To: The Delegates of the Na[illegible]nal Open

From: Grass Awn Survey Commitee

July 2, 2023

Atached find a protocol example from Chris Benda, who prepared the surveys at Pyramid State Park in Illinois for the 2020 NAC. Copy of Chris' 2019 reports atached. Chris' work con[illegible]ues to represent a worthy model for further surveys.

Chris also shared the following:

> Regarding your questions and comments:
>
> As far as whom to hire, the person needs to be proficient in the identification of grasses. This is expert level botany and it will likely be difficult to find someone with the qualifications required that is also available for the surveys as many agencies do not permit outside contractual services by their staff. They need not necessarily have any certifications or degrees in the subject, as occasionally, there are non-professionals that might be sufficiently able to identify plants (including grasses) so they might not need to be a professional. I would inquire with local universities, especially USDA soil and water conservation offices and university extension services (that's how Jerry found me).
>
> Distance between tracks - this should be up to the opinion of the surveyor as to how far they can see plants. The issue is that the closer we mandate the tracks to be, the longer it will take to conduct the surveys, depending on how large the field is, and thus the more it will cost. However, I put a 50 meter minimum distance in between passes in the document. The app I use for GPS shows my tracks on my phone in the field so I can ensure that coverage is close enough to identify plants in between tracks. Alternatively, the surveyor can place flagging tape along their route as a guide on the subsequent pass, but then they should really remove the flags when they are done, which would be time consuming and more expensive.
>
> The universal FQA calculator has many databases that can be used depending on the region in question. However, it is true that a database might not be available for that area. It is not essential that it be used, a list in a spreadsheet or other document can suffice for the list of plants encountered. Another note is that there will always be differences in plant names due to taxonomic issues and common names are often misleading or different between regions. When in doubt, ask for the current botanical names per the USDA plants database.

I asked for some sort of lis[illegible]g of the various acronyms that "botanist types" might use, but Chris wasn't able to provide one. Unfortunately this doesn't seem to be a situa[illegible]on where acronyms alone can provide any comfort around qualifica[illegible]ons for the task at hand, so each commitee will have to interview their poten[illegible]l survey provider and assure themselves that the person/company is adequately knowledgeable to render an opinion and understands the purpose of the project.

Peyton Loss inquired about the commitee's work, and we looped her in on the discussion. She made the following addi[illegible]nal observa[illegible]ons. If the NOC (or ESSFTA, or NAC) wish to form a standing commitee on this topic I suggest contac[illegible]g Peyton to determine if she might be interested in chairing (loss025@umn.edu).

> I looked over the "Protocol for Vegetation Survey..." from Chris. I'm unsure which acronyms you mentioned but my two initial thoughts are 1) Random meandering may introduce unconscious bias. An individual may choose or not choose a certain path without even thinking about it. Would

it be worth considering a set number of points, say per acre that are predetermined using GPS? One option would be to do grid sampling or stratified random sampling with quadrats, and 2) it says that the professional will maintain a minimum of 50 meters between tracks. Is that correct? Would it be beneficial to decide on an explicit range so tracks are no closer than 50 meters but no further than say 100?

Additionally, I think this is a great idea and effort put forth by the national committee. Can you catch me up to speed on what the overall objectives are? Is it a goal to have the national committee create a network of professional resources (USDA, SWCD, Extension, etc.) that the interclubs can use to administer these surveys?

Would something similar to the attached document [Grassland Monitoring Team Quality and Invasive Indicators . . .pdf – attached] be useful? If we were to determine based on the USDA Plant Hardiness Zone Map which grasses of interest may be present in each zone it would be a tool that clubs could use to identify their potential risks based on their location and then more easily communicate their needs with their professional cooperator.

Par□ularly as regards the Na□nals, it seems to me that it could be useful to develop an FAQ for the plants of greatest concern (Canada and Virginia wild rye, cheatgrass, mouse barley) by region, and with notes as to what □me of year these are the greatest hazard to the best of current knowledge. For Na□nal events we have more handlers traveling to areas that they may not be familiar with, so some advance warning seems like it would be par□ularly helpful. The effort to make sure that the trial cover is safe serves the community well, but we should also be doing what we can to make sure that handlers don't get their dogs in trouble when they are airing them. This suggests that the trial commitee look at the airing areas adjacent to the hotel, par□ularly, and consider whether any mowing or other remedia□n just prior to the trial would help safeguard the trial par□ipants, whether to post warnings if remedia□n isn't possible, whether to provide a list/map of safe airing spots in the area, or other such precau□ns. This would be a great service to those atending.

It's encouraging to see greater interest in this subject. It can be discouraging that there aren't brighter lines to steer the trial commitees, but that is no excuse for not making the reasonable efforts to safeguard the dogs. It's certainly not an excuse for doing nothing.

Given the uncertain□s, another takeaway is that Na□nal commitees need to consider this aspect of trial management early on, at least informally. If a property is unsuitable, best to determine that early on to avoid last minute disrup□ns in planning as well as keep costs of obtaining surveys to the reasonable minimum.

Cathy Lewis
Commitee Chair

Commitee Members:

John Dunn
Alan Young
Rick Paquin

With thanks to Jerry Barret for facilita□g communica□ns with Chris Benda and Peyton Loss for heinput.

Protocols for Vegetation Surveys of Field Trials Sites
Created by Chris Benda, Botanist, Makanda, IL
www.illinoisbotanizer.com

PURPOSE: This document is meant to serve as a guide for conducting vegetation surveys for English Springer Spaniel Field Trials (ESSFT) regarding identifying any plants that might pose a risk for dogs.

PROBLEM: Seeds from some plants found regularly in the cover used for Spaniel field trials can penetrate the dog's skin and/or are inhaled as the dog is questing for game. These seeds can carry problematic bacteria from their environment or pick up bacteria in the mouth as they are inhaled which can create an abcessing infection in the dog's body. Barbed or awned seeds frequently migrate once they enter the dog's body and potentially create more widespread infections. These infections, particularly in the chest cavity or lung, can be debilitating to fatal for the affected dog. In order to safeguard the field trial participants' dogs it is imperative that diligence be exercised to provide as detailed a report as possible to inform participants of the plants present at the site.

SOLUTION: In order to serve the best interests of the field trial participants and their dogs, it is recommended that managers of the field trials hire an agronomist, botanist, or taxonomist to conduct vegetation surveys throughout the grasslands where the field trials are set to occur and provide a report of the findings far enough in advance of an event to allow for changes in plans if significant hazards are found. The hired professional is required to be proficient in the identification of grasses.

MONITORING: The hired professional will thoroughly survey all potential areas that might be used for the field trials. It is recommended that more grasslands than required be selected for the surveys so there are backup sites as a contingency. Surveys should employ a random meander method for inspection of the vegetation present. Using Global Positioning System (GPS), the surveyor will record their tracks to overlay on aerial imagery. The hired professional will maintain a minimum of 50 meters in between tracks to ensure adequate coverage. It is recommended that the surveyor identify all plants encountered during the survey. Plants should be identified to the species level, but in some cases, plants might only be able to be identified to the genus level. Ideally, several surveys throughout the growing season should be conducted, but if that's not possible a qualified botanist should be able to identify most of the dominant vegetation during one visit any time of the year.

The list of plants identified at each site will be entered into the Universal FQA calculator (https://universalfqa.org/) if a database is available for the region where the surveys occur. This tool will generate a table with conservation metrics such as species richness, in addition to plant characteristics and botanical and common names for each plant species. FQA stands for Floristic Quality Analysis and is an easy way to consistently present a list of plants and allow participants to understand the natural quality of a site, in a general sense. Sites with higher coefficient of conservatism values (C values) are higher in natural quality and more representative of a site with intact natural community remnants, and therefore to be less infested with "weeds," which includes some of the plants reported to cause problems for dogs. Plant nomenclature will follow whatever database is selected and if none is applicable, the surveyor will present the current botanical and common names for plants as listed on the USDA Plants database, located at https://plants.usda.gov/home.

A list of all plants identified and areas surveyed will be provided in a report that will be made available to participants. Areas with potentially problematic plant species will be recorded with GPS and denoted on the map of the areas surveyed. Problematic species will vary from site to site, but generally includes grasses with awns or barbs or plants with other armature. Additionally, photos will be taken, or specimens collected, of each potentially problematic plant species so they can be verified as necessary.

DISCLAIMER: The report serves as a guide for participants to better understand the conditions of the fields where the field trials occur. It is logistically impossible to provide a comprehensive assessment of the areas surveyed. Problematic plants might still occur in the areas surveyed. The surveyor will not be held responsible for issues that arise from the field trials.

ENCLOSURE: The attached report serves as an example of the deliverable that is expected to be submitted to the hiring committee.

Last updated 2/24/2023

Spring Survey of 5 grasslands at Pyramid State Park in Perry County, Illinois

Report by Christopher David Benda, M.S.

March 2019

A survey of 5 grasslands that may be used for field competition exercises at Pyramid State Park in Perry County, Illinois was performed on March 29th and 31st in 2019 (Figure 1.). The objective of the survey was to locate occurrences of plants because some may be harmful to dogs. One resource chronicling these plants of concern, often referred to as "mean seeds" is located at the url http://www.meanseeds.com/resources/the-bad-grass-list/.

All vascular plant species encountered in the 5 grasslands were recorded and the list, along with some floristic metrics, is provided (Table 1.). A total of 97 species were observed within the 5 fields (Fig 1-5.). These maps include locations of two plants that are included among the list of "mean seeds" that might be harmful to dogs.

Other plants that inhabit the fields are listed in the report and some may possibly be of concern to dog enthusiasts. This report attempts to inform the reader so that each individual can make his or her own decision regarding their participation in events held at the locations listed in the report. All dog owners, handlers, and participants should review the list of plants and endeavor to become educated with regard to "mean seeds" and make independent decisions regarding the safety of their animals. This report is descriptive in nature and neither its author nor the committee that commissioned it can guarantee the safety of any individual dog from harmful plants. It is impossible to certify any field as 100% clear of harmful plants; however, the providers of this report are confident that each field was surveyed intensively and pertinent information regarding harmless plants is provided.

At least two locations contained some plants of concern. Virginia Wild Rye (*Elymus virginicus*) was observed in small numbers in fields 1 and 3. Field 1 contains approximately 12 plants in a very small area and field 3 contains a 20ft x 20ft patch of approximately 100 plants. Nimblewill (*Muhlenbergia schreberi*) was also mentioned on one of the websites provided in the initial request and was observed on the NW edge of field 2. These locations are indicated on the maps provided. The areas not surveyed in field 5 were mowed at the time of the survey. Other areas in many of the fields contained dense stands of Common Reed (*Phragmites australis*).

Additionally, the maps contain the tracks the two botanists followed in each field. Another survey is planned for August 2019.

Note: It is impossible to guarantee that any of the harmful plants are not present in each field and the providers of this survey are not liable for any issues that may occur in these fields during the competition. However, we are confident that each field was adequately surveyed.

Pyramid State Park
3/31/2019
Practitioner: Chris Benda

Conservatism Metrics:		
Total Mean C:	1.3	
Native Mean C:	2.2	
Total FQI:	12.8	
Native FQI:	16.6	
Adjusted FQI:	16.9	
% C value 0:	51.5	
% C value 1-3:	34	
% C value 4-6:	14.4	
% C value 7-10:	0	
Native Tree Mean C:	2.4	
Native Shrub Mean C:	2	
Native Herbaceous Mean C:	2.2	

Species Richness:		
Total Species:	97	
Native Species:	57	58.80%
Non-native Species:	40	41.20%

Species Wetness:		
Mean Wetness:	1.5	
Native Mean Wetness:	0.4	

Physiognomy Metrics:		
Tree:	8	8.20%
Shrub:	7	7.20%
Vine:	1	1%
Forb:	64	66%
Grass:	16	16.50%
Sedge:	1	1%
Rush:	0	0%
Fern:	0	0%
Bryophyte:	0	0%

Duration Metrics:		
Annual:	28	28.90%
Perennial:	58	59.80%
Biennial:	11	11.30%
Native Annual:	11	11.30%
Native Perennial:	42	43.30%
Native Biennial:	4	4.10%

Species:

Scientific Name	Native?	C	Physiognomy	Duration	Common Name
Acer negundo	native	1	tree	perennial	boxelder
Achillea millefolium	non-native	0	forb	perennial	common milfoil
Agrimonia parviflora	native	5	forb	perennial	swamp agrimony
Alisma plantago-aquatica v. parviflorum	native	2	forb	perennial	common water plantain
Allium vineale	non-native	0	forb	perennial	field garlic
Ambrosia trifida	native	0	forb	annual	giant ragweed
Andropogon gerardii	native	5	grass	perennial	big bluestem
Andropogon virginicus	native	1	grass	perennial	broom sedge
Apocynum cannabinum	native	2	forb	perennial	dogbane
Arabidopsis thaliana	non-native	0	forb	annual	mouse-eared cress
Arenaria serpyllifolia	non-native	0	forb	annual	thyme-leaved sandwort
Asclepias syriaca	native	0	forb	perennial	common milkweed
Aster lateriflorus	native	2	forb	perennial	side-flowering aster
Barbarea vulgaris	non-native	0	forb	biennial	winter cress
Boehmeria cylindrica	native	3	forb	perennial	false nettle
Bromus inermis	non-native	0	grass	perennial	hungarian brome
Capsella bursa-pastoris	non-native	0	forb	annual	shepherds purse
Cardamine hirsuta	non-native	0	forb	annual	hairy bitter cress
Carex glaucodea	native	5	sedge	perennial	blue sedge
Celtis occidentalis	native	3	tree	perennial	hackberry
Cerastium dubium	non-native	0	forb	annual	three-styled chickweed
Cirsium discolor	native	3	forb	biennial	pasture thistle
Cirsium vulgare	non-native	0	forb	biennial	bull thistle
Conium maculatum	non-native	0	forb	biennial	poison hemlock
Conyza canadensis	native	0	forb	annual	horseweed
Cornus drummondii	native	2	shrub	perennial	rough-leaved dogwood
Corydalis flavula	native	5	forb	biennial	pale corydalis
Daucus carota	non-native	0	forb	biennial	queen annes lace
Digitaria sanguinalis	non-native	0	grass	annual	hairy crab grass
Dipsacus laciniatus	non-native	0	forb	biennial	cut-leaved teasel
Dipsacus sylvestris	non-native	0	forb	biennial	common teasel
Draba brachycarpa	native	2	forb	annual	whitlow grass
Elaeagnus umbellata	non-native	0	shrub	perennial	autumn olive
Elymus virginicus	native	4	grass	perennial	virginia wild rye
Erigeron philadelphicus	native	3	forb	perennial	marsh fleabane
Eupatorium coelestinum	native	3	forb	perennial	mistflower
Galium aparine	native	0	forb	annual	annual bedstraw
Galium pedemontanum	non-native	0	forb	annual	foothill bedstraw
Geranium carolinianum	native	2	forb	annual	carolina cranesbill
Gleditsia triacanthos	native	2	tree	perennial	honey locust
Helianthus tuberosus	native	3	forb	perennial	jerusalem artichoke

Holosteum umbellatum	non-native	0	forb	annual	jagged chickweed
Juncus dudleyi	native	4	forb	perennial	dudleys rush
Juncus effusus v. solutus	native	4	forb	perennial	common rush
Juniperus virginiana	native	1	tree	perennial	eastern red cedar
Lactuca canadensis	native	1	forb	biennial	wild lettuce
Lamium amplexicaule	non-native	0	forb	annual	henbit
Lepidium virginicum	native	0	forb	annual	common peppergrass
Lespedeza cuneata	non-native	0	forb	perennial	silky bush clover
Lonicera japonica	non-native	0	vine	perennial	japanese honeysuckle
Lonicera maackii	non-native	0	shrub	perennial	amur honeysuckle
Lotus corniculatus	non-native	0	forb	perennial	birdsfoot trefoil
Medicago lupulina	non-native	0	forb	annual	black medick
Medicago sativa	non-native	0	forb	perennial	alfalfa
Muhlenbergia schreberi	native	0	grass	perennial	nimblewill
Oenothera biennis	native	1	forb	biennial	evening primrose
Oxalis stricta	native	0	forb	perennial	tall wood sorrel
Panicum capillare	native	0	grass	annual	old witch grass
Panicum virgatum	native	4	grass	perennial	prairie switch grass
Phragmites australis	native	1	grass	perennial	common reed
Phytolacca americana	native	1	forb	perennial	pokeweed
Plantago lanceolata	non-native	0	forb	perennial	english plantain
Platanus occidentalis	native	3	tree	perennial	buttonwood
Poa pratensis	non-native	0	grass	perennial	kentucky blue grass
Populus deltoides	native	2	tree	perennial	eastern cottonwood
Potentilla simplex	native	3	forb	perennial	common cinquefoil
Pycnanthemum tenuifolium	native	4	forb	perennial	slender mountain mint
Quercus palustris	native	4	tree	perennial	pin oak
Ranunculus abortivus	native	1	forb	annual	little-leaf buttercup
Rhus copallina	native	3	shrub	perennial	dwarf sumac
Rhus glabra	native	1	shrub	perennial	smooth sumac
Rosa multiflora	non-native	0	shrub	perennial	japanese rose
Rubus allegheniensis	native	2	shrub	perennial	common blackberry
Rumex verticillatus	native	5	forb	perennial	swamp dock
Salix nigra	native	3	tree	perennial	black willow
Schizachyrium scoparium	native	5	grass	perennial	little bluestem
Setaria glauca	non-native	0	grass	annual	pigeon grass
Solidago canadensis	native	1	forb	perennial	canada goldenrod
Sonchus arvensis	non-native	0	forb	perennial	field sow thistle
Sorghastrum nutans	native	4	grass	perennial	indian grass
Sporobolus asper	native	3	grass	perennial	rough dropseed
Stellaria pallida	non-native	0	forb	annual	sand chickweed
Taraxacum officinale	non-native	0	forb	perennial	common dandelion
Thlaspi arvense	non-native	0	forb	annual	field penny cress
Tridens flavus	native	1	grass	perennial	common purpletop
Trifolium repens	non-native	0	forb	perennial	white clover

Triticum aestivum	non-native	0	grass	annual	wheat
Typha angustifolia	non-native	0	forb	perennial	narrow-leaved cattail
Valerianella radiata	native	1	forb	annual	corn salad
Verbascum thapsus	non-native	0	forb	biennial	woolly mullein
Verbena hastata	native	3	forb	perennial	blue vervain
Vernonia gigantea	native	4	forb	perennial	tall iron weed
Veronica arvensis	non-native	0	forb	annual	corn speedwell
Veronica peregrina	native	0	forb	annual	purslane speedwell
Vicia dasycarpa	non-native	0	forb	annual	woolly-pod vetch
Viola rafinesquii	non-native	0	forb	annual	wild pansy
Xanthium strumarium	native	0	forb	annual	cocklebur

Figure 1. Field 1 at Pyramid State Park.

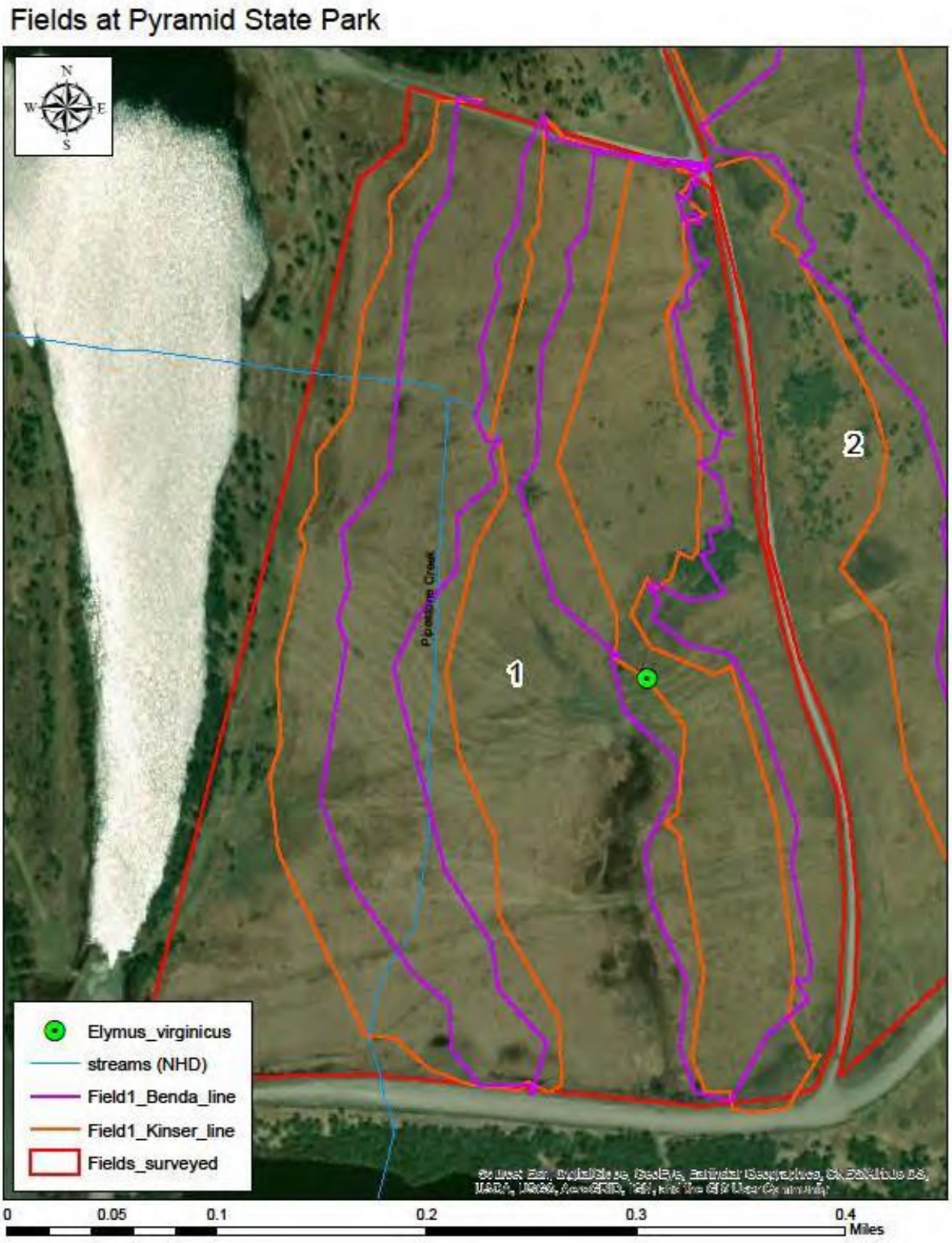


Figure 2. Field 2 at Pyramid State Park.

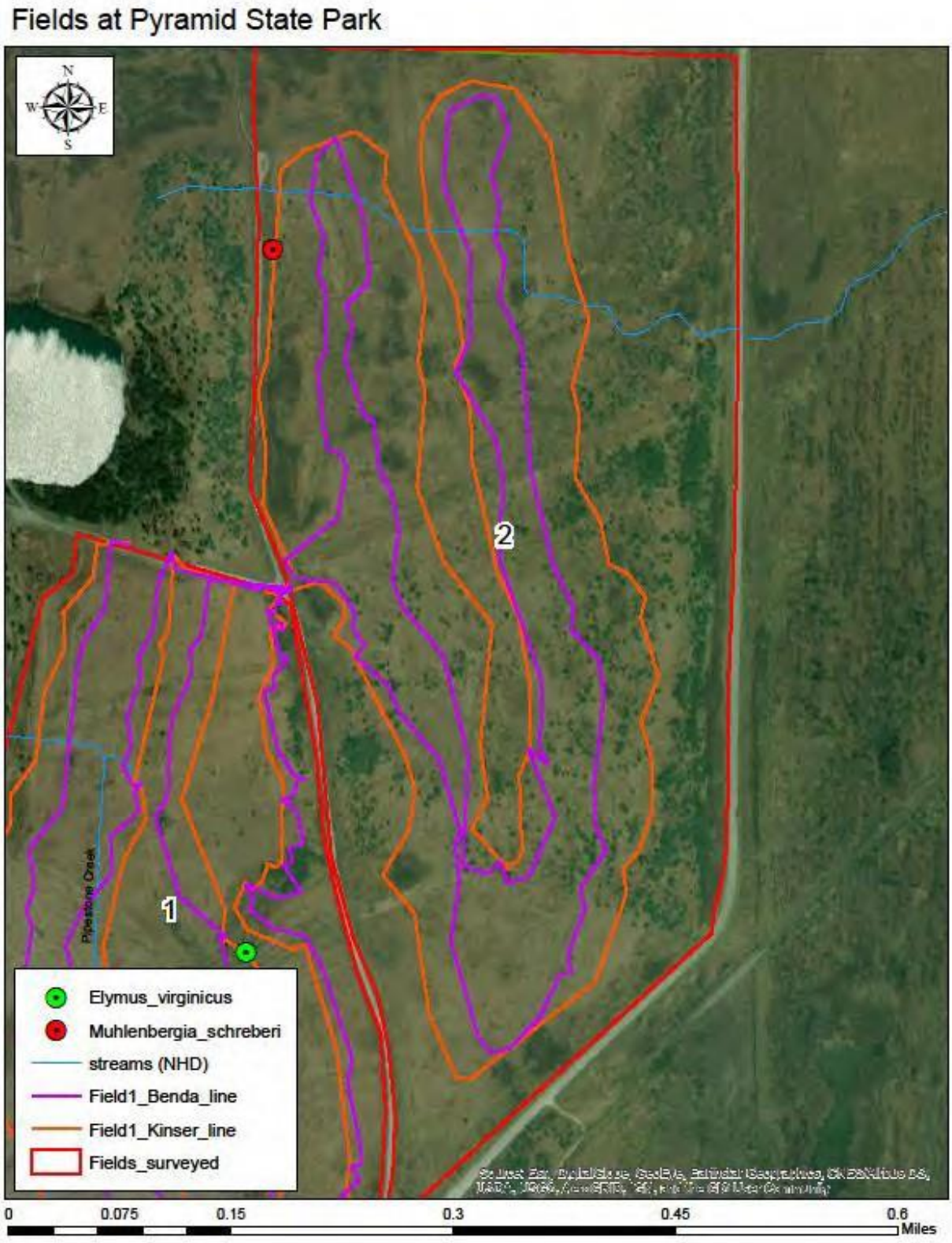


Figure 3. Field 3 at Pyramid State Park.

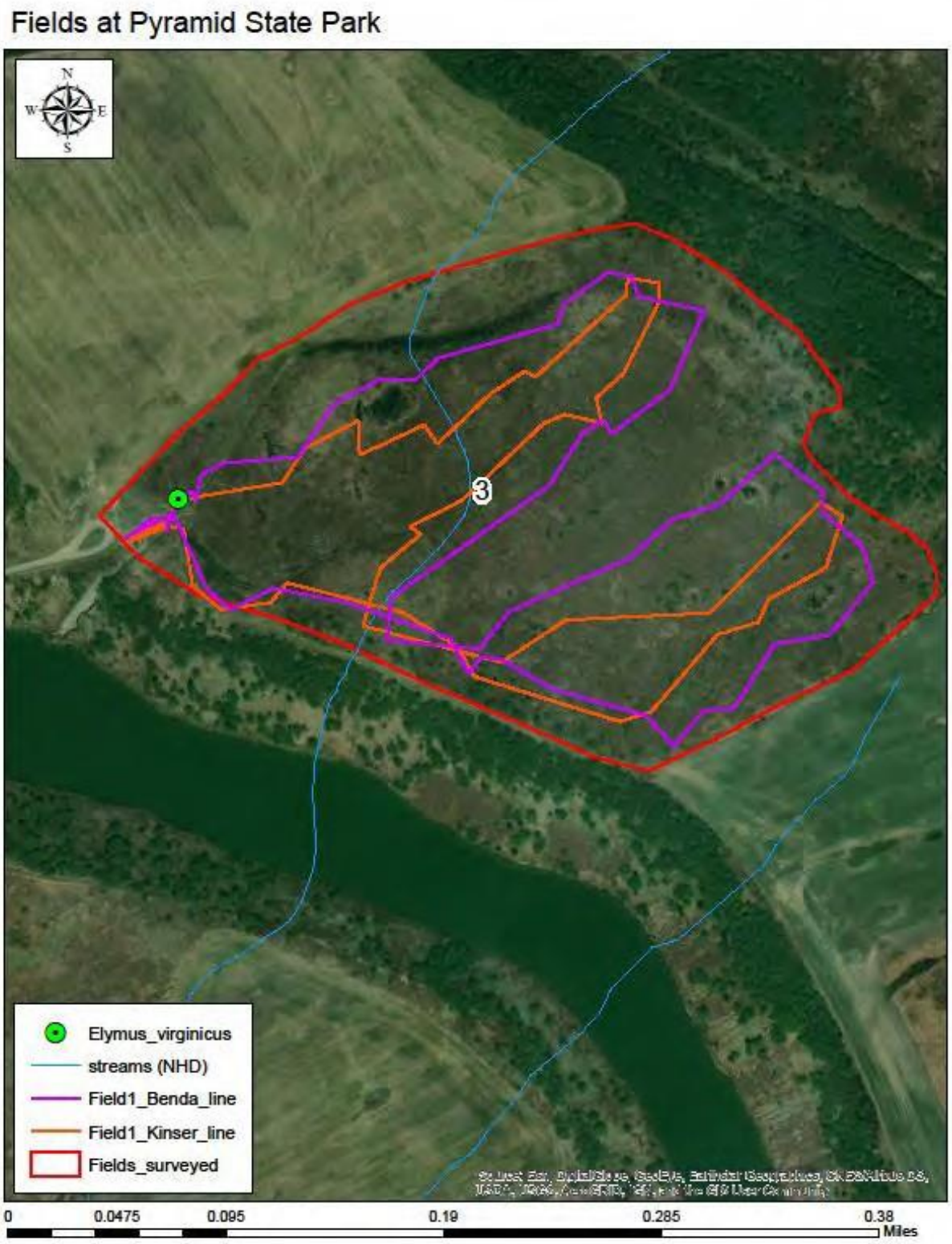


Figure 4. Field 4 at Pyramid State Park.

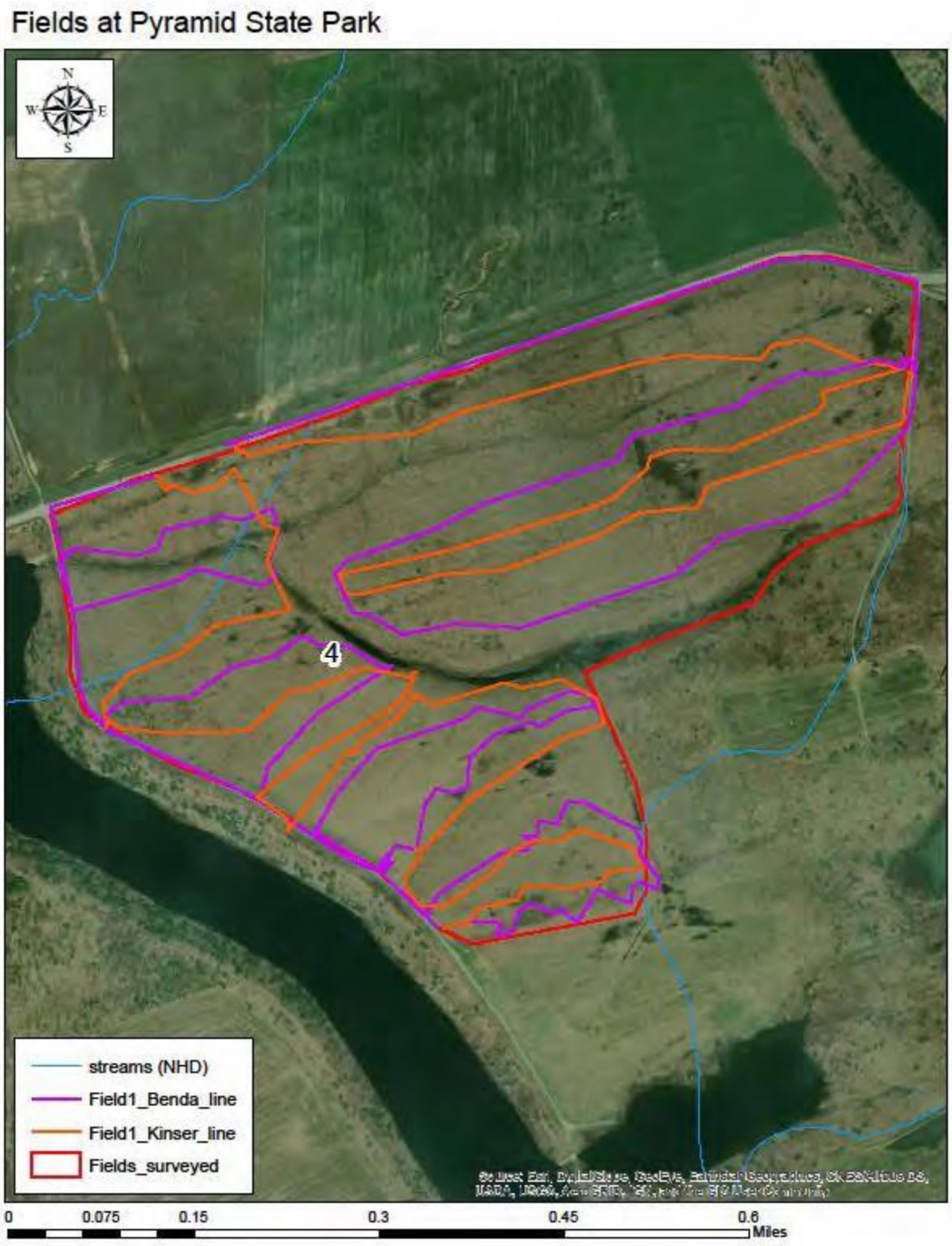


Figure 5. Field 5 at Pyramid State Park.

Summer Survey of 5 grasslands at Pyramid State Park in Perry County, Illinois

Report by Christopher David Benda, M.S.
www.illinoisbotanizer.com

August 2019

A survey of 5 grasslands that may be used for field competition exercises at Pyramid State Park in Perry County, Illinois was performed on August 12th and 13th in 2019 (Figure 1.). The objective of the survey was to locate occurrences of plants because some may be harmful to dogs. One resource chronicling these plants of concern, often referred to as "mean seeds" is located at the URL http://www.meanseeds.com/resources/the-bad-grass-list/.

All vascular plant species encountered in the 5 grasslands were recorded and the list, along with some floristic metrics, is provided (Table 1.). A total of 206 species were observed within the 5 fields (Fig 1-5.) during the March and August surveys in 2019. Nomenclature follows Taft *et al*. 1997, Floristic Quality Assessment for Vegetation in Illinois, A Method for Assessing Vegetation Integrity (https://ill-inps.org/erigenia/#15). There are 4 species that are not in table 1 (or floristic quality analysis) because of taxonomic reasons and include *Carex aureolensis*, *Carex mesochorea*, *Chamaesyce nutans*, and *Polygonum coccinea*. A total of 52 species of the 97 species located last spring were relocated during the summer surveys. An additional 109 species were added to the total list during the summer surveys (Table 2.).

Figures 1-5 are maps that include several locations found during the summer survey of one plant species (Virginia Wild Rye, *Elymus virginicus*) that is included among the list of "mean seeds" that might be harmful to dogs. Additionally, the maps contain the tracks the two botanists followed in each field during both the spring and summer surveys.

At least 3 fields contained some plants of concern. Field 1 has 4 *Elymus virginicus* populations that occur within the tall Common Reed (*Phragmites australis*) in the ditches to the south. Field 3 has 4 *Elymus virginicus* populations that occur near the front of the field by the parking area (southern edge). Field 4 has many *Elymus virginicus* populations in the ditches in between the fields. This field was also partially mowed during the summer survey. These locations are indicated on the maps provided and GPS coordinates for each occurrence of *Elymus virginicus* are also provided in Table 3 and follow the WGS 1984 projection system. Nimblewill (*Muhlenbergia schreberi*) was also mentioned on one of the websites provided in the initial request and was observed on the NW edge of field 2 during the spring survey, but the plants were not relocated during the summer survey.

Other plants that inhabit the fields are listed in the tables and some may possibly be of concern to dog enthusiasts. This report attempts to inform the reader so that each individual can make his or her own decision regarding their participation in events held at the locations listed in the report. All dog owners, handlers, and participants should review the list of plants and endeavor to become educated with regard to "mean seeds" and make independent decisions regarding the safety of their animals. This report is descriptive in nature and neither its author nor the committee that commissioned it can guarantee the safety of any individual dog from harmful plants. It is impossible to certify any field as 100% clear of harmful plants; however, the providers of this report are confident that each field was surveyed intensively and pertinent information regarding harmless plants is provided.

Table 1. Total Species List for 5 Grasslands at Pyramid State Park.

8/13/2019
Practitioners:
Chris Benda & Abel Kinser

Conservatism-Based Metrics:		
Total Mean C:	1.6	
Native Mean C:	2.5	
Total FQI:	22.7	
Native FQI:	28.6	
Adjusted FQI:	20.1	
% C value 0:	46.5	
% C value 1-3:	34.2	
% C value 4-6:	17.8	
% C value 7-10:	1.5	
Native Tree Mean C:	2.4	
Native Shrub Mean C:	2	
Native Herbaceous Mean C:	2.5	
Species Richness:		
Total Species:	202	
Native Species:	131	64.90%
Non-native Species:	71	35.10%
Species Wetness:		
Mean Wetness:	0.9	
Native Mean Wetness:	-0.1	
Physiognomy Metrics:		
Tree:	12	5.90%
Shrub:	7	3.50%
Vine:	5	2.50%
Forb:	125	61.90%
Grass:	38	18.80%
Sedge:	15	7.40%
Duration Metrics:		
Annual:	60	29.70%
Perennial:	123	60.90%
Biennial:	19	9.40%
Native Annual:	32	15.80%
Native Perennial:	93	46%
Native Biennial:	6	3%

Species:

Scientific Name	Native?	C value	Physiognomy	Duration	Common Name
Acalypha gracilens	native	4	forb	annual	slender three-seeded mercury
Acalypha virginica	native	2	forb	annual	three-seeded mercury
Acer negundo	native	1	tree	perennial	boxelder
Achillea millefolium	non-native	0	forb	perennial	common milfoil
Agrimonia parviflora	native	5	forb	perennial	swamp agrimony
Agropyron repens	non-native	0	grass	perennial	quack grass
Agrostis alba	native	0	grass	perennial	red top
Alisma plantago-aquatica v. parviflorum	native	2	forb	perennial	common water plantain
Allium vineale	non-native	0	forb	perennial	field garlic
Ambrosia artemisiifolia	native	0	forb	annual	common ragweed
Ambrosia trifida	native	0	forb	annual	giant ragweed
Ammannia coccinea	native	5	forb	annual	long-leaved ammannia
Andropogon gerardii	native	5	grass	perennial	big bluestem
Andropogon virginicus	native	1	grass	perennial	broom sedge
Apocynum cannabinum	native	2	forb	perennial	dogbane
Arabidopsis thaliana	non-native	0	forb	annual	mouse-eared cress
Arenaria serpyllifolia	non-native	0	forb	annual	thyme-leaved sandwort
Asclepias hirtella	native	6	forb	perennial	tall green milkweed
Asclepias incarnata	native	4	forb	perennial	swamp milkweed
Asclepias syriaca	native	0	forb	perennial	common milkweed
Aster lateriflorus	native	2	forb	perennial	side-flowering aster
Aster pilosus	native	0	forb	perennial	hairy aster
Barbarea vulgaris	non-native	0	forb	biennial	winter cress
Bidens aristosa v. retrorsa	native	1	forb	annual	bur marigold
Bidens connata	native	2	forb	annual	purplestemmed tickseed
Bidens vulgata	native	0	forb	annual	tall beggars ticks
Boehmeria cylindrica	native	3	forb	perennial	false nettle
Bouteloua curtipendula	native	7	grass	perennial	side-oats grama
Bromus arvensis	non-native	0	grass	perennial	chess
Bromus inermis	non-native	0	grass	perennial	hungarian brome
Campsis radicans	native	2	vine	perennial	trumpet creeper
Capsella bursa-pastoris	non-native	0	forb	annual	shepherds purse
Cardamine hirsuta	non-native	0	forb	annual	hairy bitter cress
Carduus nutans	non-native	0	forb	biennial	musk bristle thistle
Carex blanda	native	2	sedge	perennial	common wood sedge
Carex festucacea	native	6	sedge	perennial	fescue oval sedge
Carex frankii	native	4	sedge	perennial	bristly cattail sedge

Carex glaucodea	native	5	sedge	perennial	blue sedge
Carex hirsutella	native	5	sedge	perennial	hairy green sedge
Carex squarrosa	native	5	sedge	perennial	narrow-leaved cattail sedge
Carex tribuloides	native	3	sedge	perennial	awl-fruited oval sedge
Carex vulpinoidea	native	3	sedge	perennial	brown fox sedge
Cassia fasciculata	native	1	forb	annual	golden cassia
Cassia marilandica	native	4	forb	perennial	maryland senna
Celtis occidentalis	native	3	tree	perennial	hackberry
Cerastium dubium	non-native	0	forb	annual	three-styled chickweed
Chamaesyce supina	native	0	forb	annual	spotted creeping spurge
Cirsium discolor	native	3	forb	biennial	pasture thistle
Cirsium vulgare	non-native	0	forb	biennial	bull thistle
Conium maculatum	non-native	0	forb	biennial	poison hemlock
Conyza canadensis	native	0	forb	annual	horseweed
Cornus drummondii	native	2	shrub	perennial	rough-leaved dogwood
Corydalis flavula	native	5	forb	biennial	pale corydalis
Croton capitatus	native	0	forb	annual	hogwort
Croton monanthogynus	native	2	forb	annual	prairie tea
Cynanchum laeve	native	1	vine	perennial	blue vine
Cyperus esculentus	native	0	sedge	perennial	field nut sedge
Cyperus ovularis	native	2	sedge	perennial	hedgehog club rush
Cyperus strigosus	native	0	sedge	perennial	longl-scaled nut sedge
Dactylis glomerata	non-native	0	grass	perennial	orchard grass
Daucus carota	non-native	0	forb	biennial	queen annes lace
Desmanthus illinoensis	native	4	forb	perennial	illinois bundle flower
Digitaria sanguinalis	non-native	0	grass	annual	hairy crab grass
Diospyros virginiana	native	2	tree	perennial	persimmon
Dipsacus laciniatus	non-native	0	forb	biennial	cut-leaved teasel
Dipsacus sylvestris	non-native	0	forb	biennial	common teasel
Draba brachycarpa	native	2	forb	annual	short-fruited whitlow grass
Echinochloa crusgalli	non-native	0	grass	annual	barnyard grass
Echinochloa muricata	native	0	grass	annual	spiny barnyard grass
Elaeagnus umbellata	non-native	0	shrub	perennial	autumn olive
Eleocharis elliptica v. compressa	native	7	sedge	perennial	flat-stemmed spike rush
Eleocharis obtusa	native	2	sedge	annual	blunt spike rush
Eleocharis palustris	native	8	sedge	perennial	great spike rush
Eleusine indica	non-native	0	grass	annual	crowfoot grass
Elymus virginicus	native	4	grass	perennial	virginia wild rye

Eragrostis minor	non-native	0	grass	annual	lesser love grass
Eragrostis pectinacea	native	0	grass	annual	small love grass
Eragrostis spectabilis	native	3	grass	perennial	purple love grass
Erechtites hieracifolia	native	2	forb	annual	fireweed
Erigeron annuus	native	1	forb	biennial	annual fleabane
Erigeron philadelphicus	native	3	forb	perennial	marsh fleabane
Eriochloa contracta	non-native	0	grass	annual	prairie cup grass
Eupatorium altissimum	native	2	forb	perennial	tall boneset
Eupatorium coelestinum	native	3	forb	perennial	mistflower
Eupatorium perfoliatum	native	4	forb	perennial	common boneset
Eupatorium serotinum	native	1	forb	perennial	late boneset
Euthamia graminifolia	native	3	forb	perennial	grass-leaved goldenrod
Festuca pratensis	non-native	0	grass	perennial	meadow fescue
Galium aparine	native	0	forb	annual	annual bedstraw
Galium pedemontanum	non-native	0	forb	annual	foothill bedstraw
Gaura parviflora	non-native	0	forb	biennial	small-flowered gaura
Geranium carolinianum	native	2	forb	annual	carolina cranesbill
Gleditsia triacanthos	native	2	tree	perennial	honey locust
Gnaphalium obtusifolium	native	2	forb	biennial	old-field balsam
Helianthus annuus	non-native	0	forb	annual	common sunflower
Hibiscus lasiocarpus	native	5	forb	perennial	hairy rose mallow
Holosteum umbellatum	non-native	0	forb	annual	jagged chickweed
Hypericum punctatum	native	3	forb	perennial	spotted st. johns wort
Ipomoea pandurata	native	2	forb	perennial	wild sweet potato
Iva annua	native	0	forb	annual	marsh elder
Juncus acuminatus	native	4	forb	perennial	sharp-fruited rush
Juncus biflorus	native	5	forb	perennial	two-flowered rush
Juncus dudleyi	native	4	forb	perennial	dudleys rush
Juncus effusus v. solutus	native	4	forb	perennial	common rush
Juncus tenuis	native	0	forb	perennial	path rush
Juncus torreyi	native	3	forb	perennial	torreys rush
Juniperus virginiana	native	1	tree	perennial	eastern red cedar
Kummerowia striata	non-native	0	forb	annual	japanese lespedeza
Lactuca canadensis	native	1	forb	biennial	wild lettuce
Lactuca saligna	non-native	0	forb	biennial	willow-leaved lettuce
Lactuca serriola	non-native	0	forb	biennial	prickly lettuce
Lamium amplexicaule	non-native	0	forb	annual	henbit
Leersia oryzoides	native	3	grass	perennial	rice cut grass
Lepidium virginicum	native	0	forb	annual	common peppergrass
Lespedeza cuneata	non-native	0	forb	perennial	silky bush clover
Lonicera japonica	non-native	0	vine	perennial	japanese honeysuckle

Lonicera maackii	non-native	0	shrub	perennial	amur honeysuckle
Lotus corniculatus	non-native	0	forb	perennial	birdsfoot trefoil
Ludwigia palustris v. americana	native	4	forb	perennial	marsh purslane
Ludwigia peploides v. glabrescens	native	5	forb	perennial	creeping primrose willow
Lycopus americanus	native	3	forb	perennial	common water horehound
Medicago lupulina	non-native	0	forb	annual	black medick
Medicago sativa	non-native	0	forb	perennial	alfalfa
Melilotus alba	non-native	0	forb	biennial	white sweet clover
Melilotus officinalis	non-native	0	forb	biennial	yellow sweet clover
Mimulus alatus	native	6	forb	perennial	winged monkey flower
Morus alba	non-native	0	tree	perennial	white mulberry
Morus rubra	native	4	tree	perennial	red mulberry
Muhlenbergia schreberi	native	0	grass	perennial	nimblewill
Oenothera biennis	native	1	forb	biennial	common evening primrose
Oxalis stricta	native	0	forb	perennial	tall wood sorrel
Panicum capillare	native	0	grass	annual	old witch grass
Panicum philadelphicum	native	5	grass	annual	philadelphia panic grass
Panicum virgatum	native	4	grass	perennial	prairie switch grass
Paspalum laeve	native	2	grass	perennial	smooth lens grass
Paspalum pubiflorum v. glabrum	native	3	grass	perennial	four-rowed bead grass
Passiflora incarnata	native	3	vine	perennial	large passion flower
Phalaris arundinacea	non-native	0	grass	perennial	reed canary grass
Phleum pratense	non-native	0	grass	perennial	timothy
Phragmites australis	native	1	grass	perennial	common reed
Phyla lanceolata	native	1	forb	perennial	fog fruit
Physalis longifolia	non-native	0	forb	perennial	tall ground cherry
Phytolacca americana	native	1	forb	perennial	pokeweed
Plantago aristata	native	1	forb	annual	poor joe
Plantago lanceolata	non-native	0	forb	perennial	english plantain
Plantago major	non-native	0	forb	perennial	common plantain
Platanus occidentalis	native	3	tree	perennial	buttonwood
Poa compressa	non-native	0	grass	perennial	canadian blue grass
Poa pratensis	non-native	0	grass	perennial	kentucky blue grass
Polygonum hydropiperoides	native	4	forb	perennial	mild water pepper
Polygonum persicaria	non-native	0	forb	annual	ladys thumb
Polygonum punctatum	native	3	forb	annual	smartweed
Populus deltoides	native	2	tree	perennial	eastern cottonwood
Portulaca oleracea	non-native	0	forb	annual	purslane

Potentilla simplex	native	3	forb	perennial	common cinquefoil
Pycnanthemum tenuifolium	native	4	forb	perennial	slender mountain mint
Pyrrhopappus carolinianus	native	1	forb	annual	false dandelion
Quercus palustris	native	4	tree	perennial	pin oak
Ranunculus abortivus	native	1	forb	annual	little-leaf buttercup
Rhus copallina	native	3	shrub	perennial	dwarf sumac
Rhus glabra	native	1	shrub	perennial	smooth sumac
Robinia pseudo-acacia	native	1	tree	perennial	black locust
Rosa multiflora	non-native	0	shrub	perennial	japanese rose
Rubus allegheniensis	native	2	shrub	perennial	common blackberry
Rudbeckia hirta	native	2	forb	perennial	black-eyed susan
Rumex crispus	non-native	0	forb	perennial	curly dock
Rumex verticillatus	native	5	forb	perennial	swamp dock
Salix nigra	native	3	tree	perennial	black willow
Schizachyrium scoparium	native	5	grass	perennial	little bluestem
Scirpus georgianus	native	4	sedge	perennial	bristleless dark green rush
Setaria faberi	non-native	0	grass	annual	giant foxtail
Setaria glauca	non-native	0	grass	annual	pigeon grass
Sida spinosa	non-native	0	forb	annual	prickly sida
Solanum carolinense	native	0	forb	perennial	horse nettle
Solidago canadensis	native	1	forb	perennial	canada goldenrod
Sonchus arvensis	non-native	0	forb	perennial	field sow thistle
Sorghastrum nutans	native	4	grass	perennial	indian grass
Sorghum halepense	non-native	0	grass	perennial	johnson grass
Sporobolus asper	native	3	grass	perennial	rough dropseed
Stellaria pallida	non-native	0	forb	annual	sand chickweed
Strophostyles leiosperma	native	4	forb	annual	small wild bean
Taraxacum officinale	non-native	0	forb	perennial	common dandelion
Teucrium canadense v. boreale	native	3	forb	perennial	gray germander
Thlaspi arvense	non-native	0	forb	annual	field penny cress
Torilis arvensis	non-native	0	forb	annual	field hedge parsley
Toxicodendron radicans	native	1	vine	perennial	poison ivy
Tridens flavus	native	1	grass	perennial	common purpletop
Trifolium hybridum	non-native	0	forb	perennial	alsike clover
Trifolium pratense	non-native	0	forb	perennial	red clover
Trifolium repens	non-native	0	forb	perennial	white clover
Triticum aestivum	non-native	0	grass	annual	wheat
Typha angustifolia	non-native	0	forb	perennial	narrow-leaved cattail
Valerianella radiata	native	1	forb	annual	corn salad
Verbascum thapsus	non-native	0	forb	biennial	woolly mullein
Verbena hastata	native	3	forb	perennial	blue vervain
Verbena urticifolia	native	3	forb	perennial	white vervian

Vernonia missurica	native	5	forb	perennial	missouri ironweed
Veronica arvensis	non-native	0	forb	annual	corn speedwell
Veronica peregrina	native	0	forb	annual	purslane speedwell
Vicia dasycarpa	non-native	0	forb	annual	woolly-pod vetch
Viola rafinesquii	non-native	0	forb	annual	wild pansy
Xanthium strumarium	native	0	forb	annual	cocklebur

Table 2. Plant species found during the spring and summer survey

Species	Spring	Summer
Acalypha gracilens		x
Acalypha virginica		x
Acer negundo	x	
Achillea millefolium	x	x
Agrimonia parviflora	x	x
Agropyron repens		x
Agrostis alba		x
Alisma plantago-aquatica v. parviflorum	x	
Allium vineale	x	x
Ambrosia artesmisiifolia		x
Ambrosia trifida	x	x
Ammannia coccinea		x
Andropogon gerardii	x	x
Andropogon virginicus	x	
Apocynum cannabinum	x	x
Arabidopsis thaliana	x	
Arenaria serpyllifolia	x	
Asclepias hirtella		x
Asclepias incarnata		x
Asclepias syriaca	x	x
Aster lateriflorus	x	
Aster pilosus		x
Barbarea vulgaris	x	x
Bidens aristosa v. retrorsa		x
Bidens connata		x
Bidens vulgata		x
Boehmeria cylindrica	x	x
Bouteloua curtipendula		x
Bromus arvensis		x
Bromus inermis	x	x
Campsis radicans		x
Capsella bursa-pastoris	x	
Cardamine hirsuta	x	
Carduus nutans		x
Carex aureolensis		x
Carex blanda		x
Carex festucacea		x
Carex frankii		x
Carex glaucodea	x	
Carex hirsutella		x
Carex mesochorea		x
Carex squarrosa		x
Carex tribuloides		x
Carex vulpinoidea		x
Cassia fasciculata		x
Cassia marilandica		x
Celtis occidentalis	x	x
Cerastium dubium	x	
Chamaesyce nutans		x
Chamaesyce supina		x
Cirsium discolor	x	x
Cirsium vulgare	x	x
Conium maculatum	x	
Conyza canadensis	x	x
Cornus drummondii	x	
Corydalis flavula	x	
Croton capitatus		x
Croton monanthogynus		x
Cynanchum laeve		x
Cyperus esculentus		x
Cyperus ovularis		x
Cyperus strigosus		x
Dactylis glomerata		x
Daucus carota	x	x
Desmanthus illinoensis		x
Digitaria sanguinalis	x	
Diospyros virginiana		x
Dipsacus laciniatus	x	
Dipsacus sylvestris	x	x
Draba brachycarpa	x	
Echinochloa crusgalli		x
Echinochloa muricata		x
Elaeagnus umbellata	x	x
Eleocharis elliptica v. compressa		x
Eleocharis obtusa		x
Eleocharis palustris		x
Eleusine indica		x
Elymus virginicus	x	x
Eragrostis minor		x
Eragrostis pectinacea		x
Eragrostis spectabilis		x

Erechtites hieracifolia		x
Erigeron annuus		x
Erigeron philadelphicus	x	x
Eriochloa contracta		x
Eupatorium altissimum		x
Eupatorium coelestinum	x	x
Eupatorium perfoliatum		x
Eupatorium serotinum		x
Euthamia graminifolia		x
Festuca pratensis		x
Galium aparine	x	x
Galium pedemontanum	x	
Gaura parviflora		x
Geranium carolinianum	x	
Gleditsia triacanthos	x	x
Gnaphalium obtusifolium		x
Helianthus annuus	x	
Hibiscus lasiocarpus		x
Holosteum umbellatum	x	
Hypericum punctatum		x
Ipomoea pandurata		x
Iva annua		x
Juncus acuminatus		x
Juncus biflorus		x
Juncus dudleyi	x	x
Juncus effusus v. solutus	x	x
Juncus tenuis		x
Juncus torreyi		x
Juniperus virginiana	x	x
Kummerowia striata		x
Lactuca canadensis	x	x
Lactuca saligna		x
Lactuca serriola		x
Lamium amplexicaule	x	
Leersia oryzoides		x
Lepidium virginicum	x	x
Lespedeza cuneata	x	x
Lonicera japonica	x	x
Lonicera maackii	x	x
Lotus corniculatus	x	x
Ludwigia palustris		x
Ludwigia peploides		x
Lycopus americanus		x

Medicago lupulina	x	
Medicago sativa	x	
Melilotus alba		x
Melilotus officinalis		x
Mimulus alatus		x
Morus alba		x
Morus rubra		x
Muhlenbergia schreberi	x	
Oenothera biennis	x	
Oxalis stricta	x	x
Panicum capillare	x	
Panicum philadelphicum		x
Panicum virgatum	x	x
Paspalum laeve		x
Paspalum pubiflorum v. glabrum		x
Passiflora incarnata		x
Phalaris arundinacea		x
Phleum pratense		x
Phragmites australis	x	x
Phyla lanceolata		x
Physalis longifolia		x
Phytolacca americana	x	x
Plantago aristata		x
Plantago lanceolata	x	x
Plantago major		x
Platanus occidentalis	x	
Poa compressa		x
Poa pratensis	x	
Polygonum coccinea		x
Polygonum hydropiperoides		x
Polygonum persicaria		x
Polygonum punctatum		x
Populus deltoides	x	x
Portulaca oleracea		x
Potentilla simplex	x	x
Pycnanthemum tenuifolium	x	x
Pyrrhopappus carolinianus		x
Quercus palustris	x	
Ranunculus abortivus	x	
Rhus copallina	x	
Rhus glabra	x	
Robinia pseudo-acacia		x

Rosa multiflora	x	x
Rubus allegheniensis	x	x
Rudbeckia hirta		x
Rumex crispus		x
Rumex verticillatus	x	
Salix nigra	x	x
Schizachyrium scoparium	x	x
Scirpus georgianus		x
Setaria faberi		x
Setaria glauca	x	x
Sida spinosa		x
Solanum carolinense		x
Solidago canadensis	x	x
Sonchus arvensis	x	
Sorghastrum nutans	x	x
Sorghum halepense		x
Sporobolus asper	x	
Stellaria pallida	x	
Strophostyles leiosperma		x
Taraxacum officinale	x	

Teucrium canadense		x
Thlaspi arvense	x	
Torillis arvensis		x
Toxicodendron radicans		x
Tridens flavus	x	x
Trifolium hybridum		x
Trifolium pratense		x
Trifolium repens	x	x
Triticum aestivum	x	
Typha angustifolia	x	x
Valerianella radiata	x	
Verbascum thapsus	x	x
Verbena hastata	x	x
Verbena urticifolia		x
Vernonia missurica	x	x
Veronica arvensis	x	
Veronica peregrina	x	
Vicia dasycarpa	x	
Viola rafinesquii	x	
Xanthium strumarium	x	

Table 3. *Elymus virginicus* locations found during the summer surveys (WGS 1984).

Species	Date	Point_X	Point_Y
Elymus virginicus	8/12/2019	-89.5231	38.01874
Elymus virginicus	8/12/2019	-89.5225	38.01832
Elymus virginicus	8/12/2019	-89.4580	38.04152
Elymus virginicus	8/12/2019	-89.4696	38.03608
Elymus virginicus	8/12/2019	-89.5233	38.01795
Elymus virginicus	8/12/2019	-89.5236	38.01780
Elymus virginicus	8/12/2019	-89.4578	38.04142
Elymus virginicus	8/12/2019	-89.4577	38.04138
Elymus virginicus	8/13/2019	-89.4661	38.03873
Elymus virginicus	8/13/2019	-89.4669	38.03877
Elymus virginicus	8/13/2019	-89.4671	38.03877
Elymus virginicus	8/13/2019	-89.4674	38.03873
Elymus virginicus	8/13/2019	-89.4682	38.03864
Elymus virginicus	8/13/2019	-89.4697	38.03823
Elymus virginicus	8/13/2019	-89.4701	38.03795
Elymus virginicus	8/13/2019	-89.4704	38.03786
Elymus virginicus	8/13/2019	-89.4709	38.03759
Elymus virginicus	8/13/2019	-89.4709	38.03867
Elymus virginicus	8/13/2019	-89.4665	38.03876
Elymus virginicus	8/13/2019	-89.4685	38.03892

Figure 1. Field 1 at Pyramid State Park.

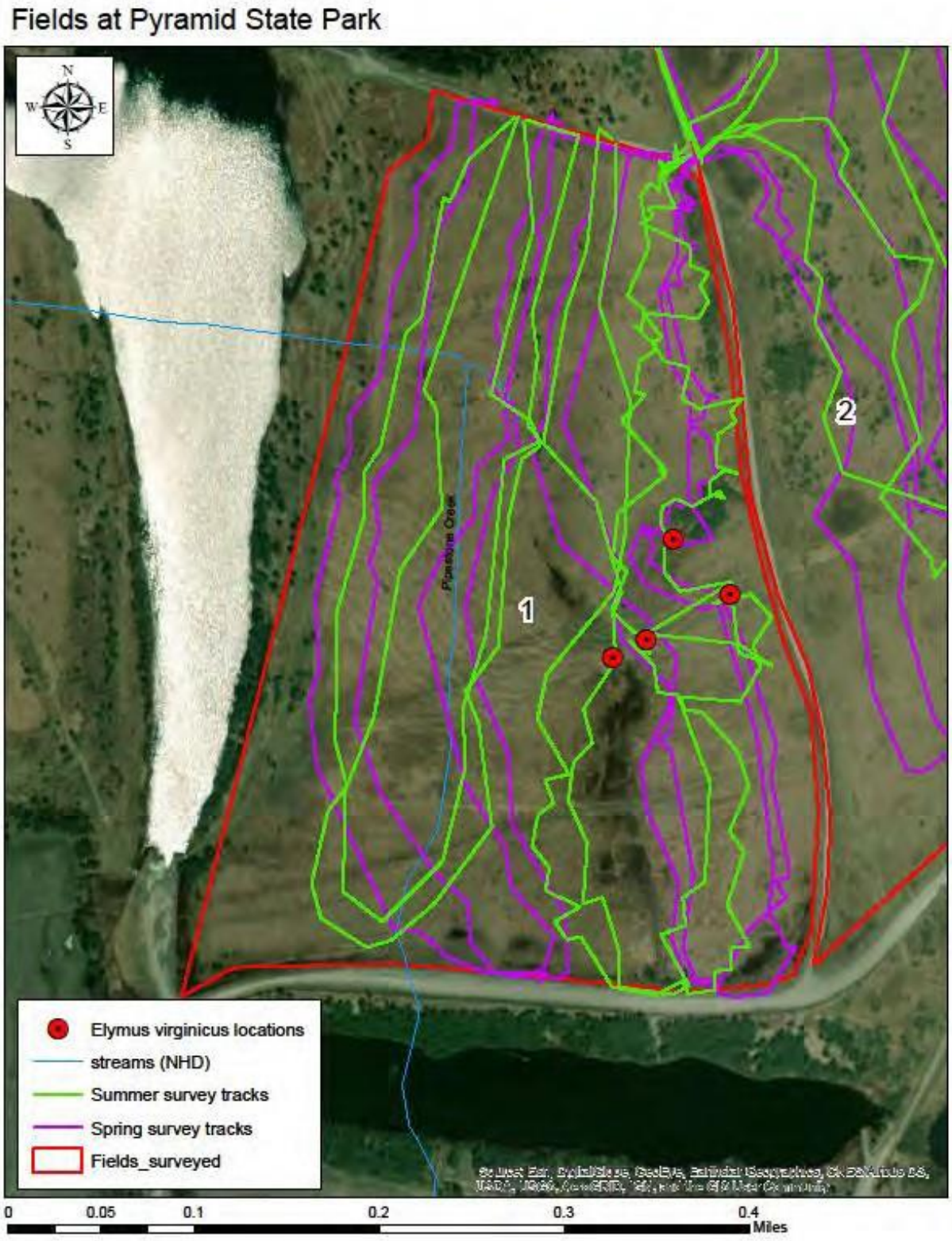


Figure 2. Field 2 at Pyramid State Park.

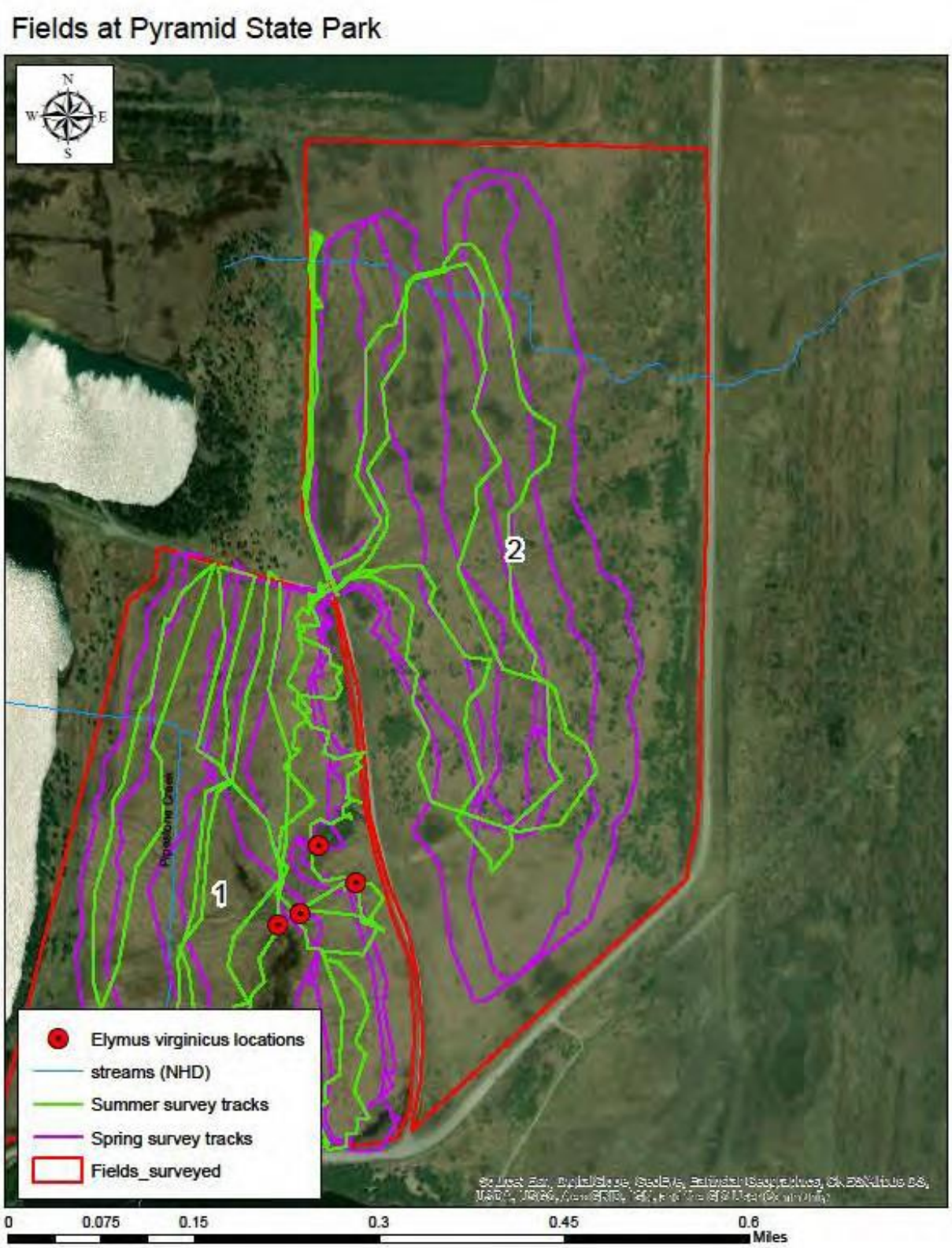


Figure 3. Field 3 at Pyramid State Park.

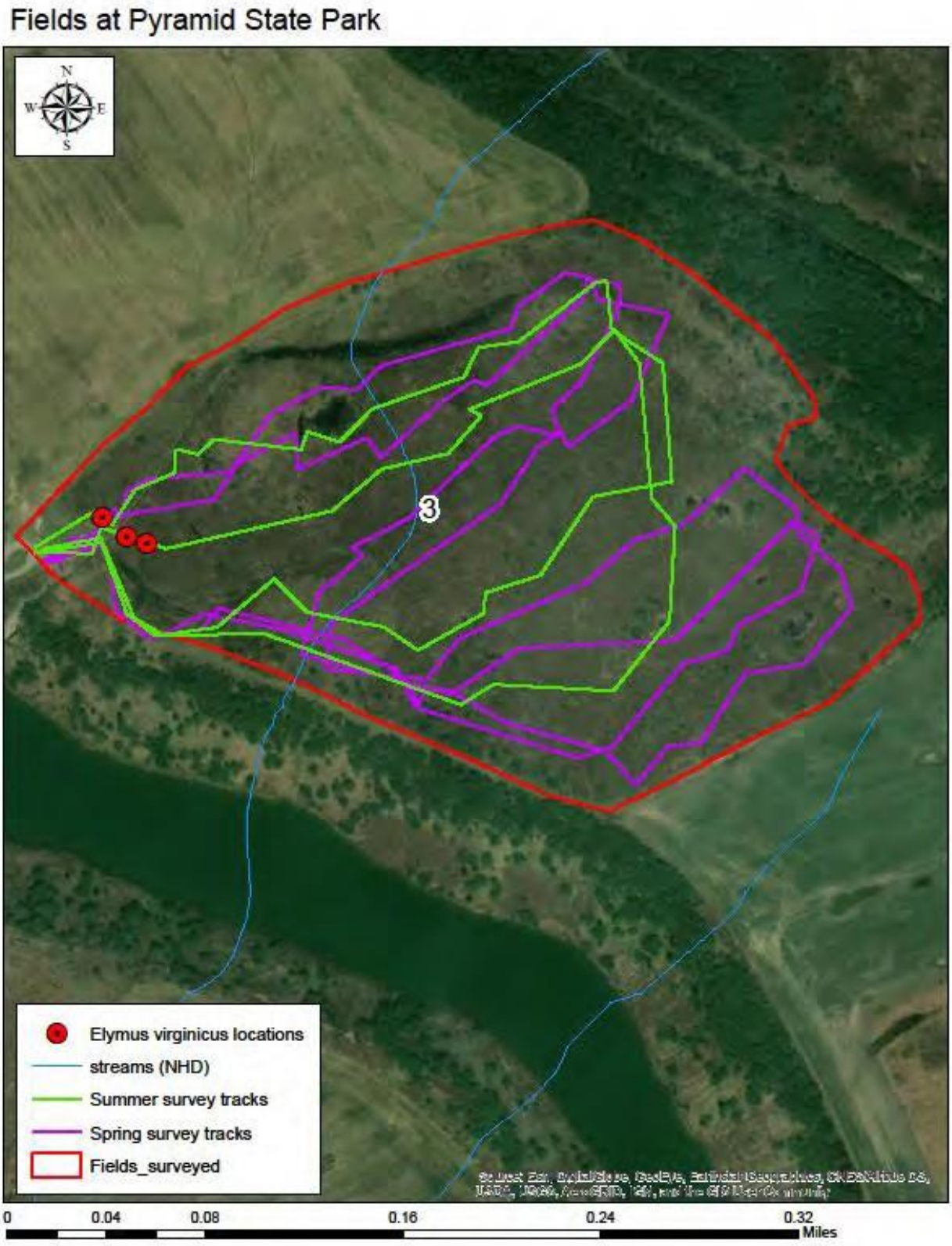


Figure 4. Field 4 at Pyramid State Park.

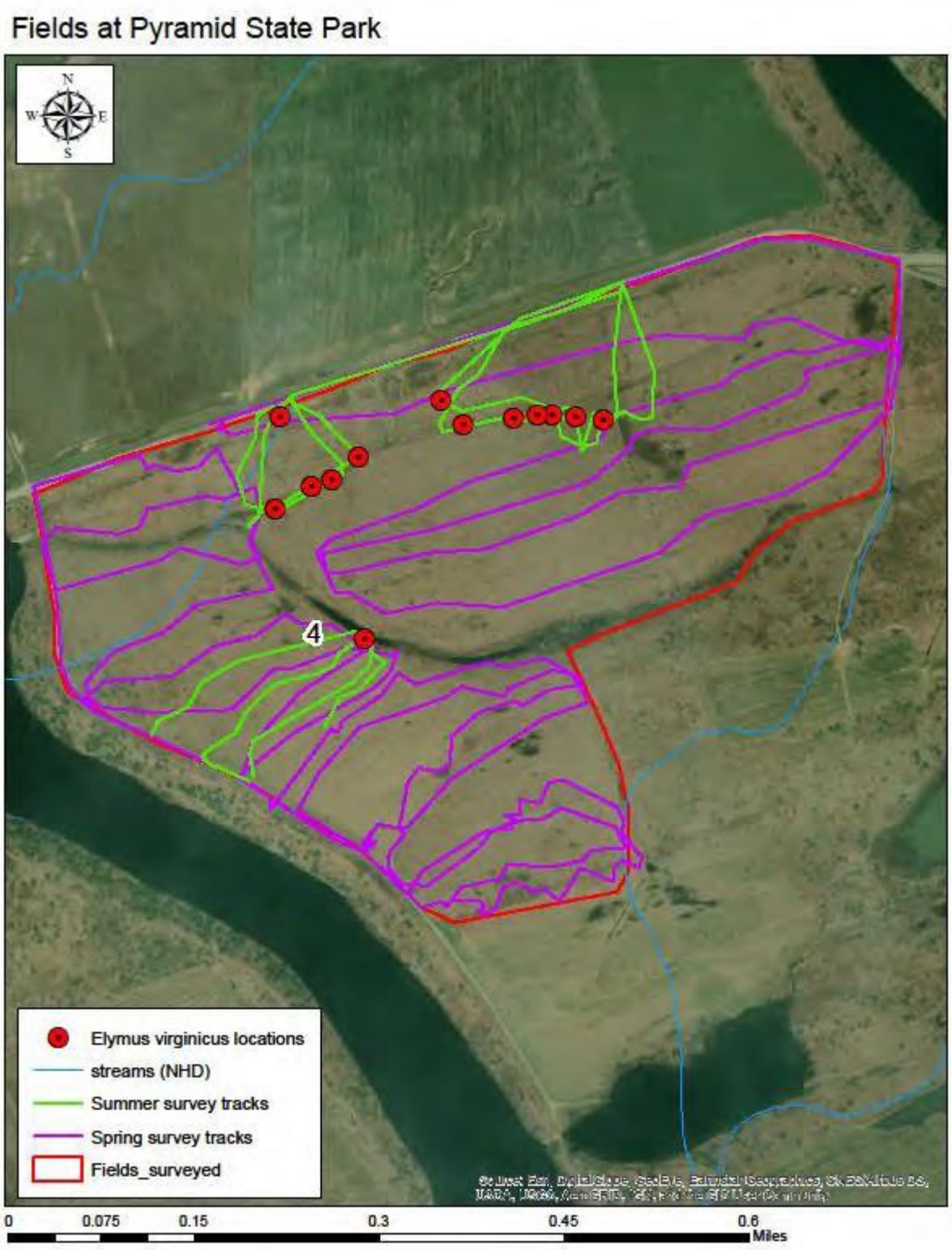
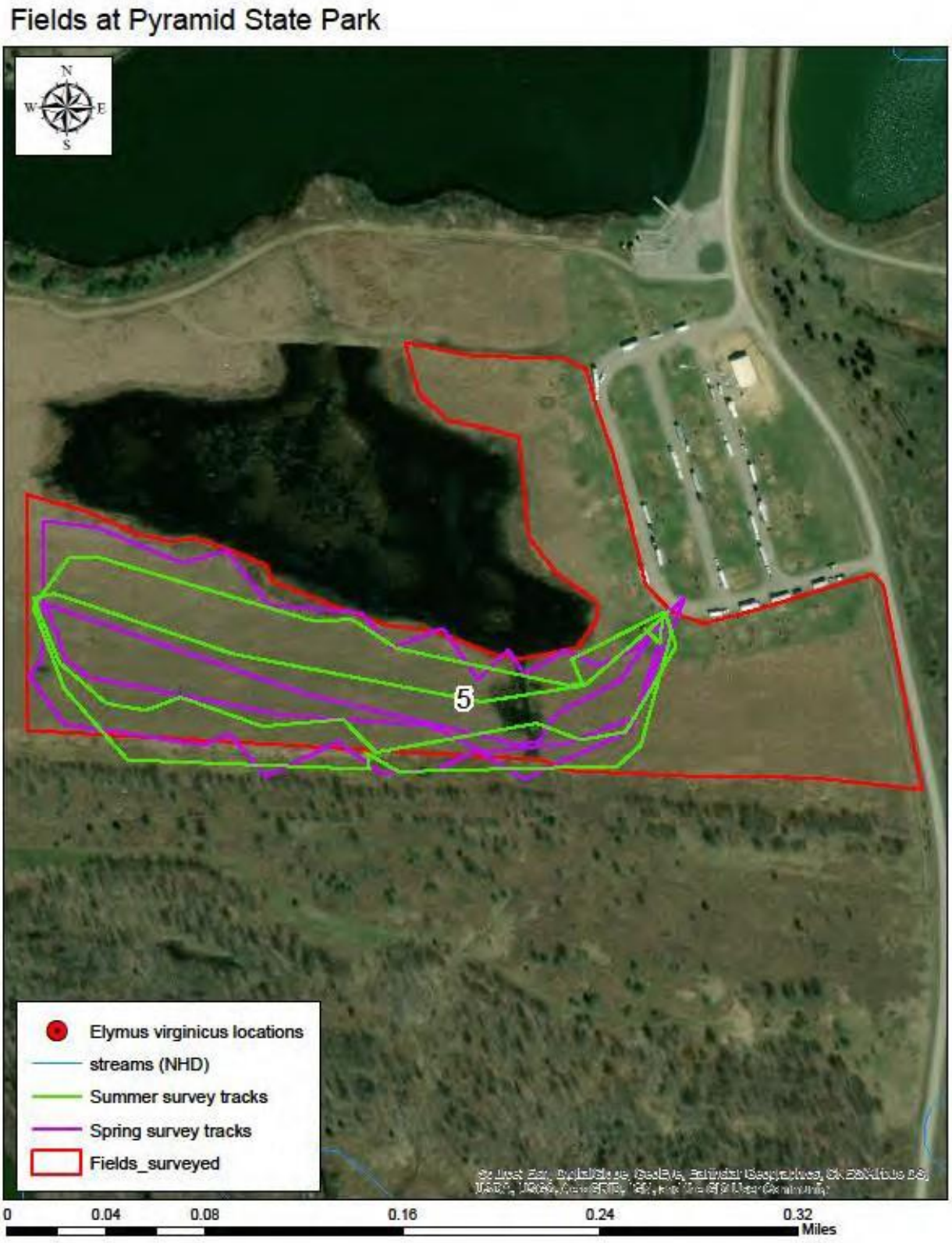


Figure 5. Field 5 at Pyramid State Park.



Grassland Monitoring Team Quality and Invasive Indicators

Tier I

Tallgrass Prairie of Western Minnesota, North Dakota, and South Dakota

Updated by Grassland Monitoring GLOBE intern Erin Medvecz, August 4, 2014

Notes

This field uide is intended as a rcfc1"ence to yasp u basic u11dcrstandu1i1of plant idcnhfication of the species associated with Tier 1 of the Grassland Mo11iloring Team monilori11g protocol for The Nnltll'e Conservancy. the Minnesota Department of Rc,;ourccs. und the U.S. Fish u11d Wildlife Sctvice.

TI,edouble leaf symbol in the upper left hnnd comer i11dicates Iha! thnt plnnl is u·Iook-alike."Refer lo the !:isl section of the packcl for extra help dislinguishing lhesc species fium others lhnt look similar.

TI1cTNC locution section on each pugc is where I. Erin Medvccz, saw that given plrutl throughout the course of the summer of 2014. OGL is Ordway Glacial Lakes. ABR is Ag::issiz Beach Ridges, and BR is Brown Ranch. Whet'< TNC localions is blank. lhc plan! wus not seen in lhc summer of 2014. II is lcfl bl:tnk so lh:tl others can fill in where they find the species.

Plant identification infonnntion was compiled from several sources, cited on the following page in Ml.A citation format.

All photos without en ptions were taken by Erin Mcdvccz.

All other phot raphs were fotmd on the Ladybird Johnson Wilclflowcr Center website,!he J\lfonesotu Wild0owcrs website, tnvasives.org. the USD/\ plnnt database. or the forestry tmnges website.·n,ese photographs may be used for nonconnncrcinl educational purposes (such as this), and are cited accordingly throughout the packet. Ml.A citations for the websites can be found 011the following pnge.

Sources

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Grassland Monitoring Team Quality Indicators

Tier 1

Tallgrass Prairie of Western Minnesota, North Dakota, and South Dakota

Updated by Grassland Monitoring GLOBE intern Erin Medvecz. August l. 2014

"Leadplant

Amorpha canescens

- •Shmb
- ·l.citvCs, Gray-srccn; fu1.z:y
- •Stem, Woody
- ·nowcr, Purple; arran cd in vc11icul clusters
- ·Soil, Sandy; loamy
- ·M.oisturci D1y to mcdimn
- ·!lloorns, June-August
- •TNC Locations, OGt, ABK BR

Cluster of flowers before blooming

ompound leaves

Flowers in bloom

\t Ground Plum

Astragalus crassicarpus

- •Forb
- ·l.ellves, Alternate; compound; leaflets paired oppositely
- •Stems, Hai1y; short
- ·Flowers, Purple; armngcd in a circtllar chtslcr around a central point
- ·fruit, Plums about the size of u cherry;grci;n to purple
- ·Soil, Sm,cty; loamy
- •Moisture, Ory to medium
- ·Blooms, J\•fay-Junc
- ·TNC locations, OGL, ABR

Cluster of purple flowers

Cluster of purple Rowers

Johnson, Johnny L. (Lady Bird Johnson Wildflower Center)

JOhMof\ lohr.ftyL(boy IIrdklhnSOft Ce111tl1

Plums found near base of plant

Plums found nHr baseof plant

\f Prrüne Tomip

Pediomelum esculentum

- •Forb
- ·Leaves, Arranged palmutcly (shaixd like lhc palm of your hand); each lc 1f divided into!, parts; hairy
- ·stc111s. Covered in long. white hairs
- ·!lowers, Blue lo purple; arranged in a cone-shaped spike
- ·Soil, Sandy
- •Moisture, D11'
- ·Blooms, May-July
- ·TNC l.ocalions, OGL., ABR

Clustt!r of flowers

Palmate-shaped leilf;1rr.angement

Ha!rystem

Entire plant

" Pasqueflower

Anemone patens

- •forb
- ·Leaves, Dissected several times; low to the ground; often grow in clumps
- ·stem, Flower stem is hairy;leaf stem is smooth
- •t1owcr, Blue, purpk. or white; 5-7 ixtuls; hait1'; develop, bloo111, and die before leaves appear
- ·J\t\oisturc, 01y lo medium
- ·Blooms, March-May
- ·TN(: Localio11s, OGL, ABR

Flowers appear before leaves

Flowers appearbefore leavH

Wide, dissected leaf

Clumps of leaves

dumps of 'eaves

Golden Alexanders
Ziziaaurea

- Forb
- Leaves, Smooth; 3-pmied; toothed leaflets
- Stems, Smooth
- flowers, Yellow; an·angcd in s111all clusters tlmt arc then arranged in a flat-topped cluster
- Soil, S.1ndy; loamy
- ,\1oisturc, Mt.!dium to wet
- lllooms, May-July

'TNC l.ocatio11s, OGL. ABR

Flat-topped cluster of flowers

Flat-toppedcluster of flowers

Basal leaves

Basalleaves

Entire plant

Entire plant

Leaf arrangement

leaf arrangemenl

\t

Heart-Leaved Alexanders
Ziziaaptcra

- Forb
- Leaves, Busa! leaves-individual and heart shaped; red dot where leaf joins petiole; toothed; Upper leaves-3-parted; vary in shape from heart to more triangular
- stems, Smooth
- Flowers, Yellow; ammgcd in small clusters that arc then arranged in a flat-topped cluster
- Moisture, Medium to wet
- Blooms, Ap1il-June
- TNC Locations, OGL ABR

Flat-topped duster of flowers

Basal leaves

Basalleaves

Upper leaw:s. hcan-shaped

Upper leaves, pointed 11ps

Entire plant

Bird's Foot Coreopsis
Coreopsis palmata.

•Forb
•Leaves, Opposite; divided into 3-5 lobes; slwpcd like a bird's foot
- $terns, Smooth
- Flowers, Yellow
- Soil, Snndy; loamy

•Moisture, Dry to medium

- Blooms, June-August

'TNC Locntio11s, OGL

Three-lobed leaf

Opposite leaf attachment

Narrow-Leaved Purple Coneflower
Echinacea angustifolia

·Forb
- 1...cnvcs, Basal; prominent vcinalion; roughly hairy
- Stems, Red-green; roughly hairy
- Flower, Purple; downward-bent petals surrounding a seed hoad
- Soil, Sandy; loamy
- 1\1oistu1·e, Dry to medium
- Blooms.June-July

•TNC Locations, OGL ABR. BR

Flower bud

Roughly hairy stem

Five-lobed leaf

Three-lobed leaf

Opposite leaf attachment

Roughly hairy stem

can be identified from last yeaf"s stalks

Roughly hairy leaf

\fWhite Prairie Clover

Dalea candida

- Forb
- Leaves, Compound; odd number of leaflets; wide leaflets
- **stcmsi Smooth**
- newer, White; urran:,.ect in a spike that blooms from lhc bollom up
- Soil, S!111dy; loamy
- **JVIoisture, Ory to medium**
- **Bloon1s,Junc-August**
- TNC Locations, OGL. AllR. BR


Entire plant


leaf attachment


Wide leaflets


Leaf attachment

\fPurple Prairie Clover

Dalea purpurea

- Forb
- Leaves, Compound; odd number of leaflets; very narrow leaflets
- **Stems, Smooth; thin**
- nower, Purple; arranged in a spike that blooms from the bottom up
- Soil, Sandy; loamy
- **Moisture, Dry to medium**
- Blooms,June-August
- TNC Locations, OGL. ABR. BR


Entire plant


Entire plant


Flower bud


Thin leaflets


Leaf arrangement

\tNorthern Plains Blazing Star

LiatrisJigulistylis

- ro1·b
- **Leaves. Up lo I 1/z inch wide; can havesh011 while hairs**
- stems, Smooth to hairy; rectdish
- **flowers, Pink; 3-10 heads or clustersof many star-shaped flowers;** looScr clusters; long stalks holding up flowers; floral bracts are flat and 1·ot111dcd on tips
- Soil. Sundy; loamy
- Moisture, Medium to wet
- Blooms,July-Scplcml>cr
- TNC Locations, ABR


Long stalks

MinnesotaWildflowers.com

"Dotted Blazing Star

Liatris punct.ata

- Forb
- Leaves,Translucent dots or pits visible on undet·side; mostly **smooth; dark green; sparse hairs may be prcscnl on margins** (lc,1f edges)
- **stems, Smooth**
- Flowers, Pink; ,1rrangcd in dcnS<!clusters
- oil, Sandy; loamy
- **Moisture, Dry to medium**
- Blooms,July-Scptembcr
- TNC Locations, OGL, ABR. BR


Thin, dark green leaves

Thin, darkgreen leaves


Buds before blooming


Flowers in bloom


Dots are visible

B#nciton, knnl,, (UdytirdJohmon Wildflower Ce-nt«)

MinnnobWllcfllc,wcn.wm

Buds before bk>oming

Flowers in bloom

"Rough Blazing Star
Liatris aspcra

- Forb
- **1..enves1Alt"enrnte; nmucr'O'us; hairy; single vein down center;** poinled lip;
- **•stems, Hairy;green-red**
- Flowers, Pink; many ru,·anged in a head; al leas! IO loosely arr:mged in a cluster-like spike; bracts urc round wilhjagged edges that fold inward
- Soil, Sandy; loamy
- •Moisture, Dry lo medium
- Blooms, August-October
- Locations, OGJ, ABR. BR


Flower clusters held


Roughly hairy


Flowerclusters held close tostem

Rou g h l y h airy


Jagged-edged bracts


Jaued-edaed bracts

\f Great Blazing Star
Liatris pycnostachya

- Farb
- **Leaves. Allc111atc;linear;erect. upward growins**
- Stems, Hairy
- f1owcrs, **Pink;** arranged in a dense. full spike
- Soil, Sandy; loamy
- Moisture, Medium to wel
- Blooms,July-Scplcmber
- TNC locations, OGI, ABR. BR


Star-shaped flowen


In bloom


oike before blooming


Hairy stem and upward growing

Hairystemandupward 1rowin1 linearleaves


Hairy leaves

Silky Aster
Symphyotrichum se.riceum

- •Forb
- **J.ca.vcs, Pale or silverygreen; entire; fine hairs give it a** silk-y feel
- stems, Smooth
- rJowers, Purple; 15-25 petals
- •soil. Sandy; loamy
- **M.oisturc, Dry**
- IJJooms, August-Octobet·
- TNC Locations, OGL. ABR. BR


Stone, Robert L. (Lady Bird Johnson Wildflower Center)


Group of plants growing near each other


Very silky leafy

Group of plants growlna Mar each other

Verysilky lHfy

Tall Cinquefoil
Potcntilla a.rguta

- •Forb
- Leaves, Compound; odd number of lcaflcls; **hairy; most m-e bas..11**
- Stems, Hairy
- **nowers, White with yellow center; 5 petnls; flowers arranged in u cluster**
- Soil, Rocky
- **•n1oisturc, Ory to medium**
- Blooms,June-July
- TNC Locations, OGL. ABR. BR


Ha,ry stem


Entire plant


Compound leaf


Flowers arranged in dusters

Alum Root
Heuchera richardsonii

•for\J
•Leaves, llusnl; long petioles; palmate; 7-!l lobes each with 3-5 l'Ot1ndcJ edges
• Stems, llairy
• **Flowers, Green to reddish; very small; nrr:mged in clusters**
• Soil, Sandy
• Moisture, Ory to wet
• Blooms,June-July
• 'INC Locations, OGL. AllR

Palmate-shapedleaf

Wood Lily
Lilium philadelphicum

•forb
• **Lenves, Groups of 4-7 around upper stem**
• **stems, Smooth**
• Rowers, Orange to red; purple *dots;* 6 petals thal do not **touch it1center;can bemultiple !lowers in a cluster or just one**
• Soil, Sandy
• Moisture, Dry
•Blooms, June-August
• TNC l.ocations, ABR

Whorl of leaves around stem
Whorl of leaves around stem

Entire plant
Entire plant

Toothed Evening Primrose
Calylophus selTlllatus

• forb
• **Leaves, NwTOw; linear; toothed;can be creased along cenhnl vein**
• Stems, Clustered
• Rowers, Yellow; four petals
•Soil, Rocky; sandy
• **Moisture, Dry**
• Blooms,,June-July
•TNC l.ocations, OCL, ABR, BR

Serrated leaf edges

Prairie Phlox
Phloxpilosa.

Entire plant
Entire plnt

•rorb
• **Leaves, Opposite; each pair :alternates between facing,1101ih-south** and east-west; slrn,,,ty pointed
• **stems, Hairy**
• Rowers, Pink to purple; five petals; arranged in u loose cluster
• Soil, Rocl-y; sandy
• **N1.oisturc, Dry**
• Blooms, April-June
'TNC Locations, OCL

Opposite leaf pairs

Smooth Rattlesnake Root
Prenanthes racemosa

- forb
- Leaves. Smooth; waxy; wavy margins (leaf edges) in between smooth :tnd loolhed; upper clasp slem
- **Stems, Smooth; havl.!ntill-yjuice**
- Flowers, Pink lo while; arranged in dense. long, and nan'Ow clusters
- Moisture, Ory lo wet
- Blooms, Augusl-Scplembcr
- TNC Locations,

Smith.AW 11..My'kdJohMOnWAdflower Cer,1erl

ıith, R.W. (Lady Bird Johnson Wildflower nter)

St'nolh,R..W.!UdyBirdJoMson W,kfflowff Cenler)

Wasowski, Sally and Andy (Lady Bird Johnson Wildflower Center)

White Camas
Zigadenus elegans

- Farb
- Leaves, Basal; thin, resembling wide blades of grass
- stems, Smooth
- Flowers, While petals wilh yellow spols fanning u circle in the center of the f10\ve1·; flowers held out from stem on stalks; arranged in a loose cluster
- Soil, Limy; sandy
- **iIi\loisture, D1y to medium**
- Blooms.July-Augnsl
- 'TNC Locations, ABR

Leaves are grass-like and hard to distinguish alone

Entire plant

Bracted Spiderwort
Tradescantia bracteala

- Farb
- u:avcs, Sides folded upwards; long ancl lhin;
- Stems, Unbmnehed
- Flowers, Blue. purple. m·even pink; 3 petals; usually only one lo a few in the loose cluster bloom al once
- Soil,Sandy; loamy
- Moisture, Dry lo medium
- lllooms, April-July
- TNC Localions, OGI,. ABR. BR

ves are thin and folded

Leaves;are thinand folded

Entire plant

Prairie Loosestrife
Lysimachia qwulriflora

- Farb
- **Leaves, Opposite;linear;** 110 **petiole; smooth**
- Stems, Smooth; square
- Flowers, Yellow; 5 petals; annnged in cluslers; hang upside down; suppo1ied by longstalks
- **Jl11oist11rc:,Medium to wet**
- Blooms,July-1\ugust
- TNC Locations, ABR. BR

Flower with 5 petals

Cluster of buds

Entire plant

Flowers droop and hang upside down

FJower-1droop and hana upside down

Opposite leaves

U arleaf

Entire plant

Sneezeweed
Helenium autumnale

- forb
- **Leaves, Alternate; numerous**
- 'Siems, Branched al lop
- flowers, Muny yellow pcla!s Iha!each have 3 lobes; pelals sur1·01111d a large yellow cenlrnl disk; arranged in branched clusters
- ii, Snndy; loamy
- Moislttrc, Medium lo wcl
- IJlooms, Augusl-Oclobcr
- TNC Localions, BR

Flower diskbeforepetalsdevelop

Alternaie leaves

$mllh,RW (1:klvlltfdkthru.onWidllowtl,!'Ctl'llt)

WaM,Wjkl, ~ 'I'' Aridy(Lady8ud Johnson \Wdfkl<iotlfCel1tt1"I

Entire plant

Grassland Monitoring Team Invasive Indicators

Tier I

Tallgrass Prairie of Western Minnesota, North Dakota. and South Dakota

Updated by Grassland Monitoring GLOBE intern Erin Medvecz. August 1. 2014

Kentucky Bluegrass
Poa pratcnsis

- Grass
- **Leaves, Boat-shaped leaf tip; smooth;"ra.ilru.:td** lmck• patlcrn of dols along micl-vein of leaf
- **Stems,Thin round**
- Seed head, Green and tl1cn tan
- Cool Season
- **Sod former**
- TNC Locations, OGI.. ABR. BR

Boai.sha leaf tip

Dead stalks from this season

Canada Bluegrass
Poa compressa

- **Grass**
- Leaves, Blue-green; boat-shaped leaf lip
- Siems, f1ul; do 1101 roll between your fingers
- Moisture, Dry
- Cool Season
- **Grows in clumps**
- '1NC Locations, OGt.. AHR

Flowering seed heads

Flowering seed heads

Joseph M. DiTomaso, University of California - Davis, Bugwood.org

Railroad-track pattern

Lale In the season

Deadst ks from thtSseason

Short leaves along stalk

Short leaves alon, stalk

Flowering seedheads

Flowerins seed he.ids

Redtop
Agrostisgigantea / stolonifera

•**Grass**
•Lcuves, Pule green; short;!all liguJc
•Seed!tend, Lnrge with mnny brnnches; red-purple; shiny-looking
•Cool season
•**sod former**
"INC Locations, ABR. BR


Leaf attachment and ligule
Learatt.;u:hm nl and ll ul





Before inflores-cences branch out


Tall ligule

Reed Canary Grass
Fhalaris arundinace,a

· **Crdss**
· Leaves, l'tall ligule; wide;sprend outward; when mature, can have a crimp like Smooth Brome
•Seed head, Yellow. can be pink-purple when spr<•ad out
· **ilt\loisture, Wet**
•**Cool season**
•Grows in clumps or monocultures
•TNC Locations, OGL, ABR. BR



Seed head


Ligule present

Crimp may be present


Smooth Brome
-*Bromusinermis*

· **Grass**
•**Leaves, H=ts an "M.· sh:ipcd crimp; smooth**
•Sheath, Comes to a·V•
· Seed head, Bronze hue
· Cool Season
•**Sod former**
"TNC Locations, OGL, AllR. BR




No ligule present

"V" sheath

ery defined "M" shaped

Seed head

Annual Bromes
Bromusjaponicus
Bromus tectorurn
Bromus secalinus

· Grass
•Seed heads, Droopy; bent over as if weighed down
•TNC Locations, BR

8. japonicus


H.MOI'IltnbrDQ,hos1NbyINUSOA-NfiCSf LAN'TSD.IUlws.e/ USOANIIO tfIS.HottJwf;jl-eclllldflor•:f'ifldoffiuauidetorit-–'. NonMBt N iotYt hdmltal Clfllttl', Cl'lnt r.

B. sccalinus

B. tcctorum


·NRCS PLANTS Database / Britton
o tigule present

'V' shealh

\lffYdefined •M"shaped

crimp

Sttd head

USOA•NRCSl 'tANTSO.ub, w/lrinOI\.

N.L.llll dA.lrOWfl.19U,AnillvJrrotf'd"''r/o/lM!'lO'fhern1.11'/ldSrarn,CoorwltBrlthhPoJ:ltwOll'J,Jl'OlJ.Charin

S(r 5Son.t,,Ht'# Yotl,V,:A l: 171.

Steve Dewey, Utah State University, Bugwood.org

P.t,,c.\-.J. .hosttr, U5DA·hllCSJ'tAHTS

Timothy
Phleum pratense

•Grass
•Leaves, Short; light green; veins visible; nut; ligule present
• Seed hc.1d, Dense spike;2,rccn and then tan
• **Moisture, Dry to 11K·ctium**
•Cool season
•Clumps or sod forming
•TNC LDcntions, OCL. ABR llR

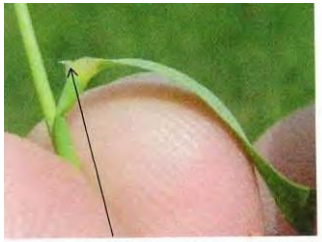

Leaves

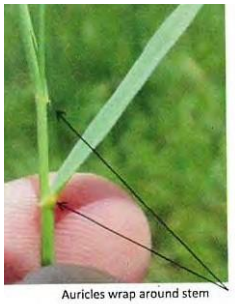

Ugule pre5ent


Seed heads

Quackgrass
Elytrigia repens

•Gr ss
• Leaves, Clasp ste111; can be ltaity; no ligulc; usually **wider than 6 mm**
• Seed hc:1d, Spikelets arc three limes us Ion&as internodes (space between the sitesof spikelet altachmcnt)
• **Collar, I-Ins auricles (arms su11-ounding stem}**
•Cool sc:ison
•Sod fo1111er
• TNC Locations, OCL. ABR BR


Auricles, "arms", present
A.uricics, arms .present


Auricles wrap around stem


Seed head

Crested Wheatgrass
Agropyron cristatum

• Crass
•**Leaves, S111oolh or hairy;opi;n sl1calhs;** short
• Seed head, Flattened and wide; *ve,y* s111all **il1tcrnodl:'s**
• Collar, Has auricles (anus su1TOu11din& stem)
• Cool season
•**Crows in clumps**
• TNC Locations,


Short leaf


Wide, flattened *seed* head

Bird's-Foot Trefoil
wtuscorniculatus

• Forb
• **Leaves, 5 parted; there arc center lcntlcls with 2 smullc1·one·sround on either sideof maincluster**
•**Stems, Many stems grow in a whorled cluster**
• **Flowers, Yellow; arranged in clustersof 4-8 flowers**
• Soil, Disturbed
• [l)ooms,June-Au2,usl
•TNC l.oc:ttions, OGJ,


Cluster of flowers


3 center leaflets

Oust,rof flow,rs


Stems all arise from a central point

Stemsall.Jrist from a central point

Spotted Knapweed
Centaurea stoebc

•Forb
•Leaves, Nurrowly lobed
• stems, Branched
•Flowers, Pink to purple; brncls hnve bbck lips
• **Soil,** Limy
• Moisture, o,y
• Blooms,June-October
•TNC Locutions,

Branched stem

Br.lnched stem

Queen Anne's Lace
Daucuscarota

• Forb
• Leaves, Feathery; carrot-like
•Stems, Hairy
• flowers, White; an"1nged in large. Oat-topped clusters
• Soil, Disturbed
• ,'vloisture, Dry
• Glooms, June-September
•TNC Locations, OGL

Carrot-lookinglear

Before bloomine
Beforebk>omlna

Before blooming

Flat-topped flower cluster

Absinthe Sagewort
Artemisia absinthium

•f'orb
•**Leaves, Altcnmlc;gray-green;divided several times;** rounded tips;smells likesage
•Stems, Stalked
• f1owers, Ntunerous; pale yellow; head droop downwards
• Soil, Disturbed
• Moisture, D1y
• IJlooms, August-September
'TNC Locntions, i\llR. BR

Individual leaf
Individualleaf

Crown Vetch
Coronilla varia

• forb
• **Leaves, Compcmnd; odd nun1bcr of leaflets**
• f1owc1·s, Pink lo while; 5 parts; arranged in a circular cluster
• Soil, Disturbed
• lllooms, ,\>lay-September
•TNC Locations,

Forms thick patches

mpound leaves
Compound tuves

Flower buds

ter of flowers

Entire plant

Enftreplant

Inconspicuous flowers

IrKonsplcuousflowers

Leaves

Leaves

Ox-Eye Daisy
Leucanthemum vulgare

•forb
•**Leaves, Alternate; upper, stnlkless, toothed;** lower, long stalked. lobed or toothed
• **stems. 1l liry**
•**Flowers1 White petals surrou11ding a yellow** disk
• Moisture, Dry
•Blooms, June-August
•**TNC Locatio11s,**

Roughly hairy stem

Upper leaves

Baul leaf (left); upper lear(right)

Parsmp
Pasfinaca safiva

•forb
• Leaves, Divided into 5-15 lobed leaflets
• Stems, Flat and ddged
• flowers, Yellow; mTimgcd in clusters that are arranged in a lnrge, flat-topped cluster
• **iMoistm . Medium to wet**
• Blooms.June-July

Flat-topped cluster of flowers

Leaf arrangement

Entire plant

Flat-topped cluster of flowers

LHf arrangement

Entire plant

Butter-and-Eggs
Lina.rill vulga.ris

• forb
• **J,eavcs, l.incar; pale green**
• **flowers, Yellow to orange; two-hued; spur at** bottom of !lower; arranged inn cluster
• Soil, Sandy
• Blooms, May-September
• TNC Locations-

Entire plant

Leafy Spurge
Euphorbia esula

•forb
• **Leaves, Bluish-green; allcrnatc; rounded tips**
• stems, Milk")'sap; smooth
•flowers, Green to yellow; arranged inn cluster
• Soil, l,ight
• **i\-l.oisturc, Dry**
• lllooms, May-September
• TNC Locations, ABR. BR

Two-toned flower with spur

Lufys1em

Many linear leaves

Inconspkuous flowers

Numerousteaves lineentirestem

Entire plant

Sweet Clover
Mefflotus officinalis Ialba

•**Forb**
•Leaves, !I parted; toothed all the way around each leaflet
· Stems, Heavily branched
· t1owcl's, While or yellow; urm11ged in Joni clusters
•**Moisture, Dry to medium**
•Blooms, May-Scplcmbcr
•TNC Locations, OGL. ABR. BR

Melilotus alba (White Sweet Clover)

Melilotus officinalis (Yellow Sweet Clover)

Melilows alba(White Sweet Clover)

Melilo1us officinolis (Yellow Sweet Ctover)

Entire plant

Leaves toothed along entire edge

Entire plant

leaves toothed alonaentire edge

Alfalfa
Medic.ago saliva

•forb
· Leaves, 3 purled; toothed only on upper hair
· **Stems, Smooth**
· **nowcrs, Pu.rplc; arranged in clusters**
· Soil, Disturbed
· Moisture, Dry
•Blooms, June-September
· TNC Loculions, OGL. BR

Leaves only toolh@d on topedge/tips

Entire plant

Flowu cluster

White Clover
Trifolium repens

•forb
· Leaves, Tiirec parted; solid darkgreen; circular lobes
· Stems, Flower stem separate from leaf stems
•**flowers, White; dense. circular cluster**
•Soil, Disturbed
· Blooms, May-Seplembe1·
'TNC Localious, OGL, ABR. BR

Red Clover
Trifolium pratense

· rorb
· Leaves, 3 paitcd; while 11iangle visible in center of leaf
· Stems, Hui1y; support both flowers und lcuves on same stem
· **nowers1Red lo pink;circular cluster**
•Soil, Disturbed
· Blooms, May-September
•TNC Locutions, OGL, ABR. BR

Solid green leaflets

Solid areenk?aflets

: colored triangles present on leaflets

Uchtcolored trl ngles present onleafleu

Entire plant

\t Alsike Clover
Trifolium hybri.dum

•Forb
· Leaves, g parted; light green; leaflets slighlly pointed on ends
· stems, Support both nower and leaves011smne stem
· **Flowers, White and turn pink with age;circular clusler**
· Soil, Disturbed
· Illooms, May-September
•**TNC Locations,**

Leaflets not fully rounded

"CanadaThistle
Cirsium arvense

· orb
· Leaves, Lighter green to white on the underside; basal leaves arc those that tend to be white,·
· Stems, Spiny
· Flowers, '/, inch wide; pink flowers; arranged with **muny heads in a cluster**
· Soil, Disturbed
· Moisture, Dry
· Blooms,June-October
· TNC Locations, OGL. ABR. BR

Entire plant

Entire plan!

\t Plumeless Thistle
Ca.rduus aCll11thoides

·rorb
'Leaves, Deeply lobed; hairy underneath; spiny tips
•Stems, Very spiny-winged up entire stem
· 110wers, ½-1 inch wide; pink;spiny bracts; **urr mgcd with one head al end of branch**
· Soil, Disturbed
· Moisture, Dry
•Illooms,July-October
•TNC l,ocations, OGL

Spiny floral bracts; spines on leaves

"Bull Thistle
Cirsium vulgare

•forb
· Leaves, Spiny; divided intolobed segments with teeth
· **stems, Spiny-winged often hnve reddish ·veins" or** ribs visible
· nowers, Up to I '/, inches wide; purple; bracts with **spiny tips; arranged with several heads in a cluster**
•Soil, Disturbed
· **J\11.oisture, D1y**
· Blooms,June-October
'TNC Locations, BR

Entire plant

Leaves with long spines

Spiny tipped bracts

Todd Pfeiffer, Klamath County Weed Control, Bugwood.org

Todd,ofelfler, O–thCoun1y WNd Contnr:11, 8.igwOOd.org

CiM'fL Flper, WWii,cton SutrUfWtBlrr, Ill;&wood om

Spiny leaf; red veins on stem are visible

Ent!re plant

LHYH with longsplnes

Spiny tipped bracts

"Musk Thistle
Carduusnutans

•ro,·b

•l.eaves, Lobed with a notice.1ble yellow or **white spine on lhc end; not hairy**

· Stems, Spiny-winged. but not all the way up **the stem; stems urc smooth underneath lhc** !lower head

•**flowers, Pink; up to 3 inches wide; nodding,;** not clustered; hiangulur-shaped bracts

· Soil, Disturbed

· Moistt11·c, ll1y

· Blooms,July-Oclober

·TNC Locations,

Steve Dewey, Utah State University, Bugwood.org

James R. Allison, Georgia Department of Natural Resources. Bugwood.org

Loke T. Kok, Virginia Polytechnic Institute and State University, Bugwood.org

USDA APHIS PPQ Archive, USDA APHIS PPQ, Bugwood.org

U50A APHISPPQAtchiwir, USDAAPttlSPPQ,. ILIIWO()d.or1

Sow Thistle
Sonchus arvensis

•Forb

•Leaves, Upper, clasping; hea,1-shaped bottom; prickly edges; Lower, deeply lobed; prickly edges

•**Stems, Mill-y juice; tull**

· t1owet'S, Yellow; look like adandelion

· Soil, Distmbed

· **,\1oisture, Medimn to wet**

· Blooms,July-October

•TNC Locations, ABR. BR

Upper leavesdaspstem

Leaf arrangement

leaf a,rangem.nt

Entire plant

Black Locust
Robinia pseudo-acacia

•**Tree**

· t,eaves, Compound; alternate, leaflets attached oppositely; untoothcd 111arzi11s (leaf edges); upper surface is darkgreen while lower is palegreen; pairs of spines at base of leaves

· Bark, Brown or gray

· flowers, While; arranged in a drooping cluster

•**fn1i1, Pod-like; brown; nat; s1nooth**

· Soil, Loamy; nonacidic

· **Moisture, Ory to moist**

•**TNC Locations,**

Makin, Julie (Lady Bird Johnson Wildflower Center)

Flaigg, Norman G. (Lady Bird Johnson Wildflower Center)

Tartarian Honeysuckle
Lonicera f8tariCII

•Shn,b

· **Lcavcs1Simple; opposite; smooth 111a.1-xins** (leaf edges); upper surface darkgreen while lower surface palegreen

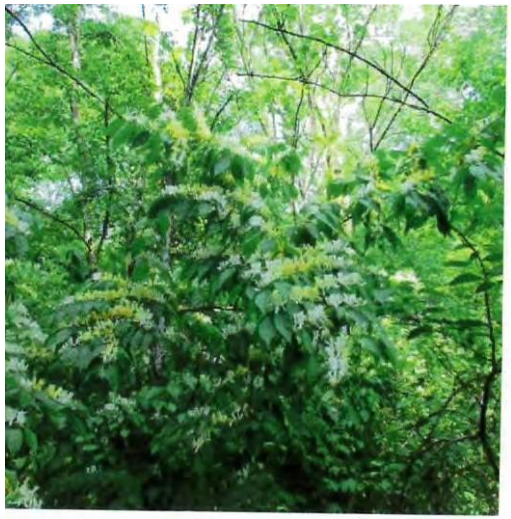
•Bark, Brown togmy; rough

· Flowers, While to pink; p:iired

· fruit, Orange to red; paired berries

· Blooms, May to June

o'J'NC Locations, OGL



Common Buck.thorn
Rhamnus cathartics

•Tall shrub/smull tree

•Lc:aves, Simple; opposite; long petioles; rounded baSe; lai<ral wins curve towards base of leaf; about !S-5 leaf veins per leaf; upper surface dark srcen while lower palegreen; toothed margins (leaf edges)

•[lark, Dark gray;smooth when young; thorns on ends of branchlets

• Fruit, Round. black fruit

• Moisture, Dry to moist

•TNC Locations, OCL

Ied, J. Mehrhoff, Unlwnllvo/Connetlcut.

Thorn

'Ile J. Meh,holf. Unlw,rsnv ol Connt<etlc:111, Buf YOOd,Otl

Curved later.ii veins

LnM, J.Mehrhoff, Univenity of Connwtk;u 91.Wwood.orl

Glossy Buck.thorn
Frangula alnus

James H. Miller, USDA Forest Service, Bugwood.org

•Tall shrub/small tree

• Leaves, Alternate; untoothed; shiny appear:111ce; abont 8-9 leaf veins per leaf

•Bark, Cray-brown; some ureas lighter in color

• rruit, Round; color ch1111ges from red to dark purple as ripens

• .1litoisturi:, \Vet

•TNC Locutions,

Steve Manning, Invasive Plant Control, Bugwood.org

James H. Miller, USDA Forest Service, HMlier, USOAForeu SMlic:e,

Leslie J. Mehrhoff, University of Connecticut,

Siberian Elm
Ulmus pumila

Toothed leaf

• Tree

•Leaves, Simple; altcnrnte; elliptical shopcd; toothed m111-gins (leaf edges); upper smiace darkgreen while lower palegreen;can be smooth or rough

• Bark,Gray

• Soil, S.111dy; loamy

• TNC Locotions, ABR. BR

SnYUtrre

• • • •

Alternate leaf attachment

American Elm
Ulmusamericana

om DeGon t, University of Arizona, Bugwood.org

•Tree

• Leaves, Simple; alternate; clliptical-slrnpcd; uneven leaf base; serrated leaf murgins (leaf edges); upper surface dark green while lower palegreen;c..1.n be smooth or rough

• 11ark, Ashygray

• Soil, Deep, moist. calcareous loam

• 'fNC Localions,

Karl'i.t booiffi.UnlWMv ofGeo,st., lklt;wood orl

Karan A. Rawlins, University of Georgia, Bugwood.org

Cottonwood
Populus dcltoides

•**Tree**

•**Leaves, Simple;ullcrnatc; ltcnrl-** shnped; toothed; smooth; bright green upper s11rfuce wilh a paler lower surface

•**Bark, Gray or brown;** coarse

•TNC Localious, BR

Sapling stem

Sapling

Sapling leaf

SapllnRleaf

Toothed leaf edge

Tooth leaf edge

Boxelder
Acerncgundo

•**Tree**

· Leaves, Compo1md; opposite; comprised *of* 3-5 leaflets; upper surface darkgreen while lower pale green and hui1y

· Bark, lll'OW!l or brown and gray

· fruit, Helicopter seeds

•TNC Locations,

Paul Wray, Iowa State University, Bugwood.org

OhioSt tl Weed Ub Archive, TheOhioStllt' Uni Y,eolfV, lkic"ood.Of",

Robert Vidéki, Doronicum Kft., Bugwood.org

Green Ash
Fraxinus pennsylvanica

•Tree

· I.caves, Compound; opposite; lance to cllipticnl shupcd; consist of 5-9 lcuflels; toothed margins; upper surfacedark green while lower surface pale green; leaves allachcd by a very shm1 petiole (stalk)

· !lark, Gray to bl'Ow11

· **Soil,Sand;silt;clay; loam**

· **Moisture, l\1oist**

· TNC l.ocations,

Paul Wray, Iowa State University, Bugwood.org

Paul Wray, Iowa State University, Bugwood.org

im DeGomez, University of Arizona, igwood.org

Robert Vidéki, Doronicum Kft., Bugwood.org

„ul WrJV, 1ow,smeu .B .Ofl

Russian Olive
Elaeagnus angustifolia

•**Tree**

· **t...cavcs, Simple; alternate; l:mcc-sh:.pcd;smooth** margins (leaf edges); upper surface dull green while lower su,face greenish gray or silve1y gray; both sides of leaves have silve,yscales 01·hairs

· f1owe,·s, Upper surface yellow while lower smface silvc1y

· Blooms, June-July

· TNC localious,

Lnllel. hthoff.l.lntvfll,qof (Of'lnKt;Cu\, lupood.otJ

T. Davis Sydnor. The Ohio State University. Bugwood.org

T. Dlwls Sydnor. 0..0hIDStM• .lupood Of'I

Lnl1et Mehrhoff. ofCOl'Wltd,art.ltufwood-0<1

Look-Alike Plants

When starting out with plant identification. many of these indicator species may look similar to each other and to other plants found on the prairie. Use this part of the field guide lo help distinguish between commonly found prairie plants and the native and invasive indicators.

Ground Plum

Non-woody
Siems grow outward in a circle from a centrnl point
Durkcr irccn lcuvcs
Smooth leaves
Circular cluster of pinkisl1 nowcrs
TNC l..ocations, OGL

Bransford, W.D. and Dolphia (Lady Bird Johnson Wildflower Center)

Leadplant

Woody
Shrub
Grayish-green leaves
Soft and fuz1.y leaves
Dense spike-like cluster of dark puq,le llowcrs
TNC Locations, OGL. ABR. BR

Leadplant

Woody
Grayish-green leaves; leaves are compound and larger tlum Sill-y Pmirie Clover
Soft and fuzzy leaves; rounded leaflet tips
Dense spike-like cluster of dark purple llowers; cluster grows ve11ically
TNC Locations, OGI, ABR. BR

Silky Prairie Clover

Non-woody; voty soft and fuzzy red stems
Grayish-green leaves; leaves are compound **and very smull**
Soft and fu1.zy leaves; pointed leaflet **tips**
Dense spike-like cluster of light purple flowers; very soft; clustct·grows hmizontally
TNC Locations, BR

Leadplant

Silky Prairie Clover

Prairie Turnip

Entire plunt is hai,y.especially the stalk
Green leaves
F1owcrs nrc arranged in circular clusters and arc light purple
TNC Locutions, OCL, AllR

Silver Scurfpea

Smooth stalk; not haity
Silver-colored leaves
f1owcrs arc very small, often paired, and d.:trk purple
TNC Locations, OGI, AllR

Pasqueflower

Leaves arc dissected mnny times and grow/curl more upright thnn violet, which has nattencd leaves
Lenves tend to grow in clumps
Flowers not present; they bloom early in spring and then the leaves develop
TNC Locations, OGL, ABR

Thimbleweed

Lobes of leuves arc much thicker and there are fewer leaf dissections than **Pasqueflowcr**
Flower and/or bud often present nnd growing out of center of leaf
TNC Locations, OGL, ABR. BR

Prairie Violet

Leaves are dissected but each lobe lies flat rather lhnn curling upwnrd like Pasquenowcr
Flowerscan be seen in enrly summer, but often leaves a,-c seen by themselves
TNC Locations, OGL, ABR. BR

Canada Anemone

Lobes of leaves arc thickest of these four species and toothed into thirds al the tips
Flower nnd/or bud often present and gl'Owinz out of center ot'lcaf
TNC Locations, OGL, AUR. UR

Pasqueflower

Prairie Violet

Thimbleweed

Canada Anemone

Golden Alexanders

Busal leuvcs arc arrow-shaped
TNC Locnlions, OGL, AIIR

Heart-Leaved Alexanders

llasal l..:uvcs arc hcarl-shapc.:d
TNC Locnlions, OGI. AUR. BR

Parsnip

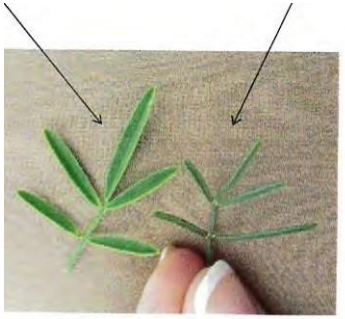
Lcuvcs are thinner
Leaves have lnrge teeth lhal are not cnlircly al'Ound the lcancts
Different leaf shnpe than other **two species**
TNC l.ocations,

White Prairie Clover

Leaves are more rounded
Leaves arc thicker
Stem is thicker
TNC Locations, OGI., ABR. BR

Purple Prairie Clover

Le.1. ves nre ve1y linear
Very thin leaves
Titl.n stem
TNC l.ocali0t1s, OGI., ABR BK



Rough Blazing Star

Steins tu-crougl1ly lrniry anct irl.!cn to red
Leaves are roughly hai,y and have a pointed lip
Flowers held close lo stem
Bracts arc round with ja:,1$ed edges that fold **inw:u·d**
Grows in d,y.sandy soils usually in more upland landscapes
TNC Locations, OGL. ABR BR

Dotted Blazing Star

Leaves arc a darker green color
Leaves are ve1y thin and have obvious·dots"or pits on the bollom of the leaf
UAtvcs may have sparse hairson margins (leaf edges)
Grows in dry, sandy soils usually in more upland landscapes
TNC Locations, OGL, ABR BR

Northern Plains Blazing Star

Siems iu\.:smooth or hairy
Leaves are largest of these 4 species
Leaves can have short whit!.!hairs
Long stalks hold up flowers
Bracts have rounded lips and are flat
Grows iu wetter areas
TNC Locations,

Great Blazing Star

Stems and leaves arc roughly hairy
Leaves at·e thin and lighter green
Grows in wetter landscapes
Has a dense spike of flowers-once the hcud starts developing it iseasy to distinguish this species
TNC Localions, OGL. ABR. IJK

Rough Blazing Star


Northern Plains Blazing Star


Dotted Blazing Star



Great Blazing Star



Tall Cinquefoil

Lc:.ivcs arc compound with 7-11 leaflets; toothed; wry fuz,y
Flowers have while petals and arc arranged in tight **clusters**
TNC Locations, OGL. ABR BR

Sulphur Cinquefoil

Leaves have 5-7 leaflets and arc razor toothed; not hai1y
Flowers lrnvc light yellow petals and arc arranged in branched clusters
TNC Locations, OGL

Silverweed

Leavesare compound; leaflets are razor toothed; underside of leaves is noticeably white/silver
Creeping; often fo11ns a mat of int.erconnected leaves
Flowers arise on a separate. leal1cssstalk; petals arc yellow
TNC Locations, ABR






Prairie Loosestrife

Leaves :ire linear and very thin
Flowers droop and hang upside down
TNC Locations, AHR. BR

Lance-Leaved Loosestrife

Leaves are "lance" shaped and much wider than those of Prairie Loosestrife
Flowers have a red circle in center of flower; droop and hani upsidi; down
TNC Locations, ABR

Prairie Loosestrife




Lance-Leaved Loosestrife




Kentucky Bluegrass

Round stem
lloal-shupcd leuf lip
Long and thin leaves
TNC Loc.1lions, OGL, ABR, BR

Canada Bluegrass

f1at stem
lloal-shapcd leaf lip
Long and thin leaves
TNC l.ocalions, OGI, ABR

Redtop

Round stem
Wider, shorter leaves
Tall ligule
TNC Loc.1tions, ABR. BR

Smooth Brome

No ligule
Narrower lcnf than recd
·M· shaped CI'Ullp present
TNC Locations, OGL, ABR. BR



"M"shaped crimp is obvious

Reed Canary Grass

Ligule present
Wide,erect leaf
Larger leaves can have a crimp. bu! look for the presence of a ligule
TNC Locations, OGL. ABR. BR



Crimp canbe present on some leaves

Wheatgrasses

Quackgruss,

Lat"&csl leaves of these species
6-I0mm wide
Nol stronily tidied
Can hnve hairs
Open sheaths
Well developed auticlc:s that clasp stc:m
lnteniodes are small-mily 4-6 mm long
Sod-forming grass
TNC Locations, Al1R. BR

Slender Wlteatgmss
J.,cnvesm-e2-5 mm wide
- Somewhat ridicd

J\u1icles may be pl'esenl
lnternodes ure 7-9 mm long. with the lowest over 12 mm long
Clump-forming grass
TNC Locations, BR

Crested Whcatgrass

Leaves are 1.5-Gmm wide
- Somewhat ridged
- Open sheaths

J\ul'ieles are usually present
Smallest internodcs of these species
- 0.7-5 nun long

Spikelels are three times as long as **inlcrnodcs**
Clump-fo1111i11ggrass
TNC Locations,

1\1a11y other wltcatgrasscs can alsobe found in some of these areas, such as Western wheatgrass, intc1111ediatc whcatgrass, and Canada wild rye to nnme a few. Consult a grass field guide for more helpdistinguishingall of these species.

Queen Anne's Lace

flower cluster is very flat-lopped
- Leaves resemble those of a ca11·ot


Hemlock

Flowers arc arruttged il1small cl11stcrs and then in a more rounded cluster; resembles the shape of Golden Alexander flower clusters
Leaves urc compound and much larger than thoseof the other two species


Yarrow

Individual flowers are lnrger and more pronounced than the olher two species; nrranged in a dense. rounder cluster
I.caves arl.! fern-like and very distinctive


Crown Vetch

Grows in clusl crs
Leaflets arc s111aller nnd lie flat
'l11ere are many more leaflels pt!l' leaf
flowers ut\ta.rrangcd in a circular c111stcr
fiowet-s m-e light pink
TNC Loc.1tions,

Marsh Vetchling

Vine; docs not grow in clusl.crs
Leaflets a,-., larger and fold upwards
There a,-.:fewer leaflets per leaf
Flowers arc usually singular or paired
Flowers are more purpk and larger
TNC l.ocalions, OGL, ABR

Sweet Clover

Toothed "II lhc way
ar01111d leallets
TNC Loc"tions,0GL,
ABR. BR

White Clover

Round loaflcls
Solid, dark green
TNC Localions, OGL,
ABR. BR

Black Medick

Toothed only on top
edge of leanets
Grows low to the
ground
TNC Localions, OGL.
ABR. BR

Red Clover

Round leaflets
Darkzrccn with light
colored triangle on
leallcls
TNC Localions, OGL.
ABR. BR

Alfalfa

Toothed only on lop
edge of leaflets
Grows Inlier and
leaflets nre la1·ge1·
TNC Locations, OGI,
ABR. BR

Alsike Clover

Round lcaflcls with
more pointed tips
Light green
TNC Locations,

Canada Thistle

Leaves often have a whitish underside, but not stark while lik native thistles
Flowers are the smallest of these 4 thistles and are lighter pink, mther thnn bright pink to purple like the other 3 species
Spines:ore very lhin, not •winged·
Siems can be reddish or green; have smull spines. nol numerous
TNC Locations, OCL. ABR. BR

Musk Thistle

Leaves, Not hairy underneath like Plumeless; 1101 as sharply lobed as Bull; resc111blc Canada the IIIOSI
Stems1 Smooth; no spines near top of stem
undc111cath flower, unlike Bull and Plumeless Ihat have spines all the way up the stem
Flowcn;, Pink; largest of these lhisllcs; nodding; before blooming, buds hav triangular-shaped bracts, unlike 3 other thistles
TNC Localions,

Bull Thistle

Leaves are spiny and thinner/more sharply lobed titan Plumeless; have long spines at lhc ends of the teeth
Stems arc ·spiny-winged" and often have reddish lines rtmning vertically up lhe111
flowers arc large and purple; before blooming. the buds are round and havespiny bracts
TNC Localions, BR

Plumeless Thistle

Leaves are spiny and larger/thicker thnn Canada's
Stems, Very spiny-winged up *c11tireslem*
flowers, Btisht pink; spiny bracts; head smaller than Bull's but larger than Ca11nda's
TNC Locations, OGL

Canada Thistle

Bull Thistle

Musk Thistle

James B. Allison, Georgia

Loke T. Kok, Virginia Polytechnic

Plumeless Thistle

Todd Pfeiffer, Klamath County Weed

Steve Dewey, Utah State University,

Common Buckthorn

Rougher looking leaves; not shiny

Leaf veins are rounded and are all directed towards the tip of the leaf; 3-5 veins per leaf

l'indy toothed leaves

Leslie J. Mehrhoff, University of Connecticut, Bugwood.org

U We J.Mehrhott, IJnlven..ty of CQfinttllcut. lll&WflGd.ort

Glossy Buckthorn

Shiny lcuvcs

Leaf veins resemble a typical 'V' pattem; 8-!l veins per leaf

Untoothed leaves

Leslie J. Mehrhoff, University of Connecticut, Bugwood.org

Le J.t.whrt.c;iff, Unlw'sltv of Cgnnt(CINI, &ucwood.org

American Elm

Unl.!vc.:n leaf base

Tend to have smoother, shinier le..1ves. but can also be rough

Karan A. Rawlins, University of Georgia, Bugwood.org

Siberian Elm

Even kaf base

Tend to have a rougher leaf texture. but can also lx smooth