



AGENDA
CHARTER TOWNSHIP OF MERIDIAN
LAND PRESERVATION ADVISORY BOARD
SITE VISIT
May 8, 2019

FOR SITE VISITMEET AT END OF CREEKSTONE TRAIL, OKEMOS AT 6 PM
(closest address is 2704 Creekstone Trail, Okemos)

1. CALL MEETING TO ORDER
2. APPROVE AGENDA
3. WALK AND DISCUSS FUTURE MANAGEMENT OF THE SOUTHWEST MERIDIAN UPLAND PRESERVE AND IF TIME ALLOWS, VISIT SERAFINE PRESERVE (end of Delmar Drive, Okemos)
4. ADJOURNMENT

All comments limited to 3 minutes, unless prior approval for additional time for good cause is obtained from the Supervisor.
Appointment of Supervisor Pro Tem and/ or Temporary Clerk if necessary.

Individuals with disabilities requiring auxiliary aids or services should contact the Meridian Township Board by contacting:
Parks & Recreation Director LuAnn Maisner, 2100 Gaylord C. Smith Court, Haslett or 517.853.4600 - Ten Day Notice is Required.
Meeting Location: End of Del Mar Drive, Okemos, MI

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Robin Faust

From: Kelsey Dillon
Sent: Wednesday, May 8, 2019 8:47 AM
To: kielbas3@anr.msu.edu; steph143@msu.edu;
jtmayes@sbcglobal.net; harmesr@aol.com; hillier1jw@gmail.com;
Lee, Yu; Dan Opsommer; Kirk Lapham
Cc: Jane Greenway; LuAnn Maisner; Robin Faust
Subject: Site Visit Reminder - LPAB Meeting at SW Meridian Uplands
Attachments: Sturk Southwest Meridian Uplands Stewardship 2015.pdf

Hello LPAB Members,

I wanted to send a reminder to everyone that we are visiting the SW Meridian Uplands Preserve in lieu of a regular meeting this evening. The start time is still 6pm and we'll meet at the property. I'll provide a map when you arrive and I've also attached the stewardship plan written in 2015 by Leslie Kuhn and Jim Hewitt from the Mid-Michigan Stewardship Network if anyone is interested in reviewing it beforehand.

A few quick notes for those who haven't visited this preserve:

- The property is notoriously buggy but we might be early enough in the year to avoid the worst of it. I was there last week and it wasn't too bad. I'll bring extra bug spray just in case (we'll also be walking through tall grass so ticks might be an issue).
- Parking is on the road at the back of the Sundance Estates subdivision. The closest address to our meeting point is 2704 Creekstone Trail. If you put that address in GPS you'll be able to find us.
- Bring binoculars or a telephoto lens camera if you're interested in checking out the heron rookery(nesting site)!

Please call my cell if you have any questions or need directions: 937-684-7484.

Thank you!



Kelsey Dillon
Park Naturalist/Stewardship Coordinator
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Mid-Michigan Stewardship Initiative (MMSI)

Stewardship Report: Sturk/Southwest Meridian Uplands Preserve Visit, 7/8/15

Compiled by Leslie Kuhn and Jim Hewitt (MMSI), with additional information from Carla Clos (Ingham County Drain Commission), Eckhart Dersch (Dept. of Community Sustainability, MSU, and Meridian Park Commission), Jim Harding (Dept. of Integrative Biology, MSU), Phyllis Higman (Michigan Natural Features Inventory), Mark Ledebuhr (Fenner Nature Center), and Vern Stephens (Designs by Nature, LLC)

Copies to: Meridian Township Land Preservation Advisory Board (Jim Kielbaso, Chair; Jane Greenway, Staff; Julie Brixie, Roland Harmes, Frank Hatfield, Jon Mayes, Robert Rusch, Margo Smith, and Mark Stephens), Environmental Commission Liaison Lise Schools, Eckhard Dersch, Phyllis Higman, Bill Morgan, and Tom Valli

Our group, Jim Kielbaso, Jane Greenway, Julie Brixie, Frank Hatfield, Rollie Harmes, Lise Schools, Jim Hewitt, Leslie Kuhn, and preserve neighbors Bill Morgan and Tom Valli had a very nice and informative walk at this preserve, although we were a Thanksgiving feast for the evening mosquitoes! We entered the preserve from the southern entrance on the east side via Sophiea Parkway in Okemos and then walked west along the two-track road through the center of the preserve. At the end of the two-track, many of us headed north to the railroad tracks and walked west until reaching the northwestern corner, where the preserve is bounded by the railroad to the north and Herron Creek on the west. From there, we could clearly view the Herron Creek ditch, floodplain and ponds on the preserve, as well as the Serafine property immediately north of the tracks, an attractive prospect for land acquisition. The goals of the walk were to share information and observations about the preserve, assess progress on the prairie restoration project, and develop recommendations for future stewardship activities.

Flora Observations

As we entered the preserve, there was a moderate to high density of invasive buckthorn and Asian honeysuckle shrubs on either side of the road under the tree canopy. The road surface and edges (only) were covered in a number of common agricultural herbaceous weeds, such as birdsfoot trefoil, butter-and-eggs, and alfalfa. There were only a few rosettes of garlic mustard (basal leaves) and cutleaf teasel (sharply spined ovate thistle seedhead; <http://www.michiganinvasives.org/facts/detail.php?id=50>) on the edges of gravel road near the entrance, likely brought in on boots or tires.

Entering the open, grassy area and walking uphill to the end of the road near the center of the property, the density of herbaceous, highly invasive species steadily rose to a critical point, especially spotted knapweed (*Centaurea maculata*, which looks like miniature pink thistles), hoary alyssum (*Berteroa incana*, with tiny white lobed lobelia-like flower clusters), and common mullein (*Verbascum thapsus*; very tall spikes with large, fuzzy basal leaves). A colony of aggressive, non-native Canada thistle ("Canada" is a misnomer) was on the knoll a few hundred feet southwest of the end of the road. All are 2-5' in height and incredibly dense (a mixed culture of invasive species only) focused on the center of the preserve, which is the site where

prescribed burns and herbicide spraying have been done over the past 1-3 years in preparation for planting a native prairie. <http://www.michiganinvasives.org/facts> is an excellent website on identification and control of these plants, and michiganflora.net has additional photos, plus the more interesting native Michigan species! Few native plants were seen except for mature trees in corridors and islands on the property, clumps of monarda (bee balm) and pokeweed (photo on the right below), plus a lone *Heliopsis helianthoides* (yellow sunflower) shown in Jim Hewitt's photo below. These are happily deer-resistant species that should thrive in those sandy, well-drained soil conditions!



To the west, the tree border of a hardwood swamp shows a number of heritage oaks in good condition, except for lower branches being shaded out and dying back. Eckhard Dersch noted, "Except for some interesting woodlands on its periphery, the land is highly disturbed".



As we walked north to the railroad tracks, the density of these invasive species steadily decreased, and the undeveloped Serafine property north of the railroad tracks was relatively free of aggressive invasive species.

Fauna and Hydrology

The Herron Creek floodplain to the northwest is now highly infested with reed canarygrass. The creek has been channeled into a ditch along much of the western property boundary. Eckhart

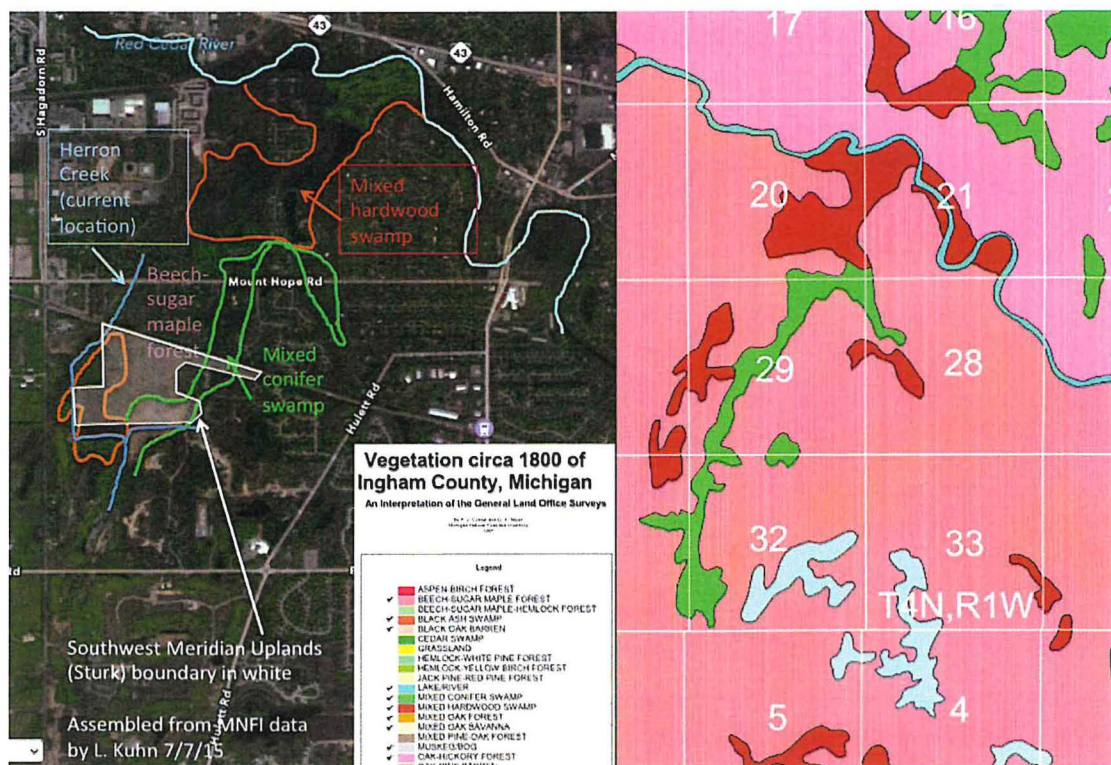
Dersch and Carla Clos noted that so much of the water spreads out into the floodplain that some times of the year the ditch runs dry, which is problematic for the fishery. Louise Kelley, a township trustee in the late 80's and early 90's, was an informal caretaker of the creek from her

home on Hawthorne Lane and Mt. Hope Road. She used to speak about the spawning salmon that made their way up the creek. Also, Jim Harding noted that all the wetlands in Meridian Township are a hotspot for the state special-concern Blandings turtle, a species that is rare and decreasing statewide and threatened or endangered in the eastern U.S.. Our township is fortunate to be one of the strongholds of Blandings turtles, which can live to be 60-100 years old (see photo above by Chris Reidy). They can be protected in part by ensuring that street curbs are shallow (S-shaped) rather than steep-walled, which often cause the female turtles (which lay eggs on sandy upland away from wetlands) to be trapped in roads and hit by cars. The Ingham County Drain Commissioner's Office plans to do a study of the Herron Creek ditch this fall under a SAW grant (MDEQ Stormwater, Asset Management, and Wastewater program) from a hydrology and water quality perspective.

The Michigan Natural Features Inventory lists observations of the following special concern, threatened, or endangered plant and animal species in the vicinity of the Sturk Preserve:

- Baptisia lactea, Prairie false indigo, 1928
- Scirpus torreyi, Torrey's bulrush, 1893
- Galearis spectabilis, Showy orchid, 1895, 1877 (orchid)
- Tradescantia virginiana, Virginia spiderwort, 1923
- Microtus pinetorum, Woodland vole, 1938
- Cryptotis parva, Least shrew, 1945
- Arabis perstellata, Rock cress, 1866
- Hemileuca maia, Barrens buckmoth, 1953

The mid-1800's General Land Survey of the vegetation and soils at every square-mile corner in Michigan indicates the Sturk Preserve was primarily hardwood and mixed conifer swamp and beech sugar maple forest at that time; see map below.



Why is the Sturk Land So Changed?

Before this 94-acre property was purchased by the Land Preservation program, it had suffered several abuses. Eckhart Dersch recollects, "The Sturk property was far more interesting from a restoration perspective than a preservation perspective. Except for some interesting woodlands on its periphery, the land is highly disturbed (Sturk enjoyed 'playing' with his bulldozer on a rather large part of the property). And many years ago, MSU disposed of its cafeteria food waste on this property for hog feed (remnants of MSU flatware and china can still be found scattered on the property)." The soil disruption by bulldozing would favor the establishment of invasive species, especially those tolerant of exposed, sandy/gravelly, well-drained soil with little organic matter, like spotted knapweed, hoary alyssum, and mullein.

The further clearing of the land by a prescribed burn and herbiciding without follow-up seeding probably shifted conditions further towards invasive species, as the native seedbank was likely depleted due to years of farming followed by more recent surface disruption. The US Fish & Wildlife Service's Partners in Fish & Wildlife program support for prairie restoration (resulting in the prescribed burn and/or herbicide treatment over the past 1-3 years) was contingent upon the township seeding the area and doing follow-up maintenance on a defined schedule, but unfortunately this did not happen. Mark Ledebuhr, who oversees stewardship activities at Fenner Nature Center, said in hindsight that their biggest mistake in the large-scale prairie restoration at Fenner was not planting a cover crop to shield otherwise bare soil. They have been battling invasive species in the prairie, including a heavy mullein infestation.

Spotted knapweed and mullein are not well controlled by fire, and it may even stimulate their spread. Both thrive in bare sands and gravel, and they have very prolific and long-lived seeds (lasting up to 100 years for mullein, with up to 175,000 seeds per plant). The appendix below provides information on seed characteristics and fire/disturbance effects for spotted knapweed, common mullein, and hoary alyssum.

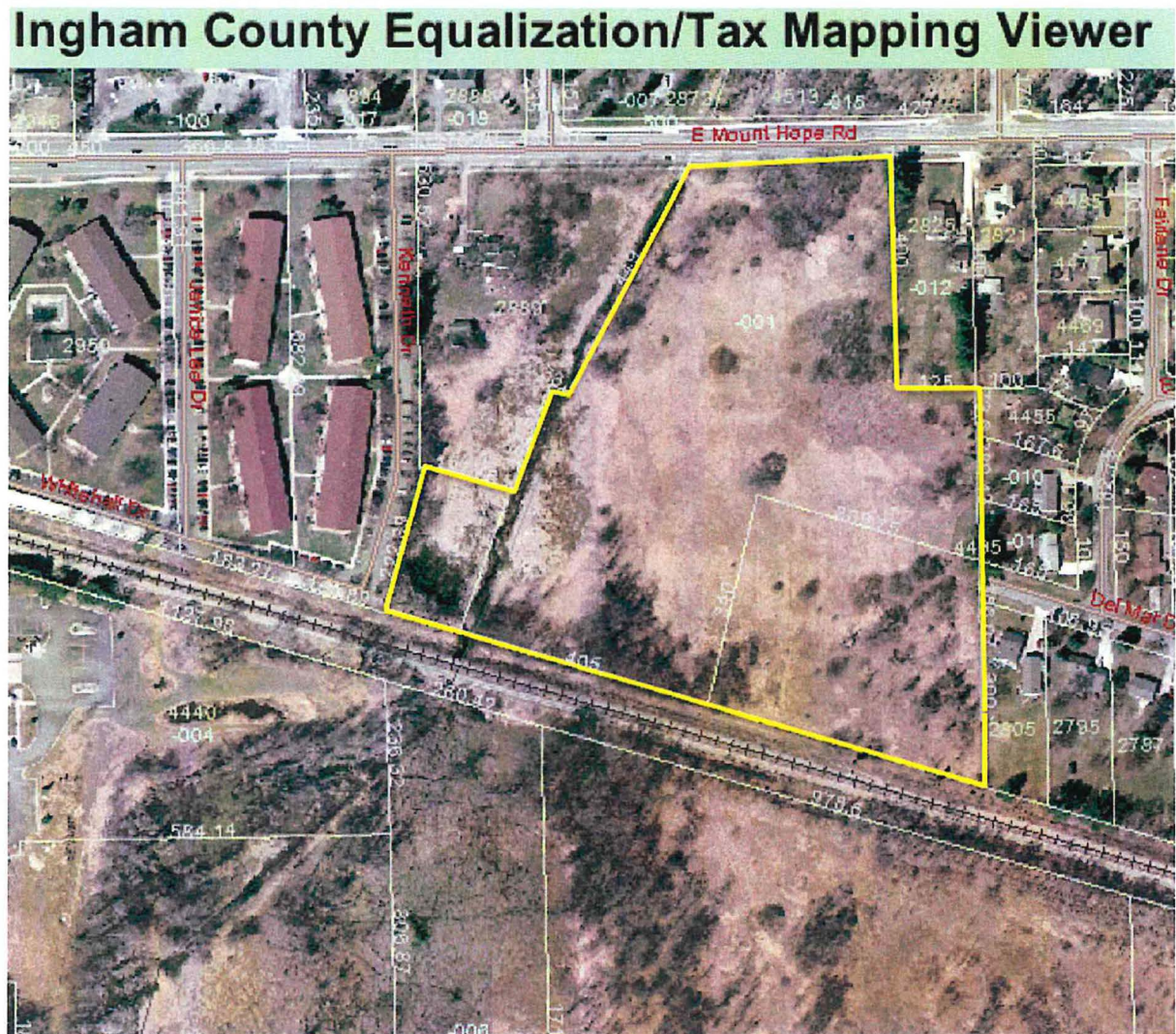
What Activities will Best Promote the Natural Communities, Esthetics, and Neighbor Involvement at Sturk Preserve?

We recommend, given the currently very limited stewardship staffing for the Meridian land preserves, that efforts focus on containment of highly invasive species and restoration of the highest quality and most habitat-rich parts of the property. **The most undisturbed and important habitats of the Sturk Preserve and suggested restoration activities are:**

- *The far southwest corner, and the narrow extension in the northeast corner along the railroad (which our recent walk did not reach).* A visit to these areas by interested members of the group could be led by Jim Hewitt, aimed at doing an informal survey of natural features and threats. The northern area would be ideal for community engagement in restoration, since the three neighbors on Wednesday's walk all live just north of this site, and some are restoring native habitat on their own adjacent property.
- *The Herron Creek corridor.* This riparian corridor and floodplain likely support fish spawning, amphibians, rare turtles, birds, and also the water supporting many other native species in the hardwood swamps downstream. Cooperation with the Ingham County Drain Commissioner on studying the hydrology, water quality, and fauna along the creek would be valuable in prioritizing ways of enhancing the stream and floodplain. Devoting the small funding needed to carry out a herp/turtle survey along the creek (e.g., by working with Herpetological Resource and Management (<http://www.herprman.com>), which is currently consulting with ICDC on the Montgomery Drain project) could provide

valuable data on the habitat value of this riparian corridor and advice on restoration. A small scale stream or pond-side restoration project in one of the less reed canarygrass infested areas could help assess the feasibility of restoring native wetland plants (herbs and sedges) on a larger scale.

- *Acquisition of the Serafine property to the north.* This 13 acre (possibly larger) property immediately north of Sturk (see map below) includes a substantial part of Herron Creek and is the equivalent of Sturk north of the railroad. However, the Serafine property is generally in much better condition than Sturk due to less disruption of the uplands and fewer invasive species. This would be the top-priority acquisition opportunity we know of for the Land Preservation program. Conserving more contiguous, high-quality land would significantly benefit the Sturk property and the wildlife it supports. The fate of the Serafine property is currently being decided by the family trust – whether to develop the land as housing on a much lesser scale than they had envisioned – so this is an ideal time to discuss the land conservation/preservation opportunity with them.



Recommendations for restoring other areas to maximize habitat value and minimize invasive species spread:

- *Control spotted knapweed, Canada thistle, and common mullein from spreading to the northern part of Sturk.* Define a boundary delineating the heavily infested area from east to west with a series of stakes, and twice a year treat all the spotted knapweed basal rosettes north of that line. Work further south as the northern region is controlled. Also investigate the current availability of spotted knapweed biocontrol insects for release in Michigan; we are checking with Sue Tangora at MDNR about this. Common mullein and Canada thistle are not as dense as the knapweed infestation (but could be, given their prolific seeding). The mature mullein can be chopped up with a thrasher before it sets seed, or the seed stalks otherwise cut into multiple pieces to ground level. The basal rosettes of mullein can be spot-treated with herbicide, moving from north of the line of demarcation to south of the line. Canada thistle is poorly controlled or even stimulated by many herbicides, but Milestone (which does not affect grasses), used in very low concentration, is highly effective.
- *Control the East-West spread of spotted knapweed and woody invasive species.* Work along both sides of the two-track road just as it enters the property. Near the entrance, there are just a few garlic mustard and cutleaf teasel plants. The rosettes and seedheads should be pulled or sprayed and the area monitored vigilantly, since it is much easier to keep garlic mustard and teasel out than to control them once they drop seed. Also along the entrance road, before the main mullein jungle, the soil is thinner, and although there is knapweed which would need to be controlled, it might be a better location to plan for an eventual installation of a small prairie-type planting. Removing some of the invasive buckthorn and honeysuckle shrubs by basal bark treatment or cutting the stumps and herbiciding them would open up a sight-line to the south and the large open wetland expanse. By pushing north and south of the two-track, improvements could be made in this area which would be highly visible along the main entrance to the property. Over time, such work could continue west. A high priority would be to remove all the few free-standing (satellite infestations of) buckthorn and honeysuckle in the open grassy areas, to prevent the wide spread of these species (which, left unchecked, became a major obstacle at Fenner, taking years to control).

Mid-Michigan Stewardship Initiative leaders Jim Hewitt and Leslie Kuhn would be happy to provide additional details on herbicide regimens (chemicals, timing, and most efficient approaches) and to accompany LPAB members on additional walks on the property to discuss these opportunities. The restoration work could involve a combination of dedicated Meridian staff time and community volunteer efforts. This property is close to MSU and could provide nice long-term volunteer and field training opportunities for Restoration Ecology, Community Sustainability, Forestry, and Fisheries & Wildlife students.

Appendix: Seed Banking and Fire/Disturbance Effects on Spotted Knapweed, Common Mullein, and Hoary Alyssum

Literature references in parentheses may be found at the URLs given for the US Forest Service Fire Effects Information System (FEIS)

Spotted knapweed:

<http://www.fs.fed.us/database/feis/plants/forb/cenmac/all.html#POSTFIRE%20REGENERATION%20STRATEGY>

Spotted knapweed is a nonnative, perennial forb that can live at least 9 years. Plants more than 7 years old may have high incidence of root rot, indicating senescence [16]. Once established, spotted knapweed can form monotypic stands because its age class hierarchy allows it to occupy all available niches [173].

Early and deep fine root development, and the colonization of spotted knapweed roots by arbuscular mycorrhizal fungi, may contribute to its invasiveness in native grasslands [116,117] by allowing for greater resource acquisition. Chemical allelopathy of spotted and diffuse knapweeds has been suggested as a mechanism of interference with the growth of other herbaceous species [19,88,111].

Seed banking: Spotted knapweed seeds are known for their longevity and durability. They have a thick, durable pericarp that protects the seeds but does not restrict water imbibition or water loss [30]. Nolan and Upadhyaya [130] determined that a portion of the spotted knapweed seed population requires exposure to red light to germinate. This light requirement may permit buried seeds to remain dormant for an extended period of time [29,30]. Experimental evidence indicates that spotted knapweed seeds can remain viable but dormant after 5 years of burial [29].

Flowering and pollination: Spotted knapweed plants may remain in the rosette stage for 1 to 4 years, producing flowering stems the second year [220] or later [16,205]. Flowering during the year of seedling emergence is rare [166]. Boggs and Story [16] observed the percentage of flowering plants increasing with age up to 5 to 7 years, with little or no flowering in the first and second years, in Montana. Flowers are pollinated by insects [220], and spotted knapweed is heavily visited by several species of bees [35,64,220]. Large pollen counts in late July and early August in the Missoula Valley, Montana, suggest that spotted knapweed is also wind pollinated [44]. Fertilization in spotted knapweed requires cross-pollination between flowers on different plants (obligately xenogamous). This can limit the reproductive success of isolated individuals, but it also promotes genetic diversity, and may thereby improve competitive ability [64].

Seed production: The number of seeds produced by an individual knapweed plant or a population of plants is highly variable among plants, sites, and years. Reported average seed production per plant ranges from about 65 seeds per plant in Montana [73], 400 to 900 seeds per plant under range conditions in British Columbia [220], and about 2,000 seeds per plant, averaged across diverse sites in Washington and Idaho [166]. A population of plants may produce about 5,000 to 40,000 seeds per m² per year [174,205].

FIRE ECOLOGY OR ADAPTATIONS: Spotted knapweed has a large, perennial taproot and is likely to survive and sprout after fire if the root crown is not killed. It also produces large quantities of durable, heat-tolerant seed that can probably survive most grassland fires, although high severity fire may kill some spotted knapweed seeds [1]. See [Fire Effects](#) for more

detail.

Landis lab webpage on spotted knapweed

biocontrol: http://www.landislab.ent.msu.edu/Research/biocontrol_spotted_knapweed.html

Hoary Alyssum - *Berteroa incana* - http://plants.usda.gov/factsheet/pdf/fs_bein2.pdf

Hoary alyssum populations can be temporarily suppressed using 2, 4-D applied at label rates. Spring applications when plants are actively growing and prior to bolting will be most effective. Because hoary alyssum germinates and establishes throughout the growing season, repeated applications will be needed to target plants regenerating from the seed bank. Reports indicate metsulfuron applied at 0.5 ounce product (Escort®, Rainbowgreen Metsulfuron®, and others) per acre will control hoary alyssum, although hoary alyssum is not listed on the label. Other sulfonylurea herbicides including chlorsulfuron, and trisulfuron products as well as dicamba, and imazapic products may also be effective. Consult your Extension Agent for herbicide recommendations. Glyphosate will control hoary alyssum on seedbed preparation treatments. Studies are needed to develop herbicide recommendations for this weed.

There is no information on prescribed fire effects on hoary alyssum. Fall burns may reduce seed production if seed pods are burned before seed release. Fire may create a disturbance favorable to hoary alyssum establishment and sites should be monitored for weed occurrence and follow-up weed control should be applied where weeds are found.

Common mullein - *Verbascum thapsus*

<http://www.fs.fed.us/database/feis/plants/forb/vertha/all.html>

Seed production: Common mullein produces abundant seed, and branching and fasciation of the flower stalk can lead to even greater seed production. In a 3-year-old abandoned field in Michigan, common mullein produced between 0 and 749 seeds/capsule for an average of 208 seeds/capsule. Total seeds per plant averaged 175,000 [52]. In 1- to 4-year-old fields in southwestern Michigan, common mullein averaged 100,000 seeds/plant [53].

Seed banking: The common mullein seed bank is persistent. Seeds have germinated after 100 years or more in the soil [71,99].

In southwestern Michigan, common mullein seedlings established and survived only in 1-year-old fields when seeds were sown in 1- and 15-year-old fields. Seedlings that survived to the end of the growing season (~20 weeks) on 1-year-old fields were restricted to bare areas. When openings were created in 15-year-old fields, seedling emergence increased and some seedlings established [53,54].

Rarely is common mullein described in undisturbed communities. The creation of sunny, open sites by heavy grazing, severe storms, logging, fire, or other disturbances is generally necessary for common mullein establishment, growth, and reproductive success.

Fire adaptations: Common mullein is typical in early postfire communities [14,23,24,86]. In most cases, common mullein establishes from soil-stored seed on burned sites. For additional information, see [Plant Response to Fire](#).