

Illinois Invasive Species Council - Terrestrial Plant Subcommittee Assessment

Pastinaca sativa (Wild Parsnip)

Prepared by Kellie Schmidt for presentation at the June 8, 2023 Terrestrial Plant Subcommittee Meeting

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Approved by Subcommittee on September 21, 2023

Approved by Invasive Species Council on June 4, 2024

Results:

- Yes, Wild parsnip exhibits qualities that would support designation as an invasive species in Illinois
 - Once established, the species out-competes other low-growing herbaceous vegetation that is beneficial to pollinators.
 - The sap from the stems and leaves poses high human health risk and can also be a risk to livestock and poultry.
 - It is a prolific seed producer, spreads rapidly through disturbance, and has seeds that can remain viable in the soil for up to 4 years.
 - The species has been found in every county for the state for over 100 years
- Although not a candidate for complete eradication, it should be encouraged in certain areas
- Recommend regulation through the Noxious Weed Act.

Purpose:

The purpose of this assessment protocol is to compile information to be used by the IISC board for making recommendations regarding listing a species as an invasive species.

While questions below can be answered in any manner deemed appropriate by the assessor, citations should be included wherever possible. Where information is incomplete or a question is not able to be answered directly or fully, any records or available information providing context are appreciated.

Definitions/Glossary:

IISC - Illinois Invasive Species Council

Invasive Species - an aggressive species whose presence causes or is likely to cause economic, ecological, or environmental harm. Invasive species are not native to places where they are considered invasive. Genetically modified plants, exotic genotypes, or aggressive cultivars of native species may be considered invasive in some situations.

Aggressive Plant Species - Species that, usually because of human-caused disturbances, spread rapidly and can outcompete other plant species. Aggressive plants can be native or non-native, and they may be aggressive in some places, but not others.

Non Native - Non-native plants are those introduced (intentionally or accidentally) to a new place or new type of habitat. Historically, most of these introductions have resulted from human activities. Since they did not evolve locally over thousands of years, their presence can often have negative impacts on endemic ecosystems. The words “exotic,” “alien,” and “introduced” are synonyms for “non-native.” Note: not all non-native plants are invasive species.

Native - Species within its natural range or natural zone of dispersal (i.e., within the range it could have, or would have, occupied without direct or indirect introduction and/or care by humans. Excludes species descended from domesticated ancestors).

Illinois Native - Native plants originally occur within a region as the result of natural processes and are adapted to local climate and soils. They have co-evolved with native insects and wildlife and are critical to ecosystem functions.

Illinois Non-native - Non-native plants are those introduced (intentionally or accidentally) to a new place or new type of habitat. Historically, most of these introductions have resulted from human activities. Since they did not evolve locally over thousands of years, their presence can have negative impacts on endemic ecosystems. It is important to note that not all non-native plants are invasive.

Establish - A plant species would be considered “established” when a free-living plant population (not cultivated by humans) is able to perpetuate itself and/or spread to new areas.

High Quality Ecosystem - An intact plant community representative of the natural ecosystems found pre-settlement in Illinois.

Current Recognition as an Invasive or Injurious Species - A

1. What are the scientific binomial and common names of the species?

- *Pastinaca sativa* (synonyms: *Pastinaca sativa* L. var. *pratensis*)
- Common Name: Wild Parsnip
- Also known as Hart's-eye, bird's-nest, poison parsnip

2. Is the species, or a related species, regulated, documented, or listed due to invasiveness or injuriousness by any state, municipality, or other regulatory entity?

- On a state invasive species list (non-regulatory)- Alaska, Indiana (documented as highly invasive), Pennsylvania, West Virginia
- Regulated in state – Minnesota (noxious weed), Wisconsin, Ohio (prohibited noxious weed), Ontario (noxious weed)

Sources: Invasive.org; Midwest Invasive Plant Network (mipn.org);

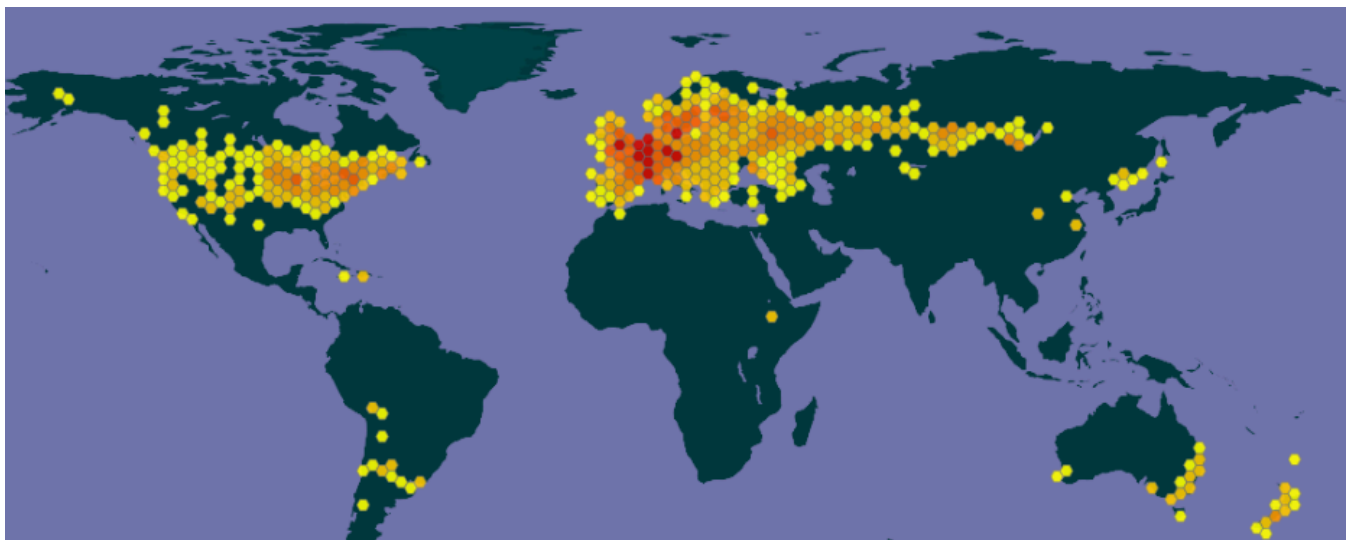
Where the Species Currently Resides - B

1. What is the native range and global distribution of the species?

Native to Eurasia and occurs in sunny areas with varying degrees of moisture. Found in open places along roadsides and in waste places. It endures a wide range of edaphic conditions, usually dry to mesic soils, but occasionally will be found in wet meadows. Grows best on calcareous, alkaline soils.

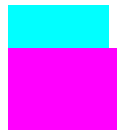
Recorded as introduced in 21 countries. Found in all United States except Florida, Hawaii, Alabama, Mississippi, and Georgia. Also found in 3 provinces (Prince Edward Island, Ontario, Quebec). In Illinois, there are 1,061 reports and it has been found in all counties.

Wild parsnip is closely related to carrot and parsley, and was introduced to the US by early colonists as a food source. It was in cultivation in Virginia by 1609. The plant has been in Michigan since at least 1838. Its edible root becomes sweeter after winter frost and was used as a sweetener in Europe historically before cane sugar was introduced. The escaped form is less palatable. Wild parsnip is common throughout the northern US and Canada and thrives in a wide variety of soils and moisture conditions. It spreads primarily in disturbed areas, where it can form dense stands. It does not compete well in established grasslands, but can invade along the edge and in degraded patches, and also in prairie restorations.



2. How widespread is the species currently in natural areas across the state and country?

EDDMapS - Early Detection & Distribution Mapping System. The University of Georgia - Center for Invasive Species and Ecosystem Health. www.eddmaps.org/; last accessed April 3, 2023.



Species exotic and present
Species present in state and exotic
Species noxious
Species not present in state

The Biota of North America Program (BONAP). 2015. North American Plant Atlas. Chapel Hill, N.C. [maps generated from Kartesz, J.T. 2015. Floristic Synthesis of North America, <http://bonap.net/MapGallery/County/Pastinaca%20sativa.png>

iNaturalist Observations

May 1, 2019 – May 1, 2023

769 total verifiable observations of wild parsnip

www.inaturalist.org/observations

Accessed May 10, 2023

3. Has the species invaded or become established in any high-quality ecosystem that are found in Illinois?

Invades disturbed bare areas, especially those with calcareous (chalky) soils. In infested areas it regularly occurs along paths and roadsides where eradication is desirable from a human safety as well as ecological standpoint. Well-established prairies are not likely to be invaded by parsnip, but it can become quite abundant on prairie edges and in disturbed patches within otherwise high-quality prairies. It is also highly persistent on sites that remain disturbed or bare such as rocky areas, paths, or roadsides.

Once established at the edges, parsnip can spread into adjacent high-quality areas. Wild parsnip out-competes other lower-growing herbaceous vegetation by its profuse growth and may displace species that are important nectar sources. Mature parsnip plants are taller than the dry prairie species they replace.

Wild parsnip can become abundant along roadsides that are regularly mowed as mowing seems to encourage the production of flowering plants. It does not compete well in established grasslands, but can invade along the edge and in degraded patches, and also in prairie restorations.

Source: Indiana Non-Native Plant Invasiveness Ranking Form, Wild Parsnip, Original assessment July 2013, reassessed October 2019 - https://www.entm.purdue.edu/iisc/pdf/plants/Pastinaca_sativa.pdf

4. **Do these questions sufficiently capture the current extent of the species?** Yes
If not, what additional information should be considered by the IISC? N/A

Where the Species Could Colonize - C

1. **Does the species have the capacity to establish and survive in Illinois currently?**

Yes – it has been found at least once in all counties in Illinois, invading prairies, oak savannas, and fens, as well as roadsides, old fields, and pastures. Wild parsnip has the potential to establish and thrive in ditches, old fields, roadsides, prairie edges, railroad rights-of-ways, forest edges, and disturbed patches within high quality natural areas.

Collections & Observations by Decade – Illinois Natural History Survey

Pre-1900	1900	1910	1920	1930	1940	1950	1960	1970	1980	1990	2000	2010	2020
0	0	0	0	0	31	0	28	6	38	18	258	526	29

Source: Illinois Natural History Survey; Illinois Plants – Wild Plants of the Prairie State – *Pastinaca sativa* - <https://www.inhs.illinois.edu/data/plantdb/detail/1428>

2. **Is there potential the species could establish in Illinois under likely future climate conditions?**

The concentrations of the toxic compound found in wild parsnip have been shown to increase with increased UV-B radiation, which is one of the consequences of climate change. Increased presence of the compound makes it more threatening to the wildlife around it and allows it to be even less palatable to other species, increasing its allelopathic characteristics, which could expand its range.

3. **What ecosystem types or habitats in Illinois are vulnerable to invasion by the species?**

Habitats include moist to mesic black soil prairies, savannas, pastures and fields, weedy meadows, areas along railroads and roadsides, vacant lots, and waste areas. Areas with fertile soil will be especially vulnerable.

4. **Does the species show potential to invade any high-quality ecosystems found in Illinois?**

It does not compete well in established grasslands, but can invade along the edge and in degraded patches, and also in prairie restorations.

5. **Do these questions sufficiently capture the extent to which the species could colonize in Illinois?** Yes
If not, what additional information should be considered by the IISC?

Measures of Spread - D

1. **Does the species have the potential to spread long distances within Illinois?**

Seeds disperse in September and November, moving, on average, about 3 meters.

2. **What is the rate of spread of the species with no management?**

Gradual spread in suitable habitat. "The Invaders Database System (2000) has tracked the spread of wild parsnip in the five northwestern states, Washington, Oregon, Montana, Idaho, and Wyoming using historical and botanical accounts of the weed. From the first occurrence in 1889, the weed has spread gradually over 110 years, and now occurs in 45 counties within these five states."

3. **What is the role of disturbance in the establishment of the species?**

Can become abundant along roadsides that are regularly mowed as mowing seems to encourage the production of flowering plants. Species is more abundant in disturbed areas.

4. **Do these questions sufficiently capture the potential rate of spread in Illinois?** Yes **If not, what additional information should be considered by the IISC?** N/A

Mechanisms of Spread - E

1. **Dispersal Potential: (discuss each pertinent dispersal mechanism)**

- a) **Ornamental** – A domesticated variety of parsnip is used as an edible garden plant and that may contribute slightly to the spread.
- b) **Forage** - A variety of animals will graze on wild parsnip, providing some potential for spread however, too much parsnip grazing can result in injury from the sap reacting with the sun to cause burning. It is important to maintain ample amounts of other forage species where grazing occurs to prevent this.
- c) **Erosion Control** – This plant has not been intentionally planted for erosion control.
- d) **Medicine/Food** - Roots are reportedly edible, but it is doubtful that anyone has intentionally planted the wild type in years.
- e) **Bird** - Birds may consume the seeds and disperse them, although the furanocoumarins deter most herbivores from consuming the plant's foliage.
- f) **Mammal/Land Animal** – Deer and small mammals may consume the seeds and disperse them, although the furanocoumarins deter most herbivores from consuming the plant's foliage. Although occasionally eaten by animals (Cain et al., 2010), there is little evidence that the seeds are dispersed by animals.

However, low levels, about 5%, of secondary dispersal by unidentified granivores other than arthropods and slugs, are reported (Pufal and Klein, 2013).

- g) **Vehicles/Footwear/Clothing** - Average dispersal has been measured to be 3 meters
- h) **Wind** – Seeds become viable three weeks after the plant flowers, making spread by wind more likely.

Source: Jongejans, E. and Telenius, A. 2001. Field experiments on seed dispersal by wind in ten umbelliferous species (Apiaceae). *Plant Ecol.* 152:67–78

- i) **Water** – Average dispersal has been measured to be 3 meters
- j) **Equipment/Management Activities** - Seeds are dispersed when the shoots are cut by mowing.
- k) **Other** - The furanocoumarins in parsnip are known to be toxic to most insects, with the exception of *Depressaria pastinacella* (parsnip moth), which acts as a predator to the species. The concentrations of these compounds have been shown to increase with increased UV-B radiation, which is one of the consequences of climate change. After accidental introduction of native predator (*Depressaria pastinacella*), wild parsnip has increased its toxic compound. This allows it to be even less palatable to other species and increase its allelopathic characteristics, which could expand its range.

A study done in 2012 of floral plant hosts playing a role as host to adult beetles showed that wild parsnip was the most preferred plant by 42 beetle species in Central Illinois.

2. Are asexual propagules effectively dispersed?

No. Wild parsnip only 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.

3. What is the primary method of seed and/or propagule dispersal?

Seeds mature in mid-summer but unless disturbed, for example by mowing, they do not shatter until late summer or autumn (Baskin and Baskin, 1979). At an average wind velocity of 4.7 m/s, most seeds will disperse over short distances (2–5 m) from the parent plant (Jongejans and Telenius, 2001). Warning (1934) speculated that, since umbels and umbellets easily break as stem tissues age and fruits ripen, these larger structures may act as “tumbleweeds” facilitating fruit dispersal. Secondary dispersal is likely accomplished by surface water flow.

4. Do these questions sufficiently capture the mechanisms of spread by the species? Yes If not, what additional information should be considered by the IISC? N/A

Species Life Cycle - F

1. What is the life cycle and reproduction method of the species? (e.g., annual, biennial, perennial)

Wild parsnip is a monocarpic perennial that exists as a basal rosette for at least one year, and then flowers and dies. Wild parsnip often flowers and sets seed during its second year, although it may not flower until subsequent

years. In the growing season, seeds dispersed in late summer and autumn of the previous year are the first to germinate. Plants emerging from spring-germinating seeds are better able to survive extended periods of low precipitation during the summer, and low temperatures during the winter.

2. What is the species habit (graminoid, forb, vine, shrub, tree, etc.)?

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. It grows 4- 6 feet tall.

3. What is the seed longevity in the seed bank?

It is a prolific seed producer with seeds that can remain viable in the soil for up to four years. Produces up to 2000 fruits per plant. One or both of the two mericarps in each fruit may contain a seed, although mature fruits lacking seeds are also common.

4. What is the seed production and germination rate?

Seeds germinate predominately in the spring and develop into basal rosettes that persist one or more years until producing a flowering stalk. If the flowering plants are not removed by mowing or physical removal, each plant can set hundreds of seeds within a 10 foot area of the mother plant.

5. What is the generation time (i.e. time until sexual maturity)?

Flowering usually occurs in the second or third year, from June to the middle of July or longer, dependent upon site conditions. Pollinators have not been documented, but ants are suspected to be among them. Seeds mature in late fall after which the plant dies. Seeds are viable about three weeks after maturation and are reported to remain viable for at least four years. Seeds disperse in September and November, moving, on average, about 3 meters.

6. What is the reproductive strategy of the species? (i.e. monoecious/dioecious, self-fertile, cleistogamous, apomictic, etc.)?

Wild parsnip does not reproduce vegetatively. It only reproduces by seed, predominately in the spring. It is andromonoecious, with individual plants bearing both male and hermaphroditic flowers. The hermaphroditic flowers are protandrous, going through a staminate, then a pistillate stage with little or no overlap between the stages, thus preventing cross pollinations between flowers of the same plant.

Source: Averill, K and A. DiTommaso (2007) Wild Parsnip (*Pastinaca sativa*): A Troublesome Species of Increasing Concern. *Weed Technology* 21:279-287

7. How is the species pollinated? Does the species require specialized pollinators? What are the known pollinators?

A 2012 study of floral plant hosts playing a role as host to adult beetles showed that wild parsnip was the most preferred plant by 42 beetle species in Central Illinois. Beetles may provide important pollination services for many species of plants of diverse families. The study stated that the association between species of beetles and

their hosts has received little attention and remains poorly understood.

Source: Graham EE, JF Tooker and LM Hanks (2012) Floral host plants of adult beetles in Central Illinois: an historical perspective. Conservation Biology and Biodiversity 105: 287-297.

8. What is the extent of vegetative reproduction or regeneration? (e.g. clonal spreading, runners, fragments, etc.)

It reproduces only via seed.

9. Does the species have characteristics that provide a competitive advantage, such as shade tolerance, ability to grow on infertile soils, perennial habit, fast growth, nitrogen fixation, allelopathy, etc.?

P. sativa does tolerate a range of soils and moisture levels, but it requires sun.

10. Can the species hybridize with native species (or other introduced species) and produce viable seed and fertile offspring in the absence of human intervention?

Only one source could be located referencing this topic and it states that there are no known cases of wild parsnip hybridizing with other species.

Source: Ontario Invasive Species Council Best Management Practices for Wild Parsnip, February 2014

11. Do these questions sufficiently capture the pertinent life cycle attributes of the species? Yes If not, what additional information should be considered by the IISC? N/A

Harm/Impact - G

Ecological Impacts

1. What is the typical population density in invaded areas?

Because P. sativa is mostly found in open places in pastures, fields and weedy meadows, along railroads and roadsides, in vacant lots and waste areas, the population in these areas is very low.

2. What is the extent of recorded rare/threatened/endangered species impacts?

No significant impact on rare/threatened/endangered species was found.

3. Does the species reduce native species richness or diversity in remnant or restored ecosystems?

It does spread rapidly and develops large monocultures that replace native plant habitat.

4. Does the species alter community structure? (canopy, subcanopy, herbaceous structure or soil characteristics, etc.)

Wild parsnip can colonize forested areas where the canopy is disturbed and there is increased light penetration. It can be advantageous to manage these openings by restoring the canopy quickly.

Source: Michigan Department of Natural Resources, Michigan Natural Features Inventory, March 2018, Wild Parsnip, <https://mnfi.anr.msu.edu/invasive-species/WildParsnipBCP.pdf>

5. Does the species alter community functions and processes? (fire intensity, hydrology, erosion potential, wildlife forage, etc.)

Native species displacement in open ecosystems may reduce wildlife forage some, but no documentation of significant impact was found.

6. Does the species have the potential to introduce or harbor another pest or serve as an alternate host?

The parsnip webworm is an important herbivore that feeds on the plant. The webworm was introduced to North American from Europe in 1869. Feeding by webworm larvae can reduce wild parsnip seed production. However, the plant and webworm appear to have a symbiotic relationship.

7. Do these questions sufficiently capture the extent to which the species could negatively impact ecosystems in Illinois? If not, what additional information should be considered by the IISC?

Economic Impacts

8. Does the species have realized or potential negative economic impacts on food crops, livestock, or companion animals?

A variety of animals will graze on wild parsnip, however, too much parsnip grazing can result in injury from the sap reacting with the sun to cause burning. It is important to maintain ample amounts of other forage species where grazing occurs to prevent this.

Source: Michigan Department of Natural Resources, Michigan Natural Features Inventory, March 2018, Wild Parsnip, <https://mnfi.anr.msu.edu/invasive-species/WildParsnipBCP.pdf>

9. Does the species have realized or potential negative economic impacts on specialty crops, including home lawns and gardens? No

10. Does the species have realized or potential negative economic impacts on property or real estate values?

The risk to human health and subsequent limitations on use of heavily invaded areas could potentially decrease property values but no known documentation of impacts to property values was located.

11. Does the species have realized or potential negative economic impacts on timber stands?

Wild parsnip typically does not grow in heavily forested environments so would have minimal, if any, economic impacts on timber stands.

12. Does the species have realized or potential negative economic impacts on trade? No

13. Is the species a known or potential vector or host of any crop pests? The parsnip webworm is the main insect that calls wild parsnip home, but the larvae feed exclusively on parsnip.

14. Do these questions sufficiently capture the extent to which the species could negatively impact any economic entities in the state? Yes **If not, what additional information should be considered by the IISC?**
N/A

Health, Safety, and Human Use Impacts

15. Does the species pose any known or potential risk to human health?

The sap from wild parsnip stems and leaves contains furanocoumarin, a photosensitive chemical that can cause photodermatitis. After exposure to ultraviolet radiation from sunlight the affected skin may redden or blister like a severe sunburn within 48 hours and the affected areas may remain discolored for two years. The effect is enhanced when skin is moistened by humidity or perspiration. Livestock and poultry are also vulnerable when sap contacts bare skin.

16. Does the species impact visibility along roads or other transportation settings?

While the plant does get up to five feet tall and is commonly found growing along roadsides, it is not likely to impact visibility because the mature plant is a tall spindly stalk.

17. Does the species increase wildfire risk?

No

18. Does the species inhibit or impact recreational activities?

Wild parsnip regularly occurs along paths and roadsides, so there is a high likelihood of negative impact to people who are walking, hiking or, running, since the sap from the stems and leaves causes photodermatitis.

19. Does the species impact the aesthetics of natural vistas and viewsheds?

Once established at the edges, parsnip can spread into adjacent high-quality areas. Wild parsnip out-competes other lower-growing herbaceous vegetation by its profuse growth and may displace species that are important nectar sources. Mature parsnip plants are taller than the dry prairie species they replace.

20. Do these questions sufficiently capture the extent to which the species could harm health, cause safety concerns, or impact human use of natural areas or property? Yes **If not, what additional information should be considered by the IISC?** N/A

Economic/Agricultural Concerns - H

1. Does the species have clearly defined benefits? (i.e. Horticulture, food, etc.)

They have an edible root, but their leaves and stems are highly toxic. The root can be boiled, roasted, grilled or fried for an earthy taste. It reportedly pairs well with honey, mustard, and herbs like thyme and rosemary. Historically, it was used as a sweetener. It is said to support the digestive system and contains antioxidants and is a good source of fiber. Although the plant is sometimes thought to be poisonous, it is not. The fleshy taproots can be eaten raw or boiled. It is contact with the sap of this plant that can be dangerous.

2. Is the species currently being used, produced, and/or sold in Illinois, and for which purposes is the plant used? (i.e. Medicinal, fiber, ornamental, etc.)

At the time this assessment is being conducted, there are no known businesses producing wild parsnip for commercial purposes. Cultivated parsnips are produced by some specialty crop operations and home gardeners. While the species are related, the cultivated parsnip does not cause such severe reactions as wild, but some people do still get rashes when working with the plants.

3. Do these questions sufficiently capture the extent to which the species could impact agricultural entities in Illinois? Yes If not, what additional information should be considered by the IISC? N/A

Control - I

1. What is the relative difficulty of detecting/identifying the species?

Detection of wild parsnip is easiest when it is in flower, as the large, flat-topped, yellow umbels are conspicuous on their irregular, long stalks. Up close, it can be distinguished at other times, by the long, pinnately divided leaves with many coarsely toothed leaflets.

Looks similar to Giant Hogweed, Golden Alexander, Poison Hemlock, Cow Parsnip, and Queen Anne's Lace. One way to differentiate them is smell and color. Wild parsnip has intense yellow flowers, while the other four species boast white flowers. Wild parsnip has a parsnip-like odor, while the other look-alikes are distinctly different: Poison hemlock has a mouse-like odor, Common Hogweed smells like swine, Cow Parsnip resembles parsley, and Queen Anne's lace smells like carrot. Both inhabit roadsides, pastures, and field edges, but hogweed and hemlock prefer moist conditions, while wild parsnip and Queen Anne's Lace favor dry sunny areas.

Source: Iowa State Extension, ICM News Archive, pgs 219-220, IC-498(18) – July, 9, 2007 issue

2. Are treated areas likely to need extensive restoration or remediation?

Treatment will require several growing seasons but minimal effort. If the species is present on adjacent sites, some level of management may be required, but early detection and intervention can greatly reduce the time and resources required to control established parsnip stands. Monitoring is critical.

Using a combination of control methods usually provides better control than any single treatment alone. Herbicide, grazing or prescribed fire treatments are often followed up with spot treatment by hand-pulling, herbicides or burning with a hand-held propane torch. Treatment will need to be continued until the seed bank is exhausted.

Source: Michigan Department of Natural Resources, Michigan Natural Features Inventory, March 2018, Wild Parsnip, <https://mnfi.anr.msu.edu/invasive-species/WildParsnipBCP.pdf>

3. What is the degree of response to 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. Burning is not as successful a control method for wild parsnip because it allows rosettes to develop, even though periodic burning helps maintain the vigor of native plants and allows them to more effectively compete with wild parsnip. Given that seed longevity in soil is relatively short (>4 years), plants may be more easily controlled if seed production is prevented for several years.

Source: Averill, K and A. DiTommaso (2007) Wild Parsnip (*Pastinaca sativa*): A Troublesome Species of Increasing Concern. *Weed Technology* 21:279-287

4. Are there records of the species ever having been successfully eradicated from a site?

Infestations of this plant are not likely to be eliminated in a single season. Wild parsnip can be controlled and virtually eliminated within 3-5 years through proper mowing or safe physical removal practices.

5. What is the perceived effectiveness of control efforts?

- a. **Chemical** - Glyphosate can be spot sprayed on basal rosettes, applied in early spring or late fall when most desirable vegetation is dormant. Other options include phenoxy herbicides, such as 2,4-D or dicamba, applied in early spring or late summer/fall. The area should be monitored as additional herbicide applications or mechanical control measures may be necessary for the next couple of years to control newly emerging plants.
- b. **Biological** – There are no formal biocontrols for wild parsnip. The parsnip webworm has been observed causing damage to some individual plants, even severely in some cases, but is not known to devastate whole patches, so is not considered an effective biocontrol.

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.

Source:

<https://ipcm.wisc.edu/blog/2016/07/wild-parsnip-an-expanding-problem-along-roadsides-in-wisconsin/>

- c. **Cultural** - Cultural methods that favor the growth and development of desirable plant species are the best measures to deter wild parsnip. 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. Burning is not recommended as a successful control method for wild parsnip because it allows rosettes to develop, even though periodic burning helps maintain the vigor of native plants and allows them to more effectively compete with wild parsnip.

Native seeding may improve wild parsnip control efforts by increasing competition of desirable plants with parsnip seedlings. Assessment of the native seed bank prior to control efforts will help determine whether this is needed.

- d. **Mechanical** - Mechanical removal of flowers and seeds by hand pulling, digging the root crown, or repeated mowing can be effective. Elimination of seed production is the goal. Since flowering does not occur all at once, the area must be monitored for several weeks. Mechanical treatment can sometimes cause greater disturbance than if the site was left alone or if another treatment option was utilized. If removing plants, ideally, leave the stems to dry out completely at the site, off the soil, and in the sun. If digging or tilling, remember that soil disturbance can encourage growth from seed bank. If possible, begin mowing in late May and continue through the summer, at a height of 8 inches or less. Mow the area for about three years and the parsnip will be virtually gone. Can easily be controlled and virtually eliminated within 3-5 years through proper mowing or safe physical removal practices.

Using a combination of control methods usually provides better control than any single treatment alone. Herbicide, grazing or prescribed fire treatments are often followed up with spot treatment by hand-pulling, herbicides or burning with a hand-held propane torch. Treatment will need to be continued until the seed bank is exhausted.

Source: Michigan Department of Natural Resources, Michigan Natural Features Inventory, March 2018, Wild Parsnip, <https://mnfi.anr.msu.edu/invasive-species/WildParsnipBCP.pdf>

6. **Do these questions sufficiently describe the factors regarding control of the species in Illinois?** Yes
If not, what additional information should be considered by the IISC? N/A

Regulation (For Committee) - J

1. **Given all of the above information, does the species exhibit qualities that would support designation as an invasive species in Illinois?** Yes
2. **What information is most relevant to this designation?**
 - Once established, the species out-competes other low-growing herbaceous vegetation that is beneficial to pollinators.
 - The sap from the stems and leaves poses high human health risk and can also be a risk to livestock and poultry.
 - It is a prolific seed producer, spreads rapidly through disturbance, and has seeds that can remain viable in the soil for up to 4 years.
 - The species has been found in every county for the state for over 100 years
3. **Does the information above support the species being a priority for statewide eradication if found in Illinois?**
No. Due to how widespread the species is across the state and how long it has been so abundant, eradication is not only unlikely, but should not be a resource priority. However, it should be encouraged due to the human health risk.

4. Provide documentation of stakeholder input:

- The committee discussed the challenges with enforcement related to the Noxious Weed Act because of lack of funding. However, the committee determined that the species should still be placed on the list to encourage removal from property.

5. Should the species be regulated? Yes

6. If so, what level of regulation is suggested? The committee recommends adding this species to the Noxious Weed List

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SOURCES - K

- INHS Distribution maps, Ecology & History, - <https://www.inhs.illinois.edu/data/plantdb/detail/1428>
- Midwest Invasive Plant Network (mipn.org), <https://files.dnr.state.mn.us/eco/invasives/weedlist.pdf>
- <https://dnr.wisconsin.gov/topic/Invasives/RegulatedSpecies>
- EDDMapS. 2023. Early Detection & Distribution Mapping System. The University of Georgia - Center for Invasive Species and Ecosystem Health. Available online at <http://www.eddmaps.org/>; last accessed April 3, 2023.
- Invasive.org
- Cain N, Darbyshire SJ, Francis A, Nurse RE, Simard MJ, 2010. The biology of Canadian weeds. 144. *Pastinaca sativa* L. Canadian Journal of Plant Science, 90(2):217-240.
- Kartesz, J.T., The Biota of North America Program (BONAP). 2015. North American Plant Atlas. (<http://bonap.net/napa>). Chapel Hill, N.C. [maps generated from Kartesz, J.T. 2015. Floristic Synthesis of North America, Version 1.0. Biota of North America Program (BONAP). <http://bonap.net/MapGallery/County/Pastinaca%20sativa.png>
- Iowa State Extension, ICM News Archive, pgs 219-220, IC-498(18) – July, 9, 2007 issue <https://crops.extension.iastate.edu/encyclopedia/weed-watch-wild-parsnip-and-poison-hemlock>
- iNaturalist.org/observations - <https://www.inaturalist.org/observations>
- https://www.entm.purdue.edu/iisc/pdf/plants/Pastinaca_sativa.pdf
- Indiana Non-Native Plant Invasiveness Ranking Form, Wild Parsnip, Original assessment July 2013, reassessed October 2019 - https://www.entm.purdue.edu/iisc/pdf/plants/Pastinaca_sativa.pdf
- Averill, K and A. DiTommaso (2007) Wild Parsnip (*Pastinaca sativa*): A Troublesome Species of Increasing Concern. Weed Technology 21:279-287
- Graham EE, JF Tooker and LM Hanks (2012) Floral host plants of adult beetles in Central Illinois: an historical perspective. Conservation Biology and Biodiversity 105: 287-297.
- Jongejans, E. and Telenius, A. 2001. Field experiments on seed dispersal by wind in ten umbelliferous species (Apiaceae). Plant Ecol. 152:67–78
- Michigan Department of Natural Resources, Michigan Natural Features Inventory, March 2018, Wild Parsnip, <https://mnfi.anr.msu.edu/invasive-species/WildParsnipBCP.pdf>

- Jogesh, T., R. Peery, S.R. Downie, and M.R. Berenbaum. 2015. Patterns of Genetic Diversity in the Globally Invasive Species Wild Parsnip (*Pastinaca sativa*). *Invasive Plant Science and Management*. 8:415–429.
- Jogesh, T., M.C. Stanley, and M.R. Berenbaum. 2014. Evolution of tolerance in an invasive weed after reassociation with its specialist herbivore. *Journal of Evolutionary Biology*. 27:2334-2346. doi: 10.1111/jeb.12469
- Jongejans, E. and A. Telenius. 2001. Field experiments on seed dispersal by wind in ten umbelliferous species (Apiaceae). *Plant Ecology*. 152:67–78.
- Pufal G, Klein AM, 2013. Post-dispersal seed predation of three grassland species in a plant diversity experiment. *Journal of Plant Ecology*, 6(6):468-479.
- Darbyshire, Stephen and Simard, Marie-Josée; CABI Compendium, Published online March 23, 2015
- <https://www.cabidigitallibrary.org/doi/10.1079/cabicompendium.39028#body-ref-ref-62>
- Source: Ontario Invasive Species Council Best Management Practices for Wild Parsnip, February 2014
https://www.ontarioinvasiveplants.ca/wp-content/uploads/2016/07/OIPC_BMP_WildParsnip_Feb182014_FINAL2.pdf
- Wisconsin Literature Review of Wild Parsnip, August 2007,
https://dnr.wisconsin.gov/sites/default/files/topic/Invasives/LR_Pastinaca_sativa.pdf