

<p>MN NWAC Risk Assessment Worksheet (04-2017)</p>	<p>Common Name</p>	<p>Latin Name (Full USDA Nomenclature)</p>
	<p>Mexican Fireweed (Other common names include kochia, summer/mock/belvedere/annual/broom cypress, burning bush/burningbush, common kochia, belvedere, red belvedere, mirabel, Mexican firebush/firebrush, firebush, ragweed, fireball, railroad weed, poor man’s alfalfa, tumbleweed, and common red sage)</p>	<p><i>Bassia scoparia</i> (L.) A.J. Scott (Synonyms – <i>Kochia scoparia</i>, <i>Bassia sieversiana</i>, <i>Kochia alata</i>, <i>Kochia sieversiana</i>, <i>Kochia trichophylla/phila</i>, <i>Kochia alata</i>, <i>Kochia childsii</i>, <i>Kochia parodii</i>, <i>Kochia virgata</i>, and <i>Chenopodium scoparium</i>)</p>
<p>Original Reviewer: James Calkins</p>	<p>Affiliation/Organization: Minnesota Nursery and Landscape Association (MNLA)</p>	<p>Original Review: (07/25/2017)</p>
<p>Current Reviewer: James Calkins</p>	<p>Affiliation/Organization: Minnesota Nursery and Landscape Association (MNLA)</p>	<p>Current Review Date: (07/25/2017)</p>

Species Description:

Appearance: *Bassia scoparia* (formerly and still commonly known as *Kochia scoparia*), native to central and eastern Europe and western Asia, is a medium to fairly large (1-6 feet tall), upright, bushy (highly-branched; including from the base), pyramidal (upright-oval) to rounded, fine-textured, annual species with a distinct taproot. The species exhibits considerable phenotypic variability. Although the species exhibits considerable phenotypic variability, the form is typically upright-oval to rounded, especially for the cultivated varieties grown as landscape plants.

Family: Amaranthaceae (Pigweed/Amaranth Family); formerly in the Chenopodiaceae (Goosefoot Family) which has recently been merged with the Amaranthaceae.

Habitat: Although the species is native to Eurasia, it has been distributed worldwide by human activities. In North America Mexican fireweed has escaped cultivation and is sometimes found as a weed in disturbed (ruderal) grassland (including rangeland), prairie, and desert shrub ecosystems, in agricultural systems as both a crop and a weed, and in waste places.



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The species is tolerant of a wide variety of soils, including droughty, saline, and alkaline soils, and has been variously reported in grasslands, pastures, prairies, roadsides, ditch banks, floodplains, riparian habitats, seasonal wetlands, cultivated fields (especially those that have been newly planted), and strip-mined lands. Full sun is preferred and Mexican fireweed has no serious insect or disease problems. Mexican fireweed has been used to revegetate and stabilize disturbed lands and has also been commonly planted in residential, commercial, and public landscapes. There are several named cultivars.

Distribution: Mexican fireweed was introduced to North America from Europe in about 1900 as a forage and cover crop species and as a landscape plant valued for its fine texture, compact habit, and striking pink to red fall color. The species has subsequently escaped cultivation and become naturalized (especially on disturbed sites in arid and semi-arid regions). Although it is widely distributed in the United States and has been reported in every state except Arkansas, Alabama, Georgia, Florida, and Hawaii, it is most common in the western and Great Plains states and especially in Montana, Wyoming, Utah, Kansas, Colorado, Washington, North Dakota, Nevada, Arizona, New Mexico, and Oregon. In Canada, Mexican fireweed is present in British Columbia, Alberta, Saskatchewan, Manitoba, Ontario, Quebec, New Brunswick, and Nova Scotia.

Detailed Botanical Description: Mexican fireweed has alternate leaves that are variable in length up to 5 cm long (just under 2 inches), simple, entire, linear to narrowly ovate (lanceolate), sessile (without petioles; attached directly to the stem), and bright green to gray/bluish-green in color with a fringe of hairs along the margins. Stems are round in cross-section and are often tinged or streaked with red (especially in late summer and fall). The surfaces of the leaves and stems may be variously hairless or pubescent. In the fall, the plants develop purplish-red to scarlet fall color. The flowers are small and inconspicuous, perfect, produced in pairs or clusters in the axils of the upper leaves and in terminal spikes and panicles, sessile (without stalks), green, and apetalous (without petals) and are produced from July until plants are killed by frost in the fall (September/ October). The fruit is a globe-shaped utricle (a fragile, thin-walled, bladder-like, single-seeded, indehiscent fruit; similar to an achene except the pericarp is loose and fragile) with a persistent star-shaped, five-lobed calyx (sepals) that contains a single, oval, flattened, grooved (on each side), brown to black seed with yellow markings and a dull surface.

Seed Dispersal & Germination: Like a number of other species in the family, the stems of senesced plants often break off near the ground and the crowns tumble across the landscape distributing their seeds. The seeds require light to germinate, but have no dormancy and germinate in early spring and sporadically throughout the growing season. Young plants initially have a rosette habit.

Economic Uses: The species has good forage quality when young and is drought and salt tolerant, but prefers moist, well-drained soil; hay and silage produced from the plant was a “lifesaver” for livestock producers during the severe droughts of the 1930s and 1950s. Other uses include food, brooms, medicines, erosion control, and contaminated soil remediation.

Human Health Impact: The pollen is allergenic and can be a cause of “hay fever” in areas where Mexican fireweed is prevalent.

Current Regulation: Mexican fireweed is not currently regulated in Minnesota, with the exception of Clay County where it is regulated as a county-approved noxious weed, or by the federal government; it is listed as a noxious weed or invasive species and regulated in Connecticut, Oregon, and Washington.

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Box	Question	Answer	Outcome
1	The plant species or genotype is non-native.	Yes ; Mexican fireweed is native to Europe and Asia; likely introduced in North America in the mid to late 1800s (Friesen et al., 2009); other references suggest it was introduced sometime around 1900 (Friesen et al., 2009).	Go to Box 3
2	The plant poses significant human or livestock health concerns or has the potential to significantly harm agricultural production.		
	A. Does the plant have toxic qualities that pose a significant risk to livestock, wildlife, or people?	<i>Mexican fireweed plants contain high levels of saponins, oxalates, alkaloids, and nitrates that can be toxic to a variety of grazing animals (ruminants; cattle, sheep, horses) if large amounts are consumed; regardless, the species is still used as a forage crop (Casey, 2014; Friesen et al., 2009).</i>	This text is provided as additional information and is not part of the decision tree process for this risk assessment.
	B. Does the plant cause significant financial losses associated with decreased yields, reduced quality, or increased production costs?	<i>When present as a weed in a crop, Mexican fireweed can reportedly reduce crop yields (Friesen et al., 2009).</i>	This text is provided as additional information and is not part of the decision tree process for this risk assessment.

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Box	Question	Answer	Outcome
3	The plant, or a related species, is documented as being a problem elsewhere.	<p>Yes; Mexican fireweed is widely distributed worldwide including in North America (Casey, 2014; Esser, 1995; Friesen et al., 2009; USDA, NRCS – The PLANTS Database, 2017, https://plants.usda.gov/core/profile?symbol=BASC5; and EDDMapS, 2017, http://www.eddmaps.org/distribution/uscounty.cfm?sub=19886 - most commonly reported in the southwestern states and especially in northern Arizona; see Appendix for maps).</p> <p>Listed as a noxious weed in Clay County, Minnesota (Minnesota Department of Agriculture, 2017; Clay County, 2017); listed as an invasive species or noxious weed in the United States in Connecticut (Potentially Invasive/Prohibited; Connecticut Invasive Plant Working Group, 2014), Ohio (Prohibited Noxious Weed; Ohio Department of Agriculture, 2017), Oregon (B Listed Weed, Quarantine; Oregon Department of Agriculture), and Washington (Class B Noxious Weed, Noxious Weed Seed and Plant Quarantine; Washington State Legislature, 2016); and listed as a noxious weed in Manitoba and the Peace River district of British Columbia in Canada (Friesen et al., 2009).</p>	Go to Box 6
4	The plants’ life history & growth requirements are sufficiently understood.		
5	Gather and evaluate further information.	(Comments/Notes)	
6	The plant has the capacity to establish and survive in Minnesota.		

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Box	Question	Answer	Outcome
	A. Is the plant, or a close relative, currently established in Minnesota?	Yes ; Mexican fireweed has been documented in Minnesota and in all neighboring states and Canadian provinces (USDA, NRCS – The PLANTS Database, 2017, https://plants.usda.gov/core/profile?symbol=BASC5 and EDDMapS, 2017, http://www.eddmaps.org/distribution/uscounty.cfm?sub=19886 – 46 reports statewide, all based on herbarium records with no point reports; see Appendix for maps).	Go to Box 7
	B. Has the plant become established in areas having a climate and growing conditions similar to those found in Minnesota?		
7	The plant has the potential to reproduce and spread in Minnesota?		
	A. Does the plant reproduce by asexual/vegetative means?	No ; Mexican fireweed only reproduces by seed (Esser, 1995; Sholedice and Renz, 2006).	Go to Question C
	B. Are the asexual propagules – vegetative parts having the capacity to develop into new plants – effectively dispersed to new areas?		
	C. Does the plant produce large amounts of viable, cold-hardy seeds?	Yes ; Mexican fireweed plants produce large numbers (over 50,000 seeds/plant under favorable conditions; USDA Forest Service, 2005) of viable, cold hardy seeds and can reseed in Minnesota since naturalized plants have been reported in the state. Although the species has become naturalized in Minnesota and has been reported in far northwestern Minnesota (Zone 3), the Missouri Botanical Garden website (Missouri Botanical Garden Plant Finder) reports the species is hardy in USDA Cold Hardiness Zones 2-11 and that plants can “self-seed” in the garden” and “become somewhat weedy in USDA Zones 8-10.”	Go to Question F

Box	Question	Answer	Outcome
	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?	<i>Mexican fireweed seeds are reportedly short-lived in the soil (1-3 years) and most seeds germinate within the first year (Invasive Plant Atlas of New England, 2017). While a small percentage of seeds can survive for several years, the species does not develop a significant seed bank (Dodd and Randall, 2002). Seedlings reportedly have high vigor (Invasive Plant Atlas of New England, 2017).</i>	This text is provided as additional information and is not part of the decision tree process for this risk assessment.
	E. Is this species self-fertile?	<i>Yes; Mexican fireweed is self-compatible and can produce significant amounts of seed as a result of self-pollination (Friesen et al., 2009).</i>	This text is provided as additional information and is not part of the decision tree process for this risk assessment.
	F. Are sexual propagules – viable seeds – effectively dispersed to new areas?	Yes ; dispersed by wind and water (Invasive Plant Atlas of New England, 2017); included in the group of plants called tumbleweeds which detach at the crown when mature and roll with the wind to disperse their seeds (Invasive Plant Atlas of New England, 2017).	Go to Question I
	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; two related species are native to North America, <i>Neokochia americana</i> (formerly <i>Kochia americana</i> ; native to deserts of the mountain west) and <i>Neokochia californica</i> (formerly <i>Kochia californica</i> ; native to the Central Valley and the Mojave Desert in California and in adjacent areas of Nevada), but are not known to hybridize with Mexican fireweed (California Invasive Plant Council, 2005; Friesen et al., 2009).	
	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?		

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Box	Question	Answer	Outcome
	<p>I. Do natural controls exist, species native to Minnesota, which are documented to effectively prevent the spread of the plant in question?</p>	<p>No; apparently not; no information found.</p>	<p>Go to Box 8</p>
<p>8</p>	<p>The plant poses significant human or livestock concerns or has the potential to significantly harm agricultural production, native ecosystems, or managed landscapes.</p>		
	<p>A. Does the plant have toxic qualities, or other detrimental qualities, that pose a significant risk to livestock, wildlife, or people?</p>	<p>No; Mexican fireweed is generally not considered a significant risk to livestock wildlife, or people. While plants contain high levels of oxalates, alkaloids, and nitrates that can be toxic and occasionally fatal to a variety of grazing animals (ruminants; e.g., cattle, sheep, horses, deer, pronghorn antelope) and if large amounts are consumed (>50% of diet); toxicity is greatest following periods of drought and when seeds are present</p> <p>Mexican fireweed is still sometimes recommended and planted as a forage crop (especially on saline soils). The species is not common in native ecosystems so exposure to native ruminants would be minimal (Friesen et al., 2009; Undersander et al., 1990; Thomson et al., 2002).</p> <p>The species is considered moderately allergenic (Friesen et al., 2009; PollenLibrary.com), but the species is not common or is generally less common than other allergenic species like native ragweed (<i>Ambrosia</i> spp.). Mexican fireweed may cause dermatitis for some individuals (Friesen et al., 2009).</p>	<p>Go to Question B</p>

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Box	Question	Answer	Outcome
	<p>B. Does, or could, the plant cause significant financial losses associated with decreased yields, reduced crop quality, or increased production costs?</p>	<p>No; little specific Minnesota information and not highlighted as a particularly bad weed in Minnesota; based on the information available, it does not appear Mexican fireweed is likely to cause widespread significant financial losses in Minnesota.</p> <p>Note - Minnesota-specific information on distribution and agricultural effects is limited and more information is needed. Based on the information available at this time, however, the answer to this question is no as indicated. Nevertheless, there are some reports of concerns and, depending on degree, the answer could be yes (= Go to Box 9) and some form of regulation may be justified in the future. Concerns reported include competition for light, nutrients, and soil moisture that can reduce crop yields and contaminate crops (Rumph et al., 2016); may be a problem in sugar beets (Friesen et al., 2009) and possibly potatoes, alfalfa, and wheat (Washington Invasive Species Council, 2006; King County, 2016).</p>	<p>Go to Question C</p>
	<p>C. Can the plant aggressively displace native species through competition (including allelopathic effects)?</p>	<p>No; primarily a concern in ruderal (disturbed) areas and does not typically become dominant in native ecosystems; intolerant of shade and not found in wooded areas; allelopathy and autoallelopathy have been reported (Friesen et al., 2009; Esser, 1995).</p>	<p>Go to Question D</p>
	<p>D. Can the plant hybridize with native species resulting in a modified gene pool and potentially negative impacts on native populations?</p>	<p>No; no native species, or otherwise compatible species, are found in Minnesota.</p>	<p>Go to Question E</p>
	<p>E. Does the plant have the potential to change native ecosystems (adds a vegetative layer, affects ground or surface water levels, etc.)?</p>	<p>No; again, primarily a concern in ruderal (disturbed) areas and does not typically become dominant in native ecosystems.</p>	<p>Go to Question F</p>

Box	Question	Answer	Outcome
	F. Does the plant have the potential to introduce or harbor another pest or serve as an alternate host?	No or unknown; no specific information found.	THE SPECIES IS NOT CURRENTLY BELIEVED TO BE A RISK; NO REGULATORY ACTION
9	The plant has 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?	<p><i>Yes; Mexican fireweed is planted in landscapes, but not widely in Minnesota (personal experience); several named cultivars have been selected based on habit and foliage characteristics (e.g., ‘Acapulco Silver’ is an All American Bronze Medal winner with lime-green foliage with silver variegation) (Still, 1994, University of Minnesota Libraries, 2016) and Mexican fireweed seeds are readily available and sold online through Amazon.com and other sources.</i></p> <p><i>Mexican fireweed has been planted as a forage crop, for soil stabilization and erosion control, and is sometimes used as a landscape plant for its attractive foliage, form, and fall color (Friesen et al., 2009; Still, 1994); reportedly provides food and cover for upland game birds including pheasants and small mammals (Esser, 1995).</i></p> <p><i>Mexican fireweed is not native to Minnesota.</i></p>	This text is provided as additional information and is not part of the decision tree process for this risk assessment.
	B. Is the plant an introduced species and can its spread be effectively and easily prevented or controlled, or its negative impacts minimized through carefully designed and executed management practices?	<p><i>Yes; Mexican fireweed can be controlled by cultivation, selected herbicides, and mechanical means (cultivation and hand pulling). Infestations in Australia and Tasmania appear to have been successfully eliminated using such means (Friesen et al., 2009; CRC for Australian Weed Management, 2003; Dodd and Randall, 2002).</i></p>	This text is provided as additional information and is not part of the decision tree process for this risk assessment.

Box	Question	Answer	Outcome
	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	Enforce control as a noxious weed to prevent introduction &/or dispersal; designate as Prohibited or Restricted.		
	A. Is the plant currently established in Minnesota?		
	B. Does the plant pose a serious human health threat?		
	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?	<i>Mexican fireweed can be effectively controlled by cultivation and with a variety of pre- and post-emergent herbicides (Rumph et al., 2016). It is not effectively controlled by phenoxy herbicides (e.g., 2, 4-D) and resistance to triazine, sulfonyleurea, ALS-inhibitor, and auxinic (dicamba) herbicides has been observed in some cases (Friesen et al., 2009; Heap, 2017). Resistance to glyphosate has also been reported (South Dakota State University Extension, 2014; Heap, 2017; Jugulam et al., 2014). Mowing or cutting plants to reduce flowering or prevent seed maturation and dispersal can also reduce seed production and dispersal (Friesen et al., 2009).</i>	This text is provided as additional information and is not part of the decision tree process for this risk assessment.
11	Allowed but controlled via a species-specific management plan; designate as Specially Regulated.		
Final Results of Risk Assessment			
	Review Entity	Comments	Outcome

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Box	Question	Answer	Outcome
	NWAC Listing Subcommittee	Discussed recommendation to <u>not list</u> Mexican fireweed as a noxious weed on July 25, 2017.	Recommendation to not list Mexican fireweed as a noxious weed.
	NWAC Full-group	Formal recommendation to not list Mexican fireweed as a noxious weed submitted to the full NWAC on September 7, 2017, followed by a vote on the recommendation on November 28, 2017.	Approved recommendation to not list Mexican fireweed as a noxious weed; recommendation forwarded to the MDA Commissioner.
	MDA Commissioner	Approved NWAC Recommendation	Do not list
	FILE # MDARA00060MF_12_06_2017		

Risk Assessment Current Summary (07/25/2017):

Mexican fireweed was introduced to North America as a landscape plant and a forage and cover crop and has escaped cultivation and become naturalized across the United States and southern Canada including Minnesota; although present as a weed in Minnesota, it has been around for many years and does not appear to be a significant threat. Recommendation = no regulatory action, but more information about the distribution and crop and native ecosystem effects should be gathered.

References:

(List any literature, websites, personal communications and other publications. All references should be identified in a systematic and logical way within the RA text)

General Information – Distribution and Plant Characteristics

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Answers to Risk Assessment Questions

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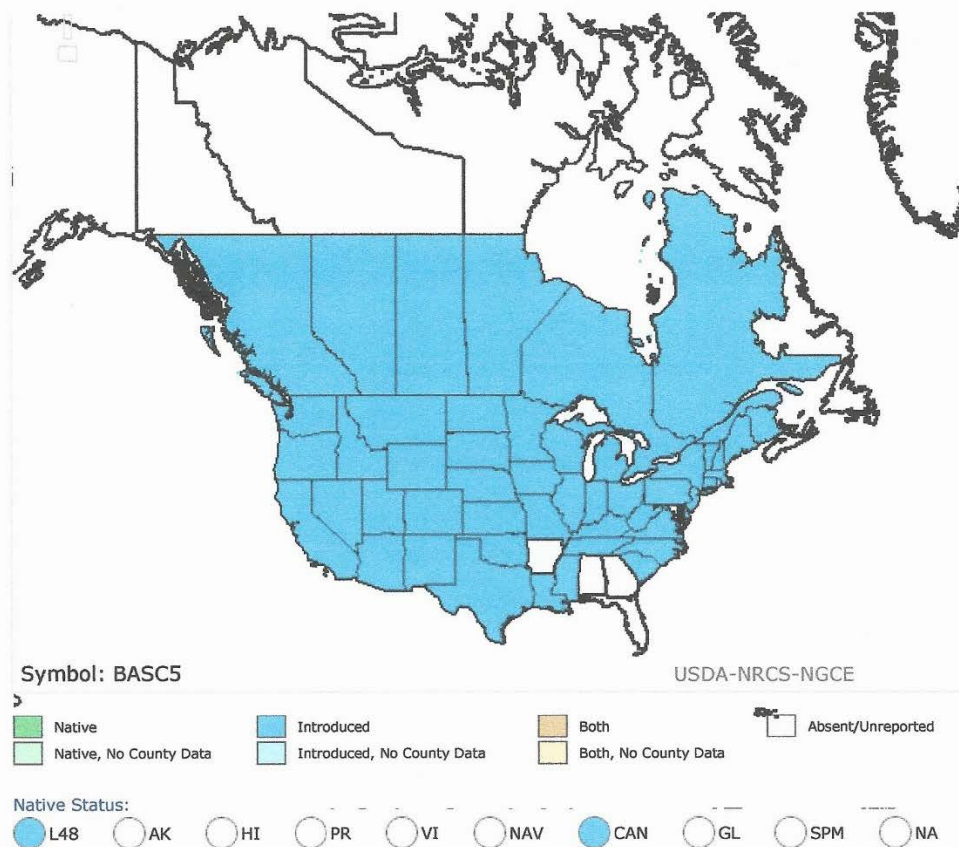
http://www.invasivespecies.wa.gov/documents/priorities/kochia_factsheet.pdf (Accessed July 17, 2017)

Washington State Legislature. 2016. Washington Administrative Code, Title 16, Chapter 16-752, Section 16-752-610 (Last Update June 23, 2016). <http://apps.leg.wa.gov/wac/default.aspx?cite=16-752-610> (Accessed July 17, 2017)

Appendix:

(Not required, but may be used to attach other supporting or pertinent information for the risk assessment)

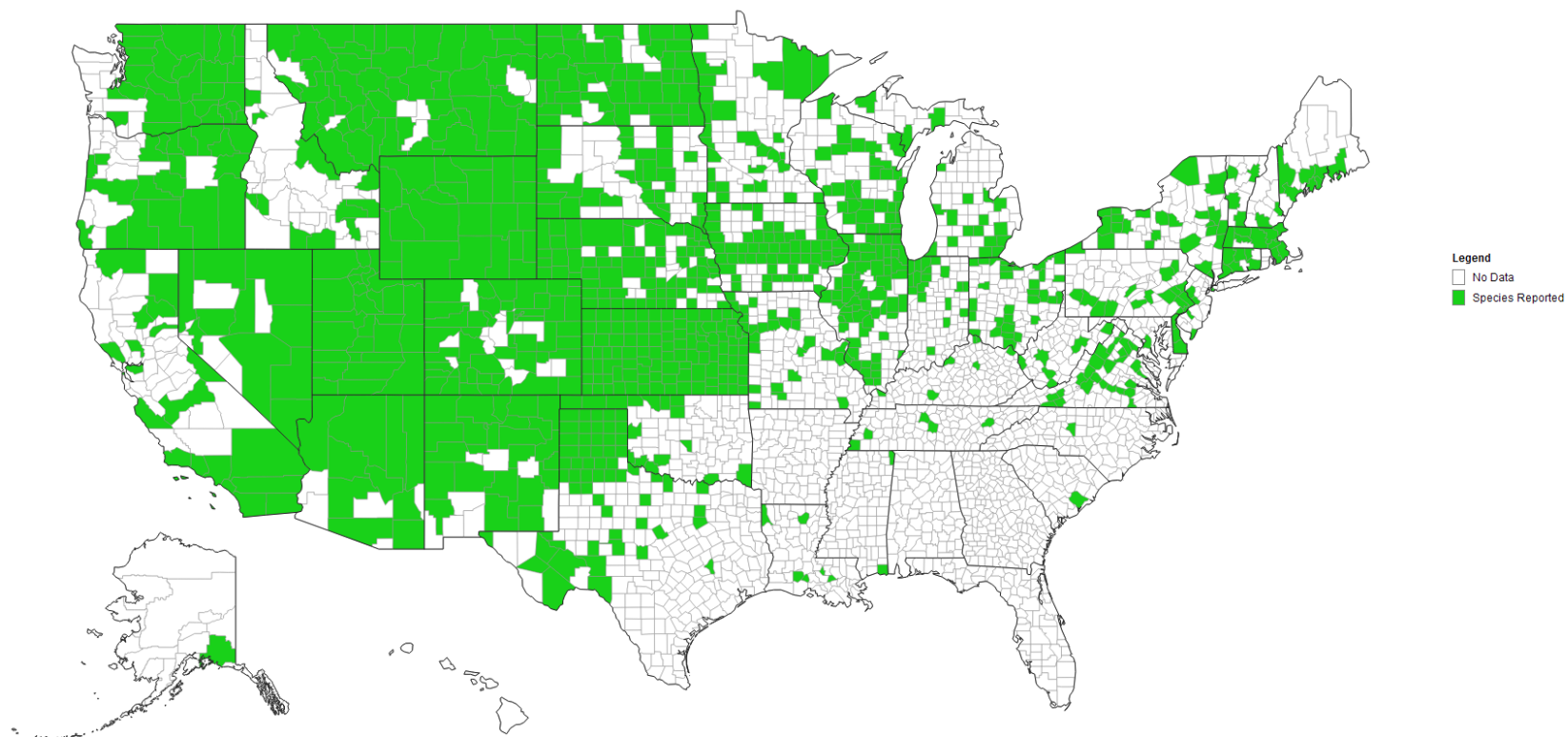
Plants Profile for *Bassia scoparia* (burningbush)



USDA, NRCS State Distribution; Map downloaded on July 18, 2017;
<https://plants.usda.gov/core/profile?symbol=BASC5>.

Draft

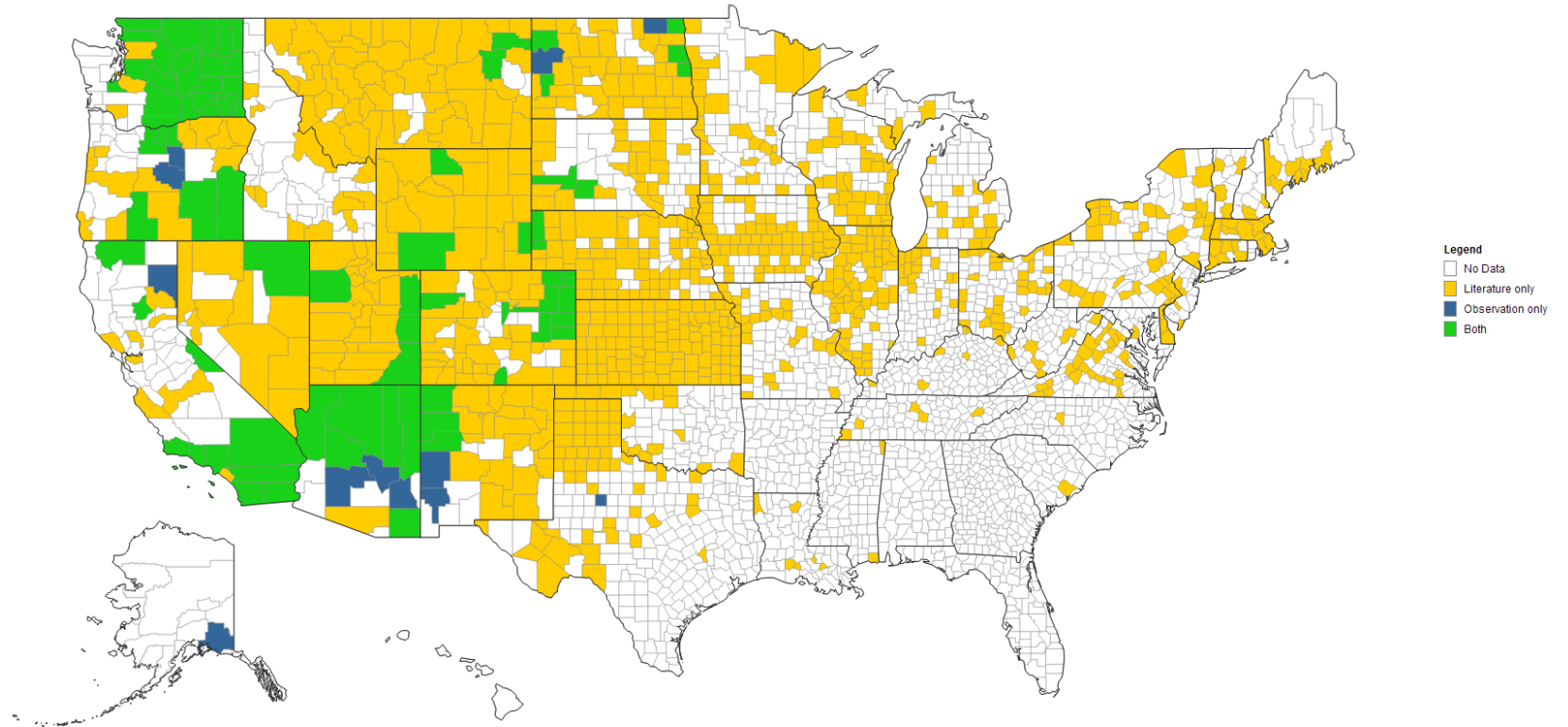
Mexican fireweed (*Bassia scoparia*)



County Distribution; Map downloaded on July 18, 2017;
<http://www.eddmaps.org/distribution/uscounty.cfm?sub=19886>.

Draft

Mexican fireweed (*Bassia scoparia*)



County Distribution/Literature vs. Observation; Map downloaded on July 18, 2017;
<http://www.eddmaps.org/distribution/uscounty.cfm?sub=19886&map=literature>.

Mexican fireweed

Bassia scoparia (L.) A.J. Scott

USDA PLANTS Symbol: BASC5
(//plants.usda.gov/java/profile?symbol=BASC5)
Invasive Plant Atlas
(//www.invasiveplantatlas.org/subject.html?sub=19886)
Species Information (/species/subject.cfm?sub=19886)

States (usstate.cfm?sub=19886) Counties (uscounty.cfm?sub=19886) Points (viewmap.cfm?sub=19886) List (List.cfm?sub=19886)

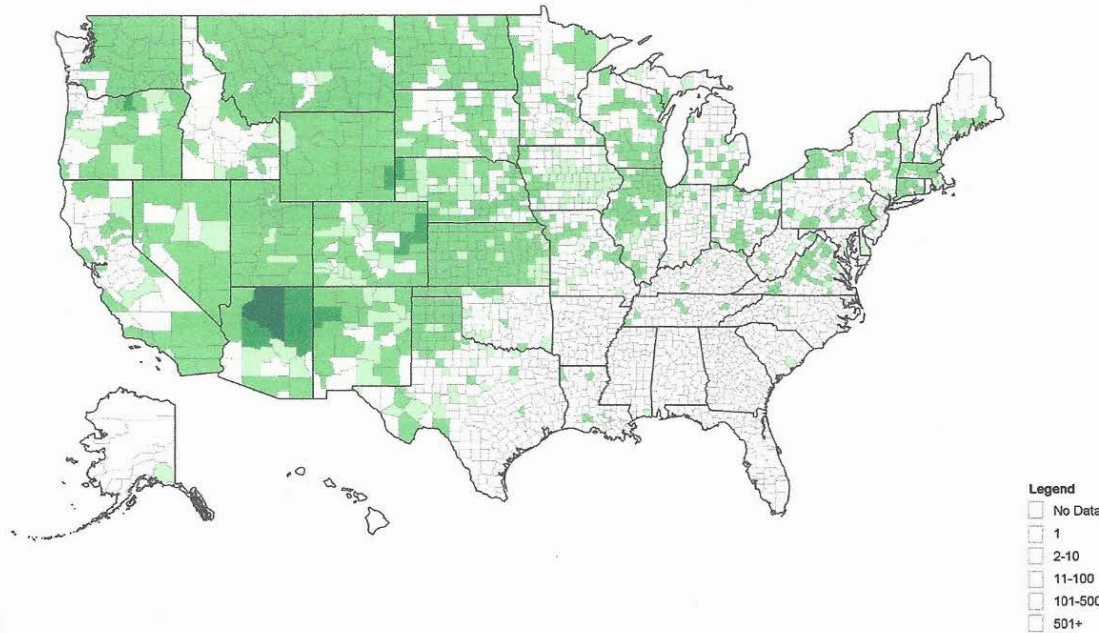
Distribution (uscounty.cfm?sub=19886&map=distribution)

Login to download data (?forcelogin&sub=19886&map=density)

Record Density (uscounty.cfm?sub=19886&map=density)

Literature vs Observation (uscounty.cfm?sub=19886&map=literature)

Share Download Flag Fullscreen



Record Density; Map downloaded on July 18, 2017;
<http://www.eddmaps.org/distribution/uscounty.cfm?sub=19886&map=density>.

Mexican fireweed

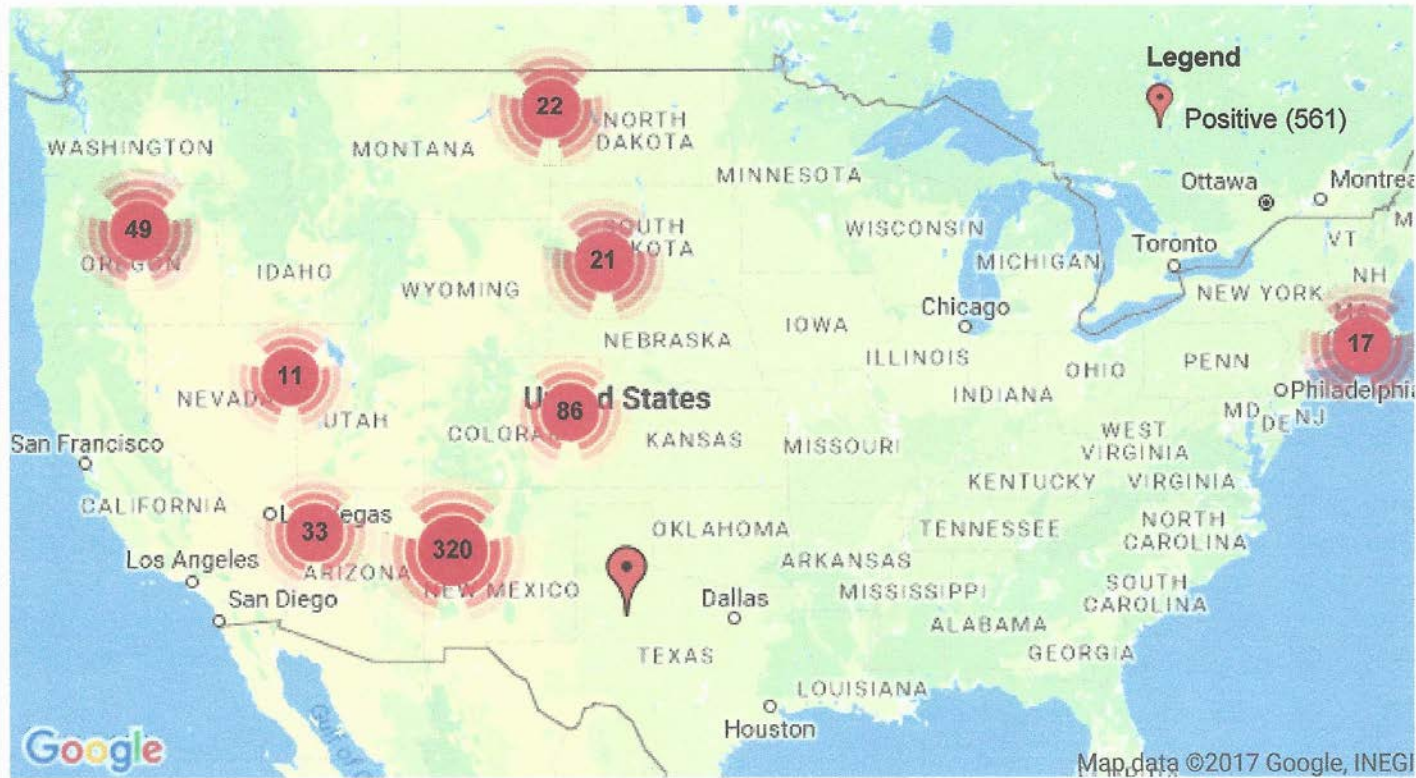
Bassia scoparia (L.) A.J. Scott

USDA PLANTS Symbol:BASC5

(//plants.usda.gov/java/profile?symbol=BASC5)

Invasive Plant Atlas (//www.invasiveplantatlas.org/subject.html?sub=19886)

Species Information (/species/subject.cfm?sub=19886)



County Distribution/Points Distribution; Map downloaded on July 18, 2017;
<https://www.eddmaps.org/distribution/viewmap.cfm?sub=19886>.