MN NWAC Risk Assessment Worksheet (04-2011)	Common Name	*Latin Name*
	Cutleaf/Cut-Leaf Teasel, Cut-Leaved Teasel	*Dipsacus laciniatus* L.
Reviewer	**Affiliation/Organization**	**Date (mm/dd/yyyy)**
Original Reviewer: Roger Becker	**University of Minnesota**	**05/23/2011**
Current Reviewer: James Calkins	**Minnesota Nursery and Landscape Association**	**09/17/2019**

Photo Credit: Minnesota Department of Agriculture

Cutleaf teasel (*Dipsacus laciniatus*) is a member of the Caprifoliaceae (Honeysuckle Family; formerly classified separately in the Dipsacaceae or Teasel Family but now merged with the Caprifoliaceae) and is native to Europe and Asia. None of the teasels are native to North America; they were imported for industrial purposes by the fabric industry and as garden plants for their upright form, showy flower heads, and interesting seed heads and subsequently escaped cultivation. Whether cutleaf teasel was initially imported purposefully like common teasel or introduced accidentally as a seed hitchhiker with common teasel or another species is not clear.

Like common teasel (*Dipsacus fullonum*), and depending on growing conditions and their impact on the amount of time needed to acquire sufficient resources for flowering, cutleaf teasel plants are either herbaceous biennials (live for two growing seasons, the first year as a rosette, and then bolt (send up flower stalks), bloom, set seed, and die the second year) or monocarpic perennials (live for several growing seasons as a rosette before flowering, setting seed, and dying). Cutleaf teasel flowers are white instead of lavender and the leaves are deeply divided (pinnately lobed/pinnatifid) compared to the leaves of common teasel which are wavy-edged and sometimes toothed. The leaves on the flowering stalks are opposite, and sessile (stalkless) and are prickly on the lower surface along the midribs. The opposite leaves merge and are fused at their bases forming a cup around the stem that can capture rainwater. During the flowering year, the plants will typically have branched stems and a mature height of 5-6 feet, but can sometimes reach heights of nine, and even 12, feet on fertile, mesic, loamy soils. Plants perform best in full sun but can tolerate light shade. The stems are bristly, and the flower heads are borne on long, bristly peduncles (flower stalks). Plants have a taproot (up to two feet long) and a fibrous, secondary root system. Flowering begins in the upper middle of the

inflorescence and progresses in both directions and typically occurs from July to September (typically starting to bloom a little later and finishing a little sooner than common teasel which typically blooms from June to October). The flowers are tubular with short lobes, perfect, and densely clustered in a spiral arrangement in compact, egg-shaped heads, each flower subtended by a spiny bract resulting in a pincushion effect, and the entire inflorescence is subtended by several long, bristly bracts (involcural bracts) that curve upward around the flowerhead. These involcural bracts, tend to be wider, stiffer, and a little less curved than those of common teasel. The fruit is a single-seeded achene. The seeds (more correctly fruits) are dropped around the parent plant and germinate in late summer and fall of the flowering year and the flowing spring and thereafter resulting in expanding colonies variously composed of rosettes and flowering plants that can form large monocultures which are capable of crowding out native species. The dead plants and the bristly and distinct remnants of the flower heads persist throughout the winter and the dried seed heads are sometimes collected and used in dried flower arrangements. Historically, the bristly seed heads, and especially those of common teasel which have hooked floral bracts, were used commercially to raise (tease) the knap on wool and other fabrics.

Although cutleaf teasel is more commonly found on higher ground, the teasels can invade both dry and wet environments and are commonly found along roadsides, railroad corridors and riverbanks, in fallow or abandoned fields and open disturbed ground, and along trails and floodplain meadows. They are also found in or near cemeteries as a result of the seed heads being used in floral arrangements. Disturbed sites are preferred, but higher-value, natural areas can also be invaded.

Current Regulatory Status in Minnesota: Since the first risk assessment for cutleaf teasel (*Dipsacus laciniatus*), a combined risk assessment with common teasel (*Dipsacus fullonum*), was completed in 2011, cutleaf teasel has been listed as a Prohibited-Eradicate Noxious Weed in Minnesota; may not be propagated, transported, or sold in/Minnesota and all of the above- and below-ground parts of existing plants must be destroyed. Cutleaf teasel is not listed on the Federal Noxious Weed List.

Box	Question	Answer	Outcome
1	Is the plant species or genotype non-native?	Yes. Cutleaf teasel is native to Europe and western Asia.	Go to Box 3
2	Does the plant species pose significant human or livestock concerns or have the potential to significantly harm agricultural production?		
	A. Does the plant have toxic qualities that pose a significant risk to livestock, wildlife, or people?		
	B. Does the plant cause significant financial losses associated with decreased		

	yields, reduced quality, or increased production costs?		
3	Is the plant species, or a related species, documented as being a problem elsewhere?	Yes. Cutleaf teasel has been documented as invasive in the United States where it is most commonly found in the northeastern and midwestern states and is currently and formally listed and/or regulated as a problematic species in nine states including Colorado, Illinois, Indiana, Iowa, Minnesota, Missouri, Ohio, Oregon, and Wisconsin (National Plant Board, 2019).	Go to Box 6
4	Are the plant's life history & growth requirements sufficiently understood?	***Yes. Multiple resources with detailed information are available.***	***This text is provided as additional information not directed through the decision tree process for this particular risk assessment.***
5	Gather & evaluate further information?	(Comments/Notes)	
6	Does the plant species have the capacity to establish and survive in Minnesota?		
	A. Is the plant, or a close relative, currently established in Minnesota?	Yes. As of June 24, 2019, cutleaf teasel, had been reported 175 times in 15 Minnesota counties through EDDMapS – Blue Earth (2 reports), Carver (1 report), Dakota (1 report), Filmore (10 reports), Freeborn (1 report), Hennepin (2 reports), Houston (53 reports), Mower (15 reports), Olmstead (12 reports), Ramsey (7 reports), Steele (1 report), Wabasha (1 report), Washington (3 reports), Winona (62 reports), and Wright (4 reports) (EDDMapS, 2019 – Cutleaf Teasel; see Figures 1 & 2). At the same time, cutleaf teasel had also been reported in 20 additional states from Massachusetts to Oregon including the nearby and neighboring states of Illinois (2,259 reports; by far, the state with the most reports in North America; see Figure 3), Iowa (51 reports), Missouri (72 reports), Nebraska (11 reports), and Wisconsin (87 reports), but not including North and South Dakota where there had been no reports (EDDMapS, 2019; see Figures 2 & 3).	Go to Box 7

		For comparative purposes, common teasel (*Dipsacus fullonum*) had only been reported 13 times in five Minnesota counties through EDDMapS – Hennepin (2 reports), Mower (2 reports), Nobles (1 report), Winona (4 reports), and Wright (4 reports) (EDDMapS, 2019 – Common Teasel). The presence of cutleaf teasel and its ability to survive and spread in Minnesota and Wisconsin has also been documented by others (Stolp and Cochran, 2006).	
	B. Has the plant become established in areas having a similar climate and growing conditions similar to those found in Minnesota?		
7	Does the plant species have the potential to reproduce and spread in Minnesota?		
	A. Does the plant reproduce by asexual/vegetative means?	No. Teasel reproduces only by seed (Gucker, 2009).	Go to Question 7C
	B. Are the asexual propagules effectively dispersed to new areas?		
	C. Does the plant produce large amounts of viable, cold-hardy seeds?	Yes. It has been variously reported that individual plants may produce up to 2000 (Invasive Plant Atlas of the United States, 2018; MDA, 2019; MDC, 2011) or 3000+ seeds (Gucker, 2009) or more (up to 1000 seeds/seed head and 33,500 seeds/plant; Bentivegna, 2006).	Go to Question 7F
	D. If this species produces low numbers of viable seeds, does it have a high level of seed/seedling vigor or do the seeds remain viable for an extended period?	***Seeds have little if any dormancy and most seeds germinate soon after dispersal or within 2 years; small numbers of seeds can remain viable for 3-5 years in the soil (DiTomaso et al., 2013; Gucker, 2009; MDC, 2011).***	***This text is provided as additional information not directed through the decision tree process for this particular risk assessment.***

E. Is this species self-fertile?	***Rarely. Information specific to cutleaf teasel was not found, but teasel flowers are reportedly perfect and protandrous (the anthers release pollen before the stigma is receptive) and most fertilization is believed to result from cross-pollination by insects; in a field experiment in Michigan, only 4% of Fuller's teasel (Dipsacus fullonum) seeds were viable when cross-pollination was prevented (Gucker, 2009).***	***This text is provided as additional information not directed through the decision tree process for this particular risk assessment.***
F. Are sexual propagules – viable seeds – effectively dispersed to new areas?	Yes. Teasel seeds are not morphologically adapted for wind dispersal and the seeds drop within 1.5 m (4.9 feet) of the parent plant, but dispersal along roadways and recreational trails is common (Gucker, 2009; MDA, 2019). Water may also play a role in seed dispersal (seeds can float for up to 20 hr without loss of viability) and seed dispersal may also be facilitated by mowing equipment and other mechanical means (Gucker, 2009; MDA, 2019). Although cutleaf teasel has been in the United States for at least 120 years, the spread of cutleaf teasel was relatively slow until about 1965 and, regardless of the means of spread, the species has been spreading rapidly since then, mainly along highways (Gucker, 2009). Movement of seed in livestock feed (hay) has also been suggested (Stolp and Cochran, 2006).	Go to Question 7I
G. Can the species hybridize with native species (or other introduced species) and produce viable seed and fertile offspring in the absence of human intervention?	***No and Maybe. There are no compatible native species in Minnesota (or North America), but cutleaf teasel <u>may</u> be able to hybridize with other species of introduced Dipsacus (Gucker, 2009).***	***This text is provided as additional information not directed through the decision tree process for this particular risk assessment.***
H. If the species is a woody (trees, shrubs, and woody vines) is the juvenile period less than or equal to 5 years for tree species or 3 years for shrubs and vines?		
I. Do natural controls exist, species native to Minnesota, that are documented to	No. None found.	Go to Box 8

	effectively prevent the spread of the plant in question?		
8	Does the plant species pose significant human or livestock concerns or has the potential to significantly harm agricultural production, native ecosystems, or managed landscapes?		
	A. Does the plant have toxic qualities, or other detrimental qualities, that pose a significant risk to livestock, wildlife, or people?	No. No supporting information found.	Go to Question 8B
	B. Does, or could, the plant cause significant financial losses associated with decreased yields, reduced crop quality, or increased production costs?	No. Cutleaf teasel does not tolerate cultivation and is generally not a problem in row crop agriculture. It can be found in pastures, but impacts have not been documented.	Go to Question 8C
	C. Can the plant aggressively displace native species through competition (including allelopathic effects)?	Yes. Teasels perform the best and are the most invasive on open, sunny, moist sites that have experienced disturbance; they are commonly found on moisture-retentive soils along ditches, roadways, railroad corridors, and waterways and riparian zones (including sandbars in streams), and in pastures, abandoned fields, dumps, and waste places, but can also invade high quality natural areas including prairies, savannas, meadows, and forest openings if adequate moisture is available (DiTomaso, et al., 2013; Gucker, 2009; Invasive Plant Atlas of the United States, 2018; MDA, 2019; MDC, 2011). In dense stands, rosettes can shade out most other herbaceous species (Gucker, 2009).	Go to Box 9
	D. Can the plant hybridize with native species resulting in a modified gene pool and potentially negative impacts on native populations?	***No. There are no compatible native species in Minnesota or North America.***	***This text is provided as additional information not directed through the decision tree process for this particular risk assessment.***
	E. Does the plant have the potential to change native ecosystems (adds a		

	vegetative layer, affects ground or surface water levels, etc.)?		
	F. Does the plant have the potential to introduce or harbor another pest or serve as an alternate host?	***No. No information found except an interesting paper about the possibility that mosquitoes might breed in the water reservoirs created by the fused leaf bases of teasels (Baumgartner, 1986).***	***This text is provided as additional information not directed through the decision tree process for this particular risk assessment.***
9	Does the plant species have clearly defined benefits that outweigh associated negative impacts?		
	A. Is the plant currently being used or produced and/or sold in Minnesota or native to Minnesota?	No. Historically planted in gardens and used in floral arrangements, but cutleaf teasel has been regulated as a Prohibited-Eradicate Noxious Weed in Minnesota since 2011 and these uses have not been allowed since then (MDA, 2019; 2019 Minnesota Noxious Weed List). Cutleaf teasel is not native to Minnesota.	Go to Box 10
	B. Is the plant an introduced species and can its spread be effectively and easily prevented or controlled, or its negative impacts minimized through carefully designed and executed management practices?		
	C. Is the plant native to Minnesota?		
	D. Is a non-invasive, alternative plant material commercially available that could serve the same purpose as the plant of concern?		
	E. Does the plant benefit Minnesota to a greater extent than the negative impacts identified at Box #8?		
10	Should the plant species be enforced as a noxious weed to prevent introduction &/or		

	dispersal; designate as prohibited or restricted?		
	A. Is the plant currently established in Minnesota?	Yes. Cutleaf teasel is established in Minnesota and has been documented in 18 counties (EDDMapS, 2019 – Cutleaf Teasel; MDA, 2019 – Cutleaf Teasel). Cutleaf teasel in upland areas, common teasel in wetter lowland areas (Rector et al., 2006).	Go to Question B
	B. Does the plant pose a serious human health threat?	No.	Go to Question C
	C. Can the plant be reliably eradicated (entire plant) or controlled (top growth only to prevent pollen dispersal and seed production as appropriate) on a statewide basis using existing practices and available resources?	Yes. Cutleaf teasel is not difficult to control and especially when populations are small; plants can be killed by pulling, cutting flowering plants just below ground level, digging, or herbicide treatments (rosettes in fall or early spring) (Bentivegna and Smeda, 2008; DiTomaso et al., 2013; Gucker, 2009; MDC, No Publication Date). Treating rosettes in the spring is more effective than summer or fall treatments (Zimmerman et al. 2013). Mowing is generally not effective as mowed plants often regenerate flower stalks (Gucker, 2009) and mowing does not improve the efficacy of herbicide treatment (Zimmerman et al. 2013). Where established, eradication may take several years because of the soil seedbank; seed production should be prevented and cut flower heads should be removed from the site and destroyed as flower heads can sometimes set viable seed even after being removed from the parent plant. Prescribed burning alone is not effective (Gucker, 2009). Biological control is of interest, but no biological control agents have been approved (Pecinar et al., 2009; Petanovic and Rector, 2007; Rector, et.al., 2006). Given that the distribution of cutleaf teasel in the state remains limited (175 reports statewide and primarily in five southeastern counties; see Box 6, Question A), eradication remains a reasonable goal and cutleaf teasel should, therefore, continue to be listed as a Prohibited-Eradicate Noxious Weed in Minnesota.	Retain the existing listing of cutleaf teasel (*Dipsacus laciniata*) as a Prohibited-Eradicate Noxious Weed.

11	Should the plant species be allowed in Minnesota via a species-specific management plan; designate as specially regulated?	NA	

2011

Final Results of Initial Risk Assessment and Subsequent Updates		
Review Entity	**Comments**	**Outcome**
NWAC Listing Subcommittee		Recommended listing cutleaf teasel (*Dipsacus laciniatus*) as a Prohibited-Eradicate Noxious Weed in 2011.
NWAC Full-Committee	Full member approved.	Voted to approve the NWAC Listing Subcommittee recommendation to list cutleaf teasel (*Dipsacus laciniatus*) as a Prohibited- Eradicate Noxious Weed in 2011.
MDA Commissioner	Commissioner approved.	Approved the NWAC recommendation to list cutleaf teasel (*Dipsacus laciniatus*) as a Prohibited-Eradicate Noxious Weed in 2011.

2019

Final Results of Initial Risk Assessment and Subsequent Updates		
Review Entity	**Comments**	**Outcome**
NWAC Listing Subcommittee	As a result of a 2019 review and update of the cutleaf teasel risk assessment, recommends retaining the listing of cutleaf teasel (*Dipsacus laciniatus*) as a Prohibited-Eradicate Noxious Weed.	Prohibited-Eradicate
NWAC Full-Committee	Vote was 15:0 in favor of remaining Prohibited Eradicate on 12/03/19.	Prohibited Eradicate
MDA Commissioner	Commissioner agreed	Prohibited Eradicate

Risk Assessment Summary (2019 Update): Cutleaf teasel (*Dipsacus laciniatus*) was first evaluated for potential listing as a noxious weed in Minnesota in 2011 and was subsequently listed as a Prohibited-Eradicate Noxious Weed later that year (2011). Based on this 2019 review and update of the risk assessment for cutleaf teasel, it is recommended that the current designation of cutleaf teasel as a Prohibited-Eradicate

Noxious Weed should be retained and that cutleaf teasel should continue to be regulated as a Prohibited-Eradicate Noxious Weed in Minnesota.

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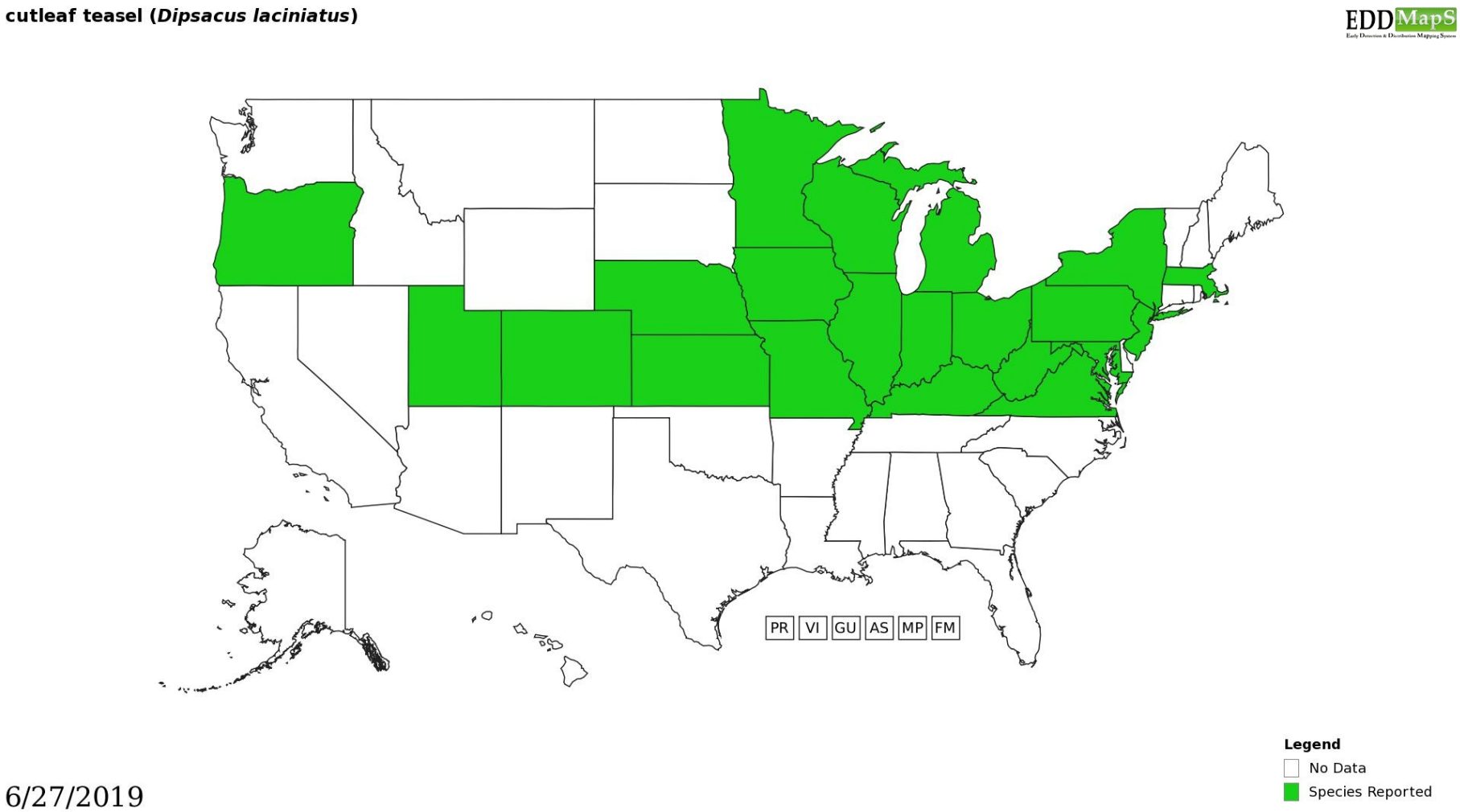
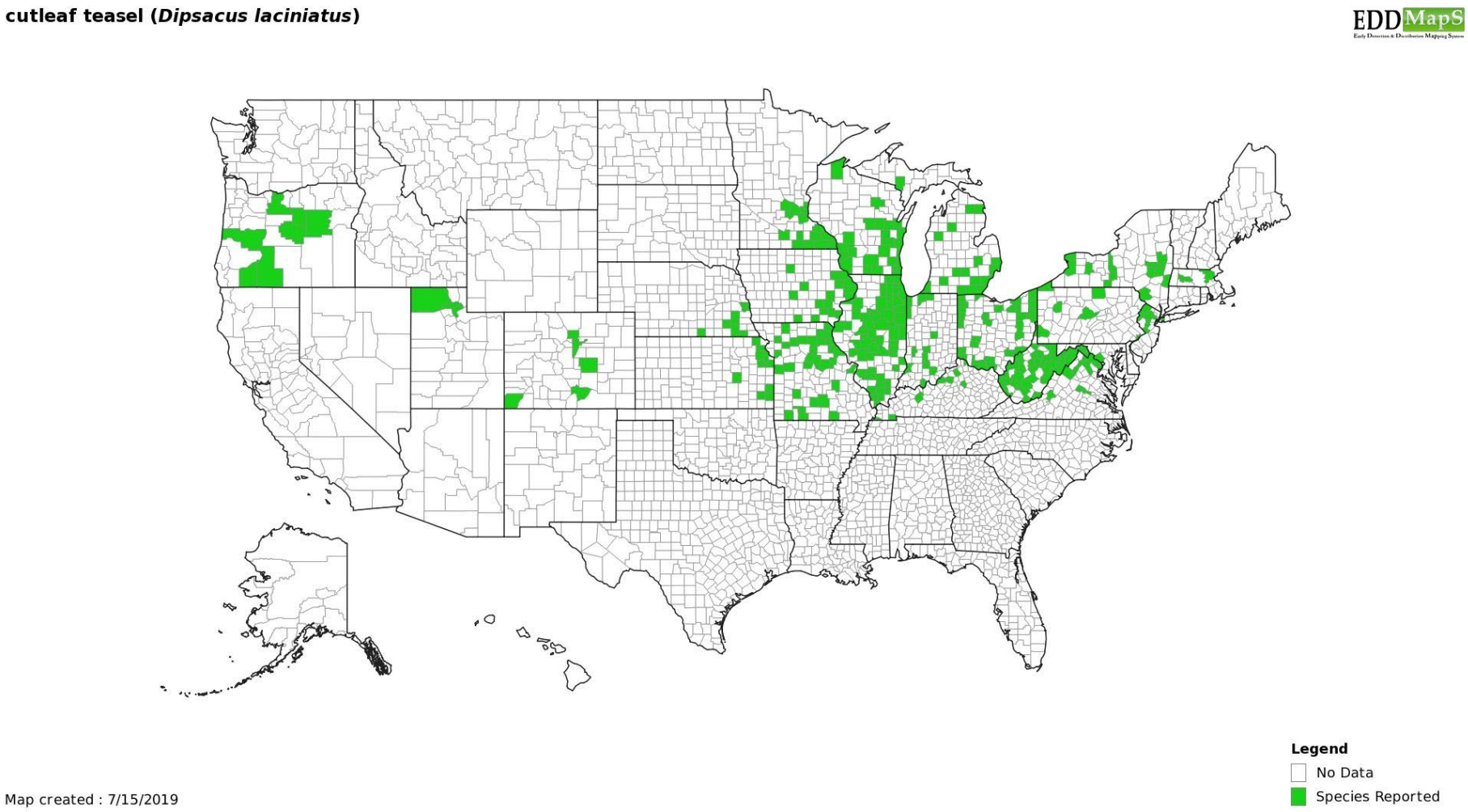
Figure 1. State distribution of cutleaf teasel (*Dipsacus laciniatus*) based on EDDMapS reporting (EDDMaps, 2019).



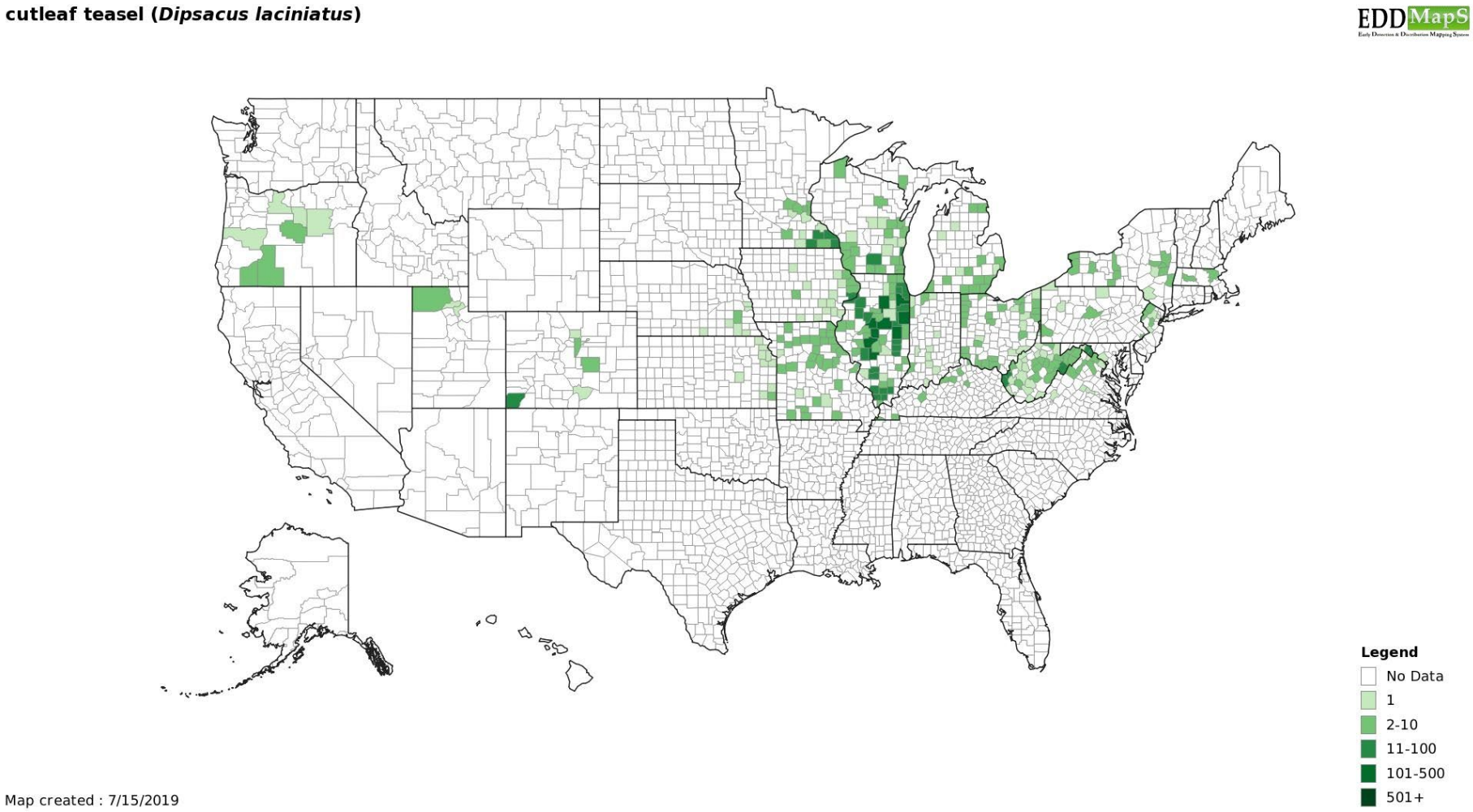
https://www.eddmaps.org/distribution/usstate.cfm?sub=5545

Figure 2. County distribution of cutleaf teasel (*Dipsacus laciniatus*) based on EDDMapS reporting (EDDMapS, 2019).



https://www.eddmaps.org/distribution/uscounty.cfm?sub=5545

Figure 3. Record density by county for cutleaf teasel (*Dipsacus laciniatus*) based on EDDMapS reporting (EDDMapS, 2019).



https://www.eddmaps.org/distribution/uscounty.cfm?sub=5545&map=density