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**Report Title**

An Analysis of Possible Risk to Threatened and Endangered  
Plant Species Associated with Glyphosate Use in Alfalfa,  
Phase 2: Species Proximity to Relevant Land Use  
at the Sub-County Level (Summary Report)

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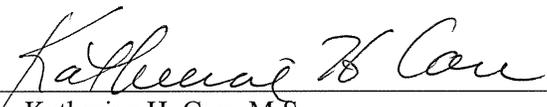
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This work is not required to meet the standards of good laboratory practices because it does not meet the definition of a study contained in Part 160.3 as there is no test material or experimentation.

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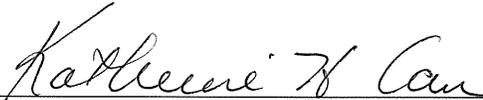
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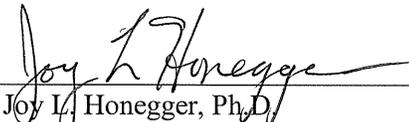


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## 1. ABSTRACT

This report provides a summary of Phase 2 of the analysis of possible risk to threatened and endangered plant species from the use of glyphosate herbicides in alfalfa production. This phase of the analysis involved assessing the proximity of land areas where alfalfa could be grown (relevant land use) to sub-county locations of threatened and endangered plant species that had been identified as “requiring further analysis” in the county-level analysis (Priester et al., 2007; 2008). This report describes the methodology employed in determining the potential for exposure of threatened or endangered plant species to glyphosate as a result of alfalfa production. Six additional reports present the details by region for each listed species observation, the relevant land use, and proximity conclusions; the regions correspond to the six U.S. Fish and Wildlife Service regions. An overview of the complete assessment of the potential for effects from glyphosate use in alfalfa production on threatened and endangered plant species is provided in Honegger et al. (2008).

For the counties identified in the county-level analysis, national land cover data was used to identify areas where alfalfa could be grown. Land use identified as either “Pasture/Hay” or “Cultivated Crops” was considered relevant. The sub-county species location data for the plant species identified in the county-level analysis were obtained from the FIFRA Endangered Species Task Force MJD (Multi-Jurisdictional Database) or from state data sources, where necessary. Geographic information system (GIS) tools were used to compare the locations of the relevant land use with the species locations to assess whether the species had overlap with or was within 250 feet of the relevant land use.

This analysis determined that there are counties in 31 states where listed plant species may be in proximity to land that has been used historically or could be used in the future for alfalfa production. There are 78 distinct species and 1399 listed plant species observations that have proximity to relevant land use.

## 2. INTRODUCTION

This report contains a summary of the proximity analysis for threatened and endangered plant species (“listed plant species”) and land use relevant for alfalfa production. Specifically, this phase of the analysis involved assessing the proximity of relevant land use to sub-county locations of threatened and endangered plant species that had been identified as “requiring further analysis” in the county-level analysis (Priester et al., 2007; 2008). An overview of the complete assessment of the potential for effects on threatened and endangered plant species from glyphosate use in alfalfa production is provided in Honegger et al. (2008).

This report provides a description of the procedures employed for the proximity assessment and a county-level summary of the conclusions. Six additional reports present the details for each listed species observation, the relevant land use (land that has been used or could be used in the future for alfalfa production), and proximity conclusions for each of the six U.S. Fish and Wildlife Service regions (Carr & Honegger 2008(b)– 2008(g), Monsanto Study Nos. RPN-2007-231 – RPN-2007-236). The regions are as follows: Region 1: Pacific; Region 2: Southwest; Region 3: Midwest; Region 4: Southeast; Region 5: Northeast; Region 6: Mountain-Prairie.

Listed plant species locations that were found to overlap or to be within 250 feet of relevant land use were further evaluated in Phase 3 of the analysis (the development of assessment-based mitigation practices) (Carr & Honegger 2008(h)).

## 3. SPATIAL DATA USED FOR THE PROXIMITY ASSESSMENT

### 3.1. Land Cover Data and Relevant Land Use

For the contiguous U.S., land cover data were obtained from the National Land Cover Dataset (NLCD 2001). Data for the NLCD 2001 were collected from 1994-1998 and represent the best comprehensive collection of national land use and land cover information for the U.S. The spatial data (resolution [minimum mapping unit]: 30 meters) was converted from raster format to vector format for Classes 81 and 82 (see class descriptions below). These two classes were considered “relevant land use” for this assessment, since land designated as cultivated crop land could be converted to alfalfa production, and some fields in alfalfa production could be converted to cultivated cropland (alfalfa fields would be classified as Pasture/Hay in the 2001 NLCD). The vector files (polygons) were used with GIS software<sup>1</sup> to assess proximity to the sub-county locations of listed plant species.

<b>NLCD 2001 Classification</b>	<b>Description</b>
Pasture/Hay (Class 81)	Areas of grasses, legumes, or grass-legume mixtures planted for livestock grazing or the production of seed or hay crops, typically on a perennial cycle. Pasture/hay vegetation accounts for greater than 20 percent of total vegetation.

<sup>1</sup> The geographic information system (GIS) software used in this project was ArcGIS v 9.2 (ESRI Inc.).

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<b>NLCD 2001 Classification</b>	<b>Description</b>
Cultivated Crops (Class 82)	Areas used for the production of annual crops, such as corn, soybeans, vegetables, tobacco, and cotton, and also perennial woody crops such as orchards and vineyards. Crop vegetation accounts for greater than 20 percent of total vegetation. This class also includes all land being actively tilled.

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For the Hawaiian Islands, comprehensive land cover data collected in 2000 by the National Oceanic and Atmospheric Administration (NOAA) Coastal Services Center was used (NOAA Coastal Services Center 2001). The land cover classification considered relevant for this assessment was “Cultivated Land”. The spatial data (resolution (minimum mapping unit): 30 meters) was converted from raster format to vector format and used in the proximity assessment.

### **3.2. Species Location Data**

Threatened and endangered plant species location data at a sub-county level were obtained from the FIFRA Endangered Species Task Force MJD (Multi-Jurisdictional Database, October 2006) or from the New Jersey state sources (NJ Department of Environmental Protection (NJDEP) and Office of Natural Lands Management (ONLM), 2002). The FESTF MJD consists of a “licensed dataset” drawn from NatureServe’s Multi-Jurisdictional Database (MJD) licensed to FESTF.<sup>2</sup> The MJD species observation records included additional data fields, such as date of last observation and observation notes; this information was evaluated and utilized when relevant to the proximity assessment.

The MJD location data were provided as polygons (areas representing where a listed plant species was observed; referred to as a “species observation”). The New Jersey data was provided in a grid format – a grid layer with each unit representing approximately 0.5 square miles. A corresponding table indicated which species were present in each grid section. Both spatial datasets were provided in a format suitable for analysis and display using GIS software.

## **4. PROXIMITY ASSESSMENT PROCESS**

It was concluded in the Tier I Endangered Species Assessment (Mortensen et al., 2008) that listed plant species may be at risk from ground applications of glyphosate exceeding 3.5 lb glyphosate acid (a.e.)/ acre or from aerial applications exceeding 0.70 lb a.e./acre. Therefore, it was necessary to assess the proximity of listed plant species to agricultural land that could receive such an application of glyphosate to alfalfa.<sup>3</sup>

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<sup>2</sup> Under the terms of the FESTF license with NatureServe, the sub-county threatened and endangered species location data are confidential information available only to FESTF member companies, companies having satisfied their data compensation obligations, and the U.S. EPA’s Office of Pesticide Programs. Information based on the sub-county species location data may be shared with cooperating federal and state agencies for regulatory decision-making related to endangered species assessments for Monsanto products. All report pages that describe or depict sub-county location data are presented in a Confidential Attachment to the respective report.

<sup>3</sup> Since the land areas being considered in this assessment are all areas identified as producing cultivated crops and also all areas identified where grasses or legumes are grown, this assessment is relevant not only for alfalfa but also for any use of glyphosate in these areas (e.g. uses in other crops or for other vegetation control purposes).

Figure 1 depicts a flow chart outlining the process followed for Phase 2 analysis. The basic steps were as follows:

1. Obtain comprehensive data regarding sub-county plant species locations and relevant land use.
2. Using GIS software, identify species observations with **proximity to relevant land use** (have overlap with or are within 250 feet of relevant land use).
3. Identify species observations that are not relevant for this assessment, either due to their historical nature (see below), or because the species has been extirpated (is no longer present) at a specific location (based on MJD detailed data).
4. Incorporate, where relevant, additional information obtained from state heritage programs regarding risk of a species from agricultural practices (either protections or exclusions). This information was not available when the county-level analysis was conducted.
5. Summarize proximity conclusions for use in Phase 3 of the glyphosate analysis (Carr & Honegger 2008(h)).

The 250-foot distance for assessing proximity to relevant land use is sufficient to protect the species from exposure as a result of spray drift from aerial application. This distance was calculated using the AgDrift model (version 2.04; Teske et al., 2002) assuming the maximum aerial application rate of 1.55 lb glyphosate a.e./acre, medium-to-coarse spray droplet size, and using the lowest No Observed Effect Concentration (NOEC) from the glyphosate vegetative vigor non-target plant study (0.035 lb a.e./acre) conducted by Monsanto (Chetram and Lucash, 1994). This calculation is described in Appendix 1.

For the purposes of this assessment, species observations were considered “historical” if the “last observed date” for the observation was prior to 1977<sup>4</sup>. Additional observation-specific data (e.g. field notes) were examined to identify observations that are noted to be “historic” or “extirpated”. In some cases, species with observations later than 1976 were flagged as “extirpated”. For several states, additional protection and exclusion information was received from the state heritage programs that was used to exclude specified species from further analysis (e.g. the species was “not of concern” in a specific county<sup>5</sup>). In situations of historic, extirpated, or not-of-concern species observations, no further analysis was conducted.

Figure 2 displays the counties identified in the county-level analysis (Priester et al., 2007; 2008) as having listed plant species that required further analysis for possible risk from exposure to glyphosate. These counties are the counties that have been evaluated in the Phase 2 proximity assessment.

## 5. PROXIMITY FINDINGS

Figure 3 depicts the regions used in reporting the detailed results of the proximity assessment (Carr & Honegger 2008(b)– 2008(g), Monsanto Study Nos. RPN-2007-231 – RPN-2007-236). These regions correspond to the U.S. Fish & Wildlife Service regions.

Figure 4 depicts the counties where a relevant land use (cultivated crop or pasture/hay) is within 250 feet of an observation of a threatened or endangered plant species considered relevant for further analysis. The observations in these counties were considered in Phase 3 (Carr & Honegger 2008(h)).

<sup>4</sup> The past 30 years is considered a conservative time period for this assessment. In several cases, species observations from the mid-1990s were noted as “extirpated” or “not found” in subsequent field surveys, as reported in the MJD additional fields.

<sup>5</sup> The county-level (Phase 1) analysis (Priester et al., 2007; 2008) would have captured a protection or exclusion of this type, had the information been available when Phase 1 was conducted.

Also depicted are those counties where all species observations were historic, extirpated, or not at risk from agriculture.

Table 1 summarizes the overall results of the proximity analysis. The number of states, counties, and species without proximity are not reported, since the observations without proximity often were in counties that had other observations that have proximity to relevant land use. The totals reported for observations in proximity to relevant land use indicate the magnitude of the Phase 3 analysis (Carr & Honegger 2008(h)). Table 2 presents the results of the proximity assessment by region. Table 3 presents the results of the proximity assessment by state.

**Table 1. Overall Results of Phase 2 Proximity Assessment**

Assessment Category (for counties with alfalfa production)	Number of:			
	States	Counties	Plant Species	Species Observations <sup>a</sup>
Requires Further Analysis (end of Phase 1)	40	438 <sup>b</sup>	141	3475
No proximity to relevant land use	--	--	--	1631
Historic (pre-1977) or extirpated	--	--	--	389
Not at risk from agriculture <sup>c</sup>	--	--	--	56
Proximity to relevant land use	<u># of States (by Taxon)</u> 26 Dicots 1 Ferns/Allies 23 Monocots	<u># of Counties (by Taxon)</u> 194 Dicots 2 Ferns/Allies 91 Monocots	<u># of Species (by Taxon)</u> 61 Dicots 1 Ferns/Allies 16 Monocots	<u># of Observations (by Taxon)</u> 1066 Dicots 7 Ferns/Allies 326 Monocots
End of Phase 2	31 <sup>e</sup>	281 <sup>d,e</sup>	78	1399

<sup>a</sup> For counties included in the FESTF MJD dataset. Does not include New Jersey or Cibola and Valencia counties in NM.

<sup>b</sup> Includes 7 counties for which no sub-county species location data were available in the FESTF MJD or from other sources. Further research indicated the species either were not present in the specified county or that agriculture was not a concern.

<sup>c</sup> Exclusion or protection communicated by state heritage program during Phase 2 data gathering.

<sup>d</sup> Includes 11 counties in New Jersey.

<sup>e</sup> Totals will not be additive for states and counties, since some counties have more than one species with proximity to relevant land use.

New Jersey has 11 counties where it is possible that listed plant species have proximity to relevant land use for alfalfa production. Due to the nature of the New Jersey species location data, it was not possible to exactly define proximity for individual species observations.

Table 4 and Table 5 summarize the results of this proximity assessment for listed plant species in counties with alfalfa production by species, taxa and state.

Table 6 through Table 11 summarize, for each of the six regions, the state, county, species, and number of species observations that have proximity to relevant land use. These tables can be used to

identify at the county level which species have proximity to relevant land use. The regions are in order by US FWS region number (see Figure 3).

The detail reports for Phase 2 (Carr & Honegger 2008(b)– 2008(g), Monsanto Study Nos. RPN-2007-231 – RPN-2007-236) provide specific details of these proximity assessments, including sub-county maps depicting all observations evaluated and the relevant land use.

**Table 2. Regional Results of Phase 2 Proximity Assessment**

Region	Proximity to Relevant Land Use; Number of:			
	States	Counties	Plant Species	Species Observations <sup>a</sup>
Pacific	5	35	23	281
Southwest	2	20 <sup>b</sup>	12	114
Midwest	6	84	8	347
Southeast	8	83	31	437
Northeast	5 <sup>c</sup>	23 <sup>c</sup>	10 <sup>c</sup>	30
Mountain Prairie	5	36	6	190
End of Phase 2	31 <sup>c</sup>	281 <sup>b,c</sup>	78 <sup>c,d</sup>	1399 <sup>d</sup>

<sup>a</sup> For counties included in the FESTF MJD dataset. Does not include New Jersey or Cibola and Valencia counties in NM.

<sup>b</sup> Includes Cibola and Valencia counties, NM.

<sup>c</sup> Includes New Jersey (3 species in 11 counties).

<sup>d</sup> Totals will not be additive, since some counties have more than one species with proximity to relevant land use, and some species observations have presence in more than one state.

**Table 3. State Results of Phase 2 Proximity Assessment**

Region	State	Proximity to Relevant Land Use; Number of:		
		Plant Species	Counties	Species Observations <sup>a</sup>
Pacific	California	3	8	16
	Hawaii	11	2	17
	Idaho	2	7	17
	Oregon	7	13	210
	Washington	3	5	22
Southwest	New Mexico	2	4	15
	Texas	11	16	99
Midwest	Illinois	4	27	48
	Indiana	2	3	3
	Michigan	1	7	18
	Minnesota	3	21	170
	Missouri	3	20	102
	Ohio	2	6	11
Southeast	Alabama	5	7	17
	Arkansas	1	3	4
	Florida	14	10	129
	Georgia	5	6	36
	Kentucky	2	13	69
	North Carolina	8	25	91
	South Carolina	6	13	62
	Tennessee	2	6	40
Northeast	Maryland	2	3	3
	New Jersey	3	11	NA
	Vermont	1	1	4
	Virginia	4	4	21
	West Virginia	3	4	4
Mountain-Prairie	Colorado	1	2	8
	Kansas	2	12	115
	Montana	3	7	27
	Nebraska	1	8	16
	Utah	2	7	25

NA: Not available.

<sup>a</sup> For counties included in the FESTF MJD dataset. Does not include New Jersey or Cibola and Valencia counties in New Mexico.

## **6. CONCLUSIONS**

A summary has been presented of the process used to assess the proximity of listed plant species observations to relevant land use utilizing comprehensive sub-county species location data and national land cover data.

This analysis determined that there are 281 counties in 31 states where listed plant species may be in proximity to land that could be used for alfalfa production. There are 78 distinct species and 1399 listed plant species observations that have proximity to relevant land use.

The next step in this analysis is Phase 3 (Carr & Honegger 2008(h)), which considers the development of assessment-based mitigation practices to protect the species observations identified in this report from possible risk from exposure to glyphosate use in agriculture.

## 7. REFERENCES

*Note: To maintain consistency in reference citations across multiple reports, letter suffixes on the citation year may not be sequential.*

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## 8. TABLES

**Table 4. Listed Plant Species with Proximity to Relevant Land Use: By Species and State**

Species	Taxa	State	Number of Counties	Number of Observations
Ashy Dogweed ( <i>Thymophylla tephroleuca</i> )	D	TX	2	5
Beautiful Pawpaw ( <i>Deeringothamnus pulchellus</i> )	D	FL	1	1
Bradshaw's Lomatium ( <i>Lomatium bradshawii</i> )	D	OR WA	4 1	42 2
Canby's Dropwort ( <i>Oxypolis canbyi</i> )	D	MD NC SC	1 1 4	1 1 8
Chaffseed ( <i>Schwalbea americana</i> )	D	FL NC SC	1 1 6	1 1 27
Cooley's Water-willow ( <i>Justicia cooleyi</i> )	D	FL	2	10
Cumberland False Rosemary ( <i>Conradina verticillata</i> )	D	TN	5	20
Decurrent False Aster ( <i>Boltonia decurrens</i> )	D	IL MO	14 4	25 14
Dwarf Naupaka ( <i>Scaevola coriacea</i> )	D	HI	1	1
Eastern Prairie White-fringed Orchid ( <i>Platanthera leucophaea</i> )	M	IL IN MI OH VA	10 1 7 5 1	14 1 18 6 1
Faurie's Panicgrass ( <i>Panicum fauriei</i> var. <i>carteri</i> )	M	HI	1	2
Florida Gayfeather ( <i>Liatris ohlingerae</i> )	D	FL	1	39
Florida Golden-aster ( <i>Chrysopsis floridana</i> )	D	FL	2	11
Gentner's Fritillaria ( <i>Fritillaria gentneri</i> )	M	OR	2	9
Green Pitcherplant ( <i>Sarracenia oreophila</i> )	D	NC	1	2
Green's Awnless Orcutt Grass ( <i>Tuctoria greenei</i> )	M	CA	2	2
Harperella ( <i>Ptilimnium nodosum</i> )	D	AL AR GA MD NC SC WV	1 3 1 2 1 1 1	2 4 1 2 1 3 1
Hawaii Lady's-nightcap ( <i>Bonamia menziesii</i> )	D	HI	2	3
Hawaiian Centaury ( <i>Centaureum sebaeoides</i> )	D	HI	1	1
Hilo Ischaemum ( <i>Ischaemum byrone</i> )	M	HI	1	1
Hoover's Broomspurge ( <i>Chamaesyce hooveri</i> )	D	CA	4	8
Howell's Spectacular Thelypody ( <i>Thelypodium howellii</i> ssp. <i>spectabilis</i> )	D	OR	2	15
Kincaid's Lupine ( <i>Lupinus oreganus</i> var. <i>kincaidii</i> )	D	OR	6	38
Knieskern's beaked-rush ( <i>Rhynchospora knieskernii</i> )	M	NJ	5	NA

Species	Taxa	State	Number of Counties	Number of Observations
Ko'oloa 'ula ( <i>Abutilon menziesii</i> )	D	HI	1	3
Large-fruit Sand-verbena ( <i>Abronia macrocarpa</i> )	D	TX	1	1
Laukahi Kuahiwi ( <i>Plantago princeps</i> var. <i>longibracteata</i> )	D	HI	1	1
Lewton's Polygala ( <i>Polygala lewtonii</i> )	D	FL	2	3
Little Amphianthus ( <i>Amphianthus pusillus</i> )	D	AL	1	2
		GA	3	10
		SC	2	2
Little River Arrowhead ( <i>Sagittaria secundifolia</i> )	M	AL	2	4
Longspurred Mint ( <i>Dicerandra cornutissima</i> )	D	FL	1	4
Lyrate Bladderpod ( <i>Lesquerella lyrata</i> )	D	AL	3	6
Mead's Milkweed ( <i>Asclepias meadii</i> )	D	IL	1	1
		KS	12	113
		MO	11	50
Merlin's-grass ( <i>Isoetes tegetiformans</i> )	F&A	GA	2	7
Michaux's Sumac ( <i>Rhus michauxii</i> )	D	NC	7	16
		VA	3	6
Minnesota Trout Lily ( <i>Erythronium propullans</i> )	M	MN	3	38
Mohr's Barbara's-buttons ( <i>Marshallia mohrii</i> )	D	GA	1	12
Nanu ( <i>Gardenia brighamii</i> )	D	HI	1	1
Navasota Ladies'-tresses ( <i>Spiranthes parksii</i> )	M	TX	5	67
Nelson's Sidalcea ( <i>Sidalcea nelsoniana</i> )	D	OR	7	68
Northeastern Bulrush ( <i>Scirpus ancistrochaetus</i> )	M	VA	1	1
		VT	1	4
		WV	1	1
'Ohai ( <i>Sesbania tomentosa</i> )	D	HI	2	2
Okeechobee Gourd ( <i>Cucurbita okeechobeensis</i> )	D	FL	1	1
Palmate-bracted Bird's-beak ( <i>Cordylanthus palmatus</i> )	D	CA	3	6
Pecos Sunflower ( <i>Helianthus paradoxus</i> )	D	NM	3	1 <sup>a</sup>
		TX	1	1
Prairie Bushclover ( <i>Lespedeza leptostachya</i> )	D	IL	4	8
		MN	12	61
Prairie Dawn ( <i>Hymenoxys texana</i> )	D	TX	1	6
Reflexed Blue-eyed-grass ( <i>Sisyrinchium dichotomum</i> )	M	NC	3	10
		SC	1	1
Robins' Bellflower ( <i>Campanula robinsiae</i> )	D	FL	1	2
Rough Popcorn-flower ( <i>Plagiobothrys hirtus</i> )	D	OR	1	9
Rugel's Pawpaw ( <i>Deeringothamnus rugelii</i> )	D	FL	1	12
Running Buffalo Clover ( <i>Trifolium stoloniferum</i> )	D	IN	2	2
		KY	10	57
		OH	1	5
		WV	2	2
Sacramento Prickly-poppy ( <i>Argemone pleiacantha</i> ssp. <i>pinnatisecta</i> )	D	NM	1	14
San Rafael Cactus ( <i>Pediocactus despainii</i> )	D	UT	1	3

Species	Taxa	State	Number of Counties	Number of Observations
Schweinitz's Sunflower ( <i>Helianthus schweinitzii</i> )	D	NC	11	58
		SC	1	21
Scrub Buckwheat ( <i>Eriogonum longifolium</i> var. <i>gnaphalifolium</i> )	D	FL	3	19
Scrub Mint ( <i>Dicerandra frutescens</i> )	D	FL	1	9
Short-leaved Rosemary ( <i>Conradina brevifolia</i> )	D	FL	1	5
Short's Goldenrod ( <i>Solidago shortii</i> )	D	KY	3	12
Slender Rushpea ( <i>Hoffmannseggia tenella</i> )	D	TX	2	4
South Texas Ragweed ( <i>Ambrosia cheiranthifolia</i> )	D	TX	2	6
Spalding's Campion ( <i>Silene spaldingii</i> )	D	ID	3	10
		MT	1	2
		WA	3	18
Spreading Schiedea ( <i>Schiedea spergulina</i> var. <i>leiopoda</i> )	D	HI	1	1
Spreading Schiedea ( <i>Schiedea spergulina</i> var. <i>spergulina</i> )	D	HI	1	1
Spring Creek Bladderpod ( <i>Lesquerella perforata</i> )	D	TN	1	20
Star Cactus ( <i>Astrophytum asterias</i> )	D	TX	1	1
Swamp Pink	M	NJ	11	NA
Sulphur Sedge ( <i>Carex lutea</i> )	M	NC	1	2
Tennessee Yellow-eyed-grass ( <i>Xyris tennesseensis</i> )	M	AL	2	3
		GA	2	6
Texas Trailing Phlox ( <i>Phlox nivalis</i> ssp. <i>texensis</i> )	D	TX	2	4
Ute Ladie's-tresses ( <i>Spiranthes diluvialis</i> )	M	CO	2	8
		ID	4	9
		MT	5	12
		UT	6	22
		WA	1	2
Virginia Sneezeweed ( <i>Helenium virginicum</i> )	D	MO	6	38
		VA	1	13
Walker's Manihot ( <i>Manihot walkerae</i> )	D	TX	3	3
Water Howellia ( <i>Howellia aquatilis</i> )	D	MT	1	13
		OR	1	1
Wedge-leaved Button-snakeroot ( <i>Eryngium cuneifolium</i> )	D	FL	1	12
Western Prairie White-fringed Orchid ( <i>Platanthera praeclara</i> )	M	KS	2	2
		MN	10	71
		NE	8	16
Willamette Valley Daisy ( <i>Erigeron decumbens</i> var. <i>decumbens</i> )	D	OR	5	28
Zapata Bladderpod ( <i>Lesquerella thamnophila</i> )	D	TX	2	3
<b>Totals:</b>			<b>281<sup>b</sup></b>	<b>1399<sup>a,b</sup></b>

<sup>a</sup> Does not include Cibola or Valencia counties in NM.

<sup>b</sup> Some observations have presence in two or more counties. Thus, the totals may be less than the sum for the individual counties.

D: dicots; M: monocots; F&A: ferns & allies

**Table 5. Listed Plant Species with Proximity to Relevant Land Use: By State and Species**

State	Species	Taxa	Number of Counties	Number of Observations
AL	Harperella ( <i>Ptilimnium nodosum</i> )	D	1	2
	Little Amphianthus ( <i>Amphianthus pusillus</i> )	D	1	2
	Little River Arrowhead ( <i>Sagittaria secundifolia</i> )	M	2	4
	Lyrate Bladderpod ( <i>Lesquerella lyrata</i> )	D	3	6
	Tennessee Yellow-eyed-grass ( <i>Xyris tennesseensis</i> )	M	2	3
AR	Harperella ( <i>Ptilimnium nodosum</i> )	D	3	4
CA	Green's Awnless Orcutt Grass ( <i>Tuctoria greenei</i> )	M	2	2
	Hoover's Broomspurge ( <i>Chamaesyce hooveri</i> )	D	4	8
	Palmate-bracted Bird's-beak ( <i>Cordylanthus palmatus</i> )	D	3	6
CO	Ute Ladie's-tresses ( <i>Spiranthes diluvialis</i> )	M	2	8
FL	Beautiful Pawpaw ( <i>Deeringothamnus pulchellus</i> )	D	1	1
	Chaffseed ( <i>Schwalbea americana</i> )	D	1	1
	Cooley's Water-willow ( <i>Justicia cooleyi</i> )	D	2	10
	Florida Gayfeather ( <i>Liatris ohlingerae</i> )	D	1	39
	Florida Golden-aster ( <i>Chrysopsis floridana</i> )	D	2	11
	Lewton's Polygala ( <i>Polygala lewtonii</i> )	D	2	3
	Longspurred Mint ( <i>Dicerandra cornutissima</i> )	D	1	4
	Okeechobee Gourd ( <i>Cucurbita okeechobeensis</i> )	D	1	1
	Robins' Bellflower ( <i>Campanula robinsiae</i> )	D	1	2
	Rugel's Pawpaw ( <i>Deeringothamnus rugelii</i> )	D	1	12
	Scrub Buckwheat ( <i>Eriogonum longifolium</i> var. <i>gnaphalifolium</i> )	D	3	19
	Scrub Mint ( <i>Dicerandra frutescens</i> )	D	1	9
	Short-leaved Rosemary ( <i>Conradina brevifolia</i> )	D	1	5
	Wedge-leaved Button-snakeroot ( <i>Eryngium cuneifolium</i> )	D	1	12
GA	Harperella ( <i>Ptilimnium nodosum</i> )	D	1	1
	Little Amphianthus ( <i>Amphianthus pusillus</i> )	D	3	10
	Merlin's-grass ( <i>Isoetes tegetiformans</i> )	F&A	2	7
	Mohr's Barbara's-buttons ( <i>Marshallia mohrii</i> )	D	1	12
	Tennessee Yellow-eyed-grass ( <i>Xyris tennesseensis</i> )	M	2	6
HI	Dwarf Naupaka ( <i>Scaevola coriacea</i> )	D	1	1
	Faurie's Panicgrass ( <i>Panicum fauriei</i> var. <i>carteri</i> )	M	1	2
	Hawaii Lady's-nightcap ( <i>Bonamia menziesii</i> )	D	2	3
	Hawaiian Centaury ( <i>Centaurium sebaeoides</i> )	D	1	1
	Hilo Ischaemum ( <i>Ischaemum byrone</i> )	M	1	1
	Ko'oloa 'ula ( <i>Abutilon menziesii</i> )	D	1	3
	Laukahi Kuahiwi ( <i>Plantago princeps</i> var. <i>longibracteata</i> )	D	1	1
	Nanu ( <i>Gardenia brighamii</i> )	D	1	1
	'Ohai ( <i>Sesbania tomentosa</i> )	D	2	2
	Spreading Schiedea ( <i>Schiedea spergulina</i> var. <i>leiopoda</i> )	D	1	1
	Spreading Schiedea ( <i>Schiedea spergulina</i> var. <i>spergulina</i> )	D	1	1
ID	Spalding's Campion ( <i>Silene spaldingii</i> )	D	3	10
	Ute Ladie's-tresses ( <i>Spiranthes diluvialis</i> )	M	4	7
IL	Decurrent False Aster ( <i>Boltonia decurrens</i> )	D	14	25
	Eastern Prairie White-fringed Orchid ( <i>Platanthera leucophaea</i> )	M	10	14
	Mead's Milkweed ( <i>Asclepias meadii</i> )	D	1	1
	Prairie Bushclover ( <i>Lespedeza leptostachya</i> )	D	4	8

State	Species	Taxa	Number of Counties	Number of Observations
IN	Eastern Prairie White-fringed Orchid ( <i>Platanthera leucophaea</i> )	M	1	1
	Running Buffalo Clover ( <i>Trifolium stoloniferum</i> )	D	2	2
KS	Mead's Milkweed ( <i>Asclepias meadii</i> )	D	12	113
	Western Prairie White-fringed Orchid ( <i>Platanthera praeclara</i> )	M	2	2
KY	Running Buffalo Clover ( <i>Trifolium stoloniferum</i> )	D	10	57
	Short's Goldenrod ( <i>Solidago shortii</i> )	D	3	12
MD	Canby's Dropwort ( <i>Oxypolis canbyi</i> )	D	1	1
	Harperella ( <i>Ptilimnium nodosum</i> )	D	2	2
MI	Eastern Prairie White-fringed Orchid ( <i>Platanthera leucophaea</i> )	M	7	18
MN	Minnesota Trout Lily ( <i>Erythronium propullans</i> )	M	3	38
	Prairie Bushclover ( <i>Lespedeza leptostachya</i> )	D	12	61
	Western Prairie White-fringed Orchid ( <i>Platanthera praeclara</i> )	M	10	71
MO	Decurrent False Aster ( <i>Boltonia decurrens</i> )	D	4	14
	Mead's Milkweed ( <i>Asclepias meadii</i> )	D	11	50
	Virginia Sneezeweed ( <i>Helenium virginicum</i> )	D	6	38
MT	Spalding's Campion ( <i>Silene spaldingii</i> )	D	1	2
	Ute Ladie's-tresses ( <i>Spiranthes diluvialis</i> )	M	5	12
	Water Howellia ( <i>Howellia aquatilis</i> )	D	1	13
NC	Canby's Dropwort ( <i>Oxypolis canbyi</i> )	D	1	1
	Chaffseed ( <i>Schwalbea americana</i> )	D	1	1
	Green Pitcherplant ( <i>Sarracenia oreophila</i> )	D	1	2
	Harperella ( <i>Ptilimnium nodosum</i> )	D	1	1
	Michaux's Sumac ( <i>Rhus michauxii</i> )	D	7	16
	Reflexed Blue-eyed-grass ( <i>Sisyrinchium dichotomum</i> )	M	3	10
	Schweinitz's Sunflower ( <i>Helianthus schweinitzii</i> )	D	11	58
	Sulphur Sedge ( <i>Carex lutea</i> )	M	1	2
NE	Western Prairie White-fringed Orchid ( <i>Platanthera praeclara</i> )	M	8	16
NJ	Knieskern's beaked-rush ( <i>Rhynchospora knieskernii</i> )	M	5	--
	Data-sensitive Species	D	5	--
	Swamp pink ( <i>Helonias bullata</i> )	M	11	--
NM	Pecos Sunflower ( <i>Helianthus paradoxus</i> )	D	3	1 <sup>a</sup>
	Sacramento Prickly-poppy ( <i>Argemone pleiacantha</i> ssp. <i>pinnatisecta</i> )	D	1	14
OH	Eastern Prairie White-fringed Orchid ( <i>Platanthera leucophaea</i> )	M	5	6
	Running Buffalo Clover ( <i>Trifolium stoloniferum</i> )	D	1	5
OR	Bradshaw's Lomatium ( <i>Lomatium bradshawii</i> )	D	4	42
	Gentner's Fritillaria ( <i>Fritillaria gentneri</i> )	M	2	9
	Howell's Spectacular Thelypody ( <i>Thelypodium howellii</i> ssp. <i>spectabilis</i> )	D	2	15
	Kincaid's Lupine ( <i>Lupinus oreganus</i> var. <i>kincaidii</i> )	D	6	38
	Nelson's Sidalcea ( <i>Sidalcea nelsoniana</i> )	D	7	68
	Rough Popcorn-flower ( <i>Plagiobothrys hirtus</i> )	D	1	9
	Water Howellia ( <i>Howellia aquatilis</i> )	D	1	1
	Willamette Valley Daisy ( <i>Erigeron decumbens</i> var. <i>decumbens</i> )	D	5	28
SC	Canby's Dropwort ( <i>Oxypolis canbyi</i> )	D	4	8
	Chaffseed ( <i>Schwalbea americana</i> )	D	6	27
	Harperella ( <i>Ptilimnium nodosum</i> )	D	1	3
	Little Amphianthus ( <i>Amphianthus pusillus</i> )	D	2	2

State	Species	Taxa	Number of Counties	Number of Observations
	Reflexed Blue-eyed-grass ( <i>Sisyrinchium dichotomum</i> )	M	1	1
	Schweinitz's Sunflower ( <i>Helianthus schweinitzii</i> )	D	1	21
TN	Cumberland False Rosemary ( <i>Conradina verticillata</i> )	D	5	20
	Spring Creek Bladderpod ( <i>Lesquerella perforata</i> )	D	1	20
TX	Ashy Dogweed ( <i>Thymophylla tephroleuca</i> )	D	2	4
	Large-fruit Sand-verbena ( <i>Abronia macrocarpa</i> )	D	1	1
	Navasota Ladies'-tresses ( <i>Spiranthes parksii</i> )	M	5	67
	Pecos Sunflower ( <i>Helianthus paradoxus</i> )	D	1	1
	Prairie Dawn ( <i>Hymenoxys texana</i> )	D	1	6
	Slender Rushpea ( <i>Hoffmannseggia tenella</i> )	D	2	4
	South Texas Ragweed ( <i>Ambrosia cheiranthifolia</i> )	D	2	5
	Star Cactus ( <i>Astrophytum asterias</i> )	D	1	1
	Texas Trailing Phlox ( <i>Phlox nivalis</i> ssp. <i>texensis</i> )	D	2	4
	Walker's Manihot ( <i>Manihot walkerae</i> )	D	3	3
	Zapata Bladderpod ( <i>Lesquerella thamnophila</i> )	D	2	3
UT	San Rafael Cactus ( <i>Pediocactus despainii</i> )	D	1	3
	Ute Ladie's-tresses ( <i>Spiranthes diluvialis</i> )	M	6	22
VA	Eastern Prairie White-fringed Orchid ( <i>Platanthera leucophaea</i> )	M	1	1
	Michaux's Sumac ( <i>Rhus michauxii</i> )	D	3	6
	Northeastern Bulrush ( <i>Scirpus ancistrochaetus</i> )	M	1	1
	Virginia Sneezeweed ( <i>Helenium virginicum</i> )	D	1	13
VT	Northeastern Bulrush ( <i>Scirpus ancistrochaetus</i> )	M	1	4
WA	Bradshaw's Lomatium ( <i>Lomatium bradshawii</i> )	D	1	2
	Spalding's Campion ( <i>Silene spaldingii</i> )	D	3	18
	Ute Ladie's-tresses ( <i>Spiranthes diluvialis</i> )	M	1	2
WV	Harperella ( <i>Ptilimnium nodosum</i> )	D	1	1
	Northeastern Bulrush ( <i>Scirpus ancistrochaetus</i> )	M	1	1
	Running Buffalo Clover ( <i>Trifolium stoloniferum</i> )	D	2	2
<b>Totals</b>			<b>281<sup>b</sup></b>	<b>1399<sup>b</sup></b>

<sup>a</sup> Does not include Cibola or Valencia counties in NM.

<sup>b</sup> Some observations have presence in two or more counties. Thus, the totals may be less than the sum for the individual counties.

D: dicots; M: monocots; F&A: ferns & allies.

**Table 6. Listed Plant Species in the Pacific Region with Proximity to Relevant Land Use: By State, County, and Species**

State	County	Species	Number of Observations
CA	Butte	Green's Awnless Orcutt Grass ( <i>Tuctoria greenei</i> )	1
		Hoover's Broomspurge ( <i>Chamaesyce hooveri</i> )	1
	Colusa	Palmate-bracted Bird's-beak ( <i>Cordylanthus palmatus</i> )	2
	Fresno	Palmate-bracted Bird's-beak ( <i>Cordylanthus palmatus</i> )	1
	Glenn	Hoover's Broomspurge ( <i>Chamaesyce hooveri</i> )	1
	Merced	Green's Awnless Orcutt Grass ( <i>Tuctoria greenei</i> )	1
	Stanislaus	Hoover's Broomspurge ( <i>Chamaesyce hooveri</i> )	1
	Tulare	Hoover's Broomspurge ( <i>Chamaesyce hooveri</i> )	5
Yolo	Palmate-bracted Bird's-beak ( <i>Cordylanthus palmatus</i> )	3	
HI	Kauai	Hawaii Lady's-nightcap ( <i>Bonamia menziesii</i> )	2
		Hilo Ischaemum ( <i>Ischaemum byrone</i> )	1
		Laukahi Kuahiwi ( <i>Plantago princeps</i> var. <i>longibracteata</i> )	1
		'Ohai ( <i>Sesbania tomentosa</i> )	1
		Spreading Schiedea ( <i>Schiedea spergulina</i> var. <i>leiopoda</i> )	1
		Spreading Schiedea ( <i>Schiedea spergulina</i> var. <i>spergulina</i> )	1
	Maui	Dwarf Naupaka ( <i>Scaevola coriacea</i> )	1
		Faurie's Panicgrass ( <i>Panicum fauriei</i> var. <i>carteri</i> )	2
		Hawaii Lady's-nightcap ( <i>Bonamia menziesii</i> )	1
		Hawaiian Centaury ( <i>Centaureum sebaeoides</i> )	1
		Ko'oloa 'ula ( <i>Abutilon menziesii</i> )	3
		Nanu ( <i>Gardenia brighamii</i> )	1
'Ohai ( <i>Sesbania tomentosa</i> )	1		
ID	Bonneville	Ute Ladie's-tresses ( <i>Spiranthes diluvialis</i> )	3
	Fremont	Ute Ladie's-tresses ( <i>Spiranthes diluvialis</i> )	1
	Idaho	Spalding's Champion ( <i>Silene spaldingii</i> )	3
	Jefferson	Ute Ladie's-tresses ( <i>Spiranthes diluvialis</i> )	3
	Lewis	Spalding's Champion ( <i>Silene spaldingii</i> )	2
	Madison	Ute Ladie's-tresses ( <i>Spiranthes diluvialis</i> )	2
	Nez Perce	Spalding's Champion ( <i>Silene spaldingii</i> )	5
OR	Baker	Howell's Spectacular Thelypody ( <i>Thelypodium howellii</i> ssp. <i>spectabilis</i> )	12
	Benton	Bradshaw's Lomatium ( <i>Lomatium bradshawii</i> )	4
		Kincaid's Lupine ( <i>Lupinus oregonus</i> var. <i>kincaidii</i> )	11
		Nelson's Sidalcea ( <i>Sidalcea nelsoniana</i> )	29
		Willamette Valley Daisy ( <i>Erigeron decumbens</i> var. <i>decumbens</i> )	3
	Clackamas	Nelson's Sidalcea ( <i>Sidalcea nelsoniana</i> )	1
	Douglas	Kincaid's Lupine ( <i>Lupinus oregonus</i> var. <i>kincaidii</i> )	1
		Rough Popcorn-flower ( <i>Plagiobothrys hirtus</i> )	9
	Jackson	Gentner's Fritillaria ( <i>Fritillaria gentneri</i> )	8
	Josephine	Gentner's Fritillaria ( <i>Fritillaria gentneri</i> )	1
Lane	Bradshaw's Lomatium ( <i>Lomatium bradshawii</i> )	33	
	Kincaid's Lupine ( <i>Lupinus oregonus</i> var. <i>kincaidii</i> )	12	
	Willamette Valley Daisy ( <i>Erigeron decumbens</i> var. <i>decumbens</i> )	15	

State	County	Species	Number of Observations
	Linn	Bradshaw's Lomatium ( <i>Lomatium bradshawii</i> )	4
		Kincaid's Lupine ( <i>Lupinus oreganus</i> var. <i>kincaidii</i> )	1
		Nelson's Sidalcea ( <i>Sidalcea nelsoniana</i> )	6
		Willamette Valley Daisy ( <i>Erigeron decumbens</i> var. <i>decumbens</i> )	4
	Marion	Bradshaw's Lomatium ( <i>Lomatium bradshawii</i> )	1
		Nelson's Sidalcea ( <i>Sidalcea nelsoniana</i> )	6
		Willamette Valley Daisy ( <i>Erigeron decumbens</i> var. <i>decumbens</i> )	3
	Polk	Kincaid's Lupine ( <i>Lupinus oreganus</i> var. <i>kincaidii</i> )	6
		Nelson's Sidalcea ( <i>Sidalcea nelsoniana</i> )	20
		Willamette Valley Daisy ( <i>Erigeron decumbens</i> var. <i>decumbens</i> )	3
Union	Howell's Spectacular Thelypody ( <i>Thelypodium howellii</i> ssp. <i>spectabilis</i> )	3	
Washington	Nelson's Sidalcea ( <i>Sidalcea nelsoniana</i> )	1	
Yamhill	Kincaid's Lupine ( <i>Lupinus oreganus</i> var. <i>kincaidii</i> )	7	
	Nelson's Sidalcea ( <i>Sidalcea nelsoniana</i> )	5	
WA	Asotin	Spalding's Campion ( <i>Silene spaldingii</i> )	1
	Chelan	Ute Ladie's-tresses ( <i>Spiranthes diluvialis</i> )	2
	Clark	Bradshaw's Lomatium ( <i>Lomatium bradshawii</i> )	2
	Lincoln	Spalding's Campion ( <i>Silene spaldingii</i> )	2
	Whitman	Spalding's Campion ( <i>Silene spaldingii</i> )	15
<b>Total number of species observations with proximity (Pacific Region)</b>			<b>281</b>

**Table 7. Listed Plant Species in the Southwest Region with Proximity to Relevant Land Use: By State, County, and Species**

State	County	Species	Number of Observations	
NM	Cibola	Pecos Sunflower ( <i>Helianthus paradoxus</i> )	-- <sup>a</sup>	
	Guadalupe	Pecos Sunflower ( <i>Helianthus paradoxus</i> )	1	
	Otero	Sacramento Prickly-poppy ( <i>Argemone pleiakantha</i> ssp. <i>pinnatisecta</i> )	14	
	Valencia	Pecos Sunflower ( <i>Helianthus paradoxus</i> )	-- <sup>a</sup>	
TX	Brazos	Navasota Ladies'-tresses ( <i>Spiranthes parksii</i> )	16	
	Duval	Walker's Manihot ( <i>Manihot walkerae</i> )	1	
	Grimes	Navasota Ladies'-tresses ( <i>Spiranthes parksii</i> )	44	
	Hardin	Texas Trailing Phlox ( <i>Phlox nivalis</i> ssp. <i>texensis</i> )	1	
	Harris	Prairie Dawn ( <i>Hymenoxys texana</i> )	6	
	Hidalgo	Walker's Manihot ( <i>Manihot walkerae</i> )	1	
	Kleberg		Slender Rushpea ( <i>Hoffmannseggia tenella</i> )	2
			South Texas Ragweed ( <i>Ambrosia cheiranthifolia</i> )	1
	Leon		Large-fruit Sand-verbena ( <i>Abronia macrocarpa</i> )	1
			Navasota Ladies'-tresses ( <i>Spiranthes parksii</i> )	2
	Madison		Navasota Ladies'-tresses ( <i>Spiranthes parksii</i> )	2
	Nueces		Slender Rushpea ( <i>Hoffmannseggia tenella</i> )	2
			South Texas Ragweed ( <i>Ambrosia cheiranthifolia</i> )	5
	Pecos		Pecos Sunflower ( <i>Helianthus paradoxus</i> )	1
	Robertson		Navasota Ladies'-tresses ( <i>Spiranthes parksii</i> )	3
	Starr		Star Cactus ( <i>Astrophytum asterias</i> )	1
			Walker's Manihot ( <i>Manihot walkerae</i> )	1
			Zapata Bladderpod ( <i>Lesquerella thamnophila</i> )	2
Tyler		Texas Trailing Phlox ( <i>Phlox nivalis</i> ssp. <i>texensis</i> )	3	
Webb		Ashy Dogweed ( <i>Thymophylla tephroleuca</i> )	1	
Zapata		Ashy Dogweed ( <i>Thymophylla tephroleuca</i> )	4	
		Zapata Bladderpod ( <i>Lesquerella thamnophila</i> )	1	
<b>Total number of species observations with proximity (Southwest Region)</b>			<b>114 <sup>b</sup></b>	

<sup>a</sup> Observation count is not available; species presence based on information from New Mexico Natural Heritage program.

<sup>b</sup> Some observations have presence in two or more counties. Thus, the total species observation count may be less than the sum for the individual counties.

**Table 8. Listed Plant Species in the Midwest Region with Proximity to Relevant Land Use: By State, County, and Species**

State	County	Species	Number of Observations	
IL	Bureau	Decurrent False Aster ( <i>Boltonia decurrens</i> )	1	
	Cass	Decurrent False Aster ( <i>Boltonia decurrens</i> )	2	
	Cook	Eastern Prairie White-fringed Orchid ( <i>Platanthera leucophaea</i> )	1	
	Du Page	Eastern Prairie White-fringed Orchid ( <i>Platanthera leucophaea</i> )	1	
	Fulton	Decurrent False Aster ( <i>Boltonia decurrens</i> )	2	
	Grundy	Eastern Prairie White-fringed Orchid ( <i>Platanthera leucophaea</i> )	1	
	Hancock		Eastern Prairie White-fringed Orchid ( <i>Platanthera leucophaea</i> )	2
			Mead's Milkweed ( <i>Asclepias meadii</i> )	1
	Henry	Eastern Prairie White-fringed Orchid ( <i>Platanthera leucophaea</i> )	1	
	Iroquois	Eastern Prairie White-fringed Orchid ( <i>Platanthera leucophaea</i> )	1	
	Kane	Eastern Prairie White-fringed Orchid ( <i>Platanthera leucophaea</i> )	1	
	La Salle	Decurrent False Aster ( <i>Boltonia decurrens</i> )	1	
	Lake	Eastern Prairie White-fringed Orchid ( <i>Platanthera leucophaea</i> )	3	
	Lee	Prairie Bushclover ( <i>Lespedeza leptostachya</i> )	2	
	Madison	Decurrent False Aster ( <i>Boltonia decurrens</i> )	2	
	Marshall	Decurrent False Aster ( <i>Boltonia decurrens</i> )	2	
	Mason	Decurrent False Aster ( <i>Boltonia decurrens</i> )	5	
	McHenry		Eastern Prairie White-fringed Orchid ( <i>Platanthera leucophaea</i> )	2
			Prairie Bushclover ( <i>Lespedeza leptostachya</i> )	2
	Morgan	Decurrent False Aster ( <i>Boltonia decurrens</i> )	1	
	Ogle	Prairie Bushclover ( <i>Lespedeza leptostachya</i> )	1	
	Peoria	Decurrent False Aster ( <i>Boltonia decurrens</i> )	3	
	Putnam	Decurrent False Aster ( <i>Boltonia decurrens</i> )	2	
	Schuyler	Decurrent False Aster ( <i>Boltonia decurrens</i> )	1	
	Scott	Decurrent False Aster ( <i>Boltonia decurrens</i> )	1	
	Tazewell	Decurrent False Aster ( <i>Boltonia decurrens</i> )	1	
	Will	Eastern Prairie White-fringed Orchid ( <i>Platanthera leucophaea</i> )	1	
Winnebago	Prairie Bushclover ( <i>Lespedeza leptostachya</i> )	3		
Woodford	Decurrent False Aster ( <i>Boltonia decurrens</i> )	1		
IN	Dearborn	Running Buffalo Clover ( <i>Trifolium stoloniferum</i> )	1	
	Ohio	Running Buffalo Clover ( <i>Trifolium stoloniferum</i> )	1	
	White	Eastern Prairie White-fringed Orchid ( <i>Platanthera leucophaea</i> )	1	
MI	Bay	Eastern Prairie White-fringed Orchid ( <i>Platanthera leucophaea</i> )	2	
	Huron	Eastern Prairie White-fringed Orchid ( <i>Platanthera leucophaea</i> )	4	
	Monroe	Eastern Prairie White-fringed Orchid ( <i>Platanthera leucophaea</i> )	3	
	Saginaw	Eastern Prairie White-fringed Orchid ( <i>Platanthera leucophaea</i> )	1	
	St. Clair	Eastern Prairie White-fringed Orchid ( <i>Platanthera leucophaea</i> )	1	
	Tuscola	Eastern Prairie White-fringed Orchid ( <i>Platanthera leucophaea</i> )	6	
	Wayne	Eastern Prairie White-fringed Orchid ( <i>Platanthera leucophaea</i> )	1	
MN	Brown	Prairie Bushclover ( <i>Lespedeza leptostachya</i> )	10	
	Clay	Western Prairie White-fringed Orchid ( <i>Platanthera praeclara</i> )	9	
	Cottonwood	Prairie Bushclover ( <i>Lespedeza leptostachya</i> )	19	
	Dakota	Prairie Bushclover ( <i>Lespedeza leptostachya</i> )	1	

State	County	Species	Number of Observations
	Dodge	Prairie Bushclover ( <i>Lespedeza leptostachya</i> )	2
		Western Prairie White-fringed Orchid ( <i>Platanthera praeclara</i> )	1
	Goodhue	Minnesota Trout Lily ( <i>Erythronium propullans</i> )	8
		Prairie Bushclover ( <i>Lespedeza leptostachya</i> )	6
	Houston	Prairie Bushclover ( <i>Lespedeza leptostachya</i> )	1
	Jackson	Prairie Bushclover ( <i>Lespedeza leptostachya</i> )	14
	Kittson	Western Prairie White-fringed Orchid ( <i>Platanthera praeclara</i> )	4
	Mower	Prairie Bushclover ( <i>Lespedeza leptostachya</i> )	1
		Western Prairie White-fringed Orchid ( <i>Platanthera praeclara</i> )	1
	Nobles	Western Prairie White-fringed Orchid ( <i>Platanthera praeclara</i> )	1
	Norman	Western Prairie White-fringed Orchid ( <i>Platanthera praeclara</i> )	6
	Olmsted	Prairie Bushclover ( <i>Lespedeza leptostachya</i> )	2
	Pennington	Western Prairie White-fringed Orchid ( <i>Platanthera praeclara</i> )	4
	Pipestone	Western Prairie White-fringed Orchid ( <i>Platanthera praeclara</i> )	1
	Polk	Western Prairie White-fringed Orchid ( <i>Platanthera praeclara</i> )	42
	Redwood	Prairie Bushclover ( <i>Lespedeza leptostachya</i> )	3
	Renville	Prairie Bushclover ( <i>Lespedeza leptostachya</i> )	1
	Rice	Minnesota Trout Lily ( <i>Erythronium propullans</i> )	28
		Prairie Bushclover ( <i>Lespedeza leptostachya</i> )	1
	Rock	Western Prairie White-fringed Orchid ( <i>Platanthera praeclara</i> )	2
Steele	Minnesota Trout Lily ( <i>Erythronium propullans</i> )	2	
MO	Adair	Mead's Milkweed ( <i>Asclepias meadii</i> )	1
	Barton	Mead's Milkweed ( <i>Asclepias meadii</i> )	6
	Benton	Mead's Milkweed ( <i>Asclepias meadii</i> )	13
	Cedar	Mead's Milkweed ( <i>Asclepias meadii</i> )	2
	Dade	Mead's Milkweed ( <i>Asclepias meadii</i> )	1
	Franklin	Decurrent False Aster ( <i>Boltonia decurrens</i> )	1
	Harrison	Mead's Milkweed ( <i>Asclepias meadii</i> )	2
	Howell	Decurrent False Aster ( <i>Boltonia decurrens</i> )	1
		Virginia Sneezeweed ( <i>Helenium virginicum</i> )	22
	Iron	Mead's Milkweed ( <i>Asclepias meadii</i> )	1
	Oregon	Virginia Sneezeweed ( <i>Helenium virginicum</i> )	1
	Pettis	Mead's Milkweed ( <i>Asclepias meadii</i> )	13
	Pike	Decurrent False Aster ( <i>Boltonia decurrens</i> )	1
	Polk	Mead's Milkweed ( <i>Asclepias meadii</i> )	2
	Shannon	Virginia Sneezeweed ( <i>Helenium virginicum</i> )	10
	St. Charles	Decurrent False Aster ( <i>Boltonia decurrens</i> )	11
	St. Clair	Mead's Milkweed ( <i>Asclepias meadii</i> )	2
	Texas	Virginia Sneezeweed ( <i>Helenium virginicum</i> )	3
	Vernon	Mead's Milkweed ( <i>Asclepias meadii</i> )	7
	Webster	Virginia Sneezeweed ( <i>Helenium virginicum</i> )	1
Wright	Virginia Sneezeweed ( <i>Helenium virginicum</i> )	1	
OH	Clark	Eastern Prairie White-fringed Orchid ( <i>Platanthera leucophaea</i> )	2
	Hamilton	Running Buffalo Clover ( <i>Trifolium stoloniferum</i> )	5
	Holmes	Eastern Prairie White-fringed Orchid ( <i>Platanthera leucophaea</i> )	1
	Lucas	Eastern Prairie White-fringed Orchid ( <i>Platanthera leucophaea</i> )	1

<b>State</b>	<b>County</b>	<b>Species</b>	<b>Number of Observations</b>
	Sandusky	Eastern Prairie White-fringed Orchid ( <i>Platanthera leucophaea</i> )	1
	Wayne	Eastern Prairie White-fringed Orchid ( <i>Platanthera leucophaea</i> )	1
<b>Total number of species observations with proximity (Midwest Region)</b>			<b>347<sup>a</sup></b>

<sup>a</sup> Some observations have presence in two or more counties. Thus, the total species observation count may be less than the sum for the individual counties.

**Table 9. Listed Plant Species in the Southeast Region with Proximity to Relevant Land Use: By State, County, and Species**

State	County	Species	Number of Observations
AL	Calhoun	Tennessee Yellow-eyed-grass ( <i>Xyris tennesseensis</i> )	2
	Cherokee	Harperella ( <i>Ptilimnium nodosum</i> )	2
		Little River Arrowhead ( <i>Sagittaria secundifolia</i> )	2
	Colbert	Lyrate Bladderpod ( <i>Lesquerella lyrata</i> )	1
	De Kalb	Little River Arrowhead ( <i>Sagittaria secundifolia</i> )	2
	Franklin	Lyrate Bladderpod ( <i>Lesquerella lyrata</i> )	3
		Tennessee Yellow-eyed-grass ( <i>Xyris tennesseensis</i> )	1
Lawrence	Lyrate Bladderpod ( <i>Lesquerella lyrata</i> )	2	
Randolph	Little Amphianthus ( <i>Amphianthus pusillus</i> )	2	
AR	Perry	Harperella ( <i>Ptilimnium nodosum</i> )	1
	Scott	Harperella ( <i>Ptilimnium nodosum</i> )	1
	Yell	Harperella ( <i>Ptilimnium nodosum</i> )	2
FL	Hernando	Cooley's Water-willow ( <i>Justicia cooleyi</i> )	9
		Robins' Bellflower ( <i>Campanula robinsiae</i> )	2
	Highlands	Florida Gayfeather ( <i>Liatris ohlingerae</i> )	39
		Lewton's Polygala ( <i>Polygala lewtonii</i> )	2
		Scrub Buckwheat ( <i>Eriogonum longifolium</i> var. <i>gnaphalifolium</i> )	11
		Scrub Mint ( <i>Dicerandra frutescens</i> )	9
		Short-leaved Rosemary ( <i>Conradina brevifolia</i> )	5
		Wedge-leaved Button-snakeroot ( <i>Eryngium cuneifolium</i> )	12
	Hillsborough	Florida Golden-aster ( <i>Chrysopsis floridana</i> )	10
	Lee	Beautiful Pawpaw ( <i>Deeringothamnus pulchellus</i> )	1
	Leon	Chaffseed ( <i>Schwalbea americana</i> )	1
	Manatee	Florida Golden-aster ( <i>Chrysopsis floridana</i> )	1
	Marion	Lewton's Polygala ( <i>Polygala lewtonii</i> )	1
Longspurred Mint ( <i>Dicerandra cornutissima</i> )		4	
Scrub Buckwheat ( <i>Eriogonum longifolium</i> var. <i>gnaphalifolium</i> )		7	
Palm Beach	Okeechobee Gourd ( <i>Cucurbita okeechobeensis</i> )	1	
Sumter	Cooley's Water-willow ( <i>Justicia cooleyi</i> )	1	
	Scrub Buckwheat ( <i>Eriogonum longifolium</i> var. <i>gnaphalifolium</i> )	1	
Volusia	Rugel's Pawpaw ( <i>Deeringothamnus rugelii</i> )	12	
GA	Bartow	Tennessee Yellow-eyed-grass ( <i>Xyris tennesseensis</i> )	5
	Columbia	Little Amphianthus ( <i>Amphianthus pusillus</i> )	5
		Merlin's-grass ( <i>Isoetes tegetiformans</i> )	6
	Floyd	Mohr's Barbara's-buttons ( <i>Marshallia mohrii</i> )	12
	Greene	Harperella ( <i>Ptilimnium nodosum</i> )	1
		Little Amphianthus ( <i>Amphianthus pusillus</i> )	4
		Merlin's-grass ( <i>Isoetes tegetiformans</i> )	1
Oglethorpe	Little Amphianthus ( <i>Amphianthus pusillus</i> )	1	
Whitfield	Tennessee Yellow-eyed-grass ( <i>Xyris tennesseensis</i> )	1	
KY	Boone	Running Buffalo Clover ( <i>Trifolium stoloniferum</i> )	5
	Bourbon	Running Buffalo Clover ( <i>Trifolium stoloniferum</i> )	4
	Clark	Running Buffalo Clover ( <i>Trifolium stoloniferum</i> )	6

State	County	Species	Number of Observations
	Fayette	Running Buffalo Clover ( <i>Trifolium stoloniferum</i> )	2
	Fleming	Short's Goldenrod ( <i>Solidago shortii</i> )	1
	Harrison	Running Buffalo Clover ( <i>Trifolium stoloniferum</i> )	1
	Jessamine	Running Buffalo Clover ( <i>Trifolium stoloniferum</i> )	1
	Kenton	Running Buffalo Clover ( <i>Trifolium stoloniferum</i> )	2
	Madison	Running Buffalo Clover ( <i>Trifolium stoloniferum</i> )	32
	Montgomery	Running Buffalo Clover ( <i>Trifolium stoloniferum</i> )	1
	Nicholas	Short's Goldenrod ( <i>Solidago shortii</i> )	6
	Robertson	Short's Goldenrod ( <i>Solidago shortii</i> )	5
	Woodford	Running Buffalo Clover ( <i>Trifolium stoloniferum</i> )	3
NC	Anson	Schweinitz's Sunflower ( <i>Helianthus schweinitzii</i> )	4
	Cabarrus	Schweinitz's Sunflower ( <i>Helianthus schweinitzii</i> )	4
	Clay	Green Pitcherplant ( <i>Sarracenia oreophila</i> )	2
	Davidson	Schweinitz's Sunflower ( <i>Helianthus schweinitzii</i> )	5
	Davie	Michaux's Sumac ( <i>Rhus michauxii</i> )	1
	Franklin	Michaux's Sumac ( <i>Rhus michauxii</i> )	1
	Gaston	Schweinitz's Sunflower ( <i>Helianthus schweinitzii</i> )	2
	Granville	Harperella ( <i>Ptilimnium nodosum</i> )	1
	Henderson	Reflexed Blue-eyed-grass ( <i>Sisyrinchium dichotomum</i> )	2
	Hoke	Michaux's Sumac ( <i>Rhus michauxii</i> )	2
	Mecklenburg	Schweinitz's Sunflower ( <i>Helianthus schweinitzii</i> )	4
	Montgomery	Schweinitz's Sunflower ( <i>Helianthus schweinitzii</i> )	13
	Moore	Chaffseed ( <i>Schwalbea americana</i> )	1
	Pender	Sulphur Sedge ( <i>Carex lutea</i> )	2
	Polk	Reflexed Blue-eyed-grass ( <i>Sisyrinchium dichotomum</i> )	6
	Randolph	Schweinitz's Sunflower ( <i>Helianthus schweinitzii</i> )	12
	Richmond	Michaux's Sumac ( <i>Rhus michauxii</i> )	4
	Robeson	Michaux's Sumac ( <i>Rhus michauxii</i> )	1
	Rowan	Schweinitz's Sunflower ( <i>Helianthus schweinitzii</i> )	2
	Rutherford	Reflexed Blue-eyed-grass ( <i>Sisyrinchium dichotomum</i> )	2
	Scotland	Canby's Dropwort ( <i>Oxypolis canbyi</i> )	1
		Michaux's Sumac ( <i>Rhus michauxii</i> )	5
	Stanly	Schweinitz's Sunflower ( <i>Helianthus schweinitzii</i> )	2
	Stokes	Schweinitz's Sunflower ( <i>Helianthus schweinitzii</i> )	4
	Union	Schweinitz's Sunflower ( <i>Helianthus schweinitzii</i> )	6
	Wake	Michaux's Sumac ( <i>Rhus michauxii</i> )	2
SC	Charleston	Chaffseed ( <i>Schwalbea americana</i> )	1
	Florence	Chaffseed ( <i>Schwalbea americana</i> )	2
	Greenville	Reflexed Blue-eyed-grass ( <i>Sisyrinchium dichotomum</i> )	1
	Hampton	Canby's Dropwort ( <i>Oxypolis canbyi</i> )	1
	Horry	Chaffseed ( <i>Schwalbea americana</i> )	1
	Lancaster	Little Amphianthus ( <i>Amphianthus pusillus</i> )	1
	Lee	Chaffseed ( <i>Schwalbea americana</i> )	1
	Orangeburg	Canby's Dropwort ( <i>Oxypolis canbyi</i> )	4
	Richland	Canby's Dropwort ( <i>Oxypolis canbyi</i> )	1
	Saluda	Harperella ( <i>Ptilimnium nodosum</i> )	3

State	County	Species	Number of Observations
	Sumter	Chaffseed ( <i>Schwalbea americana</i> )	1
	Williamsburg	Canby's Dropwort ( <i>Oxypolis canbyi</i> )	2
		Chaffseed ( <i>Schwalbea americana</i> )	21
	York	Little Amphianthus ( <i>Amphianthus pusillus</i> )	1
		Schweinitz's Sunflower ( <i>Helianthus schweinitzii</i> )	21
	TN	Cumberland	Cumberland False Rosemary ( <i>Conradina verticillata</i> )
Fentress		Cumberland False Rosemary ( <i>Conradina verticillata</i> )	1
Morgan		Cumberland False Rosemary ( <i>Conradina verticillata</i> )	5
Scott		Cumberland False Rosemary ( <i>Conradina verticillata</i> )	9
White		Cumberland False Rosemary ( <i>Conradina verticillata</i> )	1
Wilson		Spring Creek Bladderpod ( <i>Lesquerella perforata</i> )	20
<b>Total number of species observations with proximity (Southeast Region)</b>			<b>437<sup>a</sup></b>

<sup>a</sup> Some observations have presence in two or more counties. Thus, the total species observation count may be less than the sum for the individual counties.

**Table 10. Listed Plant Species in the Northeast Region with Proximity to Relevant Land Use: By State, County, and Species**

State	County	Species	Number of Observations
MD	Allegany	Harperella ( <i>Ptilimnium nodosum</i> )	1
	Queen Annes	Canby's Dropwort ( <i>Oxypolis canbyi</i> )	1
	Washington	Harperella ( <i>Ptilimnium nodosum</i> )	1
NJ <sup>a</sup>	Atlantic	Data-sensitive Species	--
		Knieskern's beaked-rush ( <i>Rhynchospora knieskernii</i> )	--
		Swamp pink ( <i>Helonias bullata</i> )	--
	Burlington	Data-sensitive Species	--
		Knieskern's beaked-rush ( <i>Rhynchospora knieskernii</i> )	--
		Swamp pink ( <i>Helonias bullata</i> )	--
	Camden	Data-sensitive Species	--
		Knieskern's beaked-rush ( <i>Rhynchospora knieskernii</i> )	--
		Swamp pink ( <i>Helonias bullata</i> )	--
	Cape May	Swamp pink ( <i>Helonias bullata</i> )	--
	Cumberland	Data-sensitive Species	--
		Swamp pink ( <i>Helonias bullata</i> )	--
	Gloucester	Swamp pink ( <i>Helonias bullata</i> )	--
	Middlesex	Swamp pink ( <i>Helonias bullata</i> )	--
	Monmouth	Knieskern's beaked-rush ( <i>Rhynchospora knieskernii</i> )	--
		Swamp pink ( <i>Helonias bullata</i> )	--
Morris	Swamp pink ( <i>Helonias bullata</i> )	--	
Ocean	Data-sensitive Species	--	
	Knieskern's beaked-rush ( <i>Rhynchospora knieskernii</i> )	--	
	Swamp pink ( <i>Helonias bullata</i> )	--	
Salem	Swamp pink ( <i>Helonias bullata</i> )	--	
VA	Augusta	Eastern Prairie White-fringed Orchid ( <i>Platanthera leucophaea</i> )	1
		Northeastern Bulrush ( <i>Scirpus ancistrochaetus</i> )	1
		Virginia Sneezeweed ( <i>Helenium virginicum</i> )	13
	Brunswick	Michaux's Sumac ( <i>Rhus michauxii</i> )	1
	Dinwiddie	Michaux's Sumac ( <i>Rhus michauxii</i> )	3
Nottoway	Michaux's Sumac ( <i>Rhus michauxii</i> )	2	
VT	Windham	Northeastern Bulrush ( <i>Scirpus ancistrochaetus</i> )	4
WV	Berkeley	Northeastern Bulrush ( <i>Scirpus ancistrochaetus</i> )	1
	Brooke	Running Buffalo Clover ( <i>Trifolium stoloniferum</i> )	1
	Morgan	Harperella ( <i>Ptilimnium nodosum</i> )	1
	Randolph	Running Buffalo Clover ( <i>Trifolium stoloniferum</i> )	1
<b>Total number of species observations with proximity (Northeast Region)</b>			<b>30 <sup>b</sup></b>

<sup>a</sup> Species observation data for New Jersey was in the form of presence by grid; no observation count is available.

<sup>b</sup> Some observations have presence in two or more counties. Thus, the total species observation count may be less than the sum for the individual counties.

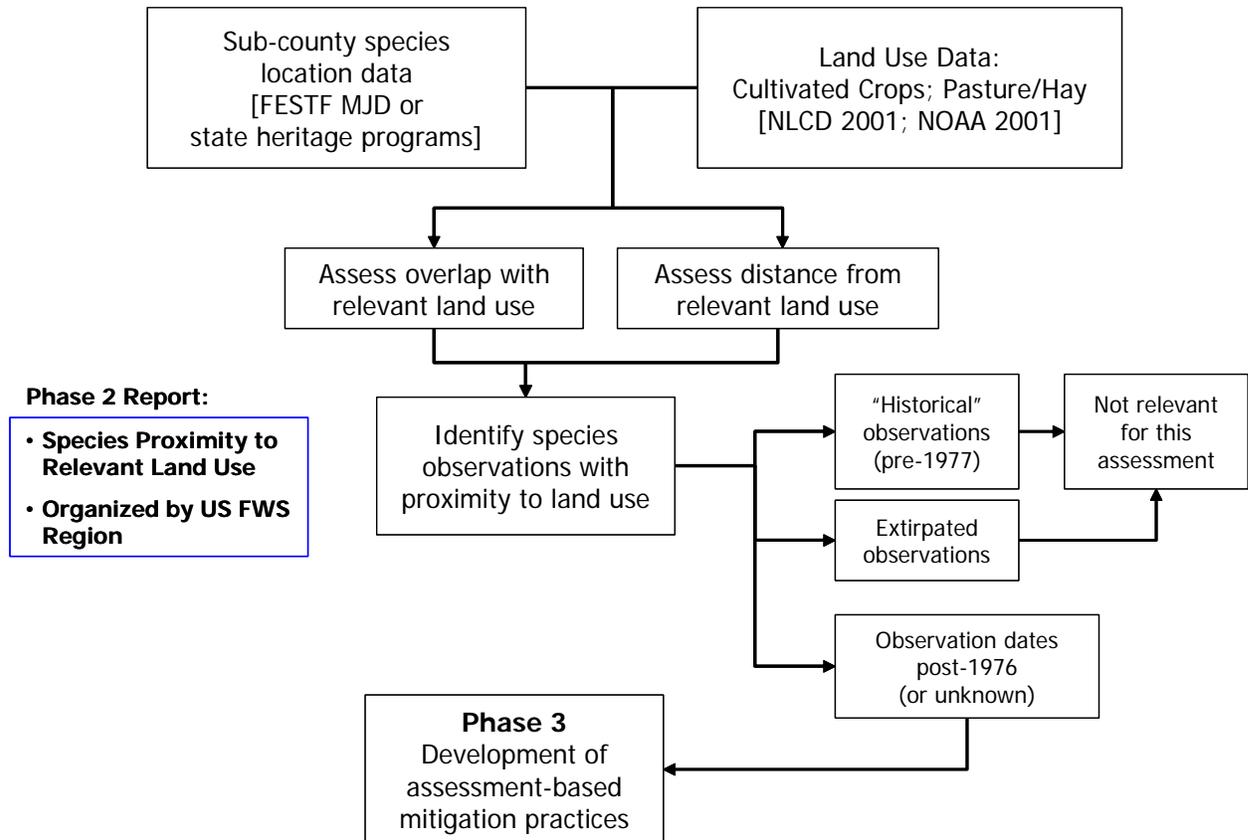
**Table 11. Listed Plant Species in the Mountain-Prairie Region with Proximity to Relevant Land Use: By State, County, and Species**

State	County	Species	Number of Observations
CO	Boulder	Ute Ladie's-tresses ( <i>Spiranthes diluvialis</i> )	7
	Larimer	Ute Ladie's-tresses ( <i>Spiranthes diluvialis</i> )	1
KS	Allen	Mead's Milkweed ( <i>Asclepias meadii</i> )	4
	Anderson	Mead's Milkweed ( <i>Asclepias meadii</i> )	24
	Bourbon	Mead's Milkweed ( <i>Asclepias meadii</i> )	6
	Crawford	Mead's Milkweed ( <i>Asclepias meadii</i> )	1
	Douglas	Mead's Milkweed ( <i>Asclepias meadii</i> )	18
		Western Prairie White-fringed Orchid ( <i>Platanthera praeclara</i> )	1
	Franklin	Mead's Milkweed ( <i>Asclepias meadii</i> )	13
	Jefferson	Mead's Milkweed ( <i>Asclepias meadii</i> )	3
	Johnson	Mead's Milkweed ( <i>Asclepias meadii</i> )	4
	Leavenworth	Mead's Milkweed ( <i>Asclepias meadii</i> )	8
		Western Prairie White-fringed Orchid ( <i>Platanthera praeclara</i> )	1
	Linn	Mead's Milkweed ( <i>Asclepias meadii</i> )	8
Miami	Mead's Milkweed ( <i>Asclepias meadii</i> )	23	
Neosho	Mead's Milkweed ( <i>Asclepias meadii</i> )	1	
MT	Beaverhead	Ute Ladie's-tresses ( <i>Spiranthes diluvialis</i> )	1
	Broadwater	Ute Ladie's-tresses ( <i>Spiranthes diluvialis</i> )	1
	Flathead	Spalding's Campion ( <i>Silene spaldingii</i> )	2
	Gallatin	Ute Ladie's-tresses ( <i>Spiranthes diluvialis</i> )	4
	Jefferson	Ute Ladie's-tresses ( <i>Spiranthes diluvialis</i> )	2
	Madison	Ute Ladie's-tresses ( <i>Spiranthes diluvialis</i> )	4
	Missoula	Water Howellia ( <i>Howellia aquatilis</i> )	13
NE	Hall	Western Prairie White-fringed Orchid ( <i>Platanthera praeclara</i> )	1
	Holt	Western Prairie White-fringed Orchid ( <i>Platanthera praeclara</i> )	1
	Lancaster	Western Prairie White-fringed Orchid ( <i>Platanthera praeclara</i> )	3
	Madison	Western Prairie White-fringed Orchid ( <i>Platanthera praeclara</i> )	2
	Otoe	Western Prairie White-fringed Orchid ( <i>Platanthera praeclara</i> )	4
	Pierce	Western Prairie White-fringed Orchid ( <i>Platanthera praeclara</i> )	3
	Seward	Western Prairie White-fringed Orchid ( <i>Platanthera praeclara</i> )	1
	Wheeler	Western Prairie White-fringed Orchid ( <i>Platanthera praeclara</i> )	1
UT	Duchesne	Ute Ladie's-tresses ( <i>Spiranthes diluvialis</i> )	3
	Emery	San Rafael Cactus ( <i>Pediocactus despainii</i> )	3
	Garfield	Ute Ladie's-tresses ( <i>Spiranthes diluvialis</i> )	1
	Tooele	Ute Ladie's-tresses ( <i>Spiranthes diluvialis</i> )	1
	Uintah	Ute Ladie's-tresses ( <i>Spiranthes diluvialis</i> )	8
	Utah	Ute Ladie's-tresses ( <i>Spiranthes diluvialis</i> )	6
	Wasatch	Ute Ladie's-tresses ( <i>Spiranthes diluvialis</i> )	3
<b>Total number of species observations with proximity (Mountain-Prairie Region)</b>			<b>190<sup>a</sup></b>

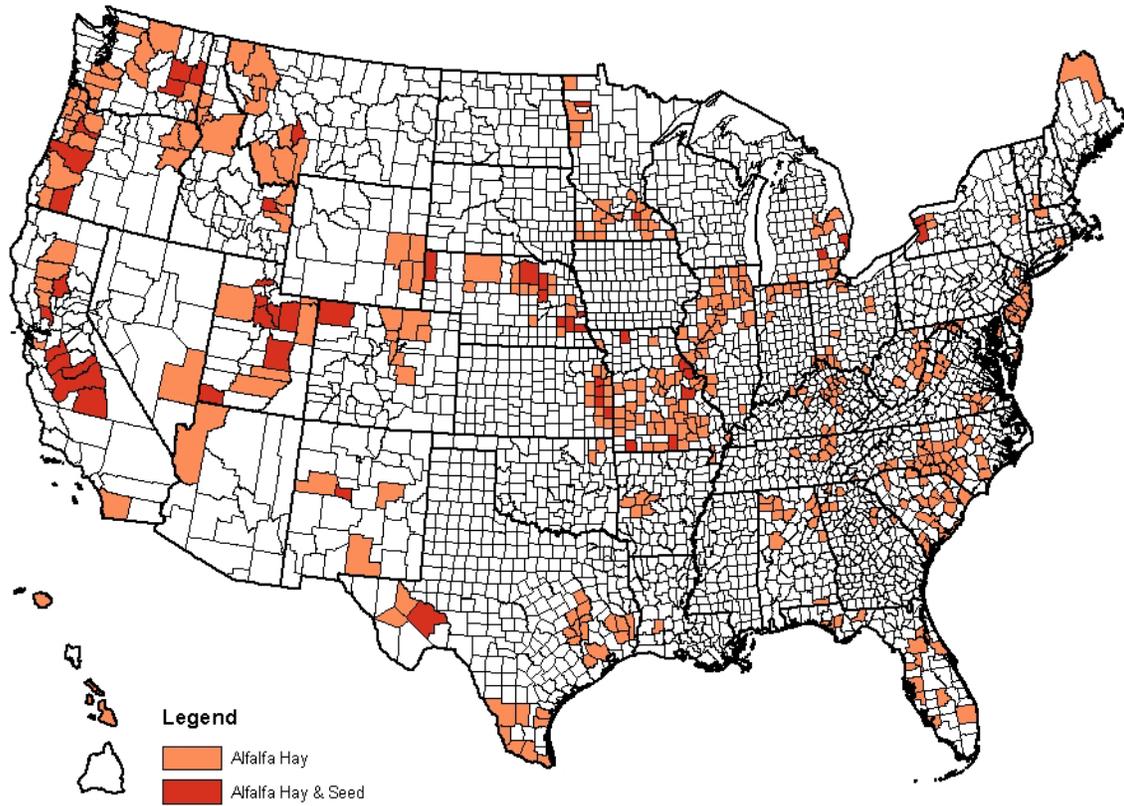
<sup>a</sup> Some observations have presence in two or more counties. Thus, the total species observation count may be less than the sum for the individual counties.

## 9. FIGURES

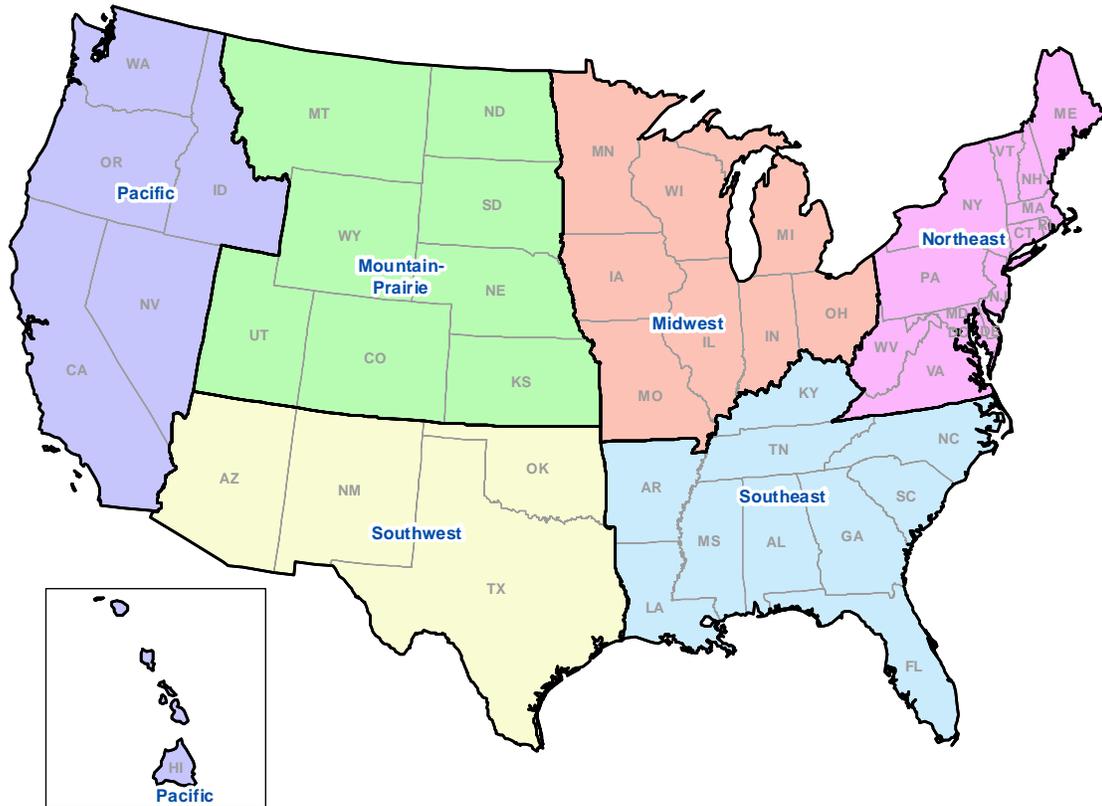
**Figure 1. Phase 2: Sub-County Proximity Assessment Process**



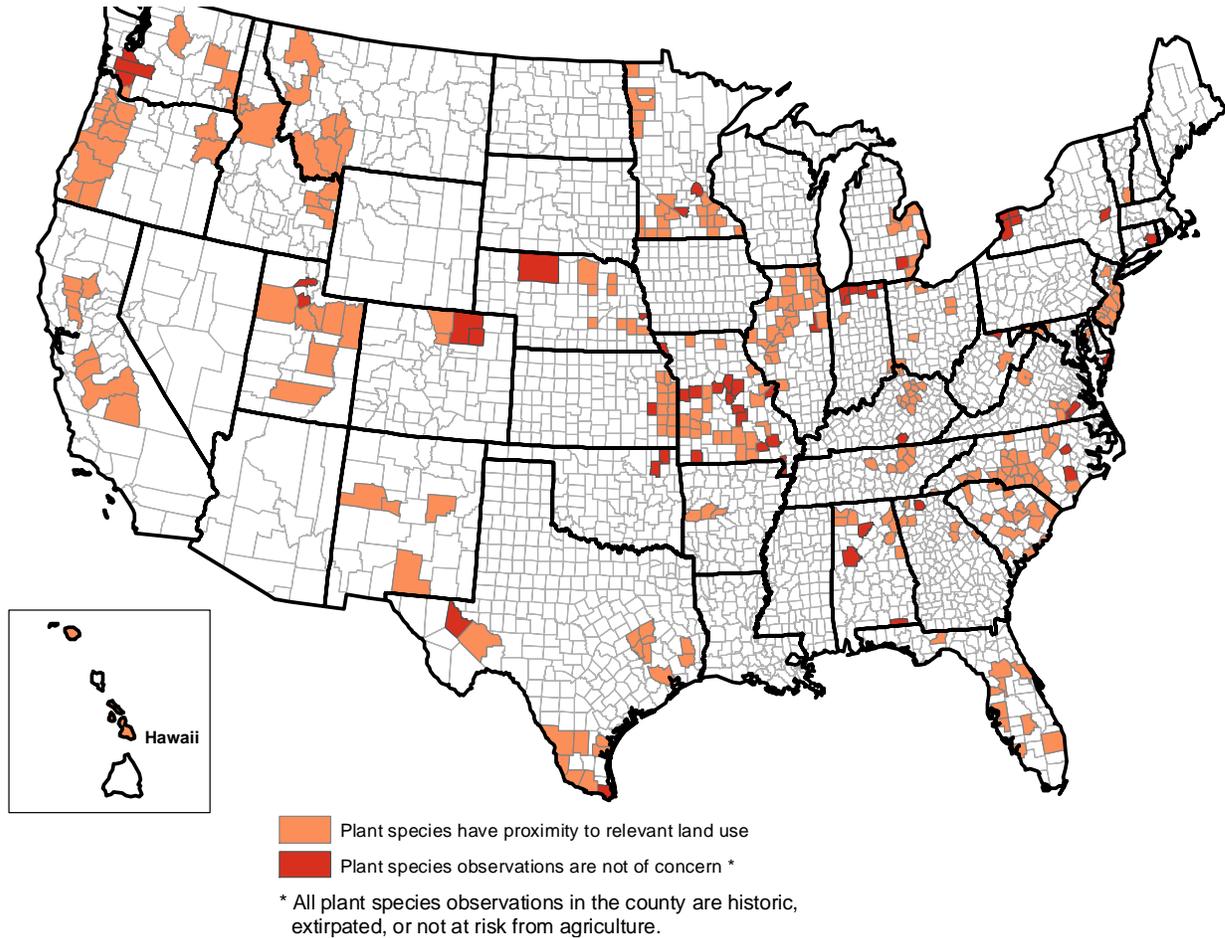
**Figure 2. U.S. counties with alfalfa production and listed plant species for which further analysis is required**



**Figure 3. Regions Used for the Glyphosate Endangered Plant Assessment Phase 2 Reports**



**Figure 4. U.S. counties with alfalfa production and listed plant species: Phase 2 Results**



## Appendix 1. AgDrift Model Description

Based on the Tier 1 endangered species assessment for glyphosate considering all taxa (Mortensen et al., 2008), it was determined that terrestrial and semi-aquatic plants are potentially at risk from aerial application of glyphosate at recommended label rates  $\geq 0.70$  lb glyphosate a.e./A. The regulatory spray drift model AgDrift® (Teske et al., 2002) was used to determine the distance between the edge of the application area and the nearest edge of the threatened or endangered species observation area that would be required to reduce the Estimated Environmental Concentration (EEC) from aerial application to a value that would result in a risk quotient (RQ) which is less than the Level of Concern (LOC).<sup>6</sup>

The lowest No Observed Effect Concentration (NOEC) from the glyphosate vegetative vigor study (Chetram and Lucash, 1994) was utilized as the toxicity endpoint for the RQ calculation. Radish and tomato were the most sensitive plant species in that study, with a NOEC for plant dry weight of 0.035 lb a.e./A. Since the LOC value for plants is 1, an acceptable RQ is any value less than 1. The EEC that is required to obtain an  $RQ < 1$  can then be calculated using equation (1):

$$\begin{aligned} EEC &= RQ * \text{Toxicity Endpoint} & (1) \\ EEC &< 1 * 0.035 \text{ lb a.e./A} \\ EEC &< 0.035 \text{ lb a.e./A} \end{aligned}$$

AgDrift (Version 2.04) was used to determine the distance between the closest edges of the application area and the threatened or endangered species area that would result in an  $EEC < 0.035$  lb a.e./A. The following steps were followed to use the model.

1. When the program opened, "Edit" was selected from the task bar at the top of the window. Then "Preferences" was selected.
2. From the "Preferences" window "Tier I Aerial" was selected in the "Starting Application Method" section. Under "Starting Mode" the default and only selection is "Agricultural". These settings will cause the model to open each time in the "Tier I Aerial Agricultural" Mode.
3. Also in the "Preferences" window in the "Units" section "English" was selected for display in units of feet, pounds, and acres.
4. If the model was not now in the Tier I Aerial Agricultural Mode (see lower right corner of window), in the drop down menu under "Tier" on the task bar "Tier I Aerial" was selected and the question posed was responded to by selecting "OK".
5. In the Tier I Aerial Agricultural Mode, the droplet size distribution was changed from the Default setting of "ASAE Fine to Medium" to "ASAE Medium to Coarse" or "ASAE Coarse to Very Coarse" based on Roundup herbicide label language that specifies using the largest droplet size possible.<sup>7</sup>

<sup>6</sup> An  $RQ < LOC$  results in a conclusion of low risk.

<sup>7</sup> Statement from the Roundup Weather MAX® Master Label (2006): "The most effective way to reduce drift potential is to apply large droplets. The best drift management strategy is to apply the largest droplets that provide sufficient coverage and control." The full text of the application guidance is included as Appendix 9 of the Phase 1 county-level analysis report (Priester et al., 2007).

7. In the resulting window, the “Terrestrial Field Description” section of the window was set to “Point Deposition”.
8. In the “Tier I Settings” section of the window, “1.55” lb/A or “0.77” lb/A was entered as the “Active Rate lb/acre”.
9. In the “Calculations” section of the window “Initial Average Deposition” was set to “0.035 lb/acre”.
10. The “Calc” button at the bottom of the window was selected with a click of the mouse, and the results of the calculation were displayed in the window.
11. In the “Calculations” section of the window, in the box “Distance to Point or Area Average From Edge of Application Area”, a distance in feet appeared. This distance is the distance required at the given application rate between the application area and the area containing the species observation to obtain a concentration equal to the LOC. Any distance greater than this will result in an acceptable RQ. Table A-1a indicates the distances required for different application rates and droplet sizes.

**Table A-1a. Distance as calculated by the AgDrift model required between application area and species observation area to obtain an acceptable Risk Quotient**

Glyphosate Aerial Use Rate (lb a.e./acre)	Buffer Distance (feet)	
	Droplet size distribution	
	Medium - Coarse	Coarse- Very Coarse
1.55	>219.81	>147.64
0.77	>124.67	>82.02

a.e.: glyphosate acid equivalents  
 Values as produced by AgDRIFT.

For the maximum aerial application rate of 1.55 lb a.e./A and a medium to coarse droplet size the separation distance required to obtain an RQ <1 is >219.8 feet. For the purposes of the Phase 2 assessment, a distance of 250 feet was considered from the edges of the species observation area when assessing potential overlap of a relevant land use and the species observation area. This distance is sufficient so that threatened or endangered plant species at the edge of the observation area would not be anticipated to be affected by aerial application of glyphosate.