question	Answer	Outcome
	B. Does, or could, the plant cause significant financial losses associated with decreased yields, reduced crop quality, or increased production costs?		
	C. Can the plant aggressively displace native species through competition (including allelopathic effects)?		
	D. Can the plant hybridize with native species resulting in a modified gene pool and potentially negative impacts on native populations?		
	E. Does the plant have the potential to change native ecosystems (adds a vegetative layer, affects ground or surface water levels, etc.)?		
	F. Does the plant have the potential to introduce or harbor another pest or serve as an alternate host?		
9	Does the plant species have clearly defined benefits that outweigh associated negative impacts?	No – not the wild form.	
	A. Is the plant currently being used or produced and/or sold in Minnesota or native to Minnesota?	<p>Yes – cultivated variety in home gardens, small acre farms supplying local farmer’s markets, and a small percentage of organic farms. Cultivated parsnips are the same species as wild parsnips (Jogesh et al. 2015). There is some cultivation in MN, but is negligible and separate from the issue of escaped/naturalized wild parsnips.</p> <p>No – <i>Pastinaca sativa</i> is not native to MN.</p>	B

Box	Question	Answer	Outcome
	<p>B. Is the plant an introduced species and can its spread be effectively and easily prevented or controlled, or its negative impacts minimized through carefully designed and executed management practices?</p>	<p>Yes – species is introduced but No – likely would not be easily controlled via management. Management of parsnips using fall applied herbicides has been shown to be very effective (MN DOT. Minnesota Noxious Weeds and Appendix 1. Management of Wild Parsnips, Renz 2016, Panke et al. 2015). Patches in ditches can be mowed before the August 1 nesting provision to control seed production since wild parsnips is currently designated a Minnesota Prohibited-Control noxious weed. However, the reality is that land managers likely will not control wild parsnips if left up to following a specific management plan as a Specially Regulated plant if answered Yes to the management question (then would have been directed to Box 11).</p>	<p>Box 10</p>
	<p>C. Is the plant native to Minnesota?</p>		
	<p>D. Is a non-invasive, alternative plant material commercially available that could serve the same purpose as the plant of concern?</p>		
	<p>E. Does the plant benefit Minnesota to a greater extent than the negative impacts identified at Box #8?</p>		
<p>10</p>	<p>Should the plant species be enforced as a noxious weed to prevent introduction &/or dispersal; designate as prohibited or restricted?</p>		
	<p>A. Is the plant currently established in Minnesota?</p>	<p>Yes (see Box 6A).</p>	<p>10B</p>
	<p>B. Does the plant pose a serious human health threat?</p>	<p>Yes (see Box 8A).</p>	<p>List the plant as a Prohibited Control Species. Exempt commercially available varieties grown for food.</p>

Box	Question	Answer	Outcome
	C. Can the plant be reliably eradicated (entire plant) or controlled (top growth only to prevent pollen dispersal and seed production as appropriate) on a statewide basis using existing practices and available resources?		
11	Should the plant species be allowed in Minnesota via a species-specific management plan; designate as specially regulated?		
Final Results of Risk Assessment			
	Review Entity	Comments	Outcome
	NWAC Listing Subcommittee 2013	First review – 06/20/2013, Final Review 08/12/2013	Specially Regulated Plant – Due to it being a grown crop in MN - Special Regulation would be to control all wild populations, excluding approved cultivated varieties.
	NWAC Full-group 2013	Reviewed 12/18/13	Vote 12 – 1 in favor of reclassifying from a Prohibited – Control species to a Specially Regulated Plant per Listing Subcommittee’s assessment

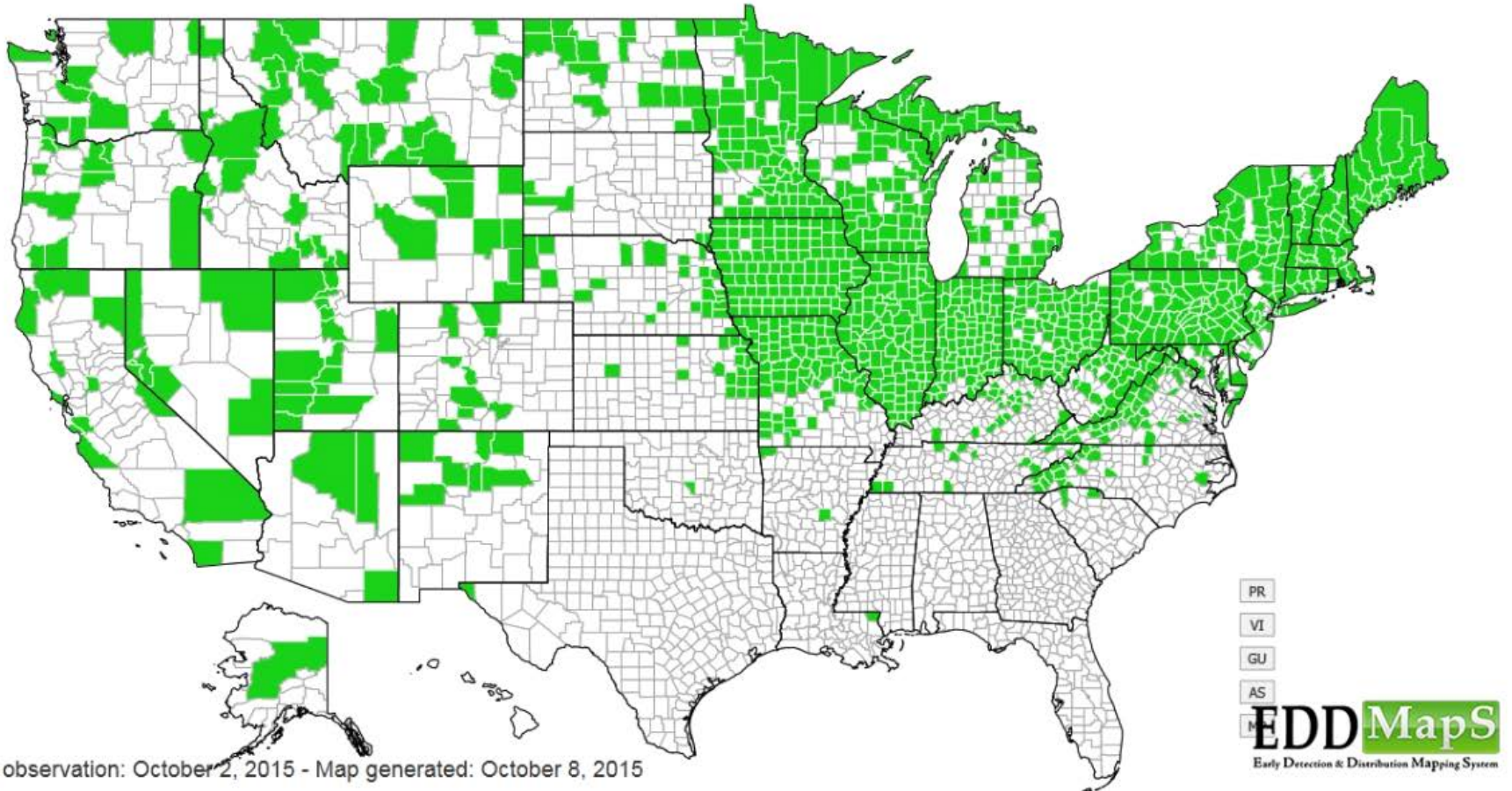
Box	Question	Answer	Outcome
	MDA Commissioner 2013	Reviewed 2/24/2014	Denied NWAC's recommendation due to petition letters and other stakeholder input that suggested reclassifying would cause confusion with the requirements under the law and the fact that parsnips are a minor crop in MN. Commissioner ordered that it remain a Prohibited Control Species with an exemption for approved non-wild cultivated varieties.
	NWAC Listing Subcommittee Review 2016	Review of 2013 Risk Assessment 08/22/2016. Continue regulated as a Prohibited Control Species.	Continue as a Prohibited Control Species.
	NWAC Full Group 2016	Voted 13 – 1 accepting the Listing Subcommittee's recommendation.	Prohibited Control Species
	MDA Commissioner 2016	Accepted NWAC's recommendation (02/06/2017).	PROHIBITED NOXIOUS WEED – CONTROL LIST (EXCEPT FOR NON-WILD CULTIVATED VARIETIES)
	FILE # MDARA00025WIPAR_2_24_2014		

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Pastinaca sativa



Last observation: October 2, 2015 - Map generated: October 8, 2015

[EDDMapS map of wild parsnip by county by state:
http://www.eddmaps.org/Species/subject.cfm?sub=6147](http://www.eddmaps.org/Species/subject.cfm?sub=6147)

wild parsnip

Pastinaca sativa L.

States

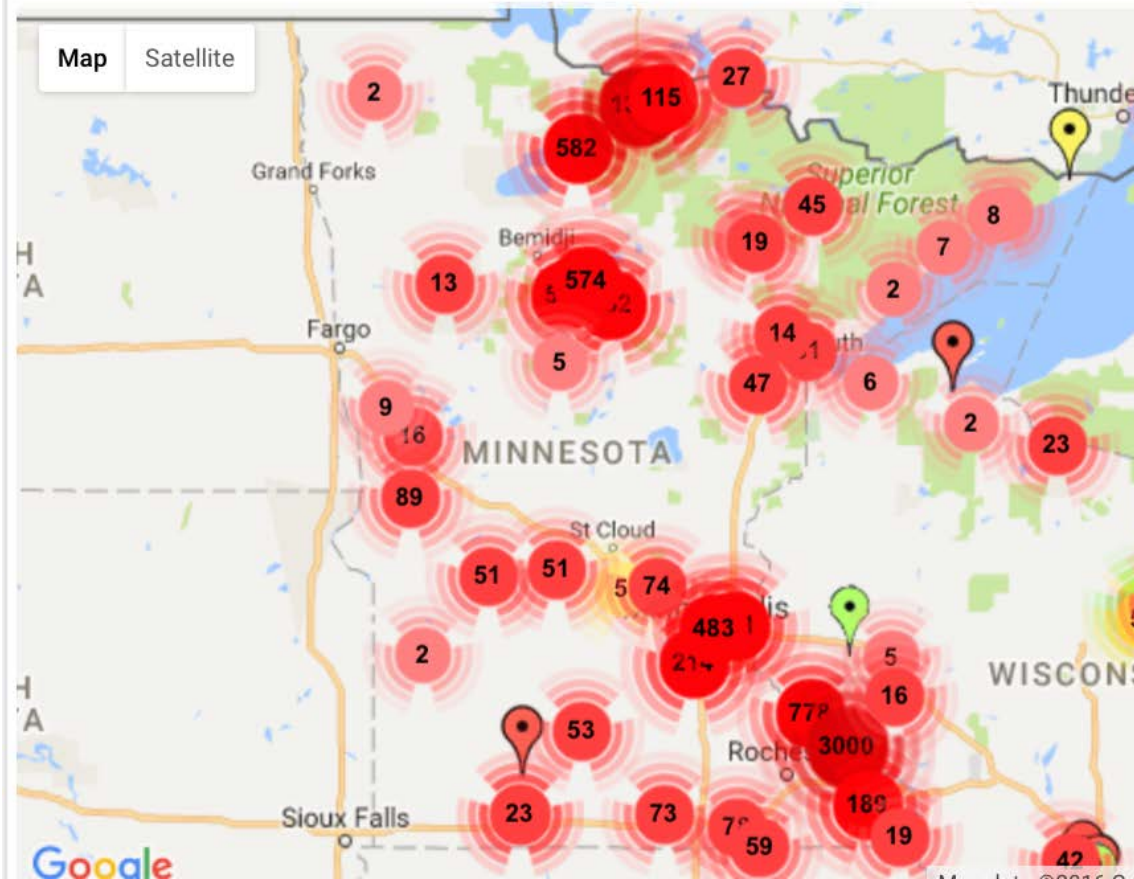
Counties

Points

List

CSV

Zoom to My Location Share Download Flag Fullscreen



<https://www.eddmaps.org/distribution/viewmap.cfm?Sub=6147>

Appendix 1. Management of Wild Parsnips.

The following excerpt is from Wild Parsnips, an expanding problem along roadsides in Wisconsin by Mark Renz, 2016. UW-Madison. <http://ipcm.wisc.edu/blog/2016/07/wild-parsnip-an-expanding-problem-along-roadsides-in-wisconsin/> It is the best overview currently available. Rather than rebuilding, control options are quoted here.

Control Options

Removal: Pulling or cutting the root from the stem is an effective individual plant control technique but is best utilized when infestations are small and isolated. Plants can be pulled if soil conditions allow for the removal of the taproot, but the best success has been observed when cutting the taproot with a sharp shovel 1–2” below the soil surface. If the entire taproot is severed it will not re-root and produce viable seeds. If seed is present make sure to properly dispose of so they do not spread into un-infested areas.

Mowing can be effective if timed after the emergence of flower heads, but before seeds enlarge. The optimum timing in Wisconsin is when the secondary inflorescences begin to flower. This has traditionally been around the first of July in southern Wisconsin. If using this method plants will resprout and likely flower. In Wisconsin’s climate these resprouting plants rarely produce viable seeds **IF** mowed at the correct stage and the growing season is not atypically long. Mowing prior to flowering (June) will likely result in viable seed being produced if populations are not mowed when resprouts are flowering. When implementing mowing as a control method, results have been very successful if implemented at the correct stage for three consecutive years. This strategy’s effectiveness is based on the short lived seeds in the soil, therefore annual management is required for multiple years to eliminate seeds from the seedbank. Often this technique when initiated in the first year will result in an increase in the number of plants, with a reduction in populations not seen until the third year. Care must be taken not to mow when mature seeds are present as this will spread the seed.

While this strategy is effective and efficient it can be challenging to implement across large areas when equipment availability is limited as the window for mowing can be as narrow as a two to three week timeframe some years. Limited success is also observed if plants are unmanaged nearby and produce viable seed that can land in the mowed areas. This is typical of roadsides where areas nearest the road are only managed.

Grazing/Biological Control: Wild parsnip is readily grazed by a variety of animals. While effective in suppressing aboveground growth, if parsnip constitutes too great a percentage of animals’ diets they can also develop toxicity to the plant. Light skinned livestock are particularly sensitive to wild parsnip, while dark skinned animals can tolerate ingesting this plant. If grazing animals on parsnip, ensure that other forages are included in sufficient amounts to prevent injury. While no studies have been conducted on long-term effectiveness of grazing, it is expected that 3-5 years of grazing at an intensity that would prevent seed production would be required to substantially reduce populations. Several insects including the parsnip webworm can also feed and induce substantial injury to wild parsnip. While these can result in near complete defoliation of individual plants and prevent seed production, effectiveness of insects in reducing large populations has not been observed.

Prescribed Fire: Spring burns can kill germinating seedlings and can suppress above-ground growth of established plants depending on fire intensity. While seedlings are often killed as a result of fire many rosette plants will resprout and flower if not managed. This management

method is not recommended unless integrated with other techniques such as mowing or herbicides.

Herbicides: A range of herbicides are effective at controlling wild parsnip. While research has shown that these products can control wild parsnip at any stage of development, the best results with the lowest rates applied have been obtained in the fall (September – October) to rosettes. Applications of herbicides that include metsulfuron, 2,4- D, or dicamba have provided greater than 90% reduction in flowering plants the following year. Unfortunately seedling germination the following spring is not reduced from herbicides with extended residual activity, therefore application would need to be applied the following year to prevent seed productions for two consecutive years. Spring applications to rosettes (April-May) can alleviate this issue if timed after seedling emergence as they will control seedlings and rosettes. This can result in two years of prevention of seed production with one application. Applications to plants that are about to or are flowering (June) can be effective, but higher rates of herbicides are required to prevent seed production. Applications when seeds are present on the plant (late July –August) ARE NOT RECOMMENDED as plants are beginning to senesce and viable seed has already been produced by the plants. It is important to remember that these active ingredients mentioned can impact other broadleaf species, but are safe to most established grasses. If concerned about off-target damage to nearby desirable broadleaf plants spot or individual spot treatments are recommended. Non selective herbicides that contain glyphosate, while effective, are not recommended in grasslands as they will also injure desirable grasses and lead to reinvasion from parsnip or other unwanted species.

Selection of the appropriate herbicide for a site is critical to be in compliance with the label and minimize non-target damage. As many of these infestations are on/near roadsides, drift of herbicides should be considered. Often sensitive crops are grown adjacent to these locations that could be injured if the herbicides drift off-target. While drift can occur any time of the year, spring and summer applications are of the greatest concern. Fall applications after crops have senesced or been harvested can alleviate some of the risk, but depending on the product and rate applied enough residual activity may persist and cause injury the following spring.”